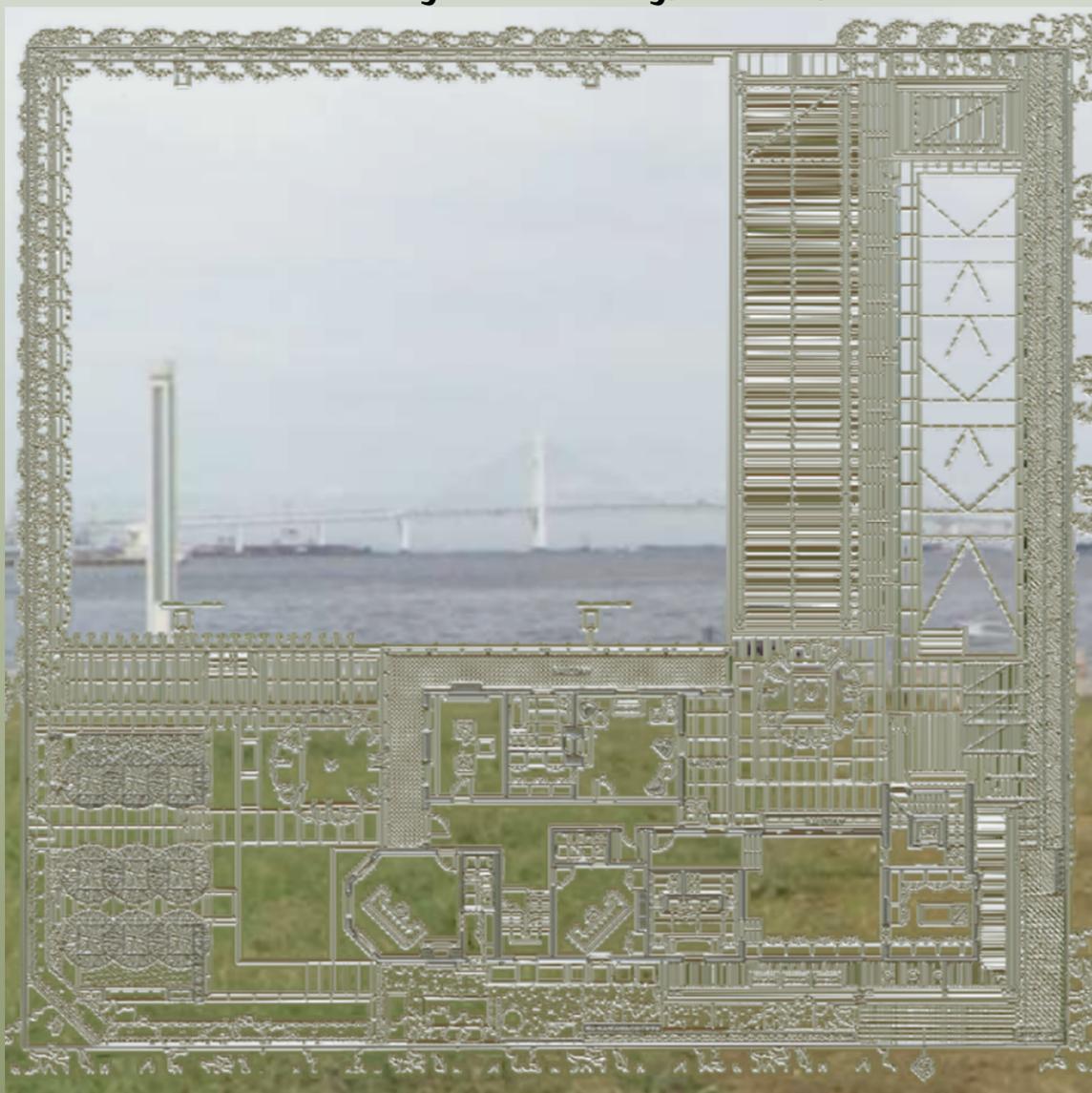


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in Management and Technovation**

December 10–11, 2021

Hanoi University of Industry, Hanoi, Vietnam



**Vu Dinh Khoa, Shivani Agarwal,
Gloria Jeanette Rincon Aponte, Nguyen Thi Hong Nga,
Vijender Kumar Solanki, Ewa Ziemba (eds.)**



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THE 2021 International Conference on Research in Management and Technovation (ICRMAT), held from December 10 to December 11 at the Hanoi University of Industry (HaUI), Vietnam, was an enormous success. This was also the first time the ICRMAT had been held in Vietnam.

Prior to this, the first ICRMAT was held in India, establishing an international forum that brought together researchers and executive practitioners in the fields of Management, Accounting and other related areas to the topic of the conference. At the ICRMAT 2021, we are yet again pleased to welcome the participation in scientific events, with the presence of several prestigious researchers, who put forth ideas on new changes and development in the field of business administration, along with emerging trends in economic research in management, tourism, marketing, logistics, human resource management, finance and banking, and accounting. All in all, this is an ideal forum to present your own ideas and achievements to researchers globally.

The ICRMAT 2021 has attracted the attention of the research community. In the context of complicated Covid-19 developments globally, we are truly delighted to have still received a large number of papers. With nearly 100 manuscripts from many countries around the world such as Indonesia, China, Indonesia, Poland, China, Thailand, Malaysia, India and Vietnam sent to ICRMAT, 54 papers finally approved after the rigorous review rounds to presentation in conference. ICRMAT 21 gathered quality research articles that used scientific and appropriate research methods. The results have made many new contributions, both in theory and practice. The topics presented at the seminar by thematic sessions were engaging and stimulated plenty of discussion from the participating scientists. The content under the topics of human resource management, production management and marketing deals with issues related to the role of empowered leaders in the emerging economy, human resource development in times of crisis, sustainable development and social responsibility in consumer behavior. The topics of accounting, finance and banking also provide interesting discussions on corporate governance and cash flow management; predicting bankruptcy, the mediating role of financial resources in the relationship between entrepreneurship and business performance; the factors affecting the liquidity of banks or the effect of diversification on the performance of commercial banks, and many other contents related to the topic. As for business administration and economics in the context of the Covid-19 pandemic, great attention from researchers was received by a series of articles and presentations at the conference. Typically, this content includes research topics on the impact of the Covid-19 epidemic on logistics businesses; India's advertising costs amid Covid 19; customer satisfaction in the hotel sector in addition to the content related to the issues of social responsibility in business administration and leadership capacity of small and medium enterprises.

In order to make ICRMAT 2021 a success, we appreciate the professional cooperation and support between Hanoi University of Industry and those involved during the preparation of the conference:

- Sincere thanks for the attention, support and close guidance of the Management Board of Hanoi University of Industry, Assoc. Prof. Tran Duc Quy - Rector; Assoc. Prof. Dr. Pham Van Bong - Vice Rector; Dr. Bui Thi Ngan - Vice Rector- Standing deputy chief; and Dr. Nguyen Anh Tuan - Vice Rector; Organizing committee and functionality departments of the HaUI.
- Sincere thanks for the companionship, support and sharing of both organizational and professional experience from Prof. Marcin Paprzycki, Systems Research Institute, Polish Academy of Sciences, Poland; Prof. Dr. Vijender Kuma Solanki and Dr. Shivani Agarwal, India.
- Sincere thanks to the keynote speakers Dr. Monika Eisenhardt, Asso. Prof. Trung Thanh Le, Mr. Sharath Martin, Dr. Le Thai Phong, Dr. Shivani Agarwal and Asso. Prof. Anurika Vaish - for sharing about emerging issues in management and economics.
- Sincere thanks to session chairs Dr. Trung Thanh Le, Dr. Nguyen Thi Hong Nga, Dr. Vu Thi Thanh Binh, Ms Kumud Sharma, Dr Le Thai Phong, Dr Dang Ngoc Hung and Dr Tran Manh Dung for sharing their knowledge with the authors.
- Sincere thanks to the participation of all local and international scientists, who have expressed their interests and submitted articles, contributing greatly to the success of the conference.
- Sincere thanks to the feedback and discussions from researchers and business managers at the conference, who were extremely active and professional in their work to make the conference a great success.

With deep gratitude and excitement to more and more opportunities to share knowledge, on behalf of the organizers, we look forward to continuing to have your cooperation and companionship in the future.

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An AHP-based Decision Support System for Personnel Selection for Manager Position in Businesses

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Abstract—Humanity is one of the most important resources for businesses. Because, with human resources, the data of the institution can be obtained and information can be produced by processing. Thus, human resources make the business a learning and dynamic organization and ensure its continuity. In enterprises, personnel selection (in terms of quantity or quality) is carried out within the scope of Human Resources Management. This selection process usually takes place when a group of decision makers evaluates the candidates according to some criteria and their own opinions. However, this situation prevents an objective and fair selection. For this reason, in this study, a decision support system (DSS) has been developed by using the Analytical Hierarchy Process (AHP), one of the Multi-Criteria Decision Making (MCDM) methods, to ensure objectivity and to select the most suitable personnel for the job description. The said DSS provides the selection of the marketing manager among the personnel working in an enterprise. For this, the 10 employees working in the marketing department of the enterprise for the longest time were taken into account. When the results are examined, it is seen that the most qualified personnel can be selected successfully in cases where customer satisfaction, performance value, and number of projects are prioritized.

Index Terms—Personnel Selection, Human Resources Management, Analytical Hierarchy Process, Decision Support Systems, Business.

I. INTRODUCTION

TODAY, the survival of businesses depends on keeping up with the competitive environment and using their resources effectively. Human resource is one of these resources. It is necessary to manage it in order to benefit from the resource in question and to use it effectively. In this context, human resources management is the dynamic and systematic management of human resources in a way that will increase their contribution to the business. Businesses need to analyze their conditions and situations, make appropriate workforce planning, and integrate this planning into their management systems. According to this planning, finding the right employees for the desired positions is described as a "personnel selection problem" [1].

Personnel selection is the selection of the most suitable candidate for the job from the candidate pool formed by qualified candidates. According to another definition, personnel selection is the management process in which the candidate personnel potential created at the end of the personnel recruitment process is evaluated according to the nature of the job and the decision is made whether to hire candidates or not [2]. From the point of view of the company, if the right person is not recruited for the right job, the de-

crease in productivity, conflict, loss of work day or increase in work accidents and ultimately dismissal will be inevitable due to incompatibility between people [3]. Wrong decisions made in personnel selection and subsequently hiring unqualified candidates create a serious problem for the institution. However, this misbehavior may cause the institution to lose important values such as money, time, business, reputation and customers [4]. Personnel selection problem is a decision-making problem like other selection problems. Decision-making problems like this pose significant risks in ensuring the accuracy of the solution, as it is affected by personnel judgment [2]. For a correct decision-making process, the problem must be well understood and examined in detail. For this, information about all the details of the problem should be reached and experienced. The easiest and most effective way to do this is to benefit from DSS [5].

In recent years, the use of DSS has become very common in the decision-making process of decision makers. DSS, which has been developed and made available to decision makers, enables end-users to easily access data inside or outside organizations or institutions. In this way, fast and timely access to the needed information increases the efficiency and the quality of the decisions taken by helping organizations make decisions on time [6]. Decisions made during personnel selection have a complex structure and are often made in an uncertain environment. Decision makers may have to examine conflicting criteria simultaneously. It may be difficult to evaluate personnel candidates using exact numbers. At this point, MCDM methods come to the fore. This method, especially in the face of uncertainty in the decision-making point of enterprises, helps them to solve the decision-making problem to a large extent [1]. MCDM is a difficult task to carry out with tools, methods and algorithms because it is a human functional mandate. By determining the criteria related to the problem, the measurement differences between the criteria, if any, are tried to be eliminated [2].

MCDM is a method used to determine the most suitable solution according to the selected criteria, when there are many conflicting criteria. The method allows us to analyze the factors, to rank the alternatives according to the results obtained, to compare, to classify and to choose the best alternative, in case of considering a large number of factors that are independent of each other and expressed in different ways. MCDM methods have been successfully applied in many areas. Many techniques are used such as Electre, Fac-

TABLE I. DATASET

Column Name	Description
Satisfaction_level	The average service satisfaction of the customers served by the personnel.
Last_evaluation	The result of the personnel's last performance evaluation
Number_project	The number of marketing projects implemented by the personnel
Time_spend_company	The number of days per week that the personnel does not work in the home-office and comes to the workplace

TABLE II. DATA OF EMPLOYEES

Personnel No	K1 (Satisfaction_level)	K2 (Last_evaluation)	K3 (Number_project)	K4 (Time_spend_company)
1	0.4	0.54	2	3
2	0.84	0.85	4	6
3	0.11	0.77	6	4
4	0.11	0.87	6	4
5	0.84	0.88	4	5
6	0.39	0.5	2	3
7	0.11	0.91	6	4
8	0.45	0.56	2	3
9	0.37	0.52	2	3
10	0.4	0.52	2	3

tor Score Method, Analytical Network Process, AHP etc. which uses quantitative and qualitative data in calculations that take into account different performance criteria and weights [7]. In this context, the AHP technique was also used in the study. Because AHP is a decision-making method used in solving complex problems involving many criteria. Thanks to AHP, decision makers can incorporate both their objective and subjective thoughts into the decision process by logically combining their knowledge, experiences and intuitions [8].

In this study, it is aimed to select the marketing manager by using the AHP method, which is one of the MCDM methods, to decide to recruit and select more objective and more accurate personnel in the private sector as an alternative to traditional personnel selection methods. All details of the study are given in the following sections.

II. MATERIALS AND METHODS

In this section, the the materials and methods of the study are given. The study aims to create a DSS that can effectively select the most authoritative and correct personnel among the personnel (manager position) that can be used in the authorization process in the enterprises. The AHP method, which is one of the MCDM techniques, was used in the study.

A. Dataset

The dataset was obtained from Kaggle with the name "HR_comma_sep.csv". The data in question were collected from a private enterprise registered by the Public Relations

Department. The data covers all departments of the business and since it is aimed to select the marketing manager in this study, the lines other than the marketing department were not used in the study. The importance levels of the criteria used in personnel selection were determined based on the data of the employees in the marketing department. The columns that cannot be used in the study were removed in order to make a sound decision, and 4 criteria were taken into account, namely the level of satisfaction, the final evaluation score, the number of projects, and the time spent in the company (Table I).

Information about 450 employees remained when irrelevant data were removed from the dataset created by the Public Relations Department. They were evaluated as alternative personnel to be used in this study, the first 10 of the marketing department employees. It is aimed to determine as the marketing manager the person with the highest score by ranking these employees. The decision process was carried out using the AHP method. In Table II, the information of 10 personnel involved in the sorting process is given.

B. Obtaining Criterion Weights

The first step in applying the AHP method is to create the Comparison Matrix (Pair Wise). The creation and calculation of the matrices were carried out using the MS Excel program. There are a total of 4 columns in the created matrix, one for each criterion. The Comparison Superiority Matrix shows the comparison of criteria among themselves. The general rule is that the diagonal is "1". A scale of 1-5 was used when making comparisons. "1" means I totally

TABLE III. NORMALIZED BINARY COMPARATIVE SUPERIORITY MATRIX

	Satisfaction_level	Last_evaluation	Number_project	Time_spend_company
	C1	C2	C3	C4
C1	0,46	0,62	0,31	0,38
C2	0,15	0,21	0,46	0,25
C3	0,23	0,07	0,15	0,25
C4	0,15	0,10	0,08	0,13

disagree, while “5” means I totally agree. In the part above the diagonal, starting from the first cell of the second column, the criteria are compared according to their level of importance. The part under the diagonal is formed by dividing the above values by 1. After the Binary Comparative Superiority Matrix called A matrix was created and column totals were taken, the normalization process was performed. The second case of matrix A after the normalization process is given in Table III.

After the matrix was normalized, criterion weights were found. For this, the rows in the normalized matrix were summed one by one and the results were divided by the number of criteria. In this study, since the number of criteria is 4, the row totals are divided into 4. The criterion weights for each criterion are given in Table IV.

TABLE IV. CRITERION WEIGHTS

Criterion Number	Criterion Name	Criterion Weight
C1	Satisfaction_level	0,44
C2	Last_evaluation	0,27
C3	Number_project	0,18
C4	Time_spend_company	0,11

After the criterion weights are found, it is necessary to test the consistency of these values and the rate of giving correct results. Randomness analysis was used to test the consistency ratio. The $A. w = \lambda_{max}. w$ formula was used to test the accuracy of the criterion weights. That is, the numbers in the A matrix (the numbers in the first matrix created) are multiplied by the criterion weight of the relevant column. After the multiplications were completed, the values in each row were summed. Table V shows the final state and total values of the matrix.

TABLE V. THE MULTIPLICATION AND SUM OF "A" MATRIX AND CRITERION WEIGHTS

	Satisfaction_level	Last_evaluation	Number_project	Time_spend_company	Total
	C1	C2	C3	C4	
C1	0,44	0,80	0,35	0,34	1,93
C2	0,15	0,27	0,53	0,23	1,18
C3	0,22	0,09	0,18	0,23	0,72
C4	0,15	0,13	0,09	0,11	0,48

First of all, the criterion weight of the criterion is divided by the total values of the criterion in Table 4 in order to find out whether the criterion weights are consistent, and after, the average of the 4 criteria is taken. The consistency Index value was found to calculate the consistency. In the study, the Consistency Index value was obtained as 0.0861053 when 4 was subtracted from the lambda max value, which was found to be 4.258316, and divided by 3.

Finally, while determining the consistency ratio, randomness index criteria were used to determine how many the Consistency Index should be divided. Since the Randomness index, which varies according to the number of criteria, is 0.882 for 4 criteria, the Consistency index value is divided by 0.882 and the value of 0.0976251 is obtained. Since this value is less than 0.10, it can be said that the weights of the 4 criteria used in the study are consistent. Consistency of the criteria values ensures correct results in ordering the personnel. Therefore, the criteria weight values given in Table IV are usable and consistent.

C. Getting Weights of Personnel Data

The same process should be applied to 10 alternative personnel after the weights of the criteria are found. The data of each employee was evaluated under the heading of each criterion, respectively. By taking the diagonals as “1” again, pairwise comparison matrices are started to be formed.

The process of examining the personnel data according to the criteria started with the first criterion, the satisfaction criterion, and the personnel data were grouped and sorted within itself. The same values were accepted as a single number and the operation was carried out, and “1” was written in the cells where they coincided with each other. After grouping, the numbers were sorted from largest to smallest and started from the line of the relevant criterion. The largest value is given as “1” and the number of values after grouping is written in the relevant cells up to that number.

TABLE IX. PERSONNEL DECISION MATRIX BY NORMALIZED NUMBER OF DAYS CRITERIA

P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	Average
0,06	0,07	0,05	0,05	0,05	0,06	0,05	0,06	0,06	0,06	0,05
0,22	0,27	0,29	0,29	0,32	0,22	0,29	0,22	0,22	0,22	0,26
0,11	0,09	0,10	0,10	0,08	0,11	0,10	0,11	0,11	0,11	0,10
0,11	0,09	0,10	0,10	0,08	0,11	0,10	0,11	0,11	0,11	0,10
0,17	0,13	0,19	0,19	0,16	0,17	0,19	0,17	0,17	0,17	0,17
0,06	0,07	0,05	0,05	0,05	0,06	0,05	0,06	0,06	0,06	0,05
0,11	0,09	0,10	0,10	0,08	0,11	0,10	0,11	0,11	0,11	0,10
0,06	0,07	0,05	0,05	0,05	0,06	0,05	0,06	0,06	0,06	0,05
0,06	0,07	0,05	0,05	0,05	0,06	0,05	0,06	0,06	0,06	0,05
0,06	0,07	0,05	0,05	0,05	0,06	0,05	0,06	0,06	0,06	0,05

TABLE X. AVERAGES OF PERSONNEL BY CRITERIA

	K1 (Satisfaction_level)	K2 (Last_evaluation)	K3 (Number_project)	K4 (Time_spend_company)
Personnel 1	0,10	0,04	0,05	0,05
Personnel 2	0,23	0,11	0,10	0,26
Personnel 3	0,03	0,08	0,17	0,10
Personnel 4	0,03	0,15	0,17	0,10
Personnel 5	0,23	0,21	0,10	0,17
Personnel 6	0,07	0,02	0,05	0,05
Personnel 7	0,03	0,29	0,17	0,10
Personnel 8	0,15	0,05	0,05	0,05
Personnel 9	0,04	0,03	0,05	0,05
Personnel 10	0,10	0,03	0,05	0,05

III. RESULTS & DISCUSSION

Although the criteria weight values are fixed, choosing which of the criteria in the application is more important varies from person to person. The result obtained when the first criterion, "customer satisfaction", is placed in the first place in priority is given in Table XII.

As can be seen in Table XII, the personnel who can be concluded to be the most qualified in cases where the "customer satisfaction" criterion is in the first place is Personnel 2 with a rate of 18.86%. Personnel in the last place is Personnel 9 with 4.58%.

The result when the second criterion, the "performance evaluation" criterion, is put in the first place in priority, is given in Table XIII.

As can be seen in Table XIII, the personnel who can be concluded to be the most qualified in cases where the performance value criterion is in the first place is Personnel 2 with a rate of 19.64%. Personnel in the last place is Personnel 9 with a rate of 4.65%. The result when the number of projects, which is the third criterion, is put first in priority, is given in Table XIV.

TABLE XI
DISPLAY OF WEIGHTS OF PERSONNEL BY CRITERIA IN DECIMAL AND PERCENTAGE

	Decimal Notation	Percentage Notation
Personnel 1	0,070089	7,01%
Personnel 2	0,174937	17,49%
Personnel 3	0,075072	7,51%
Personnel 4	0,09486	9,49%
Personnel 5	0,192656	19,27%
Personnel 6	0,049808	4,98%
Personnel 7	0,132125	13,21%
Personnel 8	0,097251	9,73%
Personnel 9	0,041871	4,19%
Personnel 10	0,066776	6,68%

TABLE XII. OUTPUT WHEN "SATISFACTION_LEVEL" IS PRIORITY CRITERIA

(C1) Satisfaction_level: 1 (C2) Last_evaluation: 2 (C3) Number_project: 3 (C4) Time_spend_company: 4									
Results									
%5.32	%18.86	%10.95	%12.07	%16.28	%4.71	%14.33	%5.96	%4.58	%5.16
Personnel 1	Personnel 2	Personnel 3	Personnel 4	Personnel 5	Personnel 6	Personnel 7	Personnel 8	Personnel 9	Personnel 10
0.40	0.84	0.11	0.11	0.84	0.39	0.11	0.45	0.37	0.40
0.54	0.85	0.77	0.87	0.88	0.50	0.91	0.56	0.52	0.52
2	4	6	6	4	2	6	2	2	2
3	6	4	4	5	3	4	3	3	3

TABLE XIII. OUTPUT WHEN "LAST_EVALUATION" IS PRIORITY CRITERIA

(C1) Satisfaction_level: 2 (C2) Last_evaluation: 1 (C3) Number_project: 3 (C4) Time_spend_company: 4									
Results									
%5.71	%19.64	%10.62	%11.29	%16.41	%5.03	%12.64	%6.61	%4.65	%5.61
Personnel 1	Personnel 2	Personnel 3	Personnel 4	Personnel 5	Personnel 6	Personnel 7	Personnel 8	Personnel 9	Personnel 10
0.40	0.84	0.11	0.11	0.84	0.39	0.11	0.45	0.37	0.40
0.54	0.85	0.77	0.87	0.88	0.50	0.91	0.56	0.52	0.52
2	4	6	6	4	2	6	2	2	2
3	6	4	4	5	3	4	3	3	3

TABLE XIV. OUTPUT WHEN "NUMBER_PROJECT" IS PRIORITY CRITERIA

(C1) Satisfaction_level: 2 (C2) Last_evaluation: 3 (C3) Number_project: 1 (C4) Time_spend_company: 4									
Results									
%5.53	%19.82	%8.99	%10.93	%18.4	%4.49	%14.81	%6.61	%4.28	%5.25
Personnel 1	Personnel 2	Personnel 3	Personnel 4	Personnel 5	Personnel 6	Personnel 7	Personnel 8	Personnel 9	Personnel 10
0.40	0.84	0.11	0.11	0.84	0.39	0.11	0.45	0.37	0.40
0.54	0.85	0.77	0.87	0.88	0.50	0.91	0.56	0.52	0.52
2	4	6	6	4	2	6	2	2	2
3	6	4	4	5	3	4	3	3	3

As seen in Table XIV, the personnel who can be concluded to be the most qualified in cases where the number of projects criterion is in the first place is Personnel 2 with a rate of 19.82%. Personnel in the last place is Personnel 9 with a rate of 4.28%. Table XV gives the result when the fourth criterion, the number of days spent in the company, is put first in priority.

As seen in Table XV, in cases where the number of days spent in the company is the first criterion, the most qualified

personnel is Personnel 7 with a rate of 17.4%. Personnel in the last place is Personnel 9 with a rate of 4.28%. Since the number of criteria is 4, 4! (factorial), that is, there are 24 alternative possibilities.

IV. CONCLUSION AND RECOMMENDATIONS

In this study, a decision support system that selects personnel for the Manager position was developed using AHP, one of the MCDM methods. The dataset required for per-

TABLE XV. OUTPUT WHEN "Time_spend_company" IS PRIORITY CRITERIA

(C1) Satisfaction_level: 2 (C2) Last_evaluation: 3 (C3) Number_project: 4 (C4) Time_spend_company: 1									
Results									
%5.53	%13.91	%11.58	%13.52	%15.81	%4.49	%17.4	%6.61	%4.28	%5.25
Personnel 1	Personnel 2	Personnel 3	Personnel 4	Personnel 5	Personnel 6	Personnel 7	Personnel 8	Personnel 9	Personnel 10
0.40	0.84	0.11	0.11	0.84	0.39	0.11	0.45	0.37	0.40
0.54	0.85	0.77	0.87	0.88	0.50	0.91	0.56	0.52	0.52
2	4	6	6	4	2	6	2	2	2
3	6	4	4	5	3	4	3	3	3

sonnel selection was obtained from Kaggle. Criteria such as customer satisfaction, final performance evaluation, number of projects and number of days spent in the company were used. The characteristics sought in personnel and the order of importance of these features may be different for each business. Although it seems that the employer makes the decision, since the AHP method, which is one of the MCDM methods, was used in this study, it can be said that objective judgments have a share in the selection of personnel as well as subjective. In other words, although the user makes the order of importance, the weights of the criteria and alternative personnel are ensured to maintain their real importance. Therefore, decisions with both objective and subjective dimensions could be taken. Although the impact of the criteria in the selection of personnel is different from each other, this difference can provide an advantage in choosing the most suitable marketing manager by adapting to the needs of the private enterprise where personnel will be recruited.

When the results are examined, it is seen that the most qualified personnel are Personnel 2 in cases where satisfaction_level, last_evaluation and number_project are prioritized. It would be a good decision for an employer who cares about these criteria to choose Personnel 2. When the alternatives are examined in general, it is seen that Personnel 2 has the highest score and Personnel 9 has the lowest score.

Finally, more detailed information on the personnel can be obtained by selecting a different dataset. Names and even photos of personnel can be added, criteria can be increased. Gender, age, graduated school, work experience, etc. factors can be included in the decision. This study is expected to set an example for AHP, one of the MCDM techniques.

REFERENCES

- [1] Öztürk, F, Kaya, G. (2020). Bulanık Vikor ile Personel Seçimi: Otomotiv Yan Sanayinde Uygulama. Gazi Üniversitesi Fen Bilimleri Dergisi Part C: Tasarım ve Teknoloji, 8 (1), 94-108. DOI: 10.29109/ gu-jsc.595288.
- [2] Erokutan, B. (2016). Mavi yakalı personel seçiminde çok kriterli karar verme yöntemlerinin kullanılması ve bir uygulama (Master's thesis, Bilecik Şeyh Edebali Üniversitesi, Sosyal Bilimler Enstitüsü).
- [3] Demirkol, Ş., & Ertuğral, S. M. (2007). İşletmelerde Personel Seçiminde Kullanılan Teknikler ve Analizler. Sosyal Bilimler Dergisi, (2).
- [4] Acer, A. & İnci, H. (2020) Personel Seçimi Sürecinin AHP Tabanlı MOORA Yöntemi ile Değerlendirilmesi: Liman Saha Operasyon Elemanı Seçimi Üzerine Bir Uygulama. OPUS Uluslararası Toplum Araştırmaları Dergisi, 16(29 Ekim Özel Sayısı), 3689-3713.
- [5] Koç, E., Şengül, Y. A., Özkaya, A. U., & Gökçe, B. (2012). Klinik karar destek sistemleri kullanımına yönelik bir araştırma: Acıbadem Hastanesi örneği. IX. Ulusal Tıp Bilişimi Kongresi, Sağlık Bilişimi'nde İnovasyon: 2012-Bildiriler, 66-67.
- [6] Aslan, V., & Yılmaz, G. (2010). Karar destek sistemlerinin kullanımı için uygun bir model geliştirilmesi. Journal of Aeronautics and Space Technologies, 4(4), 75-82.
- [7] Akin, N. G. (2016). Personel seçiminde çok kriterli karar verme: Bulanık TOPSIS uygulaması. İşletme Araştırmaları Dergisi, 8(2), 224-254.
- [8] Öztürk, D., & Keleş, M. K. (2020). AHP ve TOPSIS Yöntemleri Kullanılarak Motorlu Kurye Seçimi: İlaç Sektöründe Bir Uygulama. Manisa Celal Bayar Üniversitesi Sosyal Bilimler Dergisi, 18(2), 275-291.

Fostering employee loyalty: role of empowerment leadership, trust, commitment and satisfaction

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Abstract—Recently, the employee loyalty is among the most important issues for the firms, especially in the context of Covid-19 that cause a lot of serious problems for all society and firms. The main aim of this research is to link the empowerment leadership and employee loyalty with the mediating effects of employee trust, commitment and satisfaction. To reach the end, this research applied both qualitative and quantitative method in the context of market officer from animal feed products in Thanh Hoa, Vietnam. Finally, 220 valid questionnaires collected via a questionnaire survey were analyzed applying structural equation modelling with Amos software. The results showed that empowerment leadership has a strong influence on employee loan this research ltd. Moreover, this leadership style stimulates employee trust, commitment and satisfaction. Besides, employee commitment has a positive effect on employee loyalty.

Index Terms—Empowerment leadership, employee behavior, employee loyalty, employee commitment, employee satisfaction

I. INTRODUCTION

MANAGEMENT, after all, is the management of people because the success or failure of a firm depends greatly on the human factor, and people are the subject of all activities in the firm. Therefore, business administration is considered as science and art in using human resources. However, there are many businesses that are still limited in human resource management, so they have not fully exploited the capacity of employees. There are many factors that influence this issue and leadership style is one of them.

Previous studies have shown that leaders play a very important role in bonding, promoting loyalty and willingness to devote, stick with, and awaken the potential of employees. Besides, leaders build a strong team together and stimulate subordinates to trust each other when they are facilitated to gain more rights [1]. These studies highlight the role of internal marketing in businesses, that is, businesses not only satisfy external customers but also internal customers - employees to promote positive behaviors of employees[2].

Many studies have shown that the empowerment leadership style enhances the meaning of work, provides employees with autonomy and self-determination, demonstrates the manager's belief in the employee's motivation and makes a difference in job results by promoting the conscious influence of subordinates [3]. When trusted to empower, employees are willing to put more effort into innovation, demonstrate a greater desire to engage in creative activities, create engagement, and influence loyalty to the official organization and managers. While the empowerment leadership style

has been recognized to have an impact and influence on employee loyalty. However, through literature review, this relationship has not been fully studied, explored and analyzed. Therefore, previous scholars pointed out that it is necessary to further study this relationship by adding mediating variables in order to better clarify the mechanism of the empowerment leadership style [4].

A trust relationship between the leader and the subordinates could be another factor in the link between anti-corruption and employee loyalty[5]. From an emotional point of view, employees are more willing to reach their full potential and stay engaged for the long term when they are empowered by leaders they trust[6]. When employees have confidence in their leaders, they benefit from an increased relationship between the empowerment leadership style and their loyalty as well as a decrease in employee turnover [7]. Thus, the influence of the empowerment leadership style on employee loyalty can be mediated by trust, commitment and satisfaction in the leader.

The empowerment leadership style plays a particularly important role in employee loyalty under certain conditions, especially in the context of Vietnam's deep economic integration in the region and globally with challenges and changes. The current complicated economic situation before the impact of the Covid 19 pandemic, when the freedom of movement, travel and direct negotiations have certain limitations. In particular, when employees leave their jobs and move to rival companies, it will cause confusion and increase the risk for businesses in terms of know-how and data[8].

From the recommendations and research gaps of previous studies, along with the current context and situation in Vietnam, production and business activities in general, the agricultural sector, and more specifically in the field of livestock, farming industry in particular is facing difficulties and challenges: The complicated and unpredictable developments of the COVID-19 pandemic affect domestic consumption and production markets, the supply of raw materials for the food industry. Livestock consumption fluctuates, many agricultural product import markets tighten technical barriers and trade safeguard measures. The author understands the great importance and power of human resources in the organization, in the face of demands that always have to be mobilized and changed to match trends in the new era, cohesion and loyalty. The success of market staff clinging to the area is a matter of survival for businesses in the feed industry today. Therefore, this research wishes to clarify the

impact of anti-trafficking on the loyalty of market employees of firms in the feed industry as well as to clarify the relationship between them. Specifically, this research will answer the following questions:

Question 1: How does the empowerment leadership style affect employee loyalty?

Question 2: What is the role of employee trust, commitment, and employee satisfaction in the relationship between the empowerment of leadership and employee loyalty?

Question 3: What solutions should leaders of businesses in the feed industry in Vietnam have to improve employee loyalty?

II. BACKGROUNDED THEORIES

A. Employee loyalty

Loyalty was originally understood as an employee's feeling of attachment to the organization, according to [9]. [10] define: "Loyalty is the active expression of pride and commitment to the organization". [11] argues that "loyalty is sometimes used as a synonym for one or more forms of commitment". To [12], "Loyalty means that employees stick with someone or something even if it goes against personal interests". Final statement "Employee loyalty is the willingness to work on behalf of the organization, for its goals and values to be aligned with the organization, and the desire to remain a member of the organization." [11].

Willingness to resist criticisms, limitations, and complaints about the organization and to emphasize the positive aspects of an organization are fundamental expressions of loyalty. When employees commit themselves to the success of the organization and accept to believe that working for this organization is their best choice, it shows that they are completely loyal to the organization [13]. Employee loyalty is reflected in the fact that they stay with the organization: "the intention or desire to remain a member of the organization" [14]. Mowday's well-known definition of loyalty is similar to the Aon Consulting Institute's national concept of "retention" for many years: "Employees intend to stay with the organization despite having relatively more attractive salary offers elsewhere. Loyalty measures the following criteria: Willingness to recommend his company as a good place to work; willingness to recommend the company's products and services; willingness to stay with the company for a long time. There are many authors in the world and in Vietnam who have researched on the factors affecting employee loyalty. Specifically, [15] researched on: "The study of employee satisfaction and its effects towards loyalty in the hotel industry in Klang Valley, Malaysia". From there, we identify certain factors that affect employee loyalty to the organization, including: Nature of work, income and benefits, working conditions, leadership, work motivation employment, training and development, peer relationships. However, because of different occupations and different levels of workers, the above factors may vary to certain extents.

B. Empowerment Leadership and the Role of Empowerment Leadership

Leadership style is a leader's method and approach to set directions, implementing plans, and motivating employees. From an employee's point of view, that style is often ex-

pressed in actions either explicitly or implicitly from their leader [16]. The empowerment of leadership can be understood by many scholars as a process of sharing power and allocating autonomy and responsibility to followers, groups or collectives through a specific set of behaviors by the leader for the loyal group to enhance internal motivation and achieve success at work [17]. Above all, the concept of leadership empowerment enhances the meaning of work, gives employees autonomy and self-determination, demonstrates the manager's belief in the employee's ability to promote a sense of subordinates, and improves job performance. Since then, the benefits of leadership empowerment are often claimed to be most beneficial, humanity, and ethical.

The goal of developing the "self-leadership" of subordinates is a matter of focused leadership style. In this leadership style, employees are encouraged to act in their own way to make decisions. Leaders play a role in promoting self-discipline, stimulating interest and motivation at work, and assisting in enhancing the improvement of employees' constructive thinking habits. A new approach is the emphasis on assigning responsibilities to subordinates to help leaders streamline the distribution and exercise of power in the act of empowerment. When employees are empowered, they spend more time and effort than usual to solve problems encountered at work. Compared with their unempowered colleagues, they are more likely to generate new and useful ideas. Thus, sharing power and providing autonomy when necessary helps to activate the internal force that exists within subordinates, who are willing to put more effort into engaging in creative behaviors that create innovation.

C. Motivational theories

1) Relationship Marketing

There is evidence to support the effectiveness of trust in relationship marketing [18-20]. This trust is expressed in relationships, which have many different types of outcomes including qualitative and quantitative such as: increased satisfaction about the partnership [21], reduced dangerous disputes between parties [22], increasing the quality of information gathered for the parties [23], increasing the commitment of the parties [24, 25], strengthen cooperation between partners [26], reduce project completion time [27]. The importance of relationship marketing between large and small businesses when raising capital is similar to that of every connector in a vertical company [28].

According to the American Marketing Association - AMA, relationship marketing is a marketing activity to create and maintain long-term relationships between businesses and partners (especially customers) in order to successfully achieve business goals... From a management point of view, relationship marketing is a marketing activity that builds, maintains and strengthens the relationship between superiors and employees. Employees, customers, managers and leaders are all the same because just satisfying the necessary needs will improve their feedback to the workplace. When an employee is satisfied with his boss, working environment, and benefits, the employee's ability to devote himself to his work to contribute to the company is very high. Empowerment leadership style helps employees and leaders to build relationships that focus on long-term interests with the company's common goals as the basis, the organization will

retain talented employees and improve managerial apparatus.

According to Lowe, "Relationship marketing includes all marketing activities aimed at establishing, developing, and maintaining successful relationship exchanges" (Lowe 2019). In this theory, trust and commitment are built from: the costs of ending the relationship, the benefits from the relationship, shared values, information exchange, and opportunistic behavior.

Sujan Patel found that besides creating a favorable environment, it will help innovations to be born and shorten the communication distance between people. Technology also has a downside that is losing the privacy of users. Empowerment leadership helps employees take responsibility for their decisions and not interfere in their work [29].

2) *Theory of trust – commitment*

The theory of trust-commitment provides a theoretical framework for building trust and commitment in boss-employee relationships [25, 30]. In the long-term relationship between the parties, power is considered the fundamental concept. However, at least one-third of power-based relationships break down [31]. Organizational commitment is the degree to which employees believe and accept the goals of an employee with the desire to work for the organization [32]. Therefore, Morgan & Hunt believe that the element of commitment and trust will help increase the effectiveness in a relationship, which is very consistent with the relationship between empowerment leadership style and employee loyalty. [25].

The belief-commitment theory first appeared in Becker's word "a mechanism that induces appropriate human behavior" [33]. The concept of employee commitment attitude towards the organization as a whole is explained by Halawi (2005) as "the power to identify an individual participating in a particular organization" [34]. Commitment is expressed as a psychological state when formed after an individual's relationship with an organization is the behavior of employees deciding to stay or leave the organization [35]. The higher the employee's commitment, the easier it is to grasp the organization's goals and values; they are willing to work for the success of the organization; they have a constant desire to stay in the organization [36]. In addition, according to Morgan & Hunt, commitment refers to the trust between two parties in a long-term relationship, it is so important that it takes continuous maximum efforts to maintain. This is essential for long-term relationships between partners [37], leading to a special emotional motivation between employees and the company when actively participating in the activities. joint activities [38].

Trust manifests itself in three aspects: ability, benevolence, and integrity [35]. The person has the ability to be completely committed; a conscientious person who cares about the interests of the partner; Honest people know exactly what is going on from their side to the other side [39].

3) *Maslow's Hierarchy of Needs*

The theory of psychology and human motivation has a famous model that is Maslow's hierarchy of needs in the article "A Theory of Human Motivation" from 1943. With 5 levels of human needs with 5 levels respectively. , in which, each floor reflects a different level of complexity and the

higher up, the more human needs increase. Maslow's Hierarchy of Needs explains people's behaviors without being aware of it themselves. Therefore, the meaning of Maslow's pyramid is applied in many areas of life such as business, administration, education... especially in the field of human resource management. Here are the 5 levels of Maslow's hierarchy of needs:

- Physiological needs

At the bottom of the pyramid are physiological needs, which are the most basic needs of a human being. This need is needed for basic human survival such as food, food, health, shelter, air, water, sleep, etc. The human body cannot sustain life if these needs are met. Unsatisfied. These are considered the most important, so they must be met first and foremost.

- The safety needs

When basic physiological needs are satisfied, people will prioritize their own safety. Those needs include physical safety, health, safety in the family, finances or employment...

- Societal needs

Once physiological and safety needs are fulfilled, the need for emotional communication will focus people's attention more than ever. They can become lonely, anxious and even depressed if they do not love and be loved. Because people always want to integrate into a certain community, want a happy family, have close friends.

- The esteem needs

Everyone has a need for self-esteem and stable self-esteem. They gain respect, which can be done through a sense of self-esteem, respect for others, strength, competence, proficiency, confidence, independence, and freedom.

- The self-actualization needs

The basis for the perceived need for self-actualization is satisfactorily met after previous needs have been met. People began to focus on realizing their potential. In the hierarchy of needs, Maslow describes, "people want to achieve all that is in their ability, to be on top and constantly improve to become the best version of themselves."

Applying Maslow's pyramid to work and life is quite simple because each needed milestone has its own. However, in the field of human resource management, taking people as the root of the problem, every employee will have all 5 needs at the same time. Therefore, it is very important for the empowerment house to offer appropriate policies for each individual at different times. The same policy cannot be applied to many people, nor can the same policy apply to one person forever because they will have different needs.

4) *Expectation theory*

Vroom's expectancy theory explains why people are motivated to strive for perfection. Vroom's expectancy theory is the most commonly applied theory of all motivational theories.

Vroom explains that an individual's motivation and work behavior is determined by their perception of what they will achieve in the future when trying to work.

People will try to work if they know that this will bring them good results or rewards of great value to them. For example, a person has a goal to advance at work and they perceive that their dedication will bring them achievements,

these achievements will help them achieve their promotion goals, then the perception will motivate them to work hard to achieve their own aspirations.

Employees will decide on a certain amount of effort to be able to achieve the goals of the firm. It also depends on the results, expectations and prizes they think they will get or how important that award is to them.

The formula for determining personal motivation according to Vroom is the product of work motivation, expectations, and the probability that an individual assigns the level of effort they put in to achieve the expected level of performance.

From the above formula, it can be seen that the theory of expectation is the theory that revolves around three relationships between expected dynamics and probability.

III. RESEARCH MODEL

The leadership style of the administrator is considered as one of the important factors in the development of the firm as well as determining the attachment and loyalty to the organization of employees. Many studies have proven that if managers practice the ideal leadership style, it will create an important motivation for the increase in employee loyalty. Among them, there have also been scholars who have conducted research on the relationship between the empowerment of leadership and employee loyalty. For example, [10] surveys on a small scale demonstrated that empowerment leadership indirectly affects employee loyalty. In another study by [2] in the banking sector, it was also demonstrated that leadership empowerment is a key factor promoting employee loyalty to the organization they serve.

From there, this research proposes the following hypothesis:

H1: Empowerment leadership style has a positive effect on employee loyalty.

In corporate culture or in life, trust is the foundation for success. However, the tendency of employees and leaders to trust each other less often leads to adversarial relationships that deviate from the reality of low performance. While the potential motivation of employees is influenced by their superiors [40], the employee empowerment style of the leaders bring high efficiency in terms of work feasibility, change and improve relationships, resolve internal conflicts, consider the level nature of leadership [41] thereby enhancing confidence in a manager who is both competent and ethical. In addition, empowerment leadership facilitates the development of trust in leadership through behaviors such as demonstrating trust in authority at all levels. When employees feel supported by leaders at all levels, relationships are created and maintained in a holistic context, and trust in leadership is fostered progressively [42]. Leadership empowerment behaviors also have a strong impact on employees' attitudes, beliefs, intentions, and behaviors [43].

The mediating role of employee trust appears in the relationship between leadership and employee performance [44]. Empowerment leadership style has a positive effect on subordinates' trust in leaders. Belief in leadership increases the effectiveness of the empowerment leadership style. According to the research, [45] also confirmed that employee's

beliefs play a mediating role in influencing leadership ability.

Proposed hypothesis H2:

H2: Empowerment leadership style affects employees' belief in leadership.

Once employees trust the leader and the decisions they make about the direction and common goals, the employee's loyalty to the organization increases. The mediating role of multidimensional beliefs associated with cognitive support also influences employee loyalty characteristics [46].

Proposed hypothesis H3:

H3: Employee trust affects employee loyalty.

Kevin Kruse refers to the definition of commitment: "It is an employee's emotional commitment to an organization and its goals". Style or personality represents the difference between committed and uncommitted employees, they are based on decisions rooted in loyalty and commitment to all levels of the company. The level of employee commitment is considered a fundamental factor for achieving better performance in any organization. Research by [47] also shows that empowerment leader behaviors at one point in time is positively related to estimates of employee commitment and will be more committed to the organization. Structuring for organizational commitment takes place, leaders propose to create structurally empowerment work environments that support a stronger employee commitment to the organization [48]. Engagement in the workplace through empowerment of employees towards results-oriented commitments and strategically empowerment predecessor levels of commitment is also geared toward individual results [49]. Is the implementation of the empowerment leadership affected by the employee's commitment to the organization?

When there are talented leaders, they know how to create an effective working environment so that employees can actively apply, promote and improve their own abilities, and the loyalty of subordinates is shown. Above all, respect and admiration must be from both sides to make this relationship a lasting bond. Another study demonstrated that the mediating role of job satisfaction affects the relationship between employee commitment and their loyalty [50]. In addition, mediating the basis of employee loyalty strongly influences human resource practices, as different resources engage and retain employees [51] will have an effect. significant impact on the transformation of an organization's resources. In summary, employee commitment plays an important role, acting as a mediating bridge in the orientation of labor prevention, favoring the form of empowerment for employees from the leader and towards the common goal of improving employee satisfaction. employee loyalty to the organization.

Therefore, this research builds two hypotheses H4, H5:

H4: Empowerment leadership style affects employee commitment.

H5: Employee commitment affects employee loyalty.

Originating from motivation theory and organizational psychology, "job satisfaction is the sum of psychological, physiological and environmental factors that make a person feel satisfied with his or her job. them" [51] or "is the feeling that employees feel about their work" [52] or "attitudes about work are expressed by feelings about the beliefs and behaviors of employees." workers" [53]. The classical the-

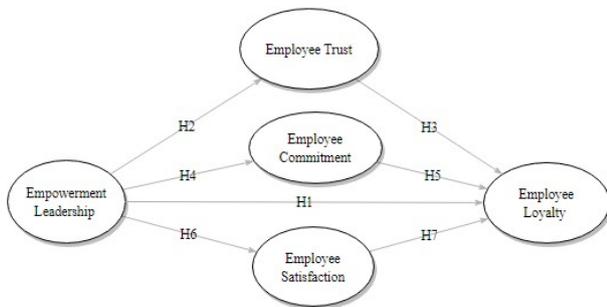
ory of job satisfaction is divided into three main groups[54]: Maslow's Needs Scale (1943) and F. Herzberg's two-factor theory (1950) are classic theories that say that "meeting the job full of needs that will satisfy employees' work"; Vroom's theory says that "job satisfaction is the impact of three relationships: expectations, values, and wants, and context theory says that job satisfaction has the impact of three factors: individual, work and organization".

With any organization, businesses need to achieve when encouraging employees to work long-term with the firm and devote themselves with their capacity, ability and enthusiasm to achieve the common goals of the organization. That is to get the loyalty of employees. From the manager's perspective, job satisfaction needs to be seen as a guiding factor to help employees work better. That is the degree to which they have a positive perception and orientation towards employment in the organization. Therefore, organizations need to link rewards to performance and ensure that it is rewarding and meets the needs of employees. Vroom believes that "the reward will be worthy for the efforts that the achievement brings results, which is what people always expect or expect. They believe that the more effort, the higher the work efficiency, the higher the work efficiency will give rewards, such as salary increases or benefits, ...". This will satisfy the necessary needs of the workers because when the desire to satisfy the needs will be strong enough, they will make remarkable efforts. In a New York Times survey of business satisfaction, only 4% of employees are expected to leave the company within a year; 27% of them say they will leave within a year when they feel unhappy. In fact, there is a relationship between employee satisfaction and loyalty: The level of employee satisfaction affects the employee's decision to leave or stay in a firm. This result has been published and tested in studies by Aon Consulting institute in the US, Canada, UK and in Australia. With the application of Maslow's theory of needs flexibly to the conditions of the modern economy, it is said that in order to improve employee loyalty to the organization, it is necessary to satisfy their needs. Therefore, the author hypothesizes H7:

H6: Empowerment leadership style has a positive impact on employee satisfaction.

H7: Employee satisfaction has a positive impact on employee loyalty.

From the above hypotheses, the research model is described as follows:



IV. METHODOLOGY

The research was carried out in Vietnam, Thanhhoa through two phases: Phase one is qualitative research through in-depth interview techniques and group discussions

with marketing lecturers, collaborators, staff/marketers. , regional head/regional supervisor working for businesses in the feed industry in Vietnam, Thanhhoa province. On that basis, the author uses the discussed contents and results to adjust the observed variables, construct the questionnaire and complete the official survey for the study. Phase two carried out formal research using quantitative research methods by distributing about 200 survey questionnaires to market staff. This research is used to test the measurement model as well as the theoretical model and the hypotheses in the model.

A. Qualitative research methods

Conduct research through focus group discussion techniques to discover, as well as confirm, adjust and supplement necessary contents to develop anti-corruption scale and employee loyalty scale. This research is carried out through group discussion by group discussion outline: 3 people, 5 people or 10 people (they are individuals or businesses in the field of feed in Thanhhoa province such as lecturers) on marketing, collaborators, staff/marketers, area heads/regional supervisors...). The qualitative research results further clarified the purpose to ensure that the concepts are measured thoroughly and adequate and consistent with the characteristics of the livestock industry in Thanhhoa. From there, through the opinions of the staff, the model that affects the empowerment of leadership on employee loyalty will be selected with the most important and influential factors.

Finally, 5 factors affecting the research on empowerment leadership affecting employee loyalty are empowerment leadership, employee loyalty, employee trust, employee commitment, employee satisfaction.

B. Quantitative research methods

1) Design of research variables and scales

The empowerment of leadership is defined as a process of transferring leadership responsibility and autonomy to subordinates and sharing leadership with them, this process helps to increase the internal motivation of employees by using a variety of strategies leadership behavior (Sharma and Kirkman 2015). The empowerment leadership scale is measured by 5 observed variables . One of the observed variables is "I am empowered to solve arising problems of customers (caring, monitoring needs, handling complaints of customers). customers, negotiate with customers...)"

Employee loyalty is understood as employee feeling attached to the organization, the loyalty scale is measured by 5 observed variables and one of the typical variables is "I will always stay at the company and contribute to the company". company, even if the company has difficulties."

Employee trust is explained as employees' trust in their leaders, they feel comfortable sharing and communicating with their leaders. This scale is measured by 12 observed variables, one of which is "I can talk freely about the difficulties I face at work with the leader and I know that he/she wants to listen to me."

An employee's emotional commitment to an organization and its goals. Employee commitment is considered a fundamental factor for achieving better performance in any organization. The commitment scale is measured by 6 factors, "I

understand and commit to the core values of the company.” is one of those variables.

Derived from motivation theory and organizational psychology, job satisfaction is defined as “the sum of psychological, physiological and environmental factors that make a person feel satisfied. about their work” [51] or “is the feeling that employees feel about their work” [52] or “attitude about work is expressed by feeling about the and worker behavior” [53]. “I am satisfied with my current job.” is one of 12 observed variables of the satisfaction scale.

2) Preliminary research

Quantitative preliminary research with the number of $n=100$ to preliminary evaluate the scale of variables after measuring the official research was carried out by quantitative method through survey questionnaires, distributed survey questionnaires. Official monitoring designed on Google Drive over the Internet. The expected number of direct survey participants for formal quantitative research is $n=200$, i.e. 200 collaborators, staff/marketers, area heads/regional supervisors, working area directors at firms in the field of feed in Thanhhoa province. The formal study was conducted in July, August 2021.

Quantitative research aims to test the scales and theoretical models. The authors use SPSS 20.0 software to test the scale through Cronbach's Alpha index and analyze the linear structural model SEM to further test the rigor of the model and research hypothesis.

V. RESEARCH RESULTS

To test the reliability of the scale, the research uses Cronbach's alpha ($C\alpha$), the observations with confidence greater than 0.6 will be kept, if the reliability is less than 0.6 will be removed by the author from the scale.

The results of the reliability coefficient test are performed with each component in the scale. The specific results of the Cronbach's Alpha reliability test are summarized in the table below:

TABLE 1. SUMMARY OF RELIABILITY ANALYSIS RESULTS

Variable symbol	Cronbach's Alpha
Empowerment Leadership	0.870
Employee Loyalty	0.893
Employee trust	0.955
Employee Commitment	0.971
Employee Satisfaction	0.897

From the above table, it can be seen that garbage variables have been eliminated, and all observations have a confidence coefficient above 0.6. In summary, with the results shown in Table 1, these scales all meet the requirements.

TABLE 2 SUMMARY OF STATISTICAL INDICATORS OF THE SCALE

	CR	AVE	MSV	Pcld	Ntld	Cknv	Hlnv	Ltt
Pcld	0.874	0.581	0.384	0.762				
Ntld	0.953	0.648	0.388	0.530	0.805			
Cknv	0.968	.836	0.388	0.578	0.623	0.914		
Hlnv	0.880	0.554	0.383	0.523	0.619	0.563	0.744	
Ltt	0.892	0.627	0.384	0.620	0.485	0.571	0.402	0.792

To evaluate the reliability of the scale more closely, the author continues to analyze the composite reliability index

(CR) and the variance index AVE of the scales in the research. The results from Table 2 prove that the scales used by the author in this research meet enough reliability. The CR index of all the scales used is above 0.7 plus the AVE value of each scale is greater than 0.5. Therefore, all of these scales are used to conduct further analysis, no components of the scale are excluded.

After verifying the scales, the author conducts SEM analysis. The analysis results show that p-value pcld affects ntld ($p=0.00$), cknv ($p=0.00$), hlnv ($p=0.00$), ltt ($p=0.000$) and cknv affects ltt ($p=0.000$) are all less than 0.05, showing that the impact of pcld on the remaining factors in the model is statistically significant, and at the same time, the unnormalized regression coefficients between these variables are all greater than 0, ie they are acting in the same direction, bearing a positive relationship with each other. However, the p-value of the unnormalized regression coefficients ntld affecting ltt ($p=0.296$), hlnv affecting ltt ($p=0.388$) is greater than 0.05 – this explains that the effect of ntld on ltt and hlnv are not statistically significant, hlnv (employee satisfaction), ntld (employee trust) have no influence on ltt (loyalty). Therefore, we have the results of hypothesis testing summarized in the table below:

TABLE 4 HYPOTHESIS TEST RESULTS

Hypothesis	P-value	Testing result
H1: Empowerment leadership has a positive effect on employee loyalty	0.000<0.05	Accepted
H2: Empowerment leadership has a positive influence on employees' trust in leadership.	0.000<0.05	Accepted
H3: Employee trust positively affects employee loyalty.	0.296>0.05	Not accepted
H4: Empowerment leadership has a positive effect on employee commitment.	0.000<0.05	Accepted
H5: Employee commitment positively affects employee loyalty.	0.000<0.05	Accepted
H6: Empowerment leadership has a positive impact on employee satisfaction.	0.000<0.05	Accepted
H7: Employee satisfaction has a positive impact on employee loyalty.	0.388>0.05	Not accepted

This is a new finding in the research, from the table above it can be said that although the leadership style of empowerment has an impact on employees' trust and their satisfaction. However, the research object here is the business staff, whose paramount goal of business is always to make a profit, so trust in the leader or the satisfaction of subordinates. For superiors, it is not enough to make a business employee loyal to an organization, their loyalty is more dependent on salary, compensation or other factors that bring greater benefits to them. This is completely consistent with the specifics of the industry.

VI. CONCLUSION AND DISCUSSION

In an open and integrated economy. Entities involved in business are facing perfect and extremely fierce competition. Many scholars have proved that the quality of human resources plays an important and not easily replaced role, to bring the victory of many businesses in those competi-

tions. And what leaders should do for the company to grow is to be able to retain qualified and potential human resources. It can be said that the relationship between managers and employees or the leadership method of the administrator has a great influence on the creativity, dedication of employees or their attachment and loyalty. Many studies have been conducted to demonstrate this effect.

This research attempts to clarify the influence of anti-corruption on the quality of the relationship between managers and their subordinates and how the style of the leader affects the loyalty of subordinates. Specifically, the research tries to clarify the role of the empowerment leadership in the above relationships. Furthermore, this research also tries to examine the impact of relationship quality between leaders and subordinates on their loyalty. The results of the research indicate that the method of empowerment that managers use is a factor that has a strong impact on employee behavior. Specifically, this leadership method is considered as a criterion that makes employees create commitments to the business and it is also a factor that increases employee loyalty in the firm. In addition, this research also clarifies the quality of relationships between leadership and subordinates. In this research, the relationship quality mentioned here includes 3 factors, one is the trust of the employees in their leader, the other is the employee's satisfaction when working and working inside. organization and finally the commitments employees show to their organization. In particular, in this research, the author proves that the commitment of subordinates is a factor that plays an important role in the quality of the relationship between managers and employees. Therefore, in order to increase loyalty or other factors, leaders need to build a commitment and voluntary contribution to the business from their subordinates. At the same time, the results of data analysis also show that leaders empower employees as a basis on which managers can rely to maintain and strengthen the quality of relationships with employees. their subordinates - empowerment positively affects the trust, satisfaction or commitments they make. However, when the author examines the impact of relationship quality on employee loyalty, the analysis results show that trust or satisfaction that comes from empowerment leaders does not affect their loyalty. This is a new finding compared to previous research. The object of the author's survey is sales staff in the animal feed industry in Thanh Hoa, a characteristic of sales staff compared to other industries is that these people are very active, and the ultimate purpose of the activity. Business activity is always profit maximization, therefore, research explains that job satisfaction or employee trust is not enough to create loyalty for sales staff. This evidence contributes a part to the governance literature, providing new insights, providing a more complete approach than previous literature on the effects of power sharing. with employees on the quality of the relationship between superiors and subordinates and the impact of anti-corruption on the loyalty of subordinates.

Besides some theoretical contributions, the results of the research also have some practical contributions. To retain the core employees of the business, businesses should encourage their managers or leaders to delegate power to their employees, to give employees the decision of their duties,

Allowing and hearing from subordinates about decisions in the development of the business, giving them the right to comment on their own professional skills improvement programs or system decisions. The reward system they receive if they successfully complete the set goals, this makes employees feel that they have an important role inside the organization and the business they are dedicating always supports them in their career development. develop professional skills. This stimulates beneficial business behaviors such as creativity, self-control, total dedication and commitment and loyalty to the organization. Firms can rely on the scales of this research to develop a toolkit of leadership behaviors for their organization. Leaders' empowerment behaviors in this research were supportive of their subordinates' development, supporting their autonomy, or motivating them by providing related development opportunities. By empowerment they can make decisions, it also creates positive effects such as encouraging initiative and focusing on goals of employees.

Second, this document demonstrates that leader empowerment of their employees have a positive impact on the quality of relationships between superiors and subordinates, which in turn produces positive effects. Specifically, it is about building and maintaining employee commitments or trust and satisfaction. Using empowerment leadership strengthens and develops employee engagement within the framework of the research with a target audience of salespeople. Through this relationship, managers can propose appropriate methods and policies. Some behaviors suggested in this research are encouraging leaders and employees to share their feelings, leaders always care about employees, problems that their subordinates face at work, superiors have work instructions and always provide full benefits that their subordinates deserve while protecting their subordinates.

Firms can consider organizing more often mass organizations, commendation activities, cultural movements, physical training and sports, and volunteering activities. This creates opportunities for superiors and subordinates to improve their performance. improve relationship quality.

Finally, research shows that commitment behaviors of subordinates are strongly related to their loyalty. From here, managers can propose suitable options to increase employee commitment and loyalty through sharing power with their employees.

In addition to the contributions to research documents and practice, this topic still has some limitations as follows:

First, this research only surveyed people who are market workers in the feed sector in Thanh Hoa province, which makes the sample incomplete and not representative. Subsequent documents may consider expanding the survey area so that the sample is more general.

Second, this research proves only a few variables to have an impact on employee loyalty, future literature may consider examining the intermediaries between the relationship of employees and employees. leaders and employees in studies on leadership empowerment and employee loyalty.

In addition, future research can add factors to have a better overview of this field by adding some other research variables. The trust factor in the research being tested in this research is trust from subordinates in their superiors, trust is a factor with two-way effect, future research can test trust as

an intermediary for empowerment leadership and employee motivation, in terms of employees gaining trust from managers, trust has a two-way effect, employees often reciprocate the trust of leaders. Leadership by demonstrating a variety of positive behaviors such as dedication or increased commitment to the business.

Finally, in addition to the behavior of increasing engagement and commitment to the business, anti-corruption violence can cause many other impacts on employees in the organization such as satisfaction with the organization, stress, ability the employee's ability to succeed or the extent to which he or she contributes to the organization. Thus, subsequent scholars can contribute to the literature as well as practice by examining these areas.

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REFERENCES

- [1] L.-M. Tseng and J.-Y. Wu, "How can financial organizations improve employee loyalty? The effects of ethical leadership, psychological contract fulfillment and organizational identification," *Leadership & Organization Development Journal*, 2017.
- [2] B. Narteh and R. Odoom, "Does internal marketing influence employee loyalty? Evidence from the Ghanaian banking industry," *Services Marketing Quarterly*, vol. 36, pp. 112-135, 2015.
- [3] G. M. Spreitzer, "Psychological empowerment in the workplace: Dimensions, measurement, and validation," *Academy of management Journal*, vol. 38, pp. 1442-1465, 1995.
- [4] S. Hassan, R. Mahsud, G. Yukl, and G. E. Prussia, "Ethical and empowering leadership and leader effectiveness," *Journal of Managerial Psychology*, 2013.
- [5] C.-M. Wu and T.-J. Chen, "Psychological contract fulfillment in the hotel workplace: Empowering leadership, knowledge exchange, and service performance," *International Journal of Hospitality Management*, vol. 48, pp. 27-38, 2015.
- [6] S. L. Albrecht and M. Andreetta, "The influence of empowering leadership, empowerment and engagement on affective commitment and turnover intentions in community health service workers: Test of a model," *Leadership in health services*, 2011.
- [7] S. Amundsen and Ø. L. Martinsen, "Self-other agreement in empowering leadership: Relationships with leader effectiveness and subordinates' job satisfaction and turnover intention," *The Leadership Quarterly*, vol. 25, pp. 784-800, 2014.
- [8] Y.-N. Cho, B. N. Rutherford, S. B. Friend, G. A. Hamwi, and J. Park, "The role of emotions on frontline employee turnover intentions," *Journal of Marketing Theory and Practice*, vol. 25, pp. 57-68, 2017.
- [9] B. Buchanan, "Government managers, business executives, and organizational commitment," *Public Administration Review*, pp. 339-347, 1974.
- [10] B. P. Niehoff, R. H. Moorman, G. Blakely, and J. Fuller, "The influence of empowerment and job enrichment on employee loyalty in a downsizing environment," *Group & Organization Management*, vol. 26, pp. 93-113, 2001.
- [11] H. Chen, "A comparative study of organisational commitment of bank employees in Ireland and China," 2009.
- [12] P. Korkki, "The shifting definition of worker loyalty," *New York Times*, vol. 8, p. 8, 2011.
- [13] S. Rajput, M. Singhal, and S. Tiwari, "Job satisfaction and employee loyalty: A study of academicians," *Asian Journal of Management*, vol. 7, pp. 105-109, 2016.
- [14] L. W. Porter, R. M. Steers, R. T. Mowday, and P. V. Boulian, "Organizational commitment, job satisfaction, and turnover among psychiatric technicians," *Journal of applied psychology*, vol. 59, p. 603, 1974.
- [15] R. Abdullah, M. Musa, H. Zahari, R. Rahman, and K. Khalid, "The study of employee satisfaction and its effects towards loyalty in hotel industry in Klang Valley, Malaysia," *International Journal of Business and Social Science*, vol. 2, pp. 147-155, 2011.
- [16] J. W. Newstrom, K. Davis, and J. L. Pierce, "Organizational behavior: Human behavior at work," 1993.
- [17] S. Arad, "Empowered work groups: Conceptual framework and empirical assessment of empowerment processes and outcomes in organizations," University of Illinois at Urbana-Champaign, 1994.
- [18] M. H. Sadegh, M. A. Shah Hosseini, and A. Heidari, "Extracting the Effective Factors on Corporate Governance Formation in Strategic Alliances with Focus on International Joint Ventures through Systematic Literature Review," *Journal of Business Management*, vol. 12, pp. 64-93, 2020.
- [19] S. Albers, B. Schweiger, and J. Gibb, "Complexity, power and timing in multipartner alliances: an integrative review and research agenda," *Managing Multipartner Strategic Alliances*. New York: Information Age Publishing, 2015.
- [20] V. H. Villena, T. Y. Choi, and E. Revilla, "Revisiting interorganizational trust: is more always better or could more be worse?," *Journal of Management*, vol. 45, pp. 752-785, 2019.
- [21] A. Alhaddad, "A structural model of the relationships between brand image, brand trust and brand loyalty," *International Journal of Management Research and Reviews*, vol. 5, p. 137, 2015.
- [22] L. Bricci, A. Fragata, and J. Antunes, "The effects of trust, commitment and satisfaction on customer loyalty in the distribution sector," *Journal of Economics, Business and Management*, vol. 4, pp. 173-177, 2016.
- [23] S. T. Certo, J. R. Busenbark, H. s. Woo, and M. Semadeni, "Sample selection bias and Heckman models in strategic management research," *Strategic Management Journal*, vol. 37, pp. 2639-2657, 2016.
- [24] Y. Choi, Y. Huang, and B. Sternquist, "The effects of the salesperson's characteristics on buyer-seller relationships," *Journal of Business & Industrial Marketing*, 2015.
- [25] R. M. Morgan and S. D. Hunt, "The commitment-trust theory of relationship marketing," *Journal of marketing*, vol. 58, pp. 20-38, 1994.
- [26] A. Payne and P. Frow, "Relationship marketing: looking backwards towards the future," *Journal of services marketing*, 2017.
- [27] M. G. Colombo and E. Piva, "Knowledge misappropriation risks and contractual complexity in entrepreneurial ventures' non-equity alliances," *Small Business Economics*, vol. 53, pp. 107-127, 2019.
- [28] N. Q. Thu, T. T. Hoàng, H. K. Tân, and N. H. Sơn, "Hoạt động gọi vốn tài trợ khởi nghiệp từ cộng đồng: Tiếp cận từ lý thuyết marketing quan hệ," *Tạp chí Nghiên cứu Kinh tế và Kinh doanh Châu Á*, vol. 29, pp. 05-22, 2020.
- [29] N. Huy, "Nâng cao chất lượng đội ngũ công chức chuyên môn cấp xã ở huyện Bồ Trạch, tỉnh Quảng Bình," 2018.
- [30] S. W. Wang, W. Ngamsiriudom, and C.-H. Hsieh, "Trust disposition, trust antecedents, trust, and behavioral intention," *The Service Industries Journal*, vol. 35, pp. 555-572, 2015.
- [31] N. V. Thắng, "Hoàn thiện hoạt động quản trị nguồn nhân lực tại công ty trách nhiệm hữu hạn một thành viên Công trình Công cộng tỉnh Vĩnh Long," 2015.
- [32] V. D. Bùi and T. H. Nguyễn, "Phát triển nguồn nhân lực logistics Việt Nam: Cần một chiến lược toàn diện," 2020.
- [33] R. Bel, "Leadership and innovation: Learning from the best," *Global business and organizational excellence*, vol. 29, pp. 47-60, 2010.
- [34] L. A. Halawi, J. E. Aronson, and R. V. McCarthy, "Resource-based view of knowledge management for competitive advantage," *The electronic journal of knowledge management*, vol. 3, p. 75, 2005.
- [35] J. P. Meyer, D. R. Bobocel, and N. J. Allen, "Development of organizational commitment during the first year of employment: A longitudinal study of pre-and post-entry influences," *Journal of management*, vol. 17, pp. 717-733, 1991.
- [36] T. M. Porter, "Making things quantitative," *Science in context*, vol. 7, pp. 389-407, 1994.
- [37] K. Do Duc, T. N. Anh, C. P. Duc, and T. H. Thanh, "Expanding fruit product market through brand, sales and distribution channel and product quality," *Science and Technology Development Journal*, vol. 17, pp. 6-19, 2014.
- [38] T. TIN and T. T Ó MT Á, "Mối quan hệ giữa cảm xúc với điểm đến và chất lượng quan hệ trong kinh doanh du lịch: Trường hợp du khách nội địa ở TP. Hồ Chí Minh," 2017.
- [39] N. Kumar, L. K. Scheer, and J.-B. E. Steenkamp, "The effects of perceived interdependence on dealer attitudes," *Journal of marketing research*, vol. 32, pp. 348-356, 1995.
- [40] M. Fiaz, Q. Su, and A. Saqib, "Leadership styles and employees' motivation: Perspective from an emerging economy," *The Journal of Developing Areas*, vol. 51, pp. 143-156, 2017.
- [41] M. Cheong, F. J. Yammarino, S. D. Dionne, S. M. Spain, and C.-Y. Tsai, "A review of the effectiveness of empowering leadership," *The Leadership Quarterly*, vol. 30, pp. 34-58, 2019.

- [42] R. C. Mayer, J. H. Davis, and F. D. Schoorman, "An integrative model of organizational trust," *Academy of management review*, vol. 20, pp. 709-734, 1995.
- [43] K. Dewettinck and M. Van Ameijde, "Linking leadership empowerment behaviour to employee attitudes and behavioural intentions: Testing the mediating role of psychological empowerment," *Personnel Review*, 2011.
- [44] T. Bartram and G. Casimir, "The relationship between leadership and follower in-role performance and satisfaction with the leader: The mediating effects of empowerment and trust in the leader," *Leadership & Organization Development Journal*, 2007.
- [45] E. K. Kelloway, N. Turner, J. Barling, and C. Loughlin, "Transformational leadership and employee psychological well-being: The mediating role of employee trust in leadership," *Work & Stress*, vol. 26, pp. 39-55, 2012.
- [46] D. Lewicka, A. Glinska-Newes, D. Morrow, and J. Gorka, "The effect of job characteristics on employee loyalty: The mediation role of vertical trust and perceived supervisory support," *Маркетинг і менеджмент інновацій*, pp. 168-185, 2018.
- [47] M. Kim and T. A. Beehr, "Job crafting mediates how empowering leadership and employees' core self-evaluations predict favourable and unfavourable outcomes," *European Journal of Work and Organizational Psychology*, vol. 29, pp. 126-139, 2020.
- [48] S. Allen, B. E. Winston, G. R. Tatone, and H. M. Crowson, "Exploring a model of servant leadership, empowerment, and commitment in nonprofit organizations," *Nonprofit Management and Leadership*, vol. 29, pp. 123-140, 2018.
- [49] C. K. Sahoo, N. Behera, and S. K. Tripathy, "Employee empowerment and individual commitment: An analysis from integrative review of research," *Employment Relations Record*, vol. 10, pp. 40-56, 2010.
- [50] M. Uzair, W. Razzaq, M. Sarfraz, and Q. A. Nisar, "Impact of HR practices on employee loyalty and commitment: Mediating role of job satisfaction," *International Journal of Management Excellence*, vol. 9, pp. 1067-1073, 2017.
- [51] B. H. Janjua and A. Gulzar, "The impact of human resource practices on employee commitment and employee retention in telecom sector of Pakistan: Exploring the mediating role of employee loyalty," *IOSR Journal of Business and Management*, vol. 16, pp. 76-81, 2014.
- [52] T. V. B. Hoàng and H. T. Hùng, "Các yếu tố ảnh hưởng đến mức độ hài lòng công việc của những người đã từng học tập hoặc làm việc ở nước ngoài-trường hợp nghiên cứu tại tỉnh thừa thiên huế," *Hue University Journal of Science: Economics and Development*, vol. 126, pp. 229-237-229-237, 2017.
- [53] D. J. Weiss, R. V. Dawis, and G. W. England, "Manual for the Minnesota satisfaction questionnaire," *Minnesota studies in vocational rehabilitation*, 1967.
- [54] J. Green, *Job satisfaction of community college chairpersons*: Virginia Polytechnic Institute and State University, 2000.

Analysis of Some Factors Affecting Business Performance From Non-Financial Aspects at Enterprises in Nam Dinh Province

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Abstract—Business performance of enterprises is evaluated by many different models, most of which use financial measures. However, traditional financial measures cannot provide information for strategy development because they skip customer satisfaction and quality of products and services... Therefore, non-financial measures for business performance is gaining a special advantage, in which the Balanced Scorecard model (BSC) with customers, internal processes and development training as non-financial measures has been widely recognized by many companies and highly regarded by many researchers for its role in the strategic management of enterprises. This article aims to examine the factors affecting business performance from non-financial aspects (customers, internal processes and development training) of enterprises in Nam Dinh province. The study used the quantitative research method and SPSS 26 data processing software, and is based on the estimated linear regression model with 520 feedbacks from enterprises in various fields of operation in Nam Dinh province in 2020. The research results show that the factors affecting business performance in terms of non-financial aspects are ranked in the following order: (1) Use of resources, (2) Market orientation, (3) Information technology (IT), (4) Local policies, (5) Capital accessibility and usage, and (6) State policies. On that basis, the article proposes some suitable solutions for managers to improve the business performance of enterprises in Nam Dinh province.

Index Terms—Business performance, influencing factors, enterprise, financial, non-financial, Nam Dinh province.

I. INTRODUCTION

IN AN increasingly fierce competitive environment, business performance evaluation becomes a basis for making management decisions. Historically, many different model for business performance evaluation have been developed that use both financial and non-financial measures such as the Balanced Scorecard BSC in [1]. The SMART pyramid model of [2] includes strategic goals and dimension of operations through 4 levels of structure appropriate for both financial and non-financial aspects of the organization. This model creates a management control system with business performance evaluation criteria at all management levels, but lacks the integration of continuous improvement. The Process Management Matrix (PMM) developed by [3] integrates financial and non-financial aspects, internal aspects and external aspects, in which internal aspects include finance (price competition criteria, relevant marketing criteria,

cost, added productivity value, warranty costs) and non-financial aspects include product reliability criteria, number of customer complaints, market share, on-time delivery, number of new products. The model of business performance of Cambridge [4] integrates internal, external, financial and non-financial factors with the strategic system in the organization's operations. Most models are based on financial and non-financial measures because the success of an enterprise is a multidimensional concept that depends on the design, production, marketing and distribution of products or services and usually in a complex and dynamic environment. Thus, focusing solely on financial measures may lead to failure to adapt to the new business environment, as pointed out by [5]. Non-financial measures also provide feedback on the company's activities that can directly and indirectly affect the business performance. This study examines the measurement of business performance by non-financial criteria, using customer, internal process, training and development ([1]) for a comprehensive and flexible evaluation across all aspects of business performance of the organization.

In fact, there are many factors that affect the business performance of enterprises. It is extremely necessary for businesses to find out which are affecting factors and to what extent the factors affect the business performance of enterprises as the basis for improvement. According to statistics in 2020, in Nam Dinh province, there are 6,061 enterprises operating in different fields; they are located in nine districts and one city. These enterprises contribute significantly to economic growth and job creation. However, they achieve low profit with the return on sales ratio (ROS) of only 0.15%, lower than the national average ratio of 0.20% (Nam Dinh Statistical Yearbook, 2020). Therefore, the analysis of factors affecting business performance in terms of non-financial aspects is necessary for enterprises in Nam Dinh province.

II. LITERATURE REVIEW

There have been many studies on the factors affecting business performance:

Group of factors belonging to characteristics of enterprises: (1) Size of enterprise: In many studies, size has a positive influence on the business performance of enter-

prises. Size of enterprise is measured by number of employees, capital, assets, revenue. According to [6], [7], the larger the size of the enterprise, the higher the efficiency. (2) Age of enterprise: according to studies by [8], [9] the age of an enterprises is a factor that affects the business existence and development [10] agrees that the longer an enterprise has been in operation, the higher its operational efficiency will be because it has built a reputation and brand name in the market. (3) Type of enterprise: the variable of enterprise type is included in the study of business performance. The study results show that ROS has a positive correlation with the type of enterprises, according to [11], and [12]. (4) Business sector: In the study of [13], the factor of business sector has the strongest impact on business performance of enterprises in a number of fields such as real estate, educational services, petroleum, tobacco.

Group of factors on business leadership: According to the study by [9], the education level and competence of the director have a positive influence on the business operation of the enterprise. When the director is capable, well-trained, experienced and qualified, it will help the enterprise develop. [11] also points out that enterprises in which the director has a university degree or higher has a higher return on assets ratio (ROA) than the rest. Regarding gender, if the leader is a man, it will contribute to the increase of business activities of enterprises due to the dynamism and decisiveness of men in finding, planning and choosing business options as well as in social relationships that bring benefits to enterprises, as in studies by [14], [15], [12]. Some studies also show that managers' experience (number of years in management) affects ROA. The study [11] concludes that ROA of enterprises increased by 1.19% when the experience of the director of the enterprise increased by 1 year.

The factor of capital accessibility and usage: According to [16], the factor of capital has a positive influence on the business performance of enterprises. [11] believes that the ROA of enterprises will decrease by 5.95% when the total charter capital of enterprises increases to 1 billion dong, which has a negative correlation with business performance. The lack of collateral is the reason why enterprises cannot borrow or can only borrow little credit from commercial banks, according to [17]. The factor of resources of the enterprise: The resource-based view (RBV) holds that firms have resources which are unique, rare, valuable, and non-replaceable, allowing them to achieve a sustainable competitive advantage, according to [18]. [19] find an unrelated association between employee satisfaction and financial performance, mediated by customer satisfaction.

Human Resource Management (HRM) enables the creation of a workforce that helps an organization achieve its goals and mission. [16] suggests that the factors belonging to the internal capacity of enterprises, including market information, marketing, labor qualifications, equipment, affect business operation of enterprises.

The IT factor: Information and technology increases efficiency and business performance through ROA and return on investment (ROI), according to [20], [21]. At the same time, [22] states that investment in information technology contributes significantly to enterprises' growth and business performance. According to [23], investment in IT helps or-

ganizations modernize business operations. [21] points out information technology has a positive impact on financial performance.

The factor of local policies: according to [16], local policies have a positive influence on the business activities of enterprises. The study of [24] also suggests that local policies have a great influence on the business performance of enterprises

The factor of state policy: according to [24], the government's macro policies affect business performance, which is similar to the viewpoint of [30], [11]. Besides, [10] once again verifies the extent to which access to government support policies affects the business performance of enterprises.

From the research gaps that have been drawn after the literature review, specific research directions are determined as follows: the team of authors will study the influence of internal and external factors on business performance in enterprises in Nam Dinh province, in which priority is given to internal factors. Business performance of enterprises will be measured from non-financial aspects (measured by the indicators of customers, internal processes and training and development). This study uses a combination of qualitative and quantitative research methods.

III. PROPOSED RESEARCH MODEL AND METHOD

A. Proposed model

Based on the research overview, the group proposes a specific research model as follows: Figure 1. Research model

3.2 Research method

To verify the research model and hypotheses, the authors designed a questionnaire. After filtering the observed vari-

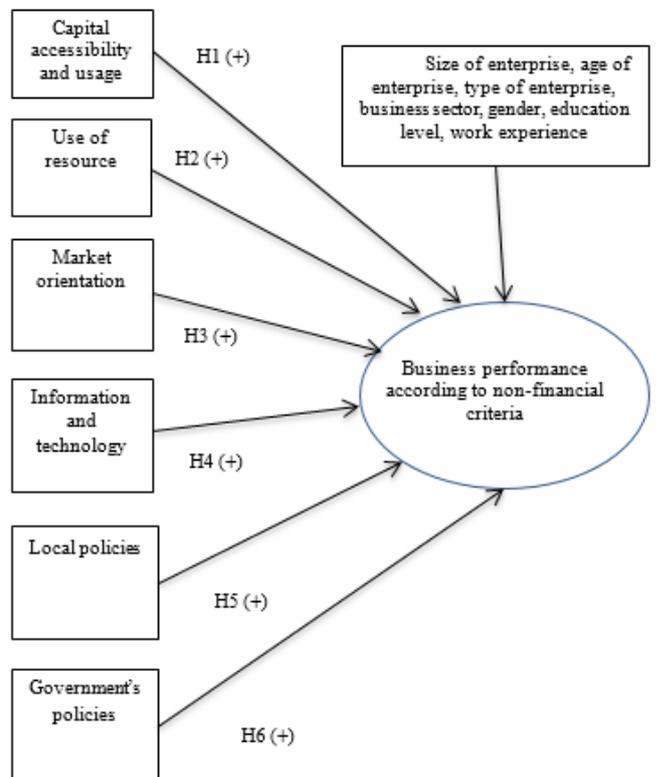


Fig. 1 Research model

ables in previous studies to match the context of enterprises in Nam Dinh province, the authors put together a questionnaire consisting of 40 observed variables for independent variables and 24 observations for the dependent variable, measured by a 5-point Likerts scale with 1 as the lowest score (least influence) and 5 as the highest score (highest influence), according to Table 1 of encoding variables. The authors collected data by surveying 130 enterprises that are representatives for business lines in Nam Dinh province (table 2) with 4 questionnaires for each enterprise (1 director and 3 managers). There are 4 research groups that carry out direct surveys at enterprises. The survey was done in nearly 2 months, from the middle of August, 2020 to December, 2020. The total eligible responses were 520, satisfying the requirement for the quantitative data analysis. The verification of the research model and hypothesis was done through collected data and combined with the use of SPSS26 software. Estimation results of the research model are carried out in the following steps: Reliability testing, exploratory factor analysis (EFA), total variance, Pearson correlation, and regression model analysis.

TABLE I
TABLE OF VARIABLES IN THE MODEL

Symbol	Factor name	Encoding	Criteria	Source
VON	Capital accessibility and usage	VON1	Accessibility to capital markets (stock market, financial leasing, etc.)	[16]
		VON2	Accessibility to capital from banks/credit institutions	
		VON3	Accessibility to capital from other individuals and organizations	
		VON4	Ability to meet loan conditions (loan records, collateral, business plans ...)	
		VON5	Interest rate policy of credit institutions	
		VON6	Ability to effectively use capital in business	
SDNL	Use of resource	SDNL1	Facilities/equipment of the enterprise are secured/operated well.	Considering the effective use of human resources and technology in using resources [25] [26]
		SDNL2	The enterprise applies advanced and modern technology.	
		SDNL3	The enterprise invests in training and human resource development programs.	
		SDNL4	The enterprise evaluates employees according to their capacity and work results	
		SDNL5	The result of ranking/assessing the completion of tasks for each employee is at a high level	
DHTT	Market orientation	DHTT1	The enterprise's business goal is derived from customer satisfaction.	According to [27], market orientation is

Symbol	Factor name	Encoding	Criteria	Source
		DHTT2	The enterprise tracks its level of commitment and orientation to serving the needs of our customers	the organizational culture necessary to create superior value for buyers, resulting in superior performance. Narver and Slater define market orientation in terms of three factors: customer orientation, competitor orientation, cross-industry coordination ([20])
		DHTT3	The enterprise's business strategy for competitive advantage is based on understanding customer needs.	
		DHTT4	The enterprise measures customer satisfaction on a regular and systematic basis.	
		DHTT5	The enterprise's development goals focus on the customer group in which the enterprise has a competitive advantage.	
		DHTT6	The enterprise's board of management regularly discusses competitors' strengths and strategies.	
		DHTT7	The enterprise communicates successful and unsuccessful experiences in all business divisions.	
		DHTT8	The enterprise's board of management understands that everyone in the enterprise contributes to the creation of customer value.	
		DHTT9	The enterprise responds to competitive actions that threaten its business.	
		DHTT10	All business functions of the enterprise are integrated in serving the needs of its target market.	
		CNTT	Information and technology	
KNM1	Modern network with high speed is used; new connection service is updated.			
KNM2	The enterprise uses different communication devices to get the work done.			
KNM3	It is easy for information exchange/communication within the enterprise.			
KNM4	The enterprises use the internet as a main form of communication in management and business activities.			
			Database	

Symbol	Factor name	Encoding	Criteria	Source
		CSDL1	The enterprise's database is stored and protected.	
		CSDL2	The required data can be retrieved from the database at any time.	
		CSDL3	It is convenient to link the databases with each other and with other management tools/software on the computer.	
		CSDL4	The common database allows the ability to extract reports of enterprises and to classify for quick usage requirement.	
CSNN	Government's policies	CSNN1	The government's system of legal documents	Application point of view [24], [17] [16]
		CSNN2	The government's support policies	
		CSNN3	The government's tax policies	
		CSNN4	The government's investment promotion policies	
		CSNN5	Policies to support international integration	
CSDP	Local policies	CSDP1	Local support policies	[24], [29] [16]
		CSDP2	Administrative reform	
		CSDP3	Infrastructure	
		CSDP4	Support for land lease processes	
		CSDP5	Support from business associations	
		CSDP6	Policy to attract investment in the high-tech sector	
KH	Customers	KH1	Ability to meet customer requirements	[30], [31] [32], [33], [34]
		KH2	Consumption market share	
		KH3	Rate of complaints resolved	
		KH4	Customer retention	
		KH5	Rate of new customers	
		KH6	Competitive relative price	
		KH7	Image, brand and reputation of the enterprise	
		KH8	Number of ads made	
QTNB	Internal processes	QTNB1	Rate of goods delivered on time	[34], [33] [32], [35], [30]
		QTNB2	Percentage of qualified goods	
		QTNB3	Inventory turnover	
		QTNB4	Machine operating time	
		QTNB5	Employee satisfaction	
		QTNB6	Labor productivity growth rate	
		QTNB7	Cost saving rate	
DTPT	Training and development	DTPT1	Employee involvement in professional associations	[30], [34] [32], [35], [31]
		DTPT2	Percentage of highly qualified employees	

Symbol	Factor name	Encoding	Criteria	Source
		DTPT3	Percentage of employees participating in initiatives for the enterprise	
		DTPT4	Quality of working environment	
		DTPT5	The ability to exchange information within the enterprise	
		DTPT6	Percentage of employees achieving goals	
		DTPT7	Number of staff trained	
		DTPT8	Rate of seminars, exchange of experiences	
		DTPT9	Leadership development	

TABLE 2
SURVEY SAMPLE CLASSIFIED BY BUSINESS SECTORS

No	Business sector	Number of enterprises		Number of surveyed enterprises	
		Quantity	%	Quantity	%
1	Industry and construction	2597	42,8	68	52,3
2	Trade and services	3041	50,2	47	36,2
3	Agriculture, forestry and fisheries	423	7,0	15	11,5
	Total	6061	100	130	100

IV. RESULTS

A. Analysis of the scale's reliability

The authors tested the reliability of the data through the Cronbach's Alpha coefficient. The scale only ensures reliability when Cronbach's Alpha coefficient is greater than 0.6, the scale has good reliability when varying in the range from 0.7 to 0.8. If the scale is greater than or equal to 0.6, then the scale is acceptable. In terms of reliability and correlation coefficient, the total variable is greater than 0.3. During the test, the authors removed the variable Capital 4 because the correlation coefficient of the total variable was less than 0.3. The results of the scale test are presented in Table 3.

TABLE 3
RESULTS OF SCALE ANALYSIS

No	Scale	Cronbach's Alpha
1	Capital accessibility (VON)	0,856
2	Use of resource (SDNL)	0,843
3	Market orientation (DHTT)	0,884
4	Network connection	0,832
5	Database	0,834
6	Government's policies (CSNN)	0,831
7	Local policies (CSDP)	0,844
8	Business performance with non-financial measure (Customer) (KH)	0,887
9	Business performance with non-financial measure (internal processes) (QTNB)	0,886
10	Business performance in non-financial measure (training and development) (DTPT)	0,881

Source: Analytical results from survey data, SPSS 26 software

Thus, all variables satisfy the conditions in the reliability analysis of the scale through Cronbach's Alpha coefficient.

B. Exploratory factor analysis

The results of EFA analysis of the dependent variables for business performance according to non-financial measures are: Customers, Internal processes, Training and development. Results of KMO and Bartlett's test of are in Table 4. Results of EFA analysis of dependent variables are shown in Table 5.

TABLE 4
RESULTS OF KMO AND BARTLETT'S TEST OF INDEPENDENT VARIABLES

Criteria	Results (KH)	Result (QTNB)	Result (DTPT)
KMO index	0,928	0,921	0,926
Bartlett's test with sig value	0,000	0,000	0,000
Total value of variance extracted	56,029	59,449	51,409
Minimum Eigenvalue	4,482	4,161	4,627

Source: Analytical results from survey data, SPSS 26 software

TABLE 5
RESULTS OF KMO AND BARTLETT'S TEST OF DEPENDENT VARIABLES

Criteria	Results (KH)
KMO index	0,914
Bartlett's test with sig value	0,000
Total value of variance extracted	61,544
Minimum Eigenvalue	1,575

Source: Analytical results from survey data, SPSS 26 software

Results of dependent variable analysis for KMO index satisfy the condition >0.5 , so the EFAs is appropriate with the actual data. The Bartlett test with sig value < 0.05 means that the observed variables are linearly correlated with the representative factor. The results of running the observed variables all with factor loadings greater than 0.5 obtained a rotation factor matrix table of independent variables with 6 factors extracted and rearranged as shown in Table 6 and rotation matrix of the dependent variables (table 7).

TABLE 6
ROTATION FACTOR MATRIX RESULTS OF INDEPENDENT VARIABLES

	Component					
	1	2	3	4	5	6
CSDL3	.781					
CSDL1	.760					
KNM4	.759					
CSDL4	.756					
KNM1	.738					
KNM3	.735					
KNM2	.723					
DHTT7		.799				
DHTT5		.760				
DHTT6		.758				
DHTT3		.746				
DHTT1		.712				
DHTT8		.710				
CSDP5			.739			
CSDP6			.729			
CSDP1			.728			
CSDP2			.710			
CSDP3			.707			

	Component					
	1	2	3	4	5	6
CSDP4			.656			
VON6				.793		
VON2				.790		
VON4				.787		
VON1				.767		
VON5				.759		
SDNL2					.810	
SDNL4					.784	
SDNL5					.775	
SDNL1					.747	
SDNL3					.710	
CSNN5						.790
CSNN1						.738
CSNN3						.734
CSNN2						.707
CSNN4						.698

Source: Analytical results from survey data, SPSS 26 software

TABLE 7
ROTATION FACTOR MATRIX RESULTS OF DEPENDENT VARIABLES

Customer	Factor 1	Internal processes	Factor 1	Training and development	Factor 1
KH2	.784	QTNB7	.792	DTPT2	.760
KH5	.783	QTNB2	.787	DTPT6	.745
KH8	.779	QTNB6	.785	DTPT3	.738
KH1	.761	QTNB3	.769	DTPT8	.722
KH6	.749	QTNB1	.768	DTPT1	.722
KH4	.724	QTNB4	.748	DTPT4	.712
KH3	.717	QTNB5	.746	DTPT7	.689
KH7	.686			DTPT5	.684
				DTPT9	.678

Source: Analytical results from survey data, SPSS 26 software

C. Regression correlation results

In this study, the authors want to test the regression correlation with business performance according to non-financial measures including 3 indicators: customer, internal processes, and training and development. The authors hope to identify which factors affect business performance of enterprises in Nam Dinh on all three criteria so that enterprises need to focus on solutions to improve their business performance. In Table 8, we see the existence of a relationship correlation between business between the dependent variable business performance measured by non-financial measures with independent variables (local policies, information technology, the government's policies, market orientation, capital accessibility and usage, use of resource) at a significance level of 1% (ie, there is a linear correlation at the 99% confidence level). Thus, independent variables can be included in the model to explain business performance (measured by non-financial measures). In addition, the correlation coefficient between the independent variables also exists as low as 0.121 to as high as 0.650, so there is no concern about multicollinearity between the independent variables in the regression analysis.

TABLE 8

MATRIX OF CORRELATION COEFFICIENTS BETWEEN VARIABLES AND THE NON-FINANCIAL DEPENDENT VARIABLE "CUSTOMER"

		PTC	CSDP	CNTT	CSNN	DHTT	VON	SDNL
PTC	Pearson Correlation	1	.510**	.629**	.399**	.650**	.326**	.634**
CSDP	Pearson Correlation	.510**	1	.238**	.510**	.267**	.344**	.165**
CNTT	Pearson Correlation	.629**	.238**	1	.203**	.486**	.136**	.319**
CSNN	Pearson Correlation	.399**	.510**	.203**	1	.208**	.284**	.136**
DHTT	Pearson Correlation	.650**	.267**	.486**	.208**	1	.121**	.277**
VON	Pearson Correlation	.326**	.344**	.136**	.284**	.121**	1	.121**
SDNL	Pearson Correlation	.634**	.165**	.319**	.136**	.277**	.121**	1

Source: Analytical results from survey data, SPSS 26 software

Looking at Table 6, the model shows that the adjusted R-squared coefficient is 0.805, meaning the independent variables affect 80.5% of the change of the dependent variable. The remaining 19.5% is the effect of factors other than the model and random error. The Durbin-Watson coefficient = 1.903 is in the range from 1.5 to 2.5, so there is no first order series autocorrelation. The ANOVA results has sig = 0.000 < 0.05, so the regression model fits the data set and can be used. With the regression results, there is no multicollinearity phenomenon, the VIP coefficients of the independent variables are less than 2. The results are statistically significant and accepted with sig < 0.05, the coefficient B of the independent variables. All the variables have a positive sign, which means that they have a positive effect (in the same direction) with the dependent variable, the hypotheses are accepted.

Based on the standardized regression coefficient beta with independent variables having coefficient sig < 0.05, it is seen that the factor of use of resources has the strongest influence on business performance (measured by non-financial criteria) with the coefficient of 0.401. The order of influence of the following variables is market orientation (0.325), information technology (0.261), local policies (0.216), accessibility and use of capital (0.104), the government's policies (0.085).

Based on the unnormalized regression coefficient B with independent variables having sig coefficient < 0.05, in the condition that other variables do not change the value, when the variable of local policy increases by 1 point, the business performance (measured by non-financial indicators) increases by 0.139 points; the variable of information technology increases by 1 point, business performance (measured by non-financial criteria) increases by 0.167 points; the variable of government's policy increases by 1 point, business performance (measured by non-financial criteria) increases by 0.053 points; the variable of market orientation increased by 1 point, business performance (measured by non-financial criteria) increases by 0.199 points; the variable of capital accessibility and usage increases by 1 point, the business performance (measured by non-financial criteria) increases by 0.063 points; the variable of use of resource using resources increased by 1 point, business performance (measured by non-financial criteria) increases by 0.255 points.

TABLE 9 RESULTS OF MULTIVARIABLE REGRESSION WITH BUSINESS PERFORMANCE FROM NON-FINANCIAL ASPECTS AS THE DEPENDENT VARIABLE

Model	Unnormalized regression coefficients		Normalized regression coefficient	T	Sig level	Multicollinearity test	
	B	Standard error				Acceptability	VIF
(Constant)	.968	.062		15.643	.000		
CSDP	.139	.015	.216	9.124	.000	.670	1.493
CNTT	.167	.015	.261	11.370	.000	.715	1.399
CSNN	.053	.014	.085	3.708	.000	.719	1.391
DHTT	.199	.014	.325	14.257	.000	.725	1.380
VON	.063	.013	.104	4.990	.000	.861	1.161
SDNL	.255	.013	.401	19.286	.000	.871	1.148
R ²						.807	
Adjusted R ²						.805	
Sig. F Change						0,000	
Durbin-Watson						1.903	

The regression model suitable with the 5% significance level is as follows:

$$YHQHDKD (PTC) = 0,968 + 0,139 CSDP + 0,167C-NTT + 0,053CSNN + 0,199 DHTT + 0,063 VON + 0,255 SDNL + \epsilon$$

In which:

YHQHDKD (PTC): Business performance measured by non-financial criteria (including customers, internal processes and development training)

CSDP: Local policies

CNTT: Information and technology

CSNN: The government's policies

DHTT: Market orientation

VON: Capital accessibility and usage

SDNL: Use of resource

D. Discussion

This study on factors affecting business performance from non-financial aspects at enterprises in Nam Dinh province has focused on studying the factors affecting business performance of enterprises to help them and organizations have a better view of their business activities and to find solutions to improve their business performance. By quantitative research method in the regression model, the study has estimated and identified factors affecting business performance in terms of non-financial aspects. There are 6 influencing factors and the level of influence of each factor in order is as follows: (1) Use of resource (2) Market orientation, (3) Information technology, (4) Local policies, (5) Capital accessibility and use, (6) Government's policies. They are statistically significant in the model. The variables are statistically significant at 5%; all have a positive correlation with business performance and also agree with viewpoints in previous studies, that is, the better the use of resources, the higher the business performance will be, according to [26], [36], [37], [38], [39]. According to the survey results, the use of resources in terms of technology and human resources of enterprises in Nam Dinh is still limited. Regard-

ing market orientation in striving to meet the needs of current and potential customers, enterprises will focus on strategies that are considered reliable in order to improve customers' awareness of quality of products and services, thereby enabling them to create and maintain better customer value. This is in line with results of [27], [40], [41]. The survey results show that market orientation based on products with strengths and competitive advantages has not been carried out effectively. Regarding IT, [42] suggests that IT is related to increased productivity. According to [42], technological competence is positively and significantly related to business performance. Another study by [43] shows that technology competence affects the overall success of an enterprise. According to the survey results, the database at enterprises is stored and exploited ineffectively. Regarding local policies, according to [16], [29], IT has a positive influence on business performance. Currently, according to enterprises, the province's policy, procedures and infrastructure have many limitations that need to be overcome. Regarding capital accessibility and use of capital [44] believe that effective use of business capital with a properly allocated capital structure will help enterprises. According to [45], as the main source of capital for enterprises, the system of financial and credit institutions will have a large influence on the size of the capital market and the growth rate of enterprises. [16] also suggests that capital accessibility affects business performance. Specifically, if accessibility to capital in capital markets and credit institutions is good, policies on loan procedures are simple and convenient, interest rate policies are reasonable, the business performance of enterprises will be higher. Survey results show that enterprises have difficulties in accessing capital sources in the province. Regarding state policies, the studies by [10], [30], [11] state that the number of forms of state support that enterprises have ever received has a positive effect on business performance. The government creates supportive policies for the development of enterprises. Enterprises are the driving force of socio-economic development, while finance is an important lifeline, leading businesses and the economy to develop. In fact, the government's policies to encourage investment and support for international integration have not been effective.

V. CONCLUSIONS AND RECOMMENDATIONS

In order to improve the business performance of enterprises in Nam Dinh province, the authors propose a number of solutions from the research results as follows:

Firstly, the use of resource has the strongest influence on the business performance of enterprises. Enterprises believe that it is necessary to focus on the human resource factor because human is the decisive factor for all activities of enterprises. Nam Dinh province needs to focus on training high-quality human resources, on practice and close association with training institutions. It is necessary to have in-depth training policies to improve workers' skills and develop professional demeanor. Enterprises need to have specific job descriptions and clear salary regulations clearly according to employees' ability to contribute at work. In addition, technology resources, if used and exploited well, will help businesses improve their business operations better. Nam Dinh

enterprises need to carry out in-depth investment to upgrade existing factories and conduct planning and new investments to meet the requirements of origin of goods. Attention should be given to building a technical and design team. Enterprises should actively invest in renewing technology lines, applying quality management methods according to international standards, productivity improvement tools such as: ISO 9001; 5S, TPM, Lean... Also, they should apply advanced, highly automated, closed production models and IT for control on smart screens, helping workers control machines in a convenient, accurate manner to save time, labour force, and manpower.

Secondly, in terms of market orientation, in order to effectively target customers, businesses should recognize the needs of customers better than their competitors. If they can do so and then be able to fulfill such needs, they will certainly gain more market share and higher profits. To implement customer orientation more effectively, employees in the enterprise should be encouraged to develop customer focus, access to customizations, and use information to provide better service quality of service. The better service quality, the better the business performance. Enterprises in Nam Dinh province should aim to target customer markets with the province's strengths in textiles, apparel, footwear, mechanics. They should monitor the level of commitment and customer orientation and measure customer satisfaction on a regular and systematic basis.

Thirdly, the fourth industrial revolution (Industry 4.0) is formed from the strong development of digital technologies. IT is the link that plays a very important role in this revolution. According to the survey results, the storage and exploitation of databases at enterprises for business purposes is still limited. Therefore, businesses need to use the data storage in many different forms such as: (1) On-site storage: This is the original data storage method. An on-site data solution that often involves the server is owned and managed by the enterprise itself; (2) Colocation: While many enterprises still want to store their valuable data on devices they own and control, they don't want to have to deal with the problems that arise with managing those devices themselves; (3) Public Cloud: Small and medium-sized companies cannot afford to invest in expensive hardware to store data. Transferring all data to a public cloud provider helps enterprises become more flexible; (4) Private Cloud: The open nature of a public cloud environment makes it difficult to protect sensitive data from unauthorized access. For companies that don't want to take these risks, private clouds deployed through a virtualized data center provide a much higher level of security, especially when combined with cryptographic protocols.

Fourthly, on local policies, it is necessary to continue to promote reform of administrative procedures in the field of business registration and investment registration. Regularly review administrative procedures in accordance with the provisions of law, abolish unnecessary procedures. Ensure publicity and transparency of all administrative procedures. Promote computerization at the one-stop shop in the process of handling administrative procedures of functional state management agencies. Equip material and technical foundations to modernize public administration. Strengthen coordi-

nation between departments, branches, People's Committees of districts and cities in solving legal problems arising in the process of establishment, investment and operation of enterprises. Improve the quality of human resources to implement state administrative reform. Strengthen the review, inspection and supervision of implementation of administrative procedures. Improve organizational capacity. Promote streamlined administrative procedures associated with the application of IT in the operations of State agencies. Regarding infrastructure in Nam Dinh province, it is necessary to: improve the quality of regional planning combined with sectoral development planning in the province; ensure publicity and transparency of plans, processes and procedures for land access; study and issue preferential regulations to encourage construction enterprises to invest in building infrastructure of industrial parks and industrial clusters for enterprises; and integrate targeted support capital sources from the state budget.

Fifthly, about the ability to access and use capital effectively, for businesses that have just got a loan for the first time but do not have enough collateral: through the appraisal, if there is enough basis to evaluate the plan as feasible, effective and that it belongs to the strong or pritized industry and field in accordance with the development orientation of the province, banks and credit institutions make agreements with enterprises to provide information on the progress of project implementation and transfer all project revenues to a bank account for debt recovery. This content is agreed upon in the credit contract so that there is a basis for early handling of contract violations when detecting that enterprises do not comply or transfer the revenue to an account at another bank, limiting the loss of debt collection. On that basis, the bank applies the form of lending a part of the outstanding balance without collateral and only needs to monitor the implementation progress and revenue of the plan to recover the debt. For enterprises that have relationships or are taking loans at banks and credit institutions: in reviewing the loan history, if the customer has good cooperation, the bank or credit institution will re-evaluate all collaterals. If collaterals are still more valuable than the guarantee obligations, they continue to make loans when the enterprise has a feasible and effective plan, strictly supervises the implementation of the plan and the enterprise's cash flow, and apply additional collateral methods such as third-party guarantee, mortgage of future assets, receivables, inventory (if any) to collect debts.

Sixthly, for policies of the government, it is necessary to improve preferential policies on land use, infrastructure support policies, investment promotion policy and support for public services, and to develop policies to support human resource training. Regarding policies to support international integration, it is necessary to formulate policies to boost exports and limit imports of non-essential consumer goods and luxury goods, formulate policies to support and develop high-quality human resources, continue to promote the effectiveness of industrial development policies in the direction of focusing on attracting multinational corporations.

REFERENCES

- [1] Kaplan, R. S., & Norton, D. (1992). The balanced scorecard-measure that drive performance. *Harvard Business Review*, 71-79.
- [2] Cross, K. F., & Lynch, R. L. (1988). The "SMART" way to define and sustain success. *National productivity review*, 8(1), 23-33.
- [3] Keegan, D. P., Eiler, R. G., & Jones, C. R. (1989). Are your performance measures obsolete? *Strategic Finance*, 70(12), 45.
- [4] Neely, A., Mills, J., Gregory, M., Richards, H., Platts, K., & Bourne, M. (1996). *Getting the measure of your business*, University of Cambridge. Manufacturing Engineering Group, Mill Lane, Cambridge.
- [5] Turney, P. B., & Anderson, B. (1989). Accounting for continuous improvement. *MIT Sloan Management Review*, 30(2), 37.
- [6] Kokko, A., & Sjöholm, F. (2005). The internationalization of Vietnamese small and medium-sized enterprises. *Asian Economic Papers*, 4(1), 152-177.
- [7] Hang, V. T. T. (2015). A study of factors affecting business performance of construction companies listed on the Vietnam stock exchange (Master thesis), University of Danang.
- [8] Panko, R., & Korn, H. (1999). Understanding factors of organizational mortality: considering alternatives to firm failure. From <http://www.eaom.org>.
- [9] Hansen, H., Rand, J., & Tarp, F. (2018). SME growth and survival in Vietnam: Did direct government support matter? Institute of Economics Discussion Paper No. 04-13, Copenhagen: University of Copenhagen. In.
- [10] Nghi, N. Q., & Nam, M. V. (2011). "Factors affecting business efficiency of small and medium enterprises in Can Tho city". *Can Tho University Journal of Science* No. 19b.
- [11] Trong, T. D. L. v. N. D. (2010). "Production and business efficiency of small and medium-sized enterprises in the Mekong Delta". *anking Technology Review*, 50(1).
- [12] Tan, N. M., Danh, V. T., & Ngan, T. T. (2015). Factors affecting the efficiency of production and business activities of small and medium sized enterprises in Bac Lieu province. *Can Tho University Journal of Science*, 38, 34-40.
- [13] Zeitun, R., & Tian, G. G. (2014). Capital structure and corporate performance: evidence from Jordan. *Australasian Accounting Business & Finance Journal*, Forthcoming.
- [14] Ndro, G. (2012). Executive compensation and firm performance: evidence from the UK charities. University of Nottingham,
- [15] Hang, T. T. (2019). A study of factors affecting business performance of SMEs in Hanoi city. (Research topic), Hanoi University of Industry.
- [16] Lý, P. T. M. (2011). Analyzing the impact of factors affecting the business activities of small and medium enterprises in Thua Thien Hue. *Journal of Science and Technology* vol 2 (43).
- [17] Danh, V. T., Cuong, O. Q., & Quang, T. B. (2013). Analysis of factors affecting the development of small and medium-sized enterprise economy in Hau Giang province. *Scientific journal of Can Tho University*, vol 27, page 34-44.
- [18] Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management*, 17(1), 99-120.
- [19] Chi, C. G., & Guroy, D. (2009). Employee satisfaction, customer satisfaction, and financial performance: An empirical examination. *International Journal of Hospitality Management*, 28(2), 245-253.
- [20] Bagheri, M. M., Hamid, A., Rezaei, A., & Mardani, A. (2012). Relationship among information technology investment, firm performance, innovation and firm growth, case study: Largest Iranian manufacturers. *International Journal of Fundamental Psychology & Social Sciences*, 2(3), 57-64.
- [21] Bunei, D. K. (2013). An Evaluation Of Information Technology Investment Influence On Organizational Performance: A Case Study of Kenyan Commercial Banks. United States International University-Africa,
- [22] Anand, A. (2013). The effects of IT capabilities on firm performance—evidence from the healthcare industry.
- [23] Ismail, A., & Mamat, M. (2012). The relationship between information technology, process innovation and organizational performance. *International Journal of Business and Social Science*, 3(2).
- [24] Hung, D. N. (2016). A study of factors affecting business performance of small and medium enterprises in Thai Binh province (Provincial research project), Department of Science and Technology of Thai Binh Province
- [25] Fitzgerald, L., Johnston, R., Brignall, T., Silvestro, R., & Voss, C. (1991). *Performance measurement in service businesses* (Vol. 69): Chartered Institute of Management Accountants London.

- [26] Wadongo, B., Odhuno, E., Kambona, O., & Othuon, L. (2010). Key performance indicators in the Kenyan hospitality industry: a managerial perspective. *Benchmarking: An international journal*.
- [27] Narver, J. C., & Slater, S. F. (1990). The effect of a market orientation on business profitability. *Journal of marketing*, 54(4), 20-35.
- [28] Aldalayeen, B. O., Moh'd Alkhatameh, W. R. n., & AL-Sukkar, A. S. (2013). Information technology and its impact on the financial performance: An applied study in industrial companies (mining and extraction). *European Scientific Journal*, 9(10).
- [29] Hiep, P. M., & Huong, V. T. B. (2019). Factors affecting the business performance of small and medium enterprises in Ben Tre city. Article in the *Journal of Finance - vol 2*
- [30] Khan, M. H.-U.-Z., & Halabi, A. K. (2009). Perceptions of firms learning and growth under knowledge management approach with linkage to balanced scorecard (BSC): Evidence from a multinational corporation of Bangladesh.
- [31] Khan, H.-U.-Z., Halabi, A. K., & Masud, M. Z. (2010). Empirical study of the underlying theoretical hypotheses in the balanced scorecard (bsc) model: Further evidence from Bangladesh. *Asia-Pacific Management Accounting Journal*, 5(2), 45-73.
- [32] De Felice, F., & Petrillo, A. (2013). Key success factors for organizational innovation in the fashion industry. *International Journal of Engineering Business Management*, 5(Godište 2013), 5-27.
- [33] Chriyha, A., Beidouri, Z., & Bouksour, O. (2012). Proposal of a Performance Model Based on the Balanced Scorecard for the Moroccan Textile Industry. *International Journal of Computer Science Issues (IJCSI)*, 9(5), 410.
- [34] Karabay, G., & Kurumer, G. (2012). Managing through strategic performance management in apparel companies. *Fibres & Textiles in Eastern Europe*(4 (93)), 13--19.
- [35] Chimwani, P., Nyamwange, O., & Otuyo, R. (2013). Application of strategic performance measures in small and medium-sized manufacturing enterprises in Kenya: The use of the balanced scorecard perspectives. *International Journal of Management Sciences and Business Research*, 2(6).
- [36] Wong, K. K., & Kwan, C. (2001). An analysis of the competitive strategies of hotels and travel agents in Hong Kong and Singapore. *International Journal of Contemporary Hospitality Management*.
- [37] Wu, L.-Y. (2007). Entrepreneurial resources, dynamic capabilities and start-up performance of Taiwan's high-tech firms. *Journal of Business research*, 60(5), 549-555.
- [38] Galbreath, J., & Galvin, P. (2004). Which Resources Matter? A Fine-Grained Test of the Resource-Based View of the Firm. Paper presented at the Academy of Management Proceedings.
- [39] Tho, N. D., & Trang, N. T. M. (2009). Dynamic competitiveness of Vietnamese enterprises in scientific research in business administration. Ha Noi: Information and Communications Publishing House, 155-238.
- [40] Johnson, W., & Huizenga, W. (2001). Market Orientation in the Asian Mobile Telecommunication Industry: Do Buyer and Seller Perceptions Concur. School of Business and Entrepreneurship, Nova Southeastern University, Fort Lauderdale-Davie, FL.
- [41] Crosby, L. A., Evans, K. R., & Cowles, D. (1990). Relationship quality in services selling: an interpersonal influence perspective. *Journal of marketing*, 54(3), 68-81.
- [42] Hill, K. O., & Meltz, G. (1997). Fiber Bragg grating technology fundamentals and overview. *Journal of lightwave technology*, 15(8), 1263-1276.
- [43] García-Muiña, F. E., & Navas-López, J. E. (2007). Explaining and measuring success in new business: The effect of technological capabilities on firm results. *Technovation*, 27(1-2), 30-46.
- [44] Thuy, L. P., Duy, V. Q., & Le Thong, P. (2020). The relation between business performance and capital structure of enterprises in Vietnam. *Journal of Asian Business and Economic Studies*, 30(6), 28-45.
- [45] Phuong, N. T. M., & Cuc, N. T. T. (2019). Evaluating the ability to access capital from credit institutions of enterprises in Nghe An province. *Journal of Economic Development*, 19-25.

Overview of Social Media Marketing and Starbucks' Social Media Marketing Strategy

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Abstract—The article is published to study some last research about social media marketing and its conceptualization. Besides, this study categorizes social media and social media marketing. Likewise, the article also studies the methods were applied social media marketing in Starbucks coffee. Therefore, the paper identifies gaps in previous studies so that the authors can continue to expand their study on this field in the next research projects.

Index Terms—social media; social media marketing; strategy; sufficient, e-word-of-mouth; Starbucks

I. INTRODUCTION

IN MODERN society, social media is one of the essential factors in a media sector and marketing. It is said that social media is a new measure for media over the world, which has a vast difference with public media.

Most entities need offer precise benefits links between their buyers, as well as other owners. Therefore, one of the many positive features of the online and digital progresses obtain a better chance to interact, communicate between companies and their consumers. Social media is such a good method to interaction between the entities and targeted customers.

Simona Vinerean (2017) studied a number of marketing usages and themes applied [1]. His study illustrated to an existent information on social media marketing (SMM) (Wang and Kim, 2017) and rises the acknowledgment of the strategic consequences of these definitions for companies that purpose to offer new products consciousness or new consumers from internet sources [2]. Likewise, his research had tackled variation among the definitions of social media and SMM. Moreover, the paper gives a total background to expand the major chances for strategic SMM in online instruments.

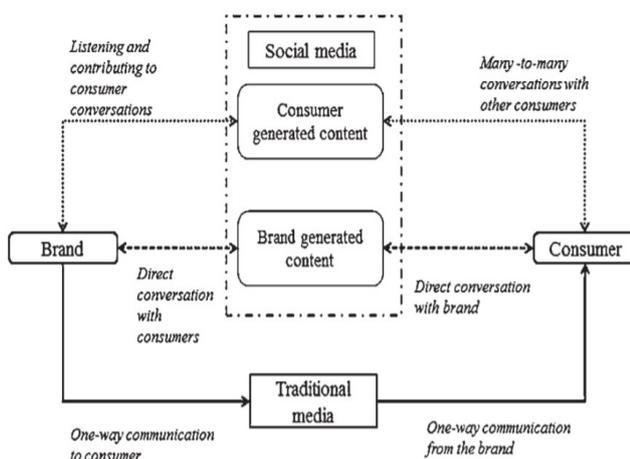
There is an important to explore the impact to sort and concept of social media platform (like Facebook, YouTube, Instagram, Twitter) on advertising actions to peak at the potential consumers. Likewise, Filo et al. (2015) [3] namely for extra concern to identify how consumers' behavior could be varied and relied on the types of Facebook promotion. Furthermore, Wang and Kim's (2017) [2] achievement argued that entities that are more social media activities can increase their brand' well-known.

Electronic Word of Mouth (E-WOM) and Customer Relationship Management (CRM) have concerned a noticeable the amount of concern from a value number of SMM research. This paper argues the links between SMM and their purposes, specially those involved in CRM, e-WOM and consumer equity. Expert Journal of Marketing, 5(1), 28-35. 33 explained that It is important to check the online marketing concept and have a meaningful recognition of social media for these purposes (Alalwan et al., 2017) [4]. As same as word-of-mouth, a sort of suggestion or assessment from people relatable is more likely to get concerned and appreciated in online settings. As companies saw this movement, they have contributed a part of their online marketing finance to bellwethers.

According to Morrison (2017) [5] from Adweek suggested in the beginning 2017, bellwethers marketing is growing into an elemental part of SMM and it applies the advertising and selling items through people (influencers) who have a huge base of famous people. Further, the major purpose of influencer marketing it to identify certain effects, in the way of consumes or tend to buy of their followers. Even if bellwethers marketing has a close similarity to well-known people marketing, its difference as anyone who spend much time following of varied social media applications can turn into an influencer for an item. Companies should also contribute budgets to monitor social media argu-

DIAGRAM I

COMMUNICATION MODEL FOR MARKETING THROUGHOUT SOCIAL MEDIA



Social media is a major of concern of both academics and administrators. There is a wide array of studies which check a social media marketing from numerous opinion that shows purposes these relationships. For example:

ment about their products and services and examine the general tendency about their goods and services and inspect which introduced content (by the entities or by other buyers) is producing precise word or mouth or has fundamental movements.

II. THE CONCEPT OF SOCIAL MEDIA AND SOCIAL MEDIA MARKETING (SMM)

A. The concept of “social media”

In modern society, “social media” is one of the terms which is immensely popular among citizens, specially in media and marketing. It is said that social media is a new method for international’s social and differ with public media. Although social media obtain much concern and interest of people, the definition of “social media” still be a secret for researchers.

Today, there are a variety of researchers made afford to identify the concept of “social media”. However, this term has not yet taken a comprehensive definition. Some views of researchers about “social media” will be mentioned below.

According to Dr Andreas Kaplan and Michael Haenlein at ESCP Europe University “Social media is a group device on the internet and based on the idea and technology of Web 2.0, It allows to create and exchange the content by user-generated” [6].

A concept of “social media” which appealing to interest from people is definition by Joseph Thorley – CEO of Thorley Fallis “Social media is a method of online social and have a flexible movement between the author’s role and individual participants. To tackle that issue, they used social software which permit non-professional authors make edition, publish, comment, or alter the content to introduce the same interest.

In conclusion, although there are several viewpoints about SMM, it still has some basic characteristics:

Firstly, SMM is a method of media based on web 2.0 platforms and it uses internet gateway to announce information.

Secondly, there are a vast difference between mass media and traditional media, which maintained in a long period. Some variation will be mentioned below:

- 1) Information will be supplied in several ways such as newspaper, magazines, radio, television to audiences. The process of delivering information will form one-to-many in mass media. Meanwhile, social media platforms such as Facebook, blog, forums allow viewers post, share and comment about information. This is many-to-many in social media.
- 2) Almost all authors take part in making and publishing information on mass media have to participate in training courses. They are professional journalists and reporters. On the other hand, anyone might take part in making and announcing information in social media. This means that users will create content by their selves.
- 3) In mass media, news often publishes in certain periods, such as a daily basic, weekly basis. Meanwhile, social media information usually gives anytime and anywhere. For example, a blog can create many posters each day.

B. The concept of “social media marketing”

Social media marketing often uses in marketing strategies in enterprises to expose to target customers. There are more experts find to the concept of SMM and several experts argued that SMM will be an innovation for the near future. As a result, concept of SMM will be formed.

On some website, people proposed “SMM is a term which illustrates using social networks, forums, blog, wiki or other online social to pursuit marketing target, selling goods, publication relationships and customer services.

According to Formic Media website “SMM is a form of online marketing and its target is participant in different social networks (Myspace, Facebook, LinkedIn), share networks (Flickr, YouTube), evaluation website (ePinions, Bizrate), blogs, forums, reading e-news systems (Second Life, Active Worlds).

Another website make definition “SMM is a certain online marketing strategy based on using social media websites such as Twitter, Digg, YouTube, StumbleUpon.

Overall, almost all definitions of SMM based on gateways which this type of marketing using. To illustrate clearer this definition, it is necessary to emphasize some details below:

SMM is one of sorts of online marketing because of using websites and other applications of social media on the internet. There are some categories of internet marketing including email marketing, banner advertising (web banner), search engine marketing -SEM. SMM is a young sort of marketing in comparison with other kinds of online marketing. However, SMM is more and more popular in marketing activities in enterprises in modern society.

The purpose of SMM is that creating inspiration for marketing strategies which entities are taking. In general, SMM is a close similarity word-of-mouth marketing implementing in social media platforms. Other aims of SMM helping companies built online instant conversation and enhanced interacted ability between entities and customers.

The major aim of SMM is generating profit, revenue, market share and establish relationship between buyers and companies, introduced brand’s corporations.

On the other hand, it is essential to distinguish two concepts “social media” and “social media marketing”. Social media is a type of communication to supply and share information to varied users compared to the target of SMM which is serving for marketing activities of enterprises.

III. TYPES OF SOCIAL MEDIA AND SOCIAL MEDIA MARKETING

Based on the two unique characteristics of social media shown in Table 1, which are media richness and self-disclosure, Kaplan and Haenlein (2010) categorized social media into six different types: collaborative projects (e.g., Wikipedia), blogs and microblogs (e.g., Twitter), content communities (e.g., YouTube and Daily Motion), social networking sites (e.g., Facebook), virtual game worlds (e.g., World of Warcraft), and virtual social worlds (e.g., Second Life). Currently, the most popular social media platforms

used by companies are Facebook, Twitter and YouTube (Wright and Hinson, 2012).

TABLE I
CLASSIFY SOCIAL MEDIA

		Social presence/media richness		
		Low	Medium	High
Self-presentation/ self-disclosure	High	Blogs	Social networking sites (Facebook)	Virtual social worlds (Second Life)
	Low	Collaborative projects (Wikipedia)	Content communities (YouTube)	Virtual game world (World of Warcraft)

Source: Adapted from Kaplan and Haenlein (2010)

Social Media Marketing is the most inexpensive and economical way to reach the target market, regardless of your business type. It refers to the process of gaining traffic or audience through social media channels or sites. Social Media channels include Facebook, Instagram, Twitter, Google+, WhatsApp, LinkedIn, Pinterest, Tumblr. These are the most popular used social media channels.

76% of the American has one of the social networking profile and by 2020 the number of global users of social media is expected to reach 2.95 billion. Facebook is the most important platforms over worldwide. Other significant channels are WhatsApp, WeChat, Instagram, Twitter, LinkedIn, Pinterest, and YouTube. According to the B2B community: 90% of adults aged 18 to 30 use social media compared with 35% of those over 65; 84% of Chief Executive Officers (CEOs) and Vice presidents (VPs) say they use social media to help make a purchasing decision; social media is the favorite way to communicate with businesses.

TABLE II
TYPE OF SOCIAL MEDIA MARKETING

Forms of SMM	Characteristic	Platform
1. Sharing of content on social media	Major type of social media marketing	YouTube, Snapchat, Instagram
2. Networking services for social media	Allow the potential for more targeted marketing	Twitter, LinkedIn
3. Building services through community	Forums, Message boards, Yahoo and google groups are the sites which is there for long.	Forums, Message, Yahoo, Google
4. Review Sites	Sites such as TripAdvisor, Make my trip, Trivago provide consumer reviews.	TripAdvisor, Make my trip, Trivago

IV. SOCIAL MARKETING PLATFORMS

A. Social networking sites

Social networking sites are websites introducing based on register account to become participants, as a result form an online community which including people have the same interest or acquaintances. In addition, these people can interact, communicate together throughout social networking sites. There are a variety of social networking sites in recent

day (Facebook, Twitter, LinkedIn, Friendster, Orkut, Myspace).

B. Sharing websites:

It allows to participants make sharing information via websites. The content might be formed by pictures, videos, presentations. There are various sharing websites in recent day, including YouTube, Vimeo, Flickr, Picasa, SlideShare, Scribd. Almost all participants have never seen each other in real society is the main difference between social networking sites and sharing websites. However, they still have same interest, hobby. For example, anyone who seek Flickr often want to share, looking for beautiful pictures.

C. Blog and Microblog:

Blog often occupies by an individual or organization in order to update blogs post or blog entry on regular basic. Blog's content is various including routine activities and academic information. Sharing information and creating motivation for users are the major purpose of bolgs.

Microblog has similar characteristics of blog. However, microblog is often shorter than blog. Some corporations such as Microsoft, IBM encourage their staffs post work's details in blog. This an incentive idea because companies do not talk about marketing, it still obtains positive interest of customers.

D. Social Bookmarking Sites

This platform is the most reputation for SMM. Social Bookmarking permist users mark, share, manage, save links which those people have concern. There are several social bookmarking websites, such as Delicious, StumbleUpon, Digg, Reddit. In general, companies can post useful links on these websites. Almost all links involve in organization's products or services.

E. Forum

Forums are websites that allow participants to discuss or initiate a discussion topic by themselves. For example: Samsung's mySamsung forum was built to make it easier to use and buy Samsung products, and Muare.vn forum is an on-line shopping forum that acts as one of the commercial websites. largest e-commerce in Vietnam. From a social media marketing perspective, these forums are often used by businesses to conduct direct reaactions with customers, gathering a lot of valuable information about customers' needs and desires. Overall, Forums have many similarities with social networks, but they are not as popular. Forums also do not have many features and especially interactivity is much worse when compared to social networks. Forum participants mainly stop at creating topics and discussing this point.

F. Other platforms

Social Network Aggregators: Social Network Aggregators are websites used to collect information from social networks to provide readers on this aggregator website. Popular websites of this type are Collectedin, myZazu, NutshellMail, FriendFeed, Gathera, etc. Currently, some websites like FriendFeed also provide the feature of aggregating information from blogs, microblogs, forums, not just from social

networks. This platform is suitable for businesses that use multiple accounts on many social networks at the same time. Through these aggregated websites, businesses can manage information on all social networks that they participate in at the same time. Also, creating more favorable conditions for customers to look up and find out information about businesses provided on many social networks at the same time.

Wikis: Open Website (Wikis) is a website that allows building and managing information pages jointly developed by many people. The outstanding feature of these open websites is that any member can edit, add information to the news page and do not record who provided that information. This is the difference between open websites and forums. The most famous open website Wikipedia. Although not very popular, recently there have been a number of businesses building open websites as an online community where customers and employees can freely share information about their experience using products and services.

Virtual Worlds: Virtual World is an online community on the network that allows participants to interact with each other based on realistic simulated situations and built in the form of 3D models, for example: Second Life, Active Worlds, Kaneva, ... Building these virtual world models, businesses can create dynamic interaction from customers when they are involved in an interesting online space that has many similarities with real life through 3D images.

Podcast: Podcast is a series of digital media files (in audio or video format) that are periodically released and can be downloaded from the web. Businesses often use this platform to provide more information to customers. For example, Starbucks coffee company has a series of podcasts introducing the process of growing and caring for coffee trees, BBC radio has a series of podcasts that update world news, etc.

Widget: Widget apps are stand-alone applications that can embed code to appear on another web page. These sites are usually blogs or social networks. Businesses often create widget applications to present their products, upload them online so that users can download and "paste" on their blog or social network, or even their computer screen or my phone. For example, Dove company once launched a widget application called "MTV Fresh Take" to promote its new product Dove Fresh Take. The guests Customers who download this widget application and "paste" it on the blogs or social networks they participate in can quickly be redirected to the official Dove website with a simple click of the mouse.

Currently, the role of widget application is increasingly appreciated in social media marketing because this application can be easily used with blogs or social networks, effectively supporting the promotion of images through these websites. Widget application is most suitable for businesses whose target customers are young people who like to express their personality through the brands they use.

It is clear that companies using above websites to advertise products and services in online communities and applying viral factor in SMM.

V. STARBUCK'S SOCIAL MEDIA MARKETING STRATEGY

Starbucks is now considered one of the successful businesses in the use of social media marketing. The secret to success of Starbucks lies on its clear and consistent viewpoint on the use of

Use social media in your marketing activities. Starbucks determine the goal they want to achieve first, and then take certain steps in your social media marketing campaigns.

For instance, Ms. Alexandra Wheeler, manager of the interactive marketing department of Starbucks once told Brandweek magazine: "One of Starbucks' top priorities in using social media is that it must be able to connect with customers through the most reasonable ways. Among those methods, information sharing is considered a perfect option. Facebook and Twitter allow the company to post interesting stories behind the process produces each cup of its coffee and shares it with a much larger audience than other media channels [7].

According to Mr. Chris Bruzzo, vice president of brand and online operations at Starbucks, emphasized: "We do not build a Fan Page on Facebook, attract millions of fans and then pursue them to buy products, by contrast we build an online community where customers are eager to share with Starbucks their thoughts on the product, expressing their desire to interact more with the activities of Starbucks [8].

In conclusion, it can be seen that Starbucks has captured the main point of Social media marketing is how to increase interaction between brands and customers through developing dialogues built on applications of web 2.0 technologies. This is the key to the success of Starbucks' social media marketing.

The platforms Starbucks uses in social media marketing activities:

Social Networking Sites: Starbucks appears on three major social networks: Facebook, Twitter and Myspace. MySpace was once the number one social network choices in the US before being usurped by Facebook. Although it is not as popular as it used to be, MySpace is still active, especially in the US.

There are now more than one million people "following" Starbucks on Twitter. These people are called "followers", in the form of "friends" on Facebook or Myspace, who add Starbucks to their Twitter connections to receive updates on Twitter. These messages are called Tweets and can only contain up to 140 characters. Starbucks uses the Tweet function -Twitter's main feature to communicate with customers.

Among the social networks Starbucks participates in, Facebook considered the most successful. Currently, Starbucks' Fan Page has attracted nearly ten million "likes". These people were formerly known as fans. Fans on Facebook are like followers on Twitter and friends on MySpace or blogs. These are people connect with businesses through these online communities so that they can quickly update information about businesses. Currently, Starbucks Fan Page has the number of "likes" or fans surpassing all of Coca-Cola. Facebook allows customers to interact with Starbucks in many ways such as commenting, showing liking or sharing the information that the business provides.

Sharing websites:

YouTube: Appearing on the world's largest video sharing network, Starbucks created its own channel, like an account on Facebook or Twitter. Currently on this channel, Starbucks has millions of subscribers with roughly ten million total views of Starbucks videos. The videos that Starbucks has uploaded to YouTube have mainly content about coffee in general and Starbucks coffee as well as Starbucks coffee in particular

Flickr: Starbucks is one of the brands that provide a lot of inspiration for both amateur and professional photographers on the photo sharing network Flickr. On Flickr, there are many groups that take the name Starbucks and post photos of its stores or products. Photos on Flickr have contributed to bringing customers opportunities to discover more interesting perspectives on the Starbucks brand.

Forum: Currently, many businesses around the world have established one or more forums to connect with customers, but the unique point of Starbucks' forum is its purpose. My Starbucks Idea Forum <http://mystarbucksidea-force.com/> was established to create an online space for Starbucks customers to share their own ideas to improve the quality of its products and services. Technically, My Starbucks Idea is built with features for users to interact with each other such as commenting, voting and grading opinions [9].

Podcasts: In September 2006, Starbucks launched a series of Podcasts with talks from experts or manufactures in the coffee industry called Coffee Conversations. This Podcast series is made for the customers of Starbucks had the opportunity to learn more about its coffee production process.

Some typical Starbucks Social Media Marketing Campaigns

With the above platforms, Starbucks has implemented many campaigns specific and obtaining successful social media marketing. Among them, the two outstanding campaigns are:

Free Pastry Day

On July 21, 2009, the entire system of Starbucks stores in the US. Company gave away a free snack (pastry) if customers buy a drink and bring an "invitation" to the event printed from the website of Starbucks. It is worth mentioning that Starbucks has taken advantage of a very basic function of Facebook is "create an event" to promote Free Pastry Day. Follow that, the firm has provided detailed information about this promotion on the page event created on Facebook. Thanks to that, many Starbucks customers already know come to this event without the need to spend effort and money on leaflets, banners advertisement. Statistics up to July 21, 2009, there were 600,000 people confirmed to participate join on Facebook. Starbucks stores that day were packed with people queuing up and hand holding an invitation to Free Pastry Day to get a promotional snack for yourself. In particular, information about this event is mentioned and shared not only through Facebook but also via Twitter. According to statistics, on Twitter that day, the number of sentence in Tweets mentioning Starbucks increased significantly, about 1% of Tweets occurrence of the word "Starbucks" about 10 times larger than weekdays. In general, in the campaign, Facebook was used as an effective informa-

tion distribution channel to customers. This campaign is considered as one of the simple social media marketing campaigns that still ensure the success of Starbucks. [10]

Starbucks poster search contest

In this campaign Starbucks conducted showing posters of the new advertising campaign on Starbucks stores at six big cities in the US. If it stopped at that level, it would still be just one traditional form of marketing. Starbucks' innovation is that it challenges its customers to be the first to take pictures of these posters and post them on their Twitter page. The prize of the contest may not be valued, but it understood the emotion of customers, especially in young people: the desire to be appreciated in their online community. Just like that, the

Twitter users spread the word among themselves and enthusiastically entered the contest with many Starbucks photos. Fame of brand is increased rapidly while Starbucks corporation does not spend too much effort and cost. All Starbucks had to do was launch the contest, and it was up to the customers themselves to get involved.

Evaluating Starbucks Coffee's Social Media Marketing strategy

Starbucks' social media marketing today has many advantages and disadvantages that coexist. Specifically, the advantages in social media marketing campaign of the company are:

Firstly, Starbucks used a very flexible set of tools in your social media marketing

Secondly, on the online communities that Starbucks participates in or builds itself, it has succeeded in building a "friendly online space". On it, every customer feedback has a quick and dedicated Starbucks staff. The content of information the company shares on these online communities is also interesting, sometimes simple, and familiar like a daily conversation, creating sympathy with customers. In addition, on the different online communities that Starbucks participates in, there are links to the company's homepage or other networks, creating a high level of interaction between these sites. For example, on the Starbucks Fan Page on Facebook, you can find links to Twitter or the company's homepage.

Thirdly, Starbucks' social media marketing campaigns have also taken advantage of the valuable experiences that businesses have gained on the network environment. Specifically, based on information collected from customers on social networks, forums, etc., Starbucks has improved products, improved service quality as well as launched specific marketing campaigns. In reality. In other words, Starbucks has achieved success with social media marketing both "online" and "offline".

Finally, Starbucks has built a professional team in charge of its social media marketing activities. For example, Starbucks currently has its own team dedicated to updating information and responding to customers on the Twitter. Such work specialization allows Starbucks to use multiple social media tools at the same time while ensuring efficiency.

VI. CONCLUSION

Social media marketing is not only a separate form of marketing but also still has some overlap with traditional

marketing forms. This paper has some following contributions. Firstly, it studies some previous paper about social media marketing and the concept of social media marketing throughout some viewpoints of authors over the world. Moreover, this paper proposed Starbucks's social media marketing, which applied social media marketing and obtain a variety of benefit for organization. However, this study has gaps so that the author can continue to expand this study on this field in the next research projects.

REFERENCES

- [1] Vinerean, Simona, 2017. Importance of Strategic Social Media Marketing. *Expert Journal of Marketing*, 1:28-35.
- [2] Wang, Z. and Kim, H.G., 2017. Can Social Media Marketing Improve Customer Relationship Capabilities and Firm Performance? Dynamic Capability Perspective. *Journal of Interactive Marketing*, 39, pp.15-26.
- [3] Filo, K., Lock, D. and Karg, A., 2015. Sport and social media research: A review. *Sport Management Review*, 18(2), pp.166-181.
- [4] Alalwan, A.A., Rana, N.P., Dwivedi, Y.K. and Algharabat, R., 2017. Social media in marketing: A review and analysis of the existing literature. *Telematics and Informatics*.
- [5] Morrison, K., 2017. *Influencer Marketing Is Becoming an Essential Business Strategy (Survey)* [online] available at: <http://www.adweek.com/digital/influencer-marketing-is-becoming-an-essential-business-strategy-survey/> [Accessed on 16 May 2017].
- [6] Kaplan, A. M. and Haenlein, M., 2010. Users of the world, unite! The challenges and opportunities of social media. *Business Horizons*, 53 (1), pp.59-68.
- [7] Wikipedia (2009), <http://en.wikipedia.org/wiki/Starbucks>, 15/03/2010.
- [8] Emily Bryson York, *Starbucks gets its business brewing again with social media*, *Advertising Age* (2010), <http://adage.com/>, 16/03/2010.
- [9] My Starbucks Idea (2010), <http://mystarbucksidea.force.com/23/04/2010>.
- [10] Adam Ostrow (2009), *Starbucks Free Pastry Day : A Social Media Triple Shot*, Mashable, <http://mashable.com/2009/07/21/starbucks-free-pastry-day/>, 18/03/2010.

Determinants of Dividend Smoothing: Empirical evidence from non-financial firms listed on Vietnam stock exchanges

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Abstract—This study considers the impact of different factors on the degree of dividend smoothing of non-financial firms listed in Vietnam during 2008 - 2018. We use two measures (Speed of Adjustment and Relative Volatility) to evaluate the degree of dividend smoothing. Using 2SLS estimation to solve endogenous issues in the model, we show that dividend smoothing is higher for firms with fragmented ownership structure, slim growth opportunities, large size, high-profit volatility and are in the highly competitive sector. We also contribute to the literature by the new finding that the firm age has a nonlinear relation (U-shaped) with the degree of dividend smoothing. Our results support the agency theory.

Index Terms—dividend smoothing, speed of adjustment, relative volatility

I. INTRODUCTION

DIVIDEND smoothing has drawn attention from many researchers after the seminal paper by Lintner [24]. Accordingly, dividend smoothing implies an attempt by corporate managers to adjust dividend payments in response to changes in earnings in order to maintain a stable dividend policy.

Existing studies on factors affecting dividend smoothing have been done in developed and emerging markets. In Vietnam, to the best of our knowledge, research on this relationship is somewhat limited. With the characteristics of a market with low liquidity and limited access to the market (such as: openness of the market and equal rights with foreign investors, limited public sector, information disclosure, ect), Vietnamese stock market is currently a frontier market and is waiting to be upgraded to an emerging market. Because of the differences in macroeconomic environment, corporate governance, agency issues and potential information asymmetry for firms, investigating factors affecting dividend smoothing in Vietnam is necessary to provide a new perspective in the new context.

Previous studies have investigated the impact of ownership structure on the dividend smoothing behavior of firms, but these studies mainly mention the role of ownership concentration and institutional ownership. Meanwhile, ownership structure in Vietnam is characterized by centralized ownership and state ownership. The state-owned firms in Vietnam are characterized by the dominant shares of the State. With this feature, in addition to the variables of centralized ownership and institutional ownership, it is neces-

sary to evaluate the influence of State ownership on the behaviour of dividend smoothing in Vietnam.

In addition, there are two main measures of dividend smoothing: the SOA-speed of adjustment proposed by Lintner [24] and relative volatility (RelVol) by Leary and Michaely [23]. RelVol is a measure that has many advantages that SOA does not have such as: Avoiding bias when the sample is small (short sample size and a limited number of observations). However, most previous studies used the traditional SOA to measure the degree of dividend smoothing. Therefore, using RelVol to consider the impact of different factors on dividend smoothing in Vietnam is also a research gap. We fill this gap by investigating the impact of different factors on dividend smoothing using both RelVol and SOA to measure dividend smoothing.

II. THEORETICAL BACKGROUND AND LITERATURE REVIEW

We employ two fundamental theories: the signalling theory and the agency theory. Signalling theory says that dividend smoothing is to minimize problems arising from information asymmetry [6]. This is a means of signalling about earnings prospects. Firms that have to face more information asymmetry will be likely to smooth their dividends [20], [19], [13].

The agency theory states that dividend smoothing is seen as a means of controlling the agency costs to harmonize benefits among stakeholders [10], [8], [3], [22]. The more the firm has potential conflicts of interest, the higher the level of dividend smoothing.

Thus, according to the above arguments, asymmetric information and agency problems affect the firm's dividend policy. Firms that face larger conflicts of interest and asymmetric information tend to smooth their dividends more. Therefore, the stability of dividends of the listed firms depends on intrinsic characteristics such as: firm age, level of risk, ownership structure, growth opportunities.

Research on factors affecting dividend smoothing of firms is still limited. Some studies are: Leary and Michaely [23], Javakhadze et al [15] and Jeong [17]. These studies aimed at testing the factors affecting the level of dividend smoothing based on information asymmetry and agency problems. The research results have contributed to providing evidence on dividend smoothing in the Korean and American markets. However, using only SOA to measure dividend

smoothing in the study of Jeong and Javakhadze et al may not be enough to confirm the robustness of the results. Regarding research methods, if these studies control the endogenous issues in the model, the research results will be more reliable.

Besides the studies on the above factors affecting dividend smoothing, a number of studies focus on testing the relationship between ownership structure, board structure and dividend smoothing [25], [2], or the relationship between dividend change and cash flow [18].

III. HYPOTHESES AND RESEARCH MODELS

A. Research hypothesis

We focus on the following research question: How do characteristics of firms and business sectors affect the degree of dividend smoothing of non-financial firms listed on the Vietnam stock market? To answer the question, we used a group of factors including characteristics of firms and the business sector proposed from the theories of information asymmetry and agency problem.

* *Firm size and firm age*: Size and age represent the maturity of the firm. Large and long-standing firms are more trustworthy because historical data is available. Investors have easier access to information than newly listed and small firms. These firms are expected to have a lower potential for information asymmetry than younger and smaller firms [22]. Meanwhile, the problem of information asymmetry is considered to be more serious for small and/or newly listed firms because of the lack of historical data or reputation.

Dividend signaling theory argues that in the presence of asymmetric information, a firm's dividends can convey reliable information from insiders (managers). Freeman [11] reported that the market prices of large firms more accurately reflect earnings than those of small firms. Thus, it can be seen that smaller firms tend to use dividends as a signal of value. All these arguments imply that the size and age of the firm may reduce the signaling function, thus reducing the degree of dividend smoothing. Therefore, we expect the following hypotheses:

H1: Firm size has a negative impact on the degree of dividend smoothing.

H2: Firm age has a negative impact on the degree of dividend smoothing.

* *Growth opportunity*: According to signalling theory, firms with higher expected growth opportunities have higher demand for funding. To meet the capital needs, these firms have to use the dividend signal by maintaining dividend payment stable relative to income. Therefore, investment opportunities will be an incentive for firms to smooth dividends [1], [17]. On the other hand, when investment opportunities increase, it will reduce the free cash flow of firms due to the need to retain income to meet capital needs, which will reduce agency conflicts between shareholders and managers. Firms are less likely to implement a stable dividend policy in this case.

With the characteristics of the Vietnam stock market, asymmetric information is always a big problem in the busi-

ness environment of firms, therefore, firm managers often tend to transmit signals about earnings prospects to investors. Therefore, we expect a positive relationship between growth opportunities and dividend smoothing as follows:

H3: Growth opportunities have a positive impact on the degree of dividend smoothing.

* *Cash flow*: The separation between ownership and control is one of the fundamental tenets of the market that creates the agency problem. Jensen and Meckling [16] argue that free cash flow will create temptation for managers to choose investment projects, managers can have an incentive to invest this excess cash flow in projects with low efficiency to increase the size of the firm or increase the level of management control. This fact may lead to a decrease in the value of the firm. The conflict of interest increases as the free cash flow of the firm increases. Therefore, dividend smoothing not only conveys information about a firm's earnings prospect but also management's commitment not to overinvest to harm shareholders' interests. The following hypothesis reflects the above analyses:

H4: Firms with high free cash flows tend to exercise dividend smoothing more.

* *Firm risk*: Asymmetric information makes high-risk firms more inclined to stabilize their dividend [20], [13]. Firms with more stable profits can predict future returns more accurately, and thus managers can pay dividends without worrying about future dividend cuts. This view is also consistent with the studies of Aivazian et al [1] and Jeong [17]. The following hypothesis is proposed:

H5: Firms with high risk have a positive impact on the degree of dividend smoothing.

* *Ownership structure*: The concentration of ownership reduces conflicts of interest, which in turn reduces agency costs. In contrast, in firms with dispersed ownership, there are potential conflicts of interest between controlling shareholders and major shareholders. Dividend smoothing can be used to mitigate this conflict of interest by reducing free cash flow and forcing firms to raise external funds from the capital market and strengthen supervision from the capital market [10]. Several results from empirical studies support this view [21], [25]. Therefore, the next hypothesis is as follows:

H6.1: The ownership ratio of larger shareholders is negatively associated with the degree of dividend smoothing.

Institutional shareholder ownership is represented for all three market conflicts (taxes, asymmetric information, and agency conflicts). From a tax point of view, institutional shareholders are not at a disadvantage in terms of dividend tax like individual shareholders. According to the agency theory, institutional shareholders are those who have strong supervisory ability and have advantages in the management of firms. The presence of institutional shareholders reduces conflicts of interest and agency problems. On the other hand, if the argument is based on the problem of information asymmetry, institutional shareholders are knowledgeable people who have easier access to information than individual shareholders, so the problem of asymmetric information

is minimized if there is a large ownership percentage of institutional shareholders in a firm [7].

Starting from the problem of information asymmetry, the study expects signalling theory to be the basis for explaining this relationship in Vietnam's stock market. The following hypothesis is proposed:

H6.2: The percentage of stock holdings of institutional shareholders has a negative impact on the degree of dividend smoothing.

The current state of ownership structure in Vietnam is a centralized ownership structure and the State holds the dominant power in a number of firms in a number of important economic sectors such as Oil and Gas and Utilities. Although the privatization is still being implemented, the number of firms owned by the State is not small. Firms with state control will face fewer agency problems, so they are less likely to smooth dividends. Thus, in addition to the ownership of major shareholders and institutional ownership, we add the following hypothesis:

H6.3: State ownership rate has a negative impact on the degree of dividend smoothing.

* *Sectoral competition:* The higher the level of competition in the sector, the lower the agency problem because firms must focus on improving competitiveness. Faced with great competition for capital, it is likely that managers will respond to investors' preferences for dividends [5] to attract funds. This means that firms tend to use dividends as a means to transmit signals to attract funds. According to this argument, firms operating in highly competitive sectors are more likely to smooth dividends. The following hypothesis is proposed:

H7: The level of sector competition has a positive impact on the degree of dividend smoothing.

* *Asset tangibility:* According to Harris and Raviv [14], it is easier for an outsider to control tangible assets than intangible assets because of the physical form of tangible assets. Therefore, a large proportion of investments in tangible assets will reduce the uncertainty of the firm's information. Therefore, we expect the following hypotheses:

H8: The proportion of tangible assets has a negative impact on the degree of dividend smoothing.

* *The volatility of returns of the sector:* The phenomenon of dividend smoothing will be more common in sectors where the volatility of returns seems to be higher. The return volatility of a sector is commonly used to assess the uncertainty of a sector's information [15]. We propose the following hypothesis:

H9: Firms in sectors with large profit fluctuations tend to smooth dividends more.

B. Research models

To test the above hypotheses, we implement the following multivariable regression model:

$$RelVol_i(SOA_i) = \beta_0 + \beta_1 OWN_i + \beta_2 AGE_i + \beta_3 SIZ_i + \beta_4 GROWTH_i + \beta_5 FCF_i + \beta_6 RISK_i + \beta_7 HHI_i + \beta_8 TANG_i + \beta_9 RISK_{IND_i} + \varepsilon_i$$

The dependent variable is the degree of dividend smoothing using simultaneously two measures SOA and RelVol. SOA is estimated from the model of Lintner and RelVol

(Relative Volatility) is proposed by Leary and Michaely. In which:

➤ Lintner model (1956):

$$DPS_{i,t} - DPS_{i,t-1} = \alpha + \beta_1 DPS_{i,t-1} + \beta_2 EPS_{i,t} + u_{i,t} \quad (1)$$

Where: DPS_t is the dividend of the year t ; EPS_t is the current income. The level of dividend smoothing SOA is the value $-\beta_1$ regressed from equation (1).

➤ Leary and Michaely model (2011)

$$Adj. DPS_{it} = \alpha_1 + \beta_1 * t + \beta_2 * t^2 + \varepsilon_{it}$$

$$TPR_i * Adj. EPS_{it} = \alpha_2 + \gamma_1 * t + \gamma_2 * t^2 + \mu_{it}$$

$$RelVol = \frac{\sigma(\varepsilon)}{\sigma(\mu)}$$

Where: $Adj. DPS_{it}$ is the dividend paid by firm i at time t after correction to eliminate volatility due to the stock split; TPR_i is the assumed target payout ratio, assumed by Leary and Michaely [23] to be equal to the median of the firm's payment rate over the study period; $Adj. EPS_{it}$ is the earnings per share of a firm at time t after corrected to eliminate fluctuations due to a stock split; t is the time trend variable numbered from 1 to n corresponding to the number of periods observed in the sample. The RelVol measure is the ratio of the root-mean-square error (RMSE) from the first equation to RMSE from the second equation.

The independent variables in the model are described in the table I below.

IV. DATA AND SAMPLE SELECTION

A. Research sample

The study sample was selected for the following criteria:

- *Firstly*, listed firms are more likely to use signals from dividends to transmit information about their performance to their investors because they must satisfy the stock listing conditions and the regulations on information disclosure. Therefore, the listed firms are more suitable for dividend smoothing behavior than the unlisted firms [25].

- *Second*, smoothing dividends is a process, so the research unit is the firms that pay dividends, which have enough data to calculate the smoothing measures [9]. We excluded the firms in the financial sector because this sector is governed by its own regulations and has a specific financial report structure. Also, this sample does not include firms that adjust data in the research period such as implementing equityization or participating in M&A business [23].

- *Third*, to determine the factors affecting the level of dividend smoothing, it is necessary to identify proxies that represent market conflicts. These variables require that data must have not more than 5 years of missing values [23].

B. Research period

We collect data of firms in the period from 2008 to 2018. Particularly data on dividend (DPS) was collected 12 years

TABLE I
DESCRIBE THE INDEPENDENT VARIABLES AND SIGN EXPECTATION WITH
THEORETICAL

Variable name	Variable code	Identification method	Expected sign
Firm size	SIZE	Natural logarithm of total asset	(-)
Firm age	AGE	Number of years listed on HOSE or HNX until 2018	(-)
Growth opportunities	GROWTH	MA/BA (Market value/Book value)	(+)(-)
Business risk	RISK	Standard deviation of (EBITDA/Total asset)	(+)
Free cash flow	FCF	Natural logarithm of operating cash flows minus capital expenditures	(+)
Large shareholder ownership	LARGE	Ownership ratio of large shareholders	(-)
	LARGEST3	Ownership ratio of the three largest shareholders	(-)
	LARGEST1	Ownership ratio of the largest shareholders	(-)
Institutional ownership	INST	Ownership ratio of the large shareholders who are institutions	(+)(-)
State ownership	SO	Ownership ratio of State shareholder	(-)
Tangible asset	TANG	Tangible asset/Total assets	(-)
Sectoral competition	HHI	Sum of square of market share of firms in the sector	(+)
Sectoral information	RISK_IND	Standard deviation of average EBIT by sector.	(+)

* Large shareholder is a shareholder that directly or indirectly owns 5% or more of the voting shares of the issuer.

(Source: Authors' review)

from 2007 to avoid missing observations due to differentiation and lagged- variables when using the Lintner model.

C. Data source

Dividend data and financial indicators are extracted from Stoxplus's data set. This data is collected from public information of the listed firms, such as: basic information of firms on securities firms' websites, audited annual financial statements, annual reports, notification of dividends. Therefore, we can easily control, update these data and calculate for specific indicators. Data in ownership structure, including: ownership of major shareholders, ownership of institutional shareholders and ownership of state shareholders are collected through Vietstock's annual data.

The sample consists of 336 listed firms, including 154 listed firms on HOSE (accounting for 45.83%) and 182 listed firms on HNX (accounting for 54.17%). The firms in the sample are divided into categories by industry, classified according to ICB level 1.

V. EMPIRICAL RESULTS

A. Descriptive statistics analysis

Descriptive statistics of the model's independent variables are presented in Table II.

Regarding the ownership structure, the ownership rate of all major shareholders (holding 5% or more shares) with the average level is 51.41% (51.92%), in which the average holding rate of 1 largest shareholder is 38.25% (40.78%) and that of 3 largest shareholders is 49.59% (51%). With such a relatively close ownership ratio, it proves that the ownership structure in Vietnam is quite concentrated. The average shareholding rate of institutional shareholders excluding state shareholders is 14%, maximum holding is 94.55% in the entire sample. The average value of State ownership is 29.39%, the highest rate is 84.44%. The average number of years of listing of listed firms during 2008-2018 is 10 years with the maximum value of 18 years and the minimum value of 6 years.

TABLE II
DESCRIPTIVE STATISTICS

	Mean	Sd	P50	Min	Max	Cv
LARGE	.5141	.1946	.5192	0	.9517	.3789
LARGEST1	.3825	.1820	.4078	0	.8295	.4758
LARGEST3	.4959	.1923	0.51	0	.9517	.3880
INST	.1400	.1936	.0556	0	.9455	1.41
SO	.2939	.2386	.3219	0	.8444	.8119
AGE	10.06	2.23	10	6	18	.2218
SIZE	6.136	1.309	6.079	3.801	8.638	.2134
GROWTH	1.309	1.028	.98	.16	5.88	.786
FCF	.1103	.1016	.0755	.0063	.3732	.9210
RISK	.0455	.0292	.0398	.0156	.1778	.5459
TANG	.4795	.2113	.4522	.1564	.8636	.4407
HHI	.1014	.1322	.0442	.0232	.7954	1.304
RISK_IND	.0493	.0080	.0453	.0361	.0650	.1632

(Source: Authors' review)

The mean firm size (SIZE) is 6.136 with a maximum value of 8.638 and the minimum value of 3.801; The average value of the ratio of tangible assets to total assets TANG is 47.95% with a minimum value 15.64% and the maximum value of 86.36%. The growth opportunity of a firm is calculated through the M/B ratio, which averages out to 1.309 and takes on a value between 0.16 and 5.88. Free cash flow (FCF) is calculated as the natural logarithm of operating cash flows minus capital expenditures. The risk variable RISK is determined through the standard deviation of EBITDA/Total assets during 2008-2018, the mean value of the total sample of this variable is 4.55% with a minimum value of 1.56% and the maximum value 17.78%.

Correlation testing (Table III) shows that most of the variables in the model are correlated with the dependent vari-

TABLE III
CORRELATION COEFFICIENTS MATRIX

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. RelVol	1.000											
2. AGE	-0.107***	1.000										
3. SIZE	-0.139***	0.176***	1.000									
4. GROWTH	0.054***	-0.013	-0.040**	1.000								
5. RISK	-0.103***	-0.050**	-0.073***	0.065***	1.000							
6. FCF	-0.005	-0.032*	-0.170***	0.142***	0.168***	1.000						
7. LARGE	0.034**	0.037*	0.050***	0.041**	0.101***	-0.041**	1.000					
8. INST	-0.030*	0.081**	0.096***	0.077***	0.006	0.089***	0.380***	1.000				
9. SO	0.048**	-0.007	-0.031*	-0.001	0.099***	0.017	0.473***	-0.361***	1.000			
10. TANG	0.038	0.100***	-0.340***	0.183**	0.231***	0.357***	0.055**	0.116***	-0.028*	1.000		
11. HHI	0.056***	-0.091***	0.050***	0.020	-0.032*	0.120***	0.075***	0.080***	0.006	0.096***	1.000	
12. RISK_IND	-0.083***	0.056***	0.183***	0.018	0.271***	0.021	0.099***	0.013	0.031*	0.031*	-0.117***	1.000

(Source: Authors' review)

able, and the independent variables in the model are not likely to be linearly correlated.

Next, we carried out the necessary tests:

(i) *Test of multicollinearity*: There is no multicollinearity

(ii) *Test of missing variables* (Ramsey E (U / X) = 0): The study added the age squared variable (AGE2) from the argument about the firm's development life cycle [12], giving Prob> F = 0.1465, so the test results support the hypothesis H0: the model has no omitted variables.

(iii) *Heteroskedasticity test*: The model violates the hypothesis of no Heteroskedasticity.

(iv) *Selection of instrument variables*: In the research model, the variable RISK is measured by the standard deviation of EBIT. Therefore, the variable TANG can affect the level of RISK in the model due to the negative impact of using operating leverage with fixed operating costs (depreciation). Furthermore, activities in a high-risk sector can also affect corporate risks. Therefore, we suspects that the variable RISK will be explained by the variable TANG and RISK_IND in the regression model.

To test whether these variables can be selected as instrumental variables for business risk variables, the study examines the correlation between these variables with the residuals of the model. The test result shows that the correlation coefficients (pworth tang risk_ind, sig) are all zero, proving that these variables are not correlated with the remainder. Thus, the research model is adjusted as follows::

$$RelVol_i(SOA_i) = \beta_0 + \beta_1 OWN_i + \beta_2 AGE_i + \beta_3 AGE2_i + \beta_4 SIZE_i + \beta_5 GROWTH_i + \beta_6 FCF_i + \beta_7 RISK_i + \beta_8 HHI_i + \epsilon_i \tag{2}$$

B. Results and discussion

The results of OLS and 2SLS regressions show that there is no significant difference in the level of statistical significance and the direction of the impact of the independent variables on the dependent variable, except for INST. This can help the study confirm the robustness of the research results. Therefore, we will use the regression results of the 2SLS method for analysis.

TABLE IV
SUMMARY OF REGRESSION RESULTS

	2SLS regression with RelVol			2SLS regression with SOA		
	(1)	(2)	(3)	(1)	(2)	(3)
LARGE	.1195***			0.0595***		
INST		-0.0159			-0.0477*	
SO			.0753***			.0230**
AGE	.0282*	.0233*	.0234*	.0021***	.0024***	.0022***
AGE2	-.0019***	-.0017**	-.0017**	-.0056***	-.0630***	-.0595**
SIZE	-.0357***	-.0355***	-.0345***	-.0082**	-.0079**	-.0078**
GROWTH	.0202***	.0203***	.0216***	.1517**	.1350**	.1397**
FCF	-.0228	-.0544	-.0351	-.0076*	-.0074*	-.0060
RISK	-1.978***	-1.504***	-1.692***	2.884***	2.6285***	2.505***
HHI	.1177***	.1476***	.1367***	.0912***	.0839***	.1032***
Constant	.9910***	1.053***	1.023***	.9384***	0.9624***	.9506***
N	3562	3684	3583	3010	3113	3019

Note: *** 1% significance level, ** 5% significance level, * 10% significance level

(Source: Authors' calculations)

Comparing the regression results according to the RelVol and SOA measures shows that most of the regression coefficients of the two models have the same impact. Particularly, the variables RISK, FCF and INST give heterogeneous results, in which FCF and INST are two variables that have no statistical relationship with the variable RelVol but have a relationship with the SOA at the significance level of 10% but the confidence interval being changed, so the study does not have a strong basis to conclude this relationship.

Regarding the RISK variable, as the hypothesis has been developed from the signaling theory, asymmetric information makes high-risk firms more inclined to stabilize dividends [20], [13]. Therefore, the RelVol regression model gives more suitable results. The variable RelVol is regressed over time by the RMSE method, while SOA is regressed according to the model of Litner with 2 independent variables, the more variables the more observations are required, so the reliability is reduced. At the same time, because the number of observations to measure SOA is small, this model

has no economic significance and the results are not as reliable as the RelVol model. Therefore, the study will use the regression results with RelVol for analysis and discussion.

TABLE V
SUMMARY OF RESEARCH RESULTS ON THEORETICAL FACTORS

Theory	Factor	Variable	Hypotheses	Regression result
Agency problem (Agency theory)	Larger ownership	LARGE	-	(-***)
	Institution ownership	INST	+	
	State ownership	SO	-	(-***)
	Growth opportunity	GROWTH	-	(-***)
	Free cash flow	FCF	+	
	Sectoral competition	HHI	+	(+**)
Problem of asymmetric information (Asymmetric information)	Firm size	SIZE	-	(+***)
	Firm age	AGE	-	Non-linear relationship (U)
	Business risk	RISK	+	(+***)
	Institution ownership	INST	-	
	Growth opportunity	GROWTH	+	(-***)

(Source: Authors' calculation and analysis)

Table V presents a summary of the research results on the direction of impact according to the statistical significance of the factors

- As regard agency issue: The regression results of variables in this group show a significant consensus on the relationship between conflict of interest and dividend smoothing, consistent with the view of Easterbrook [10]; Allen et al [3]; DeAngelo and DeAngelo [8].

- As regards the issue of information asymmetry: As a result of regression with 5 variables in this group, only the variable firm's risk supports the theoretical sign. This is the variable identified as the endogenous variable in the model and is explained by the variable rate of tangible assets and sectoral risk. Firms that use operational leverage by investing heavily intangible assets and firms operating in sectors with a high level of information asymmetry in terms of access to information will face higher risks, and at that time the behaviour of dividend smoothing is found very clearly in high-risk firms.

As regards firm size: There exists a positive relationship between firm size and degree of dividend smoothing. This can be explained contrary to the agency theory. The larger the firm is, the more complex the organizational administration is. Thus, the conflicts of interest begin to increase and the agency cost will increase accordingly. Therefore, in order to minimize agency costs, these firms implement dividend smoothing policy.

As regards the variable firm age: The test result shows that there is a nonlinear relationship (U-shaped) between the

firm age variable and the degree of dividend smoothing, with the minimum value is 10 years. This result can be explained through the business cycle and the development stage of the business, from inception to growth, the degree of stabilisation gradually decreases; when moving to the saturation stage, the level of dividend smoothing will gradually increase.

VI. CONCLUSIONS

From the above research results, there are some comments on the phenomenon of dividend smoothing in Vietnam as follows:

(i) Study results show significant consistency on the relationship between conflict of interest and dividend smoothing, confirming that the agency theory is appropriate to explain the smoothing behaviour of listed firms on Vietnam's stock market.

(ii) Smoothing of dividends in Vietnam is found more clearly in firms with large size and firms which have high-profit volatility. In contrast, firms that have centralized ownership structure; firms that are dominated by the State or hold a high ownership rate; firms that have many growth investment opportunities; firms that is in the stage of growth in the development cycle; firms that are operating in a low level of competition, are not suitable for selecting and maintaining stable dividend policy.

The research results can help stakeholders to identify characteristics of firms that tend to smooth dividends so that they can choose the suitable strategy.

Limitations: (i) There are many factors that can affect dividend smoothing behaviors but have not been taken into account in the model proposed in this research, such as forms of dividend payment or corporate governance and income management. The behavior of paying stock dividends or buying back shares of a firm may affect the behavior of dividend smoothing. (ii) The research objective is to provide information about the smoothing of dividends and not to assess whether the smoothing of dividends is good or not. Research results will not be enough to provide policy implications to encourage or limit this behaviour.

With some limitations of the research, the topic suggests further research directions through a number of unanswered questions such as: Does the form of paying stock dividends affect the behavior of dividend smoothing? Is dividend smoothing a behavior of income management? How does dividend smoothing affect firm value? In addition, further research can be implemented in the direction of considering the effects of macro factors.

REFERENCES

- [1] Aivazian, V., L. Booth and S. Cleary, "Do emerging market firms follow different dividend policies from US firms?", *Journal of Financial research*, 26(3), 371-387, 2003.
- [2] Ali, Z., A. Ullah and A. Ali, "Board structure and dividend smoothing: A case of Pakistani listed firms", *Business Review*, 14(2), 65-91, 2019.
- [3] Allen, F., A. E. Bernardo and I. Welch, "A theory of dividends based on tax clienteles", *The Journal of Finance*, 55(6), 2499-2536, 2000.
- [4] Al-Najjar, B., and E. Kilincarslan, "Corporate dividend decisions and dividend smoothing: New evidence from an empirical study of Turkish firms", *International Journal of Managerial Finance*, 13(3), 304-331, 2017.

- [5] Baker, M., and J. Wurgler, "Investor sentiment and the cross-section of stock returns", *Journal of Finance*, 61, 1645–1680, 2006.
- [6] Bhattacharya, S., "Imperfect information, dividend policy, and "the bird in the hand" fallacy", *Bell journal of economics*, 10(1), 259-270, 1979.
- [7] Brennan, M. J., and A. V. Thakor, "Shareholder preferences and dividend policy", *The Journal of Finance*, 45(4), 993-1018, 1990.
- [8] DeAngelo, H., and L. DeAngelo, "Capital structure, payout policy, and financial flexibility", *Working paper*, 2007.
- [9] Dewenter, K. L., and V. A. Warther, "Dividends, asymmetric information, and agency conflicts: Evidence from a comparison of the dividend policies of Japanese and US firms", *The Journal of Finance*, 53(3), 879-904, 1998.
- [10] Easterbrook, F. H., "Two Agency-Cost Explanations of Dividends", *American Economic Review*, 74(4), 650-659, 1984.
- [11] Freeman, R. N., "The association between accounting earnings and security returns for large and small firms", *Journal of Accounting and Economics*, 9(2), 195-228, 1987.
- [12] Grullon, G., M. Roni and S. Bhaskaran, "Are dividend changes a sign of firm maturity?", *The Journal of Business*, 75, 387-424, 2002.
- [13] Guttman, I., O. Kadan and E. Kandel, "Dividend stickiness and strategic pooling", *Review of Financial studies*, 23(12), 4455-4495, 2010.
- [14] Harries, M., A. Raviv, "The theory of capital structure", *Journal of Finance*, 46, 297-355, 1991.
- [15] Javakhadze, D., S. P. Ferris., and N. Sen., "An International Analysis of Dividend Smoothing", *Journal of Corporate Finance*, 29, 200–220, 2014.
- [16] Jensen, M. C., and W. H. Meckling, "Theory of the firm: Managerial behavior, agency costs and ownership structure", *Journal of financial economics*, 3(4), 305-360, 1976.
- [17] Jeong, J., "Determinants of dividend smoothing in emerging market: The case of Korea", *Emerging Markets Review*, 17, 76-88, 2013.
- [18] Kighir, A. E., N. H. Omar., and N. Mohamed, "Corporate cash flow and dividends smoothing: a panel data analysis at Bursa Malaysia", *Journal of Financial Reporting and Accounting*, 13 (1), 2-19, 2015.
- [19] Kumar, P., and B. Lee, "Discrete dividend policy with permanent earnings", *Financial Management*, 55-76, 2001.
- [20] Kumar, P., "Shareholder-manager conflict and the information content of dividends", *Review of Financial studies*, 1(2), 111-136, 1988.
- [21] La, P. R., F. L., A. Shleifer and R. Vishny , "Investor protection and corporate governance", *Journal of financial economics*, 58(1), 3-27, 2000.
- [22] Lambrecht, B. M., and S. C. Myers, "A Litner Model of Payout and Managerial Rents", *National Bureau of Economic Research*, 2010.
- [23] Leary, M. T., and M. Roni, "Determinants of dividend smoothing: Empirical evidence", *Review of Financial studies*, 24(10), 3197-3249, 2011.
- [24] Lintner, J., "Distribution of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes", *American Economic Review*, 46(2), 97–113, 1956.
- [25] Michaely, R., and M. Roberts, "Dividend smoothing, agency costs, and information asymmetry: Lessons from the dividend policies of private firms", *Unpublished working paper*, 2006.
- [26] Shinozaki, S., and K. Uchida, "Ownership Structure and Dividend Smoothing: International Evidence", *Working Paper Faculty of Economics, Kyushu University*, 2015.

Technological capacity of manufacturing enterprises in the North Central Vietnam: Current Status, Issues and Policy Implication

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Abstract—Applying Barney's theory of resource-based development and evaluation criteria, and Lall's technological capability classification framework, this article analyzes the operational efficiency and the technological and innovation capabilities of manufacturing enterprises in the North Central region of Vietnam, using firm survey data conducted by the General Statistics Offices (GSO) in period 2011-2019. Comparing with other regions, firms in the North Central region are overwhelmingly of micro and small scales with relatively poor operational efficiency and low level of technological and innovation capacities.

Index Terms—North Central region; Manufacturing; Enterprise; Technology capacity, R&D, innovation.

I. INTRODUCTION

THE 13th National Party Congress of Vietnam set a target that by 2030, Vietnam would become an industrialized and upper-middle income country. In order to achieve this target, the country needs to quickly improve labor productivity, especially in the industrial sector, which has remained quite low. In such a long time, Vietnam followed a model of large-scale industrial development, which focused on attracting a high volume of foreign direct investment (FDI) while not considering as much about the quality of FDI. The comparative advantage of Vietnam still bases on natural resources and low labor cost. Up until now, the majority of FDI and private enterprises in Vietnam operates in low-tech and low-value-added industries.

While sharing several common characteristics, there are heterogeneity across regions, with regards to the structure, performance and technological development of firms. This paper sheds light on the manufacturing sector of the North Central region of Vietnam, in comparison with other regions and the country as a whole. Though being rich in natural resources, for decades, this region lagged behind some other regions (i.e the Red river delta, the Mekong river delta or the South East region) due to its under-developed infrastructure. In recent years, the National Government has allocated more resource to advance the region's infrastructure, resulting in better market access and connectivity with major economic centers of the country. As a consequence, the North Central region is becoming more attractive to foreign and private investors. Several big investment projects have been established in the region (such as Formosa Factory in Ha Tinh province; Dung Quat Oil Refinery project in Nghi Son economic zone in Thanh Hoa province, the agricultural project of TH True milk in Nghe An province). This improves that the region still has a lot of potentials to further attract investment to improve its economic development level. In addition,

enhancing the growth of firms and their performance in this region will contribute greatly to the overall realization of the development target of Vietnam.

This paper focus on analyzing the performance and the current state of technology and innovation capacity of manufacturing enterprises in the North Central region of Vietnam. This topic has not been studied much in literature. In addition, the paper also aims at pointing out some policy implications for the local governments to further develop the manufacturing sectors in this region.

II. ANALYTICAL FRAMEWORK

A. Methodology

To assess firms' technological capacity, this paper focuses on two criteria: the technological level of the main manufacturing industry and the level of the main technology used in production.

Firstly, following the classification proposed by Lall (2000), high-tech industries include the following sub-sectors: chemicals and chemical products manufacturing; drugs manufacturing, pharmaceutical chemicals, and herbal ingredients manufacturing; electronic manufacturing, computer and optical products manufacturing; electrical equipment manufacturing; unclassified machinery and equipment manufacturing; manufacture of motor vehicles and trailers; other means of transport manufacturing and medical, dental, orthopedic and rehabilitation equipment and instruments manufacturing. Middle-tech industries include: Producing products from rubber and plastic; other non-metallic mineral products manufacturing; metal production; shipbuilding; other unclassified manufacturing industries; and repair, maintain and install machinery and equipment. Low-tech industries include: food production and processing; beverage production; tobacco production; weaving; costumes production; leather and related products production; wood processing; paper and paper products production; print, copy records of all kinds; production of coke, refined petroleum products; manufacture of products from prefabricated metal (except for machinery and equipment); and beds, figures, and chairs production.

Secondly, the technological level of the main production machinery used in enterprises is classified as followed: (i) low-tech (main machines used are hand tools); (ii) middle-tech (main machines used are semi-automatic machines); and (iii) high-tech (main machines used are fully automatic machines).

In addition, the study compares technological levels of firms across regions and types ownership.

B. Data

The study uses survey data on the technological capabilities of manufacturing and processing enterprises conducted by the GSO in the period 2011-2019. The survey is conducted annually to assess the performance of firms in Vietnam. In the period 2011-2014, the annual sample size was from 7,000 - 8,000 enterprises, but in the later year, the sample size decreased to only 4,000 - 5,000 enterprises. However, the sample structure is still representative at a regional level. The share of the number of enterprises in the North Central region in the sample remains quite stable during the period of study (i.e. 5.25% in 2011-2014, and 4.82% in 2015-2019, respectively).

III. RESULT AND DISCUSSION

A. General characteristics of manufacturing enterprises in the North Central region

Regarding firm's size based on the number of employees, the region hosts mainly micro and small manufacturing firms. In the period 2011-2014, they accounted for 67.4% of all manufacturing firms in the region, compared to an average of 46.2% of the whole country. In the period 2015-2019, the proportion decreased to 50.7%, but still higher than the national average of 29.8%. The share of large-scale enterprises in the region is also considerably lower than the national average (15% versus 36%, respectively) (See Figure 1).

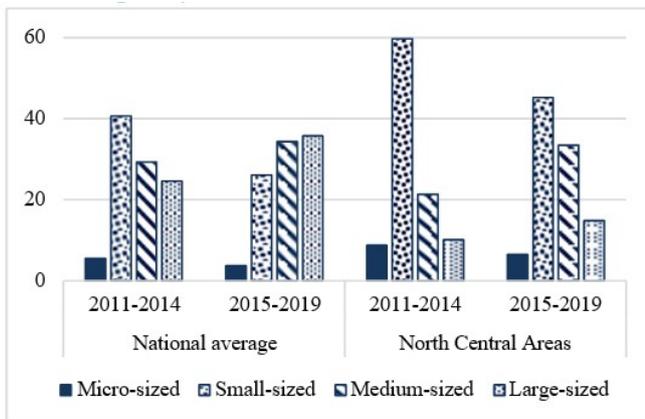


Figure 1. Composition of manufacturing enterprises in the North Central region by size

Source: authors' calculation

The high share of micro and small firms in the region shows some signs of limited capital capacity – which is crucial for firms to invest in improving technology and to invest in innovation.

This is true when we look at the size of firms' capital. In the period 2011-2014, a typical manufacturing enterprise in the North Central region had the capital of nearly VND 34 billion with a scale of 79 employees, much smaller than that of the South East region (the region with the largest scale of enterprises in Vietnam) with corresponding figures of VND 142.5 billion and 260 employees. In the period 2015-2019, the scale of manufacturing enterprises in the North Central region has changed in a positive direction, with an average

capital of VND 68.1 billion and 99 employees. However, it is still inferior to the average enterprises in other regions.

Table 1 provides information on firm size, either by capital or employee size, of enterprises in seven economic regions of Vietnam. It can be seen that the North Central region is among the lowest ranking regions.

TABLE 1. CAPITAL AND LABOR SOURCES OF MANUFACTURING ENTERPRISES STRUCTURE BY ECONOMIC REGION

Region	2011-2014		2015-2019	
	Capital (bil. VND)	Labour (person)	Capital (bil. VND)	Labour (person)
Red River Delta	94.8	193	198.4	309
Northern Midlands and Mountains Areas	57.1	167	109.0	249
North Central Areas	33.8	79	68.1	99
Central Coast	68.6	186	171.6	285
Central Highlands	50.1	87	60.0	84
South East	142.5	260	271.1	386
South West	96.0	216	225.0	392

Source: authors' own calculation

Regarding types of ownership, in the period 2015-2019, most of the manufacturing enterprises in the North Central region are in the domestic private sector. The share of firms belong to private, FDI and state sectors are 92%, 7% and 1%, respectively. The share of FDI firms in this region is significantly lower than the national average of 32.6% (See Figure 2 for more details).

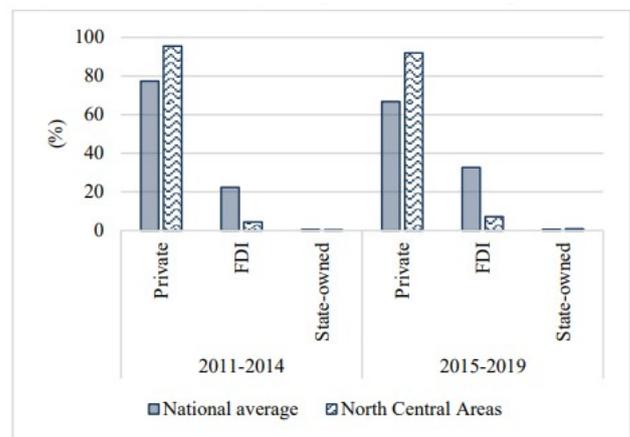


Figure 2. Composition of firm by ownership

Source: authors' calculation.

B. Operational efficiency of manufacturing enterprises in the North Central region

1) Operational efficiency by capital

The study examines 3 criteria to evaluate the efficiency of capital use of manufacturing enterprises, including: net revenue per capital, pretax profit per capital, and export value per capital. Our results show that, the ratio of net revenue/capital of the Northern Central region is among the three lowest regions in the country, but the ratio of pre-tax profit/capital source of the North Central region manufacturing enterprises is relatively good. However, firms in this region mainly focus on local labor market, and the ratio of export revenue over total capital is quite low (Table 2).

TABLE 2: CAPITAL USE EFFICIENCY OF MANUFACTURING ENTERPRISES BY REGIONS, 2011-2019.

Region	Net revenue/capital		Pre-taxes Profit/capital		Export/capital	
	2011-2014	2015-2019	2011-2014	2015-2019	2011-2014	2015-2019
	Red River Delta	1.33	1.32	0.92	1.96	0.12
Northern Midlands and Mountains	1.22	1.34	1.01	1.02	0.44	0.14
<i>North Central</i>	<i>1.28</i>	<i>1.24</i>	<i>2.33</i>	<i>1.50</i>	<i>0.10</i>	<i>0.15</i>
Central Coast	1.53	1.50	2.01	2.20	0.05	0.03
Central Highlands	1	0.84	0.88	-2.86	0.03	0.12
South East	1.96	1.51	2	3.07	0.15	0.18
South West	3.35	3.73	3.33	3.25	0.95	0.24

Source: authors' calculation.

2) *Operational efficiency by labor (Labor use efficiency)*

We examine labor use efficiency by looking at average revenue and profit per employee. The results are presented in Table 3. In the period 2011-2014, an average labor in the region generated about VND 418 million in gross revenue per year, which is the lowest in the country. Although in the period 2015-2019, this number increased significantly to nearly VND 763.6 mil/worker/year, it was still the second lowest region in the country, only higher than the Central Highlands and far behind the South West region (the region with the best labor productivity in the country) - VND 1.96 billion/labor/year.

However, in terms of profit, the North Central region has quite good labor efficiency. In the period 2011-2014, an employee of a typical manufacturing enterprise in the North Central region earned VND 12 million per year in profit for the firm, this is the 3rd best rate among second economic regions. In the period 2015-2019, the ability to generate profit increased significantly to VND 17.8 million, but was still significantly lower than other regions.

Disaggregating by firm types, FDI manufacturing enterprises are most efficient in using labor by gross revenue, followed by state-owned enterprises and private sector enterprises. Table 3 shows that in the period 2015-2019, a typical employee in an FDI manufacturing enterprise generated more than VND 2 billion in net revenue/year, 2.4 times higher than state-owned enterprises and nearly 3 times higher than private sector enterprises (Table 4).

TABLE 3. LABOR USE EFFICIENCY OF MANUFACTURING FIRMS BY REGION, 2011-2019 UNIT: MIL. VND/LABOUR

Region	Net revenue/labor		Profit before tax/labor	
	2011-2014	2015-2019	2011-2014	2015-2019
Red River Delta	677.8	1,126.5	3.0	20.3
Northern Midlands and Mountains Areas	460.7	762.7	-1.6	0.2
<i>North Central Areas</i>	<i>418.2</i>	<i>763.6</i>	<i>12</i>	<i>17.8</i>
Central Coast	529.1	927.6	6	14.2
Centrals Highlands	459.2	606.4	4.5	-16.5
South East	862.0	1,237.5	17.9	49.9
South West	1,459.7	1,958.7	14.6	20.1

Source: authors' calculation.

TABLE 4. LABOR USE EFFICIENCY OF MANUFACTURING FIRMS BY OWNERSHIP, 2011-2019 UNIT: MIL. VND/LABOUR

	Net revenue/labor		Profit before tax/labor	
	2011-2014	2015-2019	2011-2014	2015-2019
State enterprises	392.4	749.2	-24.2	7.3
Private Company	366.2	655.3	5.5	7
FDI enterprises	1,572.9	2,169.1	159.1	158

Source: authors' calculation.

C. *Technological capacity of manufacturing enterprises in the North Central region*

1) *Technology level by business line*

The North Central region has the manufacturing enterprises structure by the technology level of the "relatively modern" industry. On a national scale, the majority of manufacturing enterprises operate in industries with low technology levels, accounting for 62.7% in the period 2011-2014 and 57.4% in the period 2015-2019, while this rate of the North Central region was 50.1% and 43.9%, respectively. The percentage of manufacturing enterprises operating in the middle technology industries of the North Central region is also significantly higher than that of the national average, nearly 2 times (Figure 3). In the period 2011-2014, the average rate of manufacturing enterprises operating in the technology industry in the region accounted for 41.7%, then increased slightly to

43.8% in the period 2015-2019. While the national average rate is 23.7% and 24.4%, respectively.

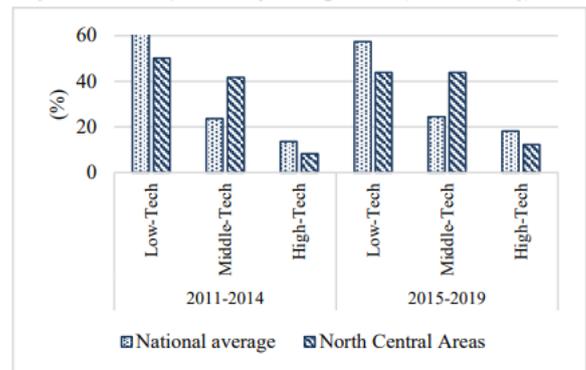


Figure 3. Manufacturing enterprises by technology levels
Source: authors' calculation.

However, the proportion of manufacturing enterprises operating in high-tech industries in the North Central region is relatively lower than the national average, which is a limitation (Figure 3). But the positive point is that the proportion of manufacturing enterprises operating in the region's high-tech industry has improved significantly over time. Indeed, in the period of 2011-2014, only 8.3% of enterprises in the North Central region operated in the high-tech industry. This rate increased to 12.3% in the period 2015-2019.

2) *Production technology capacity of manufacturing enterprises in the North Central region*

Most of the manufacturing enterprises in the North Central region use middle-level technology (semi-automatic machines). The average number of enterprises using semi-automatic machines accounted for nearly 86% in the period

2011-2014 and this figure increased to more than 90% in the period 2015-2019. However, the share of firms using high-tech machinery has remained quite stable in the past 10 years. (Figure 4).

While the level of technology does not change much, firms in the North Central region have been quite actively in innovating their production technology. Figure 5 shows the sensitivity of production technology of manufacturing enterprises, that is, the correlation between the time when production machines are created and the time when enterprises use those machines in production.

The results reveal that the high concentration on line 45 degree shows that enterprises in the North Central region use relatively new and updated machines "regularly".

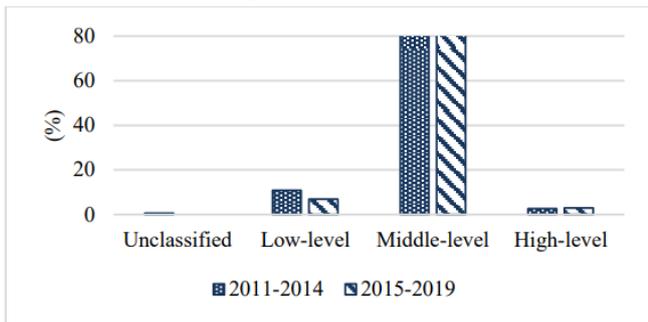


Figure 4. The technological level of the main production machinery in the enterprise. Source: authors' calculation.

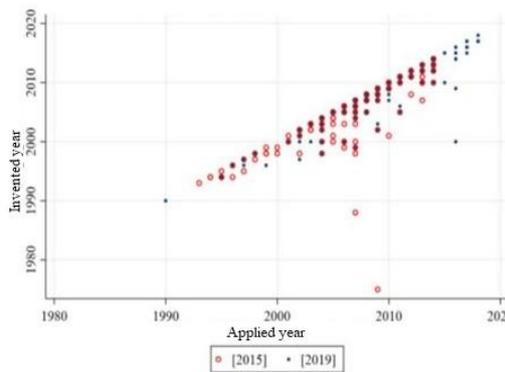


Figure 5. Sensitivity of production technology of NC region manufacturing enterprises. Source: authors' calculation.

In terms of the technology origin - the place where machinery and equipment are manufactured, most North Central enterprises use machinery and equipment manufactured domestically or imported from China. In the period 2011-2019, the proportion of enterprises using domestically manufactured machinery decreased, but the number of enterprises using machinery imported from China tended to increase. The rate of using machinery imported from developed countries with advanced technology is quite limited.

With close economic relations along with the popularity of Japanese FDI enterprises in Vietnam, manufacturing enterprises in the North Central region import many machinery and equipment from Japan. Meanwhile, the proportion of imported machinery from other high-tech countries such as the US, Western Europe, and newly industrialized countries (Korea, Taiwan, Hong Kong, Singapore – NICs) remains quite limited - less than 10% (Figure 6).

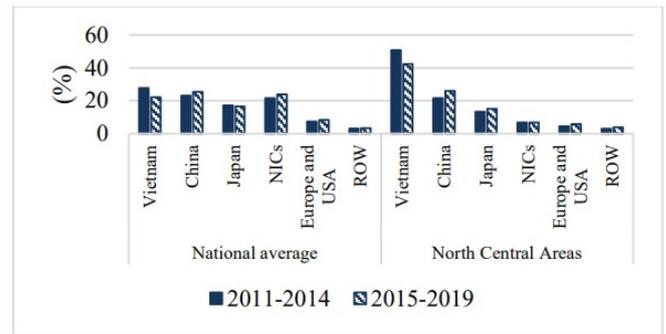


Figure 6. Main countries supplying manufacturing production machinery. Source: authors' calculation.

3) The innovation capacity of manufacturing enterprises

Innovation capacity is assessed through the proportion of enterprises with R&D activities. Survey data show that, in the period 2015-2019, the rate of enterprises with R&D activities in the North Central region was 5.3%, that is, out of 100 enterprises of public policy in the region, only less than 6 enterprises have developed R&D activities. This rate is lower than that of the national average of 6.9%. This shows the limitation of the innovation capacity of enterprises in the region (Figure 7).

In terms of how R&D activities are carried out, local manufacturing enterprises mainly self-deploy 52.3% or combine between self-implementation and outsourcing, which accounts for 43.5%, hiring other organizations to carry out R&D activities under the enterprise's order take place at a very limited rate - less than 10% (Figure 8).

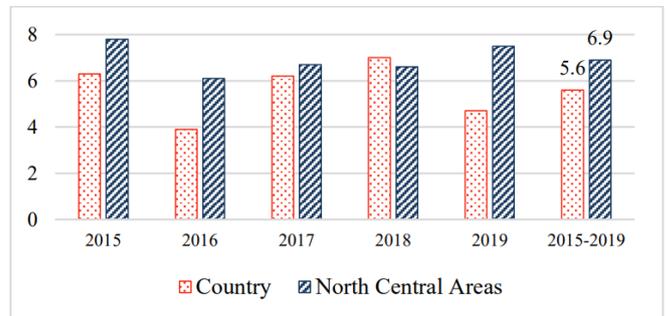


Figure 7. Percentage of firms carrying out R&D in the North Central region, 2015-2019. Source: authors' calculation.

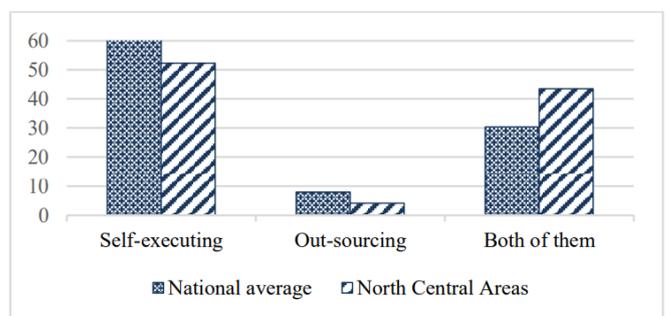


Figure 8. R&D practices of manufacturing firms in North Central region, 2015-2019. Source: authors' calculation.

Most manufacturing enterprises carry out R&D activities for the purpose of improving the quality of existing products and advancing production processes thereby enhance opera-

tional efficiency. Expansion goals such as diversifying products, expanding into new fields, and changing to new business activities are less concerned (Figure 9).

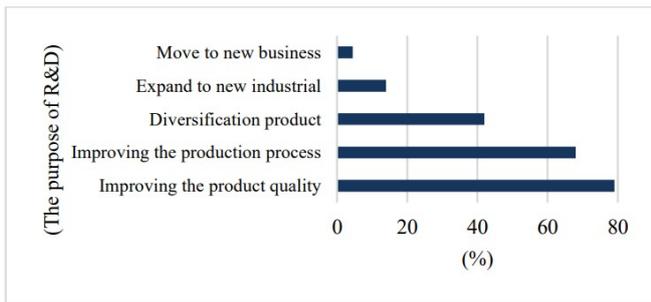


Figure 9. Main objectives of R&D activity, North Central region, 2015-2019. Source: authors' calculation.

Regarding the budget for R&D, the survey results show that most of the enterprises in the North Central region use their own capital or loans. Meanwhile, on a national scale, businesses can mobilize capital from other sources such as support from the national/regional budget, joint ventures with other organizations, and a number of other sources.

D. Some issues in improving technological capacity and innovation of public service enterprises in the North Central region

Technological innovation and innovation capacity of manufacturing enterprises in the North Central region are still limited, lagging much behind other regions: manufacturing enterprises are mainly SMEs with limited resources and limited access to capital to conduct technological innovation. Technological innovation in enterprises is still modest, does not have a long-term vision of technological innovation and improvement for sustainable development.

Research and development (R&D) is still only an additional activity in enterprises and only implements some asynchronous stages. There are very few enterprises that carry out R&D, even lacking R&D capacity.

The human resources of the current manufacturing enterprises are still weak, unable to meet the requirements of receiving new and modern technologies.

State policies have not encouraged enterprises to invest in technology. Lack of a legal framework to encourage innovation in enterprises. There is no mechanism to encourage the use of the institute's workforce to participate in innovation, improvement and technological development at enterprises.

The link between manufacturing enterprises and research institutes - universities and state management agencies in innovation, technology transfer and development remain weak.

IV. CONCLUSION

With the above situation and problems, in order to improve the technological capacity and innovation of the enterprises in the North Central region, attention should be paid to:

(1) Attracting more large-scale investment projects in the region. Currently, the majority of firms in the North Central region are of micro and small scale, hence lack of resources to update technology or to conduct R&D. In general, larger

firms will have more resources and more incentives to invest in technology and innovation. In order to attract large investors, the region should continue to invest more on infrastructure, improving business environment, and more importantly to design a clear and specific strategy to attract investment.

(2) As most enterprises in the region use their own capital or credit loans to update technologies or to innovate, it is necessary to made available more sources of capital support for firms. The national and local government should spend a larger amount of public budget to support firms to innovate, and more importantly, to make the budget more accessible to firms.

(3) Other sources of funding for R&D should also be given priority: venture capital for innovative start-up, public-private partnership, and university-enterprise collaboration.

REFERENCES

- Ahmad, N., Othman, S. N., & Mad Lazim, H. (2014), 'A review of technological capability and performance relationship in manufacturing companies. *ISTMET 2014 - 1st International Symposium on Technology Management and Emerging Technologies, Proceedings*, (May 2015), 193-198
- Avlonitis, A. J., Kouremenos, A., & Tzokas, N. (1994), 'Assessing the Innovativeness of Organizations and its Antecedents: Project Innovatrat'. *European Journal of Marketing*, 28(11), 5-28
- Barney, J. (1991), 'Firm resources and sustained competitive advantage', *Journal of management*, 17(1), 99-120
- Barney, J. B., Mackey, A., Mackey, T. B., (2007), 'Corporate social responsibility and firm performance: Investor preferences and corporate strategies', *Academy of management review*, 32(3), 817-835.
- Barney, J. B., Ketchen Jr, D. J., & Wright, M. (2011), 'The future of resource-based theory: revitalization or decline?', *Journal of management*, 37(5), 1299-1315.
- Bell, M. & Pavitt, K., 1993, 'Technology accumulation and industrial growth: contrasts between developed and developing countries. *Industrial and corporate change*. Vol 2. No.2.
- Chen, C.J. (2009), 'Technology commercialization, incubator and venture capital, and new venture performance'. *Journal of Business Research*, 62(1), 93-103;
- Chuang, L.M., Liu, C.C., Tsai, W.C. and Huang, C.M. (2010), 'Towards an analytical framework of organizational innovation in the service industry'. *African Journal of Business Management*, 4(5), 790-799
- Chantanaphant, J., Nabi, M. N. U., & Dornberger, U. (2013), 'The Effect of Technological Capability on the Performance of SMEs in Thailand'. *The Macrotheme Review*, 2(4), 16-26
- Lall, S. Technological capabilities and industrialisation. *World Development*, 20 (2), 1992, 165-186.
- Lall, S. (2000). The technological structure and performance of developing country manufactured exports, 1985-98. *Oxford Development Studies*, 28(3), 337-369. <https://doi.org/10.1080/713688318>
- Pavitt, K. (1993). Technological Accumulation and Between Developed and Developing.
- OECD (2021), Báo cáo chính sách DNNVV và khởi nghiệp tại Việt Nam.
- World Bank (2020), Báo cáo khoa học, công nghệ và đổi mới sáng tạo Việt Nam.
- Duy, N.Q. (2015), 'Đổi mới sáng tạo và các nhân tố tác động - Tổng kết cơ sở lý thuyết', *Tạp chí Kinh tế và Phát triển*, 22(2), 37-46.
- Trần Ngọc Ca, Tăng Thu Thảo, Đặng Thanh Tùng (2018), 'Học hỏi và xây dựng năng lực công nghệ doanh nghiệp thông qua kết nối với đối tác nước ngoài: một số kinh nghiệm quốc tế và thực tiễn Việt Nam', *Tạp chí chính sách và quản lý KH&CN*, Tập 7, số 3 (2018), 24-39
- Hoàng Văn Cương, Đinh Hải Hà, Nguyễn Xuân Toàn (2021), 'Hoàn thiện thể chế cho hoạt động đổi mới sáng tạo của doanh nghiệp', *Tạp chí KH&CN Việt Nam*, số 6/2021, 14-15.
- Nguyễn Hoàng Hải (2017), 'Một số gợi ý về thúc đẩy phát triển năng lực công nghệ ở Việt Nam', *Tạp chí Khoa học ĐHQGHN: Nghiên cứu chính sách và quản lý*, số 1(2017).

Management of Human Resources in Education

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Abstract—Human resources (HR) play an important part in all aspects of an organization's operations, including educational institutions. It is necessary to be competent to manage or handle human resources in line with tasks assigned so that they can perform their functions in the institution in which they are employed. As a result, functions in human resource management must be performed optimally in order to meet the requirements of individuals and institutions. Furthermore, it is predicted that with excellent human resource management methods, the current weaknesses in Vietnam education system in terms of competitiveness can be solved.

Index Terms—human resources; education; leadership

I. INTRODUCTION

TODAY, improvement of science and technology is growing in lockstep with the advancement of the present time. The existence of scientific and technological progress has a significant impact on daily routines, particularly if there is no filter as a result of the development of science and technology, which will leave impact on individuals, including education. HR have a significant role in educational implementing operation. Education which is always a procedure, cannot be isolated from the function of human resources since HR are one of the most significant parts.

Furthermore, it is true to appreciate the value of human in organizational actions, because humans can occasionally become planners, agents, and drivers of organizational goal attainment. Even if the company's technologies are advanced, goals cannot be achieved without the active participation of employees. This is also true in the field of education, because the role of instructors in the learning process cannot be substituted by technology. Good management is expected to monitor HR run properly from the initial step till the final one in this field.

It is natural to discuss the existence of human resources (HR) in educational institutions since human resources (HR) play a significant administrative and operational role in the educational process. Human resources (HR) must be under proper control in order for them to fulfill their tasks. As a result, human resource management is essential (HR).

According to [18], “management is a district process consisting of planning, organizing, actuating, and controlling, performed to determine and accomplish stated objectives by the use of human beings and other resources”. It is a development specific containing of a series of steps carried out to determine and accomplish given goals by the use of human / people and other resources.

Management, according to [12], is the art of getting things done via using labor force. In this sense, the responsibility of leaders is managing and directing people in order to

achieve organizational goals. Management is noted as the act of operating the work of organizational members, as well as the utilization of all organizational assets, in order to meet the objectives supposedly.

Management, according to [17], is an endeavor to attain a certain objective via the activity of others. As a result, the manager manages a variety of other people's actions such as planning, organization, placement and operation. Furthermore, [1] contends that management is generally associated with each organization's activities of multiple stages from drafting to wrapping and finalizing in order to coordinate the various resources owned by the company in order to produce an efficient product or service.

It is suggested that by maximizing all available resources to conduct educational practices to achieve projected goals, it is truly the success of managing education [21]. [19] defines education management as a method for managing and structuring educational resources such as teaching staff, students, communities, curriculum, finance, infrastructure and amenities and educational context”.

Thus, there are two categories distinguished in education management, namely:

(a) “Administrative management” which is concerned with actions such as planning, organization, guidance, direction, coordination, and oversight, as well as communication.

(b) “Operational management”, which focuses on administration, personnel, finance, and community interactions.

“Educational management” is a method of delivering massive operations in the area of education to attain excellent educational goals [6]. From the various statements above, it is possible to conclude that education management is utilizing all educational resources in order to carry out systematic and systemic cooperation procedures which may result in efficient education implementation in order to achieve the outlined outcomes [4].

II. LITERATURE REVIEW

A. Human Resource Management (HRM)

Human beings are one of the company's or organization's resources, yet many current management policies in place do not recognize the significance of the function of HR, therefore based on this knowledge, I can conclude that the current policy still does not prioritize human resource interests. Human resource management is an essential component of the educational process in general.

As a result, functions in human resource management must be properly carried out so as to meet the demands of individuals, organizations, and institutions. Furthermore, it

is predicted that with excellent human resource management methods, the limitations and issues that the Indonesian people confront in terms of competitiveness would be solved. Here are some professional opinions on the idea of staff management:

(a) According to [11], personnel management is “the process of manipulating the procurement of labor, development, compensation, integration, maintenance, and termination of employment with the goal of achieving the objectives of individuals, organizations, and the community in the harmony of work.

(b). Besides, personnel administration is defined as the placement of employees inside an organization or institution. Human labor implementation entails “the acquisition, upkeep and allocation of HR” [1].

Personnel management is otherwise described as the process of “establishing, implementing, and assessing policies, procedures, techniques, and programs pertaining to individual in a work place” [16]. According to [5], personnel management is the field of management concerned with “the planning, organizing, and controlling of various functions of procurement, development, maintenance, and utilization of labor” so that (1) the association's mission is defined and carried out efficiently and successfully, (2) all employees' objectives are met to the best of their abilities., and (3) “the goals of the community are taken care of and served well”.

HRM is described as the effort and procedure of developing, motivating, and evaluating the entire human resources required by the firm to achieve its goals. This comprehension comprises the following: beginning to select qualified candidates as well as how to make these sets of skills and knowledge more progressed over time [5]. Because HRM is a continuous process, similar to the educational process, it might have a specific position in educational establishments.

The HR department, or popularly known as the personnel portion, is accountable and functional as managing human resource affairs in the organizational structure of the corporation (as compared to educational institutions), thus from that knowledge it can be analyzed that HRM is a process which must create, motivate, and assess the total human resource in order for a corporation to meet its targets or objectives.

Human resources, in a broader sense, refer to the following:

a. Individuals who operate in a business setting (often referred to as personnel, labor, or employees)

b. Human potential which is an organization's activator in attaining its existence.

c. Assets and functions in the organization that are similar to capital (non-material / non-financial), and are realized as physical and non-physical potential in accomplishing the company's existence.

It is also suggested that HR development is an endeavor to improve the quality or capability of human resources via the planning, education, training, and management process of persons or workers to obtain the best possible outcome.

The personnel department's primary role is to plan the idea of human resource expansion and improvement for the organization. The major tasks of this staff include policies pertaining to labor rules, recruiting qualifications, and devel-

opment ranging from sending workers to participate in continuing education, incentive programs, or labor bonuses. So, based on this understanding, it can be concluded that management is a procedure for improving an institution that involves qualifications, estimations, and developers for the process of activities such as managing, managing, and planning in order to support the achievement of goals that have been set by employing current resources.

Furthermore, HRM is a component of management. As a result, generic management theories serve as the foundation for the debate. Human resource management (HR) is primarily concerned with managing the function of individuals in achieving optimal results. This regulation addresses the issues of planning, organizing, directing, regulating, purchasing, developing, paying, integrating, sustaining, punishing, and terminating workers in order to enable the organization, employees, and the community achieve their goals.

In order to aid in goal fulfillment, HRM responsibilities include planning, organizing, mobilizing, regulating, acquiring, developing, compensating, integrating, sustaining, punishing, and

terminating corporate demands.

(a) Organizing is the action of organizing all personnel in order to achieve goals by setting the workforce division and relations.

(b) Guiding is the action of directing all employees so that they wish to work together and effectively and efficiently in order to help the firm, employees, and community accomplish their goals.

(c) Control is the action of supervising all personnel to ensure that they follow corporate policies and work as planned.

(d) Procurement is the process of obtaining workers in accordance with the firm's demands, through withdrawal, selection, placement, orientation, and induction.

(e) Development refers to the process of enhancing employees' technical, conceptual, and moral abilities via education and training. This must be relevant to current and future work requirements.

(f) Compensation is the provision of direct and indirect services, money, or products to employees in exchange for their contributions to the company.

(g) Integration is an activity that brings together the company's interests and the demands of its personnel in order to achieve collaboration that is both joyful and mutually beneficial.

(h) Maintenance refers to the performance of maintaining or developing the physical, mental, and loyalty of workers in order for them to keep working together until they retire.

(i) Discipline is the most essential function of HRM and the key to goal achievement since it is impossible to get maximum results without adequate discipline. The termination of an employee's employment connection with a corporation is referred to as dismissal (separation).

B. HR Management's extension

HRM is a subset of management. As a result, the debate is founded on broad management ideas. Human resource management (HRM) is a more concentrated debate concerning the control of individuals' roles in achieving goals. Planning,

organizing, directing, regulating, acquiring, developing, paying, integrating, sustaining, disciplining, and terminating personnel are all covered by this legislation in order to enable the organization/institution, employees, and community achieve their goals.

The scope of HRM comprises employee scheduling which is the process of determining employee requirements, both numerically and qualitatively, for the present and future. A good and accurate personnel strategy necessitates thorough and unambiguous information on the job or activities that must be completed in the business. As a result, prior to constructing a strategy, job analysis is performed to acquire a job description.

This data is extremely useful in establishing the number of personnel required as well as in creating job criteria. This position definition offers an overview of the minimal quality of personnel that may be accepted and who must do the task as it should be done. It is possible to infer that the HR planning process is a method for setting objectives and implementing rules, and it serves as the foundation for controlling employees.

III. DISCUSSION

A. *What Is the Goal of HR Planning?*

Some of the goals of HR planning are as follows:

(a) determining the quality and quantity of personnel who will occupy all jobs in the business.

(b) To ensure labor supply, both now and in the future, so that there is someone to do every work.

(c) To avoid mismanagement and overlap in task implementation.

(d) Increasing work productivity by facilitating collaboration, integration, and synchronization.

(e) Avoiding or overburdening personnel

It is as a framework for creating a program for employee withdrawal, selection, growth, remuneration, integration, maintenance, discipline, and dismissal.

B. *Procedure for Human Resource Planning*

Some examples of human resource planning techniques are as follows: (a) Clearly specify the requirements of human resources. (b) Gathering HR data. (c) Sorting and evaluating data. (c) Create a number of alternatives. (e) Construct a strategy based on the best of the available possibilities. (f) Inform personnel about the upcoming strategy. With the specified methods, it is believed that unnecessary mistakes would be avoided throughout the process of human resource planning.

C. *Employee Recruiting*

The hiring of employees is a task that aims to address the demands of an institution's employees in terms of both quantity and quality. Recruitment operations are carried out in order to discover and hire as many prospective workers who fulfill the requirements as possible, with the best and most qualified individuals being chosen. Selection is required for this purpose, which will be accomplished through oral, written, and practical exams.

However, in rare cases, personnel might be recruited internally or from inside a company whether by promotion or

by transfer. If the formation is a little vacant, this is done. Other locations, on the other hand, have additional workers or are already prepared. Employee selection should be based on new principles which means we must first select the occupations based on descriptions.

This simply means that we are looking for the suitable candidates to fill the position based on job requirements. Prospective employee recruitment should be done correctly so that personnel are accepted in agreement with the requirements of the task to be done.

The following are the procedures or processes involved in the hiring of employees:

(a) Predicting workforce requirements is designed to ensure that the current and future workforce needs are met in line with the workload, that vacancies are avoided, and that all work is completed.

(b) Recruitment is the process of locating and securing people from a variety of sources in accordance with an organization's or institution's minimum requirements.

(c) The first effort that organizations / institutions must do in order to obtain suitable and competent people who will accomplish the tasks in the organization / institution is selection. The selection process must be honestly, meticulously, and objectively enacted so that the workers who are chosen are actually qualified to occupy positions and carry out the task, making it simpler to teach, develop, and manage personnel.

(d) Placement, orientation, and induction of new employees is a step after selection that involves placing potential workers who have been accepted (passed the selection) in positions / tasks that demand it while also delegating responsibility to that individual.

One of the keys to achieving the optimum job performance from every employee is proper employee placement. Workplace morale will improve, as will innovation and initiative. Each new employee must be orientated or introduced in order to demonstrate that they are actually recognized as workers who will collaborate with other employees in the business. With orientation, new workers may feel less concern and gain confidence in their job. Employee induction is a process that helps new workers acclimate to the regulations of the business or institution.

Induction is primarily the responsibility of the employee's immediate supervisor to ensure that the new employee understands the importance of following the rules of the organization/institution and doing his tasks appropriately. It may be stated that personnel procurement entails the processes of multiple stages in order to obtain effective and efficient people to assist the business / institution realize its goals.

D. *Employee Growth and Development*

The organization always expects its employees to carry out their jobs properly, give all of their talents to the organization's interests, and get better with each passing day. Aside from that, the managers need development and advancement in all aspects of his life, including his job. In this sense, the role of developing and developing workers is a function of personnel management that is critically important in order to enhance employee productivity.

This action of coaching is concerned not only with the employee's abilities, but also with his or her career. Employee development is becoming increasingly vital as a consequence of the demands of job or position, as a result of technical improvements and increasingly severe competition among comparable businesses / institutions. Each organization's or institution's staff must be able to operate effectively with the highest quality so that the organization's or institution's competitiveness is enhanced.

This development is carried in the manner of multiple aims for employees through workshop and seminars. It can be summarized that employee development should be carried out by each organization because it will benefit the organization, working staff, and the community.

E. Promotion and Mutation

Promotion is a step that enhances an employee's power and duty to a higher position in a company, resulting in increased duties, rights, prestige, and pay. Promotion implies that there is faith and acknowledgment in the skill and capacity of the individual in question to hold a better position. Employees will be encouraged to work hard, be well disciplined, and complete tasks in order for the organization's goals to be met to the best of their abilities. Employee mutation is one of the follow-up measures conducted as a result of the outcomes of employee performance evaluation.

Since the employee performance review will inform employee abilities in performing work descriptions assigned to him, this modification must lean on the accomplishment index that the relevant employee can attain. It is reasonable to assume that mutations are part of the employee development function because the goal is to increase organizational work efficiency.

Following the acquisition and acceptance of the potential employee, the upcoming step is to make the potential employee a genuine staff of the organization, so that he has rights and duties as a member of the organization. Promotions or initial appointments for public employees in Vietnam are often appointed as interns with a trial period of one or two years, then attend training, and are appointed full time workers following graduation. Once hiring, the next step is to position or allocate staff.

F. Employee dismissal

Termination of an employee's employment with an organization should follow sequences. Dismissal signifies the end of an employee's work relationship with the company. This dismissal is a personnel function that releases organizations and individuals from their responsibilities and benefits as a workplace institution and as employees. The grounds for terminating education workers in schools, particularly Civil Servants, can be classified into three categories:

- (a) Termination on one's own initiative.
- (b) Disciplinary action taken by the department and the government;
- (c) Suspension of the causes.

Dismissal at the employee's request, for instance, owing to a change in employment aimed at improving the employee's jobs. The department or government can fire staffs for any of the following reasons:

- (a) The worker in question is inept and unable to perform his job correctly.
- (b) Simplifying or streamlining the organization.
- (c) Rejuvenation, typically, workers over the age of 55 who are eligible to retire will go within a year.
- (d) Unhealthy in both a spiritual and bodily level, preventing them from carrying out their tasks correctly.
- (e) Committing a crime that results in a jail or confinement term.
- (f) Violation of a government servant's commitment.

G. Compensation

Compensation is a monetary reward paid by an organization to its personnel that is often granted on a permanent basis. Other than pay, compensation can be provided in the form of perks, housing, automobiles, and other items. This compensation is no longer viewed as a means of meeting material necessities, but rather as a means of preserving human dignity.

H. Employee Evaluation

To determine if personnel who have been trained and developed profit from what they have contributed, their accomplishments must be evaluated. Work performance is the outcomes of an employee's quality and quantity of work in carrying out their duties in line with the obligations assigned to him. Individual success and engagement in school activities are used to evaluate educational staff.

Employees may utilize evaluation to get feedback on topics like ability, weariness, lack, and potential, which can then be used to set objectives, pathways, plans, and advance their careers. The findings of education staff performance appraisals are particularly significant for schools in identifying school program needs, acceptance, selection, introduction, placement, promotion, incentive systems, and other components of the entire successful human resources process are all decisions that must be made.

It may be inferred that employee evaluation is required to determine the accomplishments that each individual is capable of achieving. Organizations can utilize the evaluation results to determine future policy actions.

Schools should implement programs with the following requirements in terms of management in the realm of educators and education personnel: (1) Educational empowerment programs and personnel are organized by schools. (2) Educator empowerment and education: developed in accordance with the conditions of the school, including task distribution, overcoming manpower shortages, determining the reward system, and professional development for each educator and education staff.

IV. CONCLUSION

"Human resources" play a significant role in all facets of "an institution's or organization's operations" [1]. It may work optimally if they are effectively managed. As a result, leadership is required. This management is an extremely significant part of the educational process in general. Therefore, responsibilities in human resource management must be carried out in order to meet the demands of individuals, corporations, organizations, or institutions.

HR is a procedure that involves the execution of management duties or human resource management that is offered to the school education unit to be created in accordance with the capacity of the school. “(1) Employee planning, (2) employee procurement, (3) employee growth and development, (4) promotion and transfer, (5) employee dismissal, (6) remuneration, and (7) employee assessment are all part of the scope of human resource management (HR)” [1].

All of that must be done effectively and appropriately in order to reach the desired result, which is the availability of education employees with the necessary skills and abilities to carry out good and quality work.

REFERENCES

- [1] Andrew F. Sikula, John Francis McKenna (1990) *Personnel and Human Resource Management*, R.E. Krieger Publishing Company
- [2] Amirullah and HarisBudyono (2004) *Introduction to Management*. Malang: Science Graha.
- [3] AzharArsyad. (2002) *Fundamentals of Management*, (Yogyakarta: Student Library.
- [4] Ara Hidayat and Imam Machali. (2010). *Educational Management: Concepts, Principles and Applications in Managing Schools and Madrasas*
- [5] Awarmayanti (2013) *Human Resource Management*. Bandung: RefikaAditama
- [6] DadangSuhardan. (2011). Et al, *Educational Management*, (Bandung: Alfabeta)
- [7] DjonyHerfan. (1999). *The Role of HR in Implementation*, (Jakarta: Pt Grasindo)
- [8] Ernie Trisnawati. (2005). *Introduction to Management*, (Jakarta: Kencana)
- [9] E. Mulyasa. (2012). *School Based Management*. Bandung: Teen Rosdakarya.
- [10] FitriOviyanti, et al. (2011). *School Based Management (SBM)*, (Palembang)
- [11] Flippo, E. B. (1961). *Principles of personnel management*. New York: McGraw-Hill.
- [12] Follett, M. P., & Graham, P. (1995). *Mary Parker Follett--prophet of management: A celebration of writings from the 1920s*. Boston, Mass: Harvard Business School Press
- [13] Hasibuan, Malayu S.P. (2013). *Human Resource Management*. Jakarta: Earth Literacy.
- [14] Herfan, Djony. (1999). *Role of HR in Implementation*. Jakarta: PT Grasindo.
- [15] Husaini Usman. (2011). *Management Theory, Practice, and Educational Research*, (Jakarta: Earth Literacy)
- [16] John B. Miner and Mary Green Miner (1985) *Personnel and Industrial Relations*, 4th edition, Macmillan, New York
- [17] Koontz, H., O'Donnell, C., & Wehrich, H. (1982). *Essentials of management*. New York: McGraw-Hill.
- [18] Made Pidarta. (1988). *Indonesian Education Management*, (Jakarta: Melton Putra),
- [19] Mulyasa. (2009). *Implementation of Teacher and School Principal Education Unit Level Curriculum*, (Jakarta: BumiAksara).
- [20] Sagala, Syaiful.(2013) *Understanding Educational Organizations*. Bandung: CvAlfabeta
- [21] Sondang. (1997). *Management Audit*. Jakarta: BumiAksaraSulistiyorini. 2009 *Management of Islamic Education*. Yogyakarta: TerasSumiharti, Yati. 1997. *Management*. publisher: Erlangga. Teams of Educational Administration Lecturers at the Indonesian University of Education, *Education Management*, (Bandung: Alfabeta).
- [22] Sulasmi, E. (2020). *The Development Strategy of Human Resources Management In Children's Social Welfare Institution (LKSA) (Case Study in LKSA AL-Mubaraak Orphanage Bengkulu)*. Budapest International Research and Critics Institute-Journal (BIRCI-Journal). P. 562-569.
- [23] Wisdom. (2011). *Management of Education*. Bandung: A loyal library of Kadarisman. 2013. *Management of Human Resource Development*. Jakarta:

Impacts of Diversification on Operational Efficiency of Vietnam Commercial Bank

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Abstract—This research has focused on the assessment the impacts business diversification can have on the operational efficiency of commercial banks on the basis of regression of array data of 24 Vietnamese commercial banks in the period 2010 - 2020. The findings signify the important benefits of diversification in banking. By diversifying business activities, it is possible for banks to assert their position in the market, improve competitiveness, and thereby have many opportunities to find new incomes from non-traditional activities. Diversification is also a way for banks to limit risks and improve operational efficiency. This is reflected in the fact that the diversification index has positive influences on the bank's operating efficiency both before and after risk adjustment. On the basis of research results, the author gives some policy implications.

Index Terms—Business diversification, Operational efficiency, Commercial banks.

I. INTRODUCTION

BANK is a financial institution, conducting business activities based on monetary funds formed from deposit and non-deposit sources. Banks act as intermediaries between savers and borrowers, and their main activities are accepting deposits and making loans [6]. Commercial banks – financial intermediaries play an important role in connecting the savings and investment of the economy. However, the process of international economic integration has created increasingly fierce competitive pressure on commercial banks.

Income from traditional activities of commercial banks is strongly affected by economic fluctuations. Besides, the application of science and technology has helped to diversify banking products and services. Therefore, instead of mainly focusing on traditional products and services, commercial banks diversify their activities in order to increase operational efficiency as well as increase the bank's profitability. However, whether diversification is really effective for commercial banks or not, there is still no satisfactory answer.

First, the views in favor of diversifying banking activities

Based on market power theory, modern portfolio theory, economies of scale and scope, the studies signified the benefits of diversification in improving operational efficiency of commercial banks: Diversification of banking activities brings certain advantages for banks, because it helps banks reduce costs thereby increasing profits, increasing the value of the bank or reducing particular risks and then improving bank performance ([2];[7];[15];[18]).

Second, the views not in favor of diversifying banking activities.

Contrary to the benefits found when commercial banks diversify their business activities, several studies [8];[16]; [13], based on the agent theory, the issue of moral hazard, have demonstrated the adverse effects of diversification on bank performance. This group argues that the greater involvement of banks in non-profit activities, though can bring about higher profits, also exposes banks to greater risks, resulting in the bank's low operational efficiency.

Third, several recent studies have focused on explaining inconsistencies in conclusions about the impact of business diversification on bank performance: [9] claimed that this relationship is influenced by a number of factors such as: risk management ability; the bank's ownership structure; market structure; competition level; changes in the macroeconomic and institutional environment.

It can be denied by the fact that Vietnamese commercial banks have chosen the strategy of diversifying banking activities in recent years. Since the opening of the economy, the entry of foreign banks and financial companies into the market has increased competition for banks. Banks' traditional activities, especially lending activities, are increasingly difficult due to the increase in the size of banks, and volatilities in the economy (natural disasters, epidemics...). Therefore, most banks seem to choose a diversification strategy rather than a strategy of focusing on traditional activities. However, whether diversification really increases operational efficiency for Vietnamese commercial banks has not been answered satisfactorily.

Studies in Vietnam also show two opposing opinions, according to [10]; [14] diversification has a positive impact on profitability of Vietnamese commercial banks. However, according to [20], the more diversified the bank's business activities, the higher the profit, but because the risk level tends to increase, the risk-adjusted profit is reduced. Hence, income diversification is not beneficial for Vietnamese commercial banks.

The reason for the difference in the results of the above study can be attributed to: The study of [10] while considering the effects of diversification on the earnings power of banks has not taken into account the risks that banks may face upon diversification, while the research of [14] has considered the effects of risks but has not paid attention to the endogenous factor in the research model. As a consequence, their research findings are incompatible with those of [20]. In addition, these studies were carried out in the period from 2006 to 2013, in which Vietnamese commercial banks have

not really developed as strongly as currently in terms of both quantity and scale as well as types of banking services. .

Therefore, the study has been conducted to reaffirm the influences of operational diversification on the performance of commercial banks in the current period, when Vietnamese commercial banks have grown dramatically in size, quantity and quality of banking services... Therein, the business results of commercial banks will be adjusted according to the bank's risk level to ensure the operation efficiency of the bank most accurately. Simultaneously, the Generalized Method of Moments (GMM) method is used to regress the research model, ensuring the reliability of the research results when the research model is endogenous. The research results will be useful for bank administrators in narrowing or expanding diversification effectively, for banking authorities in controlling their business activities, for investors and stakeholders in analyzing and evaluating bank performance and ultimately providing empirical evidence to answer the controversial question "Does diversifying business activities bring benefits to commercial banks?"

II. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

A. Literature review

Operational Efficiency is always a matter of concern of businesses as well as banks, which depends on the level of organization, management and use of resources to create value for the bank. Thus, there have been many studies on banking operational efficiency such as:

The research by [2] indicated a very positive impact of non-interest income from non-traditional activities (stocks, insurance and other financial activities) on the value of banks and potential to improve the bank's performance in the future. In terms of risk, the study found a nonlinear relationship between bank-specific risks and diversification. Most of the banks in the sample are able to reduce their individual risk and operate more safely thanks to income diversification; whereas, only a few large banks have higher systematic risk upon diversification due to their extensive exposure to the market or business cycle shocks. Similar results to the study of [2] are also found in the study of [10] and [14]. Expanding business activities to help commercial banks reduce bankruptcy risk and increase profits is also the core finding of [18] while examining the impact of income diversification on operational efficiency and bank risk. The research results signified the good points of income diversification in emerging economies. Diversification of non-interest income and interest income were both found to have the effect of increasing the operational efficiency of banks and reducing the risk of bankruptcy for banks. However, this finding is only found in case non-interest income of banks is at low level. Four basic reasons why the potential benefits and actual benefits of diversification may be different [18]: First, the benefits from diversification depend on the actual investment portfolio of each bank, this benefit would be limited if the bank did not hold an efficient risk portfolio. Second, banks will have to cope with higher risks if they expand their operations into new areas, especially in areas with high competition or inexperienced banks. Over-diversification is also the cause of increased individual risk

and "distorts" the real relationship between diversification and bank risks. Third, diversification does not reduce systemic risks for banks when they diversify excessively. Finally, the "indiscriminate" application of versatile bank standards to banks of all asset sizes also limits the benefits of diversification. The research by [8]; [20] also found evidences of adverse effects of diversification on bank performance such as: Reducing the safety of banks; increasing the bankruptcy risk and thereby exacerbating the bank's risk-return trade-off.

III. THEORETICAL FRAMEWORK

A. Diversification of banking activities

The basic functions of a commercial bank are: (i) Financial intermediaries, (ii) Payment intermediaries and (iii) Money creation for the economy. However, the process of globalization along with revolutionary changes in banking technology has created an increase in fierce competition among commercial banks, forcing commercial banks to change in operations and management. Instead of maintaining the traditional banking model, the bank's operations are growingly modern, diversified and innovative in order to provide customers with many utilities and satisfy the increasingly diverse needs of customers. It is the fact that commercial banks has shown strong changes in the functions and forms of operation. In addition to credit, savings and payment, the functions of investment planning, fiduciary cash management, insurance, brokerage, investment, and guarantee are progressively developed so that commercial banks can become a "financial department" conducting business activities on a large scale with a diverse portfolio of banking services.

As for the banking and finance sector, back to the 80s since financial barriers were removed, the banking systems of countries, especially Western countries, had a lot of great changes reflected in increased competition, centralization and restructuring [13]. In the new environment, banks have responded by actively applying different business strategies, in which diversification is considered an important strategy with the expectation that it can help banks increase profits or reduce bankruptcy risk [5].

Commercial banks can implement diversification in many different ways such as: (i) Diversifying financial products and services; (ii) Diversifying the scope of activities; (iii) Diversifying income; (iv) Diversifying asset classes; (v) Diversifying funding sources or (vi) Diversifying investment portfolio. Regardless of the form of diversification, its goal is to help commercial banks' business activities gradually expanded, leading to rapid changes in the asset structure and income structure of banks. Basically, the bank's overall performance with all its financial inputs and outputs is shown on the balance sheet and income statement. The assets on the balance sheet generate most of the operating income for the bank while liabilities generate most of the expenses. Therefore, when studying diversification in banks, considering asset structure and income structure is a common approach to assess the level of diversification in business activities of commercial banks.

First, the approach is based on the bank's asset structure: With the concept that all activities in which banks participate are reflected in the assets held by banks, most studies consider the degree of diversification of banks based on the proportion of different types of profitable assets in total assets or consider the ratio of off - balance sheet assets to total assets of the bank [4].

Second, based on the bank's income structure.

A bank is considered concentrated if its operating income is determined only from interest income or considered fully diversified if its overall income is equally divided into interest income and non-interest income [7];[18]. With these approaches, the bank's diversification degree depends on the ratio of interest income (generated by traditional activities) and the ratio of non-interest income and its components (generated by non-traditional activities) to total operating income of the bank [7];[13];[16];[18].

According to research by [9];[12] to determine the level of income diversification, it is necessary to use the value of total income to calculate. The use of value pooling avoids the "excessive distortions" caused by the activity related to the income bank.

Thus, a diversified bank can be considered in terms of income diversification or asset diversification. However, in terms of operational efficiency, regardless of the degree of asset diversification, it is ultimately necessary to consider the bank's performance or the benefits that assets bring. Therefore, in this study, the author mainly evaluates the degree of diversification in banking activities based on the level of income diversification.

B. Operational Efficiency in Banking

Banks' operating efficiency has been one of the main concerns of regulators, market makers, investors and researchers over the past decades in the midst of growing uncertainties in the globalized environment.

Operational efficiency is the ability to transform scarce inputs into earnings or reduce cost compared to competitors. According to this approach, the operational efficiency of an organization can be assessed through two groups of criteria: (i) The absolute efficiency criteria group allows to evaluate the operational efficiency in both breadth and depth. However, in some cases it is difficult for this criterion to compare banks of different sizes; (ii) Relative efficiency criteria can be expressed in static form (Operational Efficiency = Economic Outcome/Cost to achieve these outcomes). This indicator makes it convenient for comparison in time and space as well as between organizations of different sizes, in various periods.

Banking operations efficiency can be approached in one of two directions: structured approach and unstructured approach [11]. While the structured approach considers operational efficiency as a function of costs or profits and at the optimal point, the bank achieves the goal of cost minimization or profit maximization, the unstructured approach primarily considers operational efficiency based on financial ratios or market value adjusted for the bank's own risk factors.

C. Measuring the operational efficiency of commercial banks

In relation to the diversification of banking business activities, most of the research works consider operational efficiency in banking in the unstructured approach as [11]. Accordingly, a group of financial ratios or market value measures will be selected to directly or indirectly evaluate the bank's operating efficiency. It depends on the type of data the researcher collects such as accounting data, market data and mixed data to select the ratios.

Most studies use accounting data, measuring operational efficiency by the following ratios: Return on assets (ROA); Return on Equity (ROE); Risk-adjusted return on assets (RAROA); Risk-adjusted return on equity (RAROE).

ROA and ROE depend on the efficiency of using assets and the decisions of the bank. On the other hand, ROE can also be amplified by the equity multiplier or leverage ratio. The level of debt use in banks can also be the reason for the increase in returns on per dollar of equity. ROE is the most important measure of the bank's earnings power and growth potential [6]. Therefore, in this study, ROE is applied to measure the banks' operating efficiency.

IV. RESEARCH METHOD AND METHOD MODEL

A. Research sample

(i) Research sample: consisting of 24 commercial banks, the period of research is from 2010 to 2020. The commercial banks mentioned in the study include 4 state-owned commercial banks - which means any enterprise of which 100% charter capital is held by the State, and 20 domestic joint stock commercial banks. In the research sample, branches of foreign commercial banks in Vietnam and joint venture banks are excluded due to insufficient database to carry out the research. The total assets of the 24 commercial banks account for about 80% of the total assets of the bank system, thus ensuring the representativeness of the sample.

(ii) Data collection sources: Macro-economic variables are collected from the website of IMF, World Bank. Micro variables are collected from annual reports and financial statements posted on the websites of commercial banks.

B. Research model

Research model:

$$ROE_{i,t} \text{ (or RAROE}_{i,t}) = \beta_0 + \beta_1 DIV_{i,t} + \beta_2 DEP_{i,t} + \beta_3 LOAN_{i,t} + \beta_4 NPL_{i,t} + \beta_5 VAMC_{i,t} + \beta_6 LLR_{i,t} + \beta_7 LEV_{i,t} + \beta_8 LIQ_{i,t} + \beta_9 SIZE_{i,t} + \beta_{10} OWNER_{i,t} + \beta_{11} GDP_t + \epsilon_{i,t}$$

Including: β_0 is a constant; β_j are the regression coefficients corresponding to the independent variables; $\epsilon_{i,t}$ is the random error.

(i) Dependent variable

- $ROE_{i,t}$: calculated by dividing net income by the average equity of commercial bank i in year t

$ROE = \text{Net income} / \text{Average equity}$

- $RAROE_{i,t}$: is the ratio of risk-adjusted return on equity of bank i in year t . RAROE indicates the amount of return a bank achieves on per unit of risk. A higher RAROE reflects greater risk-adjusted returns or better banking operational efficiency.

$RAROE = ROE/SDROE$

Therein, SDROE is the standard deviation of ROE, the volatility of return on equity, thereby showing the level of risk in the bank's operations.

(ii) *Independent variable* - $X_{i,t}$: the X factor affecting the performance of commercial bank i in year t, including:

(1) Income diversification index – DIV:

DIV is calculated based on the bank's income including: Interest income from credit activities, fee income from service activities, income from investment activities and others. This index is calculated by the following formula:
 $DIV = 1 - [(INT/TOI)^2 + (COM/TOI)^2 + (TRAD/TOI)^2 + (OTH/TOI)^2]$

- INT is the total interest income of commercial banks: deposit interest; loan interest; profit from business; investment in debt securities; income from guarantee operations; income from finance lease and others.

- COM is fee income from service activities of commercial banks: payment services; treasury services, entrustment and agency operations; consulting services; insurance business and services; discount operations; asset preservation services; locker rental and others.

- TRAD is the total income of the bank from business activities: Forex trading; business securities trading and investment securities trading.

- OTH is the total income from other business activities of commercial banks: income from capital contribution, share purchase and others besides all mentioned above.

- TOI is the total operating income of the bank, calculated by summing the absolute values of INT, COM, TRAD, OTH, which ensures that the income diversification measure is properly calculated, showing that the bank still implements diversification even in the event of a loss [9].

DIV can take the value [0,1]. However, $DIV = 0$ or $DIV = 1$ is very unlikely. $DIV = 0$ when the bank is completely centralized, the total operating income TOI has been solely derived from credit activities; and $DIV = 1$ if the bank does not generate any income in a specified time period. Normally, DIV takes positive values with a maximum of 0.75. A low DIV indicates that the bank's business is mainly focused on traditional activities, while a high DIV implies that non-traditional activities are attentively implemented to generate non-interest income for banks. An increase in DIV reveals a rise in the level of banking business diversification. $DIV = 0.75$ shows that the bank is engaged in all operations, the total operating income is equally categorized into all 4 components INT; COM; TRAD; OTH.

(2) Control variables: Control variables include variables related to bank operations and macroeconomic variables, which are summarized in the table below.

V. DATA ANALYSIS METHOD

It is necessary to choose an appropriate estimation method to ensure that the results of the regression model are reliable. The estimation method is considered suitable if the defects of the research model can be overcome. Therefore, with an aim to conducting regression of the research model as well as selecting the appropriate estimation method, the author performs the following steps sequentially:

TABLE 1. LIST OF CONTROL VARIABLES IN THE RESEARCH MODEL

Code	Name of the variable	Measure	Expected sign
Control variables			
DEP	Deposit growth rate	The difference between year t and year (t-1) customer deposit balance on the customer deposit balance year (t -1)	+
LOAN	Loan balance growth rate	The difference between year t and year (t-1) customer outstanding loan balance on the customer outstanding loan balance year (t -1)	+
NPL	Non-performing loan	Non -performing loan/Gross loans	-
VAMC	Bad debt sold to VAMC	Bad debts to Vietnam Asset Management Company	-
LLR	Loan-loss reserve	Ratio of loan loss provision to total loans	-
LEV	Leverage ratio	Ratio of total liabilities to equity	+
LIQ	Liquidity	Liquid Asset to Total Asset Ratio	+
SIZE	Size of the bank	Logarit Total Assets	+
OWNER	Government ownership level	Dummy variable takes the value 1 for commercial banks with state-invested capital and takes the value 0 for other commercial banks	+
GDP	Economic growth rate	GDP growth (decrease) rate	+

Source: Author's synthesis from previous studies

- Step 1: Regress the research model by OLS method, determine the model's defects and choose an appropriate estimation method:

The table of Variance Inflation Factors (VIF) (Appendix – Table 2) shows that the VIFs of the independent variables are all less than 10. Thus, there is no possibility of multicollinearity among the independent variables in the research model.

Besides the multicollinearity, in order to determine whether heteroskedasticity (referring to the error variance) exists in the research model or not, the author performed Preusch - Pagan test, the results (Appendix - Table 3.1; Table 3.2) showed that $Prob > Chi^2 < 0.05$, rejecting the hypothesis H_0 : The model has heteroskedasticity. Similarly, in order to check whether the model has autocorrelation, Wooldridge test was performed, the results (Appendix - Table 4.1; Table 4.2) showed $Prob > F < 0.05$, rejecting the hypothesis H_0 .

The regression model has the problem of autocorrelation among independent variables, it is necessary to overcome this phenomenon to ensure the reliability of the regression results. In addition, most of the studies on the effect of diversification on banks' operating efficiency, such as: Research by [2] emphasize the need for endogenous control in the diversification decision because banks can diversify in strategic responses to the banks' business opportunities. The endogenous phenomenon occurs when the diversification decision can affect and be affected in return by the past and present efficiencies of banking operations. Therefore, similar to previous studies, the Generalized Method of Moments (GMM) method is used in this study to regress the research

model so as to solve the endogenous phenomenon and the defects of the research model.

- Step 2: Regress the research model by GMM method

VI. RESULT AND DISCUSSION

The results of GMM model regression show that the Hasen test index has Prob > chi2 = 1,000 > 0.05, which means that the model has overcome the endogenous phenomenon. The AR(1) and AR(2) indexes have Pr > z > 0.05, revealing that the model has no first-order and second-order autocorrelation. The regression model has handled the shortcomings of the research model, making sure the research results are reliable.

It can be seen from the descriptive statistics of the DIV index (Appendix - Table 2), the DIV index fluctuates in the range (0.2462 , 0.7033) with an average value of 0.35595, which means that during the research period most commercial banks in Vietnam have diversified their business activities. However, there is a large divergence when the standard deviation reaches 0.1340. This shows that there is a big difference in the degree of business diversification among commercial banks over the period.

TABLE 2. RESULTS OF REGRESSION ANALYSIS OF THE RESEARCH MODEL BY GMM METHOD (ROE)

Group variable: NAME		Number of obs = 240			
Time variable : year		Number of groups = 24			
Number of instruments = 54		Obs per group: min = 10			
Wald chi2(12) = 24449.69		avg = 10.00			
Prob > chi2 = 0.000		max = 10			
ROE	Coef	Std. Err.	z	P> z	[95% Conf.Interval]
DIV	0.19312	0.05014	3.850	0.0000	0.09485 0.29139
NPL	-1.43480	0.25014	-5.740	0.0000	-1.92507 -0.94453
LLR	-1.03974	0.44857	-2.320	0.0200	-1.91893 -0.16055
LEV	-0.00679	0.00160	-4.230	0.0000	-0.00994 -0.00365
LIQ	0.35718	0.11178	3.200	0.0010	0.13810 0.57625
VAMC	-1.29E-06	8.16E-08	-15.800	0.0000	-1.45E-06 -1.13E-06
DEP	0.02432	0.02400	1.010	0.3110	-0.02272 0.07135
LOAN	0.04189	0.03341	1.250	0.2100	-0.02358 0.10737
SIZE	0.07277	0.04277	1.700	0.0890	-0.01106 0.15660
OWNER	0.05694	0.03890	1.460	0.1430	-0.01930 0.13318
GDP	1.25465	0.46979	2.670	0.0080	0.33387 2.17543
_cons	-0.36694	0.19041	-1.930	0.0540	-0.74013 0.00625
Arellano-Bond test for AR(1) in first differences: z = -1.3			Pr > z = 0.198		
Arellano-Bond test for AR(2) in first differences: z = -1.98			Pr > z = 0.194		
Sargan test of overid. restrictions: chi2(102) = 76.75			Prob > chi2 = 0.001		
Hansen test of overid. restrictions: chi2(102) = 17.34			Prob > chi2 = 0.999		

Source: Data processing results on Stata software 14

The results demonstrates that income diversification has a positive impact on the operational efficiency of commercial banks in both pre and post risk-adjusted cases. This result is inconsistent with those of some previous studies such as: [8];[16];[20]... According to these studies, diversification has negative effects on banking operations efficiency, reducing safety and increasing bankruptcy risk, thereby exacerbating the risk-reward trade-off.

However, the research results are favored by market theory, modern portfolio theory, and the perspectives on economies of scale and scope. Accordingly, business diversification can enable the banks to reduce costs, increase profits and the bank's value, or reduce individual risks or improve operational efficiency [2];[18].

In addition to the impact of income diversification, the banks' operating efficiency is negatively influenced by some factors: Non-performing loan ratio (NPL); Leverage ratio;

TABLE 3. RESULTS OF REGRESSION ANALYSIS OF THE RESEARCH MODEL BY GMM METHOD (RAROE)

Group variable: NAME		Number of obs = 240			
Time variable : year		Number of groups = 24			
Number of instruments = 41		Obs per group: min = 10			
Wald chi2(12) = 4013.42		avg = 10.00			
Prob > chi2 = 0.000		max = 10			
RAROE	Coef	Std. Err.	z	P> z	[95% Conf.Interval]
DIV	3.36663	0.890268	3.78000	0.00000	1.62174 5.111530
NPL	-23.06065	11.75428	-1.96000	0.05000	-46.09862 -0.022681
LLR	-16.94380	11.87081	-1.43000	0.15300	-40.21016 6.322552
LEV	-0.11273	0.022744	-4.96000	0.00000	-0.15731 -0.068152
LIQ	9.33737	1.767305	5.28000	0.00000	5.87352 12.801220
VAMC	-0.00002	0.000010	-1.75000	0.08100	-0.00004 0.000002
DEP	0.120920	0.506090	0.24000	0.81100	-0.87010 1.112838
LOAN	0.90494	0.626893	1.44000	0.14900	-0.32375 2.133628
SIZE	1.40093	0.641256	2.18000	0.02900	0.14409 2.657768
OWNER	2.13162	0.992809	2.15000	0.03200	0.18575 4.077484
GDP	29.86953	7.915406	3.77000	0.00000	14.35562 45.383440
_cons	-8.06362	3.098377	-2.60000	0.00900	-14.13633 -1.990915
Arellano-Bond test for AR(1) in first differences: z = -1.77			Pr > z = 0.063		
Arellano-Bond test for AR(2) in first differences: z = -2.17			Pr > z = 0.096		
Sargan test of overid. restrictions: chi2(102) = 132.19			Prob > chi2 = 0.000		
Hansen test of overid. restrictions: chi2(102) = 16.35			Prob > chi2 = 0.952		

Source: Data processing results on Stata software 14

TABLE 4. IMPACT OF FACTORS ON THE OPERATIONAL EFFICIENCY OF VIETNAMESE COMMERCIAL BANKS

Variable	Sign expectation	Realistic sign		Significance level	
		ROE	RAROE	ROE	RAROE
DIV	+	+	+	1%	1%
NPL	-	-	-	10%	5%
LLR	-	-	-	5%	Insignificant
LEV	-	-	-	1%	1%
LIQ	+	+	+	5%	1%
VAMC	-	-	-	5%	10%
DEP	+	+	+	Insignificant	Insignificant
LOAN	+	+	+	Insignificant	Insignificant
SIZE	+	+	+	10%	5%
OWNER	+	+	+	Insignificant	5%
GDP	+	+	+	1%	1%

Source: Author's synthesis from research results

NPLs sold to VAMC; whereas, Liquidity level; total asset size and the growth rate of the economy have a positive impact on the operational efficiency of the bank.

Most studies suggest that commercial banks with a larger scale are more operationally efficient because the advantages of scale allow banks to reduce operating costs and increase profitability. At the same time, in the event of economic growth and stability, the operations of banks become more beneficial, thus the bank operational efficiency is enhanced and vice versa.

On the other hand, when the quality of assets is not controlled, the banks will exhibit operational efficiency in an

undesirable way. Specifically, when NPL ratio goes up, the customers lack ability to repay the principal, which will erode the bank's profit and make the bank's operations less efficient. In particular, the NPLs sold to VAMC increase, which means that the NPL ratio of banks has exceeded the safe limit, showing the seriousness of bad debts, credit activities as well as less efficient banking operations.

It is desirable to see from the research results that in the model of assessing the impact of factors on the bank's operational efficiency without risk adjustment, the state ownership factor has a positive effect but no statistical significance; on the contrary, in such model after risk adjustment, this factor favorably affects the performance of banks with the p-value significance level < 5%. This suggests that state-owned banks appear to operate more safely and efficiently than private banks. This is completely compatible with the reality in Vietnam, in which state-owned banks are large-scale, long-standing, reputable and most valuable banks brands of the market. These banks are at the forefront of the industry in compliance with market discipline and international safety and operational standards. As a result, state-owned commercial banks operate more efficiently and profitably.

VII. SOME POLICY IMPLICATIONS

Commercial banks are increasingly under pressure to compete with other commercial banks, especially in emerging markets like Vietnam. The growth rate of loan outstanding balance has a downward trend, the demand for non-credit financial services of customers is highly increasing, forcing banks to constantly innovate technology, provide convenient services with the support of modern technology. Therefore, it is not suitable for market requirements if focusing only on traditional activities.

According to the theory of market power built from the ideas of [19], diversification is one of the ways that companies in general and banks in particular can improve their competitiveness with competitors, and gain competitive power in the market. Diversification allows banks to find new sources of income to increase profits and improve operational efficiency. However, under no circumstances do the banks escape from risks, in order that diversification is really beneficial for the banks, it is desirable for them to ensure effective risk management, diversification in accordance with the size and management capacity of the bank because over-diversification can increase individual risks and "distort" the benefits of diversification. At the same time, the banks need to expand the scale of total assets, product quality, scope of activities and product diversification to achieve efficient diversification.

In contrast, according to Modern Portfolio Theory, diversification is a way by which a bank can minimize market risks for an expected return through creating a diversified portfolio. Accordingly, the diversification of the investment portfolio and portfolio components is expected to reduce the risks for the bank, the risk-adjusted operational efficiency can therefore be improved, and the value of the bank is raised.

It should also be noted that currently Vietnamese commercial banks are mostly small-sized banks, so it is essential

to expand their asset and capital scale to take advantage of the size of the bank in business diversification. Besides debt capital, equity is also an important factor for Vietnamese commercial banks in ensuring capital adequacy requirements according to international standards.

Additionally, from the perspective of regulatory agencies, it is also necessary to propose policies to limit the high degree of concentration in banking operations through regulations on lending limits and ratios. Because according to the structure-behavior-efficiency theory, the company's behavior has a decisive effect on market efficiency [17]. Accordingly, the more concentrated the market is, the more banks tend to centralize their business activities to enjoy the significant difference between lending interest rates and capital mobilization interest rates. On the contrary, when the market is less concentrated or increasingly highly competitive, banks show a tendency of diversifying their business activities in search of new sources of income to increase profits and improve operational efficiency.

REFERENCES

- [1] Amidu, M., & Wolfe, S. (2013). Does bank competition and diversification lead to greater stability? Evidence from emerging markets. *Review of Development Finance*, 3(3), 152-166.
- [2] Baele, L., De Jonghe, O., & Vander Vennet, R. (2007). Does the stock market value bank diversification?. *Journal of Banking & Finance*, 31(7), 1999-2023.
- [3] Berger, A.N., 1995(a). The profit - structure relationship in banking: Tests of market- power and efficient-structure hypotheses. *Journal of Money, Credit, and Banking*, 27, 404-431.
- [4] Berger, A. N., Hasan, I., & Zhou, M. (2010). The effects of focus versus diversification on bank performance: Evidence from Chinese banks. *Journal of Banking & Finance*, 34(7), 1417-1435.
- [5] Boyd, J. H., & Graham, S. L. (1988). The profitability and risk effects of allowing bank holding. *Federal Reserve Bank of Minneapolis. Quarterly Review-Federal Reserve Bank of Minneapolis*, 12(2), 3.
- [6] Casu et al. (2015), "Introduction to banking", 2nd Ed. London: Prentice Hall Financial Times.
- [7] Chiorazzo, V., Milani, C., & Salvini, F. (2008). Income diversification and bank performance: Evidence from Italian banks. *Journal of financial services research*, 33(3), 181-203.
- [8] DeYoung, R., & Roland, K. P. (2001). Product mix and earnings volatility at commercial banks: Evidence from a degree of total leverage model. *Journal of Financial Intermediation*, 10(1), 54-84.
- [9] Doumpos, M., Gaganis, C., & Pasiouras, F. (2016). Bank diversification and overall financial strength: International evidence. *Financial Markets, Institutions & Instruments*, 25(3), 169-213.
- [10] Ho Thi Hong Minh & Nguyen Thi Canh (2015), Income diversification and factors affecting profitability of Vietnamese commercial banks. *Journal of Technology-banking*, 106 – 107, 13 – 24.
- [11] Hughes, J. P., & Mester, L. J. (2008). Efficiency in banking: theory, practice, and evidence.
- [12] Laeven Luc & Ross Levine(2005). Is there a diversification discount in financial conglomerates? *Journal of Financial Economics*, 85(2), 331-367
- [13] Lepetit, L., Nys, E., Rous, P., & Tarazi, A. (2008). Bank income structure and risk: An empirical analysis of European banks. *Journal of banking & finance*, 32(8), 1452-1467.
- [14] Le Long Hau & Pham Xuan Quynh (2016). Impact of income diversity on business performance of Vietnamese commercial banks. *Journal of Banking technology*, (124), 11-15.
- [15] Meslier, C., Tacneng, R., & Tarazi, A. (2014). Is bank income diversification beneficial? Evidence from an emerging economy. *Journal of International Financial Markets, Institutions and Money*, 31, 97-126.
- [16] Mercieca, S., Schaeck, K., & Wolfe, S. (2007). Small European banks: Benefits from diversification?. *Journal of Banking & Finance*, 31(7), 1975-1998.
- [17] Montgomery, C. A. (1994). Corporate diversification. *Journal of economic perspectives*, 8(3), 163-178.

- [18] Sanya Sarah và Simon Wolfe (2011). Can bank in emerging economies benefit from revenue diversification? *Journal of Financial services Research*, 40(1-2), 79-101
- [19] Porter, M. E. (1989). From competitive advantage to corporate strategy. In *Readings in strategic management* (pp. 234-255). Palgrave, London.
- [20] Vo Xuan Vinh, Nguyen Trung Thong (2015), Impact of credit portfolio diversification on profitability and risk of Vietnamese commercial banks. *Journal of Economics and Development*, 216(II), 87-95.

APPENDIX

TABLE 1. DESCRIPTIVE VARIABLE STATISTICS

Variable	Obs	Mean	Std. Dev.	Min	Max
RAROE	240	2.1088	1.8393	-2.4539	10.2116
ROE	240	0.0992	0.0827	-0.5633	0.2912
DIV	240	0.3595	0.1376	0.0246	0.7033
NPL	240	0.0237	0.0173	0.0002	0.1221
LLR	240	0.014	0.0105	0.0028	0.1083
LEV	240	12.134	4.8754	2.9000	33.4426
LIQ	240	0.1789	0.0892	0.0191	0.5031
DEP	240	0.2338	0.2470	-0.1740	2.1070
LOAN	240	0.2306	0.2122	-0.2986	1.1309
SIZE	240	245407	300006	12577	1489957
GDP	240	0.0620	0.0075	0.0500	0.0700
VAMC	240	4069.05	9964.77	0.0000	91715.3

Source: Data processing results on Stata software 14

TABLE 2. VARIANCE INFLATION FACTOR

Biến	VIF	1/VIF
SIZE	3.23	0.309483
OWNER	2.08	0.481527
LEV	1.98	0.506006
DEP	1.85	0.539454
LOAN	1.68	0.596080
GDP	1.47	0.679850
VAMC	1.37	0.730064
NPL	1.28	0.780593
LIQ	1.25	0.796871
LLR	1.25	0.803164
DIV	1.16	0.860442
Mean	1.69	

Source: Data processing results on Stata software 14

TABLE 3.1 BREUSCH AND PAGAN LAGRANGIAN MULTIPLIER, TEST: RANDOM EFFECTS (ROE)

$$roe[NAME,t] = Xb + u[NAME] + e[NAME,t]$$

Estimated results:

	Var	sd = sqrt(Var)
ROE	0.006833	0.0826604
e	0.004082	0.0638913
u	0.000287	0.0169304

Test: Var(u) = 0

$$chibar2(01) = 11.19$$

$$Prob > chibar2 = 0.0004$$

Source: Data processing results on Stata software 14

TABLE 3.2 BREUSCH AND PAGAN LAGRANGIAN MULTIPLIER, TEST: RANDOM EFFECTS (RAROE)

$$roe[NAME,t] = Xb + u[NAME] + e[NAME,t]$$

Estimated results:

	Var	sd = sqrt(Var)
ROE	3.382949	1.839280
e	0.824134	0.907818
u	2.494429	1.579376

Test: Var(u) = 0

$$chibar2(01) = 418.77$$

$$Prob > chibar2 = 0.0000$$

Source: Data processing results on Stata software 14

TABLE 4.1 TEST: FIRST-ORDER AUTOCORRELATION (ROE)

H0: no first-order autocorrelation
F(1, 23) = 6.9140
Prob > F = 0.0150

Source: Data processing results on Stata software 14

TABLE 4.2 TEST: FIRST-ORDER AUTOCORRELATION (RAROE)

H0: no first-order autocorrelation
F(1, 23) = 93.343
Prob > F = 0.0000

Source: Data processing results on Stata software 14

Assessment of the financial safety of securities companies in Vietnam

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Abstract—The study was carried out to assess the financial safety of securities companies in Vietnam through the CAMEL system and Decision 617/QD-UBCK dated October 9, 2013 of the Chairman of State Security Commission of Vietnam (SSC) on guiding the classification of Vietnamese securities businesses. The study used statistical and data collection methods from financial statements and financial safety ratio reports of 71 securities companies which are the members of Ho Chi Minh Stock Exchange in the period 2013-2019. From there, the author calculated and analyzed the groups of criteria for assessing financial safety of securities companies, including: Capital Adequacy (C); Asset Quality (A); Earnings Power (E) and Liquidity (L). The results showed that the financial safety of most securities companies between 2013 and 2019 has been guaranteed, only a few securities companies have not gained capital adequacy or remained low profitability, causing prolonged business losses. Therefore, the study proposed a number of solutions to ensure financial safety for the system of securities companies in Vietnam.

Index Terms—Financial Safety, Securities Company.

I. INTRODUCTION

ACHIEVING financial safety is increasingly becoming a vital issue for each country, especially in the context of globalization and economic-financial liberalization taking place as fairly rapidly as today. For the operation of financial institutions in general and securities companies in particular, financial safety is not a completely new concept but has not been fully and systematically studied. In addition, the issue of financial safety for the operation of securities companies has a great influence on the stock market and the investor community. However, the financial safety assurance of the system of Vietnamese securities firms is still weaker than many countries in the region and in the world, which is evidenced by the fact that many securities companies in Vietnam have been discharged from the market due to inability to ensure secure finance and continuous business losses. Therefore, the research is conducted to evaluate the financial safety of securities companies that are members of Ho Chi Minh Stock Exchange over the period of 2013-2019, thereby providing appropriate solutions and proposals to ensure financial safety for securities companies next time.

This research has applied classification regulations for securities firms according to CAMEL standards and Decision No. 617/QD-UBCK dated October 9, 2013 of the SSC. This regulation is issued to classify and evaluate their activities comprehensively, on that basis to aid the SSC in the management and supervision of these businesses' activities. Similar to the versions of the CAMEL system used in other countries around the world, the CAMEL system is used in-

ternally by the SSC to monitor securities companies. The results of calculation, evaluation and ranking of securities companies are not publicized in order to keep their internal information confidential and avoid affecting their reputation negatively, maintaining stability for the Vietnamese stock market. In general terms, the SSC also uses the factors which are Capital Adequacy (C); Asset quality (A); Management Quality (M); Earnings Power (E) and Liquidity (L) for the CAMEL system applied to Vietnamese securities firms. Whereas, the group of financial factors including C, A, E, L can be calculated according to the data taken from the reviewed or audited financial statements, periodical reports and other financial data. The management quality (M) factor is considered separately because it is difficult to quantify this factor and it mainly relies on qualitative criteria to evaluate. There are internal criteria and securities companies need to provide more information to the SSC. Therefore, in this study, the author only studies the group of financial factors to review their financial safety.

II. LITERATURE REVIEW

The securities company is a financial institution providing securities services on the financial market. Therefore, the activities of securities companies also have similarities with financial institutions such as commercial banks typically. Therefore, the author's research on financial safety of securities companies is also based on literature review on financial safety of commercial banks. [8] stated that the financial safety net of a country was the security system of commercial banks, insurance companies and securities companies. This study also built the structure of the financial safety net in accordance with the conditions of Latin American countries. In the study of [1], the authors collected data of 17 banks in Pakistan as of December 2010. On the basis of CAMEL model, the study ranked these banks then assessed the level of financial safety of each bank in the research period. Furthermore, the study by [6] also assessed the level of financial safety and the soundness of the Indian banking system according to the CAMEL model comprising of two groups of state-owned banks and private banks. The used research data was the statistics of banks for 11 years (during the research period from 2000 to 2011). Research results have illustrated that the state-owned banks of India always have a better CAMEL rating than private banks, which means that the financial safety and soundness level of the state-owned banks are always higher than those of private banks. India top state-owned banks have the highest level of

financial safety and private banks like Union Bank and SBI have the lowest financial safety based on the CAMEL rating. In addition, the authors [12] have studied the importance of the elements constituting the CAMEL system, thereby building the optimal criteria set to assess the level of financial safety of financial institutions. The data used in this study were taken from the income statements of Nigerian banks for the period from 1997 to 2005. The results of the study indicate that no single factor in the CAMEL system has the capacity of comprehensively evaluating a particular financial institution such as a bank. Therefore, it is necessary to combine factors on certain rates; in other words, to build an optimal rating structure for each element in the CAMEL system.

Thus, the studies on financial safety of commercial banks have been conducted by many authors around the world. Most of the studies have used the CAMEL model to rank and evaluate the financial safety of commercial banks, especially comparing the CAMEL ratings of state-owned banks with private banks. Besides, it is desirable to integrate all factors with certain rates, not just rely on a single factor to review the financial safety of a commercial bank.

It can be seen that there is a wide array of studies on financial safety of commercial banks. However, that of securities companies has still become a less concerned matter to the researchers. Globally, there are several typical studies such as: Research by the International Organization of Securities Commissions [3]. In this study, after assessing the capital's effect on liquidity of securities firms as well as on operational risk, the study concluded that securities firms need to ensure capital adequacy to some extent. Securities firms' capital adequacy depends on each active market and the number of businesses that they participate in. Additionally, there is a study by the International Organization of Securities Commissions [4]. This is a study on capital adequacy ratio, liquidity, and the harmonization of capital and assets of non-banking securities firms in some countries with developed stock markets such as the US, UK, France and Japan.

In Vietnam, there have been very few elaborate and systematic studies on securities firms' financial safety so far. Directly related to this topic, it is possible to mention the scientific research topic at Banking Academy level by [7]. In this topic, the author gives his own view on the safety of the financial system and financial safety of securities companies. The topic also outlines some models currently being used to review the financial safety of financial intermediaries. Four of the five factors of the CAMEL model which are capital, assets, liquidity and earnings were used in Chapter 2 to assess financial safety of Vietnamese securities firms from 2012 to 2014. This is also a group of financial factors of securities companies. Based on the results of analysis and assessment of financial safety of Vietnamese securities companies, the author has built a system of solutions to improve their financial safety. However, in this study, the results have not shown the basic characteristics of financial safety of securities companies and not built a system of criteria for assessing their financial safety. Also, this issue is studied from the perspective of securities companies; therefore, the given solutions are only meaningful for them, any solutions for state management agencies in the financial safety super-

vision for securities firms' system haven't been recorded. Moreover, it only mentions the financial safety situation of Vietnamese securities firms from 2012 to 2014, not in later periods. During the stock market fluctuation, this study hasn't updated the changes to provide solutions that can be applied in the near future and oriented to 2030.

What is more, it is possible to mention the research of [2]. Theoretically, the study has clarified the concept, evaluation criteria, characteristics, assessment criteria system, influencing factors, especially the research has shown the lessons on ensuring financial safety of global securities companies and lessons for securities companies in Vietnam. In practical terms, the study has assessed the current situation of financial safety of Vietnamese securities firms between 2012 and 2016 through the evaluation criteria; at the same time, it has classified and assessed the financial safety of Vietnamese securities companies according to the CAMEL model and Circular 226. On that basis, it has proposed solutions to ensure financial safety for securities companies, including solutions for securities firms and for state management agencies. In general, the thesis has clarified the issue of financial safety of Vietnamese securities companies, however, the research period ends in 2016, which is also a gap for further studies to be carried out.

III. THEORETICAL FRAMEWORK

A. The concept of financial safety of securities companies

As stated by Chinese economists, Financial safety refers to the safety of the monetary fund and the stability of the entire financial system [11]. Financial safety is the basic problem studying financial economics. In the rapid development of the current globalized economy, financial safety has played an increasingly enhanced role in national economic security. Financial safety is closely related to the financial crisis. Specifically, safety level may be explained and measured through risk and crisis; on the other hand, financial risk and crisis level may be explained and measured by using financial safety. The higher safety level leads to the lower risk and vice versa. Financial crisis results from a large-scale outbreak of accumulated risks, being a serious insecurity as well as a financial disaster. Thus, financial safety bears a close relevance to financial risk.

As claimed by [2], "*securities firms' financial safety is the state of financial stability and soundness of a securities company, on that basis, minimizing risks for securities companies*". Financial stability means that there are no abnormal fluctuations while creating, distributing and using monetary funds and financial relationships of securities companies. Financial stability plays an essential role in the development of securities firms. A securities company with financial instability will be vulnerable to the crisis. However, it is necessary to maintain stability in the movement and development. It not only needs to maintain financial activities as in previous years but must always be in the process of going up, further improving operational efficiency and constantly developing. In other words, financial stability must always be associated with financial soundness. The financial soundness of securities firms is initially a condition in which the securities firms effectively perform their inherent functions

for the economy and simultaneously have the ability to curb or handle risks in advance of those threats to the operation of securities companies. More specifically, if considered in a narrow scope, the financial soundness of a securities company is a condition in which the assets and capital sources do not fluctuate abnormally, meet debt obligations and risks, are not crisis-free and also expressed by its state of financial stability. The sustainable financial status is reflected in the fact that the securities company can meet enough business capital, ensure asset quality, meet the requirements of profitability and liquidity, and improve the quality of corporate governance.

Accordingly, financial safety of securities firms can also be defined as a state of being free from danger or threat from internal and external influences. In other words, the activities associated with the assets and capital of the securities company are not left vulnerable from the risks during their business activities.

B. Assessment criteria for financial safety of securities companies

To evaluate the financial safety of securities companies, the author relies on the table of criteria, scale and weight of financial factors in the ranking of securities companies shown in Appendix 01 issued with Decision No. 617/QĐ. /UBCK dated October 9, 2013 of the Chairman of the State Securities Commission. However, agreeing with the authors of the study [7] and [10], the author also believes that the criteria group of management quality (M) is only a factor affecting the financial safety of securities firms. Hence, the author will employ the CAMEL criteria set selectively, using only 4 groups of financial criteria of this set including: Capital adequacy (C), Asset quality (A), Earnings power (E), Liquidity (L). This set of criteria is called the CAEL model to assess the financial safety levels. At the same time, in each group of indicators, the author selects a representative one (with high evaluation weight in the group) to include in the set of criteria for assessing financial safety of securities companies. Specifically, the evaluation criteria used in the study include:

1. Available fund ratio (belonging to the criteria group of Capital Adequacy - C)

$$\text{Available fund ratio} = \frac{\text{Available funds}}{\text{Total risk value}}$$

Available capital ratio is an important indicator in assessing the capital adequacy of financial institutions in general and securities companies in particular. This indicator is used by most of the studies; typically, studies [2], [3], [4], [7] used available capital ratio in the set of criteria for assessing the financial safety of securities firms.

Available funds are the amount of capital that is accessible to meet financial obligations. It can be known as the equity that can be converted into cash in a short period of time. It is usually calculated by subtracting illiquid asset value from equity. What items will be excluded in determining available funds will depend on each country's regulations and each stage of the market.

Total value at risk is the total value of market risk, liquidity risk and operational risk. Market risk value corresponds to the level of loss that can occur when the market price of

the asset in possession fluctuates in an adverse direction. Value at liquidity risk is the value corresponding to the level of loss that can occur when the counterparty is unable to make payment on time or fails to deliver assets on time as committed. Value at operational risk refers to the level of losses incurred for technical errors, systems and failed operational processes, human errors in the operation process, or due to lack of business capital arising from investment expenses and losses, or from other external events.

The efficiency level in ensuring financial safety of securities companies is demonstrated through the continuity of the process of ensuring the available capital adequacy ratio when always meeting the requirements of capital adequacy, operational safety, and not falling into a state of being controlled or special control as required by law.

2. Ratio of receivables/total assets (belonging to the criteria group of Asset Quality - A)

$$\text{Ratio of receivables/total assets} = \frac{\text{Accounts Receivables}}{\text{Total assets}}$$

This indicator has a weight of 10%, which is high compared to the rest of the indicators of asset quality, so this is also very important in assessing the financial safety of securities firms. It has been used by studies [2] and [7] to evaluate the financial safety of securities companies.

If this ratio is high, most of the securities company's assets are used to finance customers. Thus, the asset safety level will rely on the financial situation as well as the variations in the customer's investment portfolio. It will be difficult for the securities firms to control the risks. As a consequence, the laws of many countries often give a maximum rate for this criterion to ensure the safety of the securities firm's assets.

- (3) Return on Equity – ROE (belonging to Earnings indicators - E)

$$\text{ROE} = \frac{\text{Net Income}}{\text{Shareholders' Equity}}$$

ROE is a very common indicator in assessing the earnings power of enterprises generally and securities companies particularly. ROE is also an indicator that investors are very interested in when analyzing and evaluating the financial situation of a business. This is also applied by studies [2] and [7] to evaluate the financial safety of securities companies.

Return on Equity is a measure of profitability that calculates how many dollars of a profit a company generates with each dollar of shareholders' equity. This measure signifies all aspects of financial management, including revenue and expense management, asset management, and capital management of securities companies. The higher this ratio is, the more effectively the securities firms' equity is used, which is the basis for them to increase their capital size as well as ensure their financial safety.

- (4) Short-term assets to short-term debt ratio (in the group of liquidity – L)

It is also known as the short-term debt ratio. This ratio indicates the likelihood that a company will be able to deliver payments on its outstanding short-term liabilities, so it also shows the level of security for short-term debt payments of the securities company.

$$\text{Short-term debt ratio} = \frac{\text{Short-term assets}}{\text{Short-term liabilities}}$$

This indicator has a weight of 15%, the highest in the group of indicators to assess the liquidity quality of securities companies, proving that this criterion is very essential in assessing the financial safety of securities businesses. This indicator has been used by studies [2] and [7] to evaluate the financial safety of securities companies.

On the whole, the low ratio (especially ratios less than one) suggests that the company may be incapable of making debt payments and it is also a sign of potential financial difficulties that a securities firm may encounter in making payments on its short-term debts. On the other hand, this greater coefficient reflects that the company will be able to be ready to pay short-term debts that are due and then it will help the firm to maintain financial safety in its business activities.

IV. RESEARCH METHOD

The research method primarily used in the study is qualitative method, specifically including the following variants:

- Statistical method: Data are collected and synthesized from financial statements and reports on financial safety ratio of 71 securities companies that are members of Ho Chi Minh Stock Exchange over the period 2013-2019 to serve the assessment of financial safety of the securities company system in Vietnam. The source of research data is taken from the information page of Ho Chi Minh Stock Exchange (hsx.vn).

- Method of analysis, comparison and evaluation: On the basis of analyzing every specific criterion, the researcher compares them over the years and makes assessments on capital adequacy (C), asset quality (A), earnings (E) and liquidity (L) of securities firms, thereby giving a general review of their financial safety.

V. ASSESSMENT OF FINANCIAL SAFETY OF VIETNAMESE SECURITIES CORPORATIONS

A. Assess capital adequacy (C)

As previously mentioned in the section of assessment criteria, the indicator of available funding ratio is chosen to evaluate the capital adequacy of the securities company. Their average ratio of available capital for the period of 2013-2019 is demonstrated in the following chart:

Unit: %

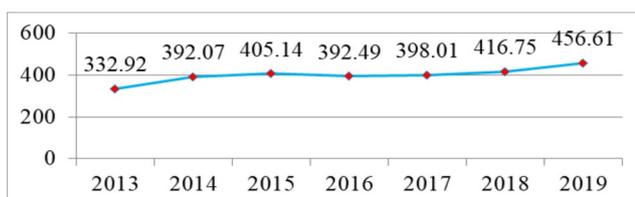


Figure 1. Average available capital ratio of securities companies from 2013 to 2019

(Source: compiled from the financial statements of the member securities firms of Ho Chi Minh Stock Exchange)

It is noticeable that the ratio had a tendency to increase gradually over the period (only slightly decreased in 2016

and 2017). At the same time, the number of securities companies that do not meet this safety criterion also decreased. The main reason is that the restructuring process of securities companies has been carried out since 2012, which has helped these businesses increasingly ensure capital safety. According to Circular 91/2020/TT-BTC dated November 13, 2020, which stipulates financial safety norms and measures for handling securities organizations that do not meet financial safety targets [5] and rating criteria for securities firms according to Decision 617 [9], those with the available capital ratio of less than 180% are considered the unsound, including:

TABLE 1. SECURITIES COMPANIES (SC) WITH UNSECURED AVAILABLE CAPITAL RATIO (<180%) Unit: %

	2013		2014		2015		2016		2019	
	SC	Ratio	SC	Ratio	SC	Ratio	SC	Ratio	SC	Ratio
1	ART	48	SBS	16.54	VICS	156.42	ORS	150.16	CVS	136.2
2	BSI	154	SBBS	149					VICS	151.8
3	ABS	167.52	BSI	166						
4	PHS	173	MSC	168.7						
5	ORS	179	BSC	171						

(Source: compiled from the financial statements of the member securities companies of Ho Chi Minh Stock Exchange)

It is immediately apparent that the number of securities companies with an unsecured ratio of available capital was 5 in 2013 and 2014 (accounting for 7.04% of the total number of securities companies). In particular, SBS Securities Company has a very low rate of available capital in the year 2014, constituting only 16.54%, while the financial safety level must be over 180%. Similarly, the figure for ART Securities Company in 2013 was also low, at 48%. In contrast, from the 2015's onwards, these two corporates were excluded from those with an unsecured available capital ratio, which were VICS in 2015 and ORS in 2016. Over the next two years, no securities firms had to experience the ratio below 180%. However, by the end of 2019, VICS Securities Company continued to have an unsecured capital ratio, compared to CVS with a rate of 136.2%. It can be observed that the number of securities companies that do not meet the criteria has decreased compared to the pre-restructuring period (before 2012). That proves during the restructuring of securities companies, weak companies which do not meet the requirements of the available capital ratio have been purged from the market. Most of the securities companies currently operating in the market meet the requirements for the available capital ratio.

B. Access Asset Quality (A)

The financial safety of securities organizations depends a lot on the ratio of receivables to their total assets. If this ratio is getting higher, the financial safety level will depend much on receivables. Therefore, to ensure financial safety for these firms, the ratio of receivables to total assets will have to be limited at a certain rate, which is currently applied to Vietnamese securities companies at 50%. With this figure, securities companies will be less reliant on receivables, then finance will be more secure.

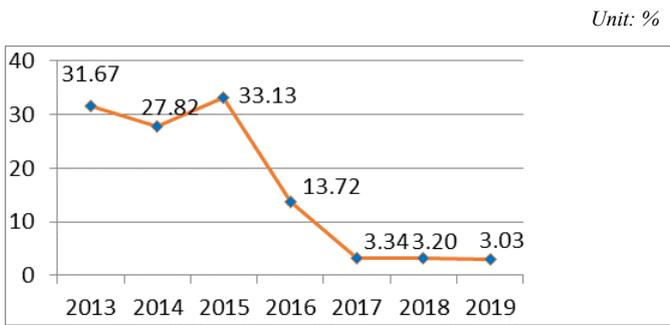


Figure 2. Receivables to total assets ratio of securities companies (Source: compiled from financial statements of member securities companies of Ho Chi Minh Stock Exchange)

It can be seen from the graph that the receivables to total asset ratio has a downward trend over the period shown and is at a very low level in the last 3 years (over 3%). The rate in previous years were also below 50%. Thus, it can be inferred that the ratio of receivables to total assets averaged for 71 member securities companies of Ho Chi Minh Stock Exchange in the period 2013-2019 is safe. That has proven that the securities companies have more closely managed the receivables in total assets to limit the risks associated with doubtful debts, or irrecoverable debts. However, some of them underwent a quite high rate (over 75%), which was seen by SJCS Securities Company in 2013 at 85.29% and SBSI and KIS in 2015 at over 79%. In 2014, 2016, 2017 and 2018 there was no securities company with this ratio above 75%. In 2019, only VNCS had this ratio of 84%. Details are shown in Table 2 below:

TABLE 2. SECURITIES COMPANIES WITH A RATIO OF RECEIVABLES TO TOTAL ASSETS OVER 75% UNIT: %

No.	2013		2015		2019	
	SC	Receivables / total assets	SC	Receivables / total assets	SC	Receivables / total assets
1	SJCS	85.29	SBSI	79.76	VNCS	84.01
2			KIS	79.52		

(Source: compiled from financial statements of member securities companies of Ho Chi Minh Stock Exchange)

Overall, the system of securities companies in Vietnam has a secure ratio of receivables to total assets. In particular, there are still one or two companies that do not guarantee this ratio. This is also a good sign in ensuring financial safety of Vietnamese securities companies.

C. Earnings Assessment (E)

With the purpose of evaluating the earnings power of securities companies, the author uses the ratio of return on equity (ROE) as a representative. ROE indicates the return on equity over a certain period of time, which is a vital criterion in persuading investors to become the shareholders. Normally, a high ROE shows that the return on equity of the securities company is high, the equity is used effectively and then the securities company can easily increase the size of equity to expand the business, contributing to financial safety. In general, in Vietnam market conditions, when ROE reaches 0% or more, the securities company's finances are considered secure. According to the evaluation criteria of securities companies in Decision No. 617/QD/UBCK dated

October 9, 2013, those with ROE at 5% or more are considered to have good earnings power (reaching over 70 points), from 0% to 5% is normal (reaching 50 points) and below 0% is not good. From the statistics, ROE of Vietnamese securities company system is shown as below:

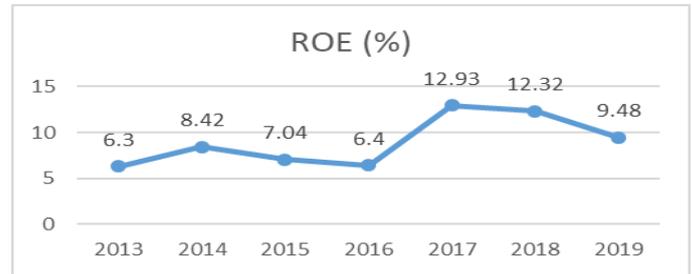


Figure 3. Return on equity of securities companies (Source: compiled from financial statements of the member securities companies of Ho Chi Minh Stock Exchange)

For the whole period of 2013-2019, their average ROE has reached over 5%, of which the highest was in 2017 and ROE was over 12% in 2018. 2017 was the year when the Vietnamese stock market developed strongly because of favorable factors from the macro-economic environment and the introduction of the derivatives stock market also helped the underlying stock market to operate more vibrantly and positively. That was also the reason for securities companies to increase their earnings power and reach a high level in 2017 and continue in 2018. Typically, the top 10 securities companies with ROE over 5% from 2013 to 2019 can be mentioned as in Table 3 below:

TABLE 3. ROE OF 10 SECURITIES COMPANIES AT OVER 5% IN THE WHOLE PERIOD OF 2013-2019

No.	SC	2013	2014	2015	2016	2017	2018	2019
1	FPTS	7.87%	11.17%	10.14%	10.57%	12.00%	27.78%	10.49%
2	HSC	12.80%	16.33%	9.20%	13.04%	21.38%	23.09%	32.03%
3	IBSC	14.70%	22.71%	12.72%	6.87%	9.09%	21.35%	9.22%
4	SSI	8.00%	13.62%	13.78%	12.68%	14.73%	14.66%	9.8%
5	TCBS	21.97%	17.00%	30.30%	27.74%	32.39%	42.91%	37.62%
6	VCBS	7.85%	9.80%	6.84%	5.95%	12.60%	12.76%	10.25%
7	VCSC	13.73%	22.79%	29.36%	31.04%	30.50%	24.69%	18.02%
8	VNDS	10.82%	10.38%	9.64%	9.59%	21.19%	13.59%	12.27%
9	TVSC	15.55%	16.01%	16.43%	11.30%	24.82%	17.37%	11.89%
10	CTS	7.29%	7.28%	8.00%	8.06%	9.81%	12.10%	8.74%

(Source: compiled from financial statements of the member securities companies of Ho Chi Minh Stock Exchange)

These companies always reach an above 5% ROE though the years in the period shown. This proves that the return on equity of these securities companies is very stable and high. Technological and Commercial Securities (TCBS) is on top with ROE of 42.91% and 37.62% in 2018 and 2019 respectively, followed by Viet Capital Securities Company (VCSC) with ROE of 31.04% in 2016 and 30.5% in 2017. Therein, there was a significant increase to 104% in the brokerage revenue in 2018. FPTS Securities also achieved a fairly high ROE in 2018 at 27.78%.

According to international standards, ROE of 15% or more is most likely considered safe. Compared to this figure, the ROE of the whole industry has not been achieved. There are only a few securities firms in the market that have

seen this high safe ratio. In 2013, the whole market had only 3 securities companies with ROE >15%, in 2014 there was 8. A slight decrease from 5 to 4 in the number of companies achieving ROE ratio > 15% was recorded in the period from 2015 to 2016. Between 2017 and 2019, the figures were 6, 4 and 2 respectively. Several securities companies always maintain a high ROE ratio such as VCSC, TCBS, TVSC... These are large companies with good risk management ability followed by high profitability.

In contrast, there are still many securities companies with low or negative ROE in consecutive years.

TABLE 4. ROE OF SOME SECURITIES COMPANIES HAS BEEN NEGATIVE FOR MANY YEARS
UNIT: %

No.	SC	2013	2014	2015	2016	2017	2018	2019
1	APSC	-7.43	2.04	-7.81	-10.75	-1.27	-13.49	-10.76
2	JSI	2.53	-7.51	-9.27	-13.37	-1.41	0.69	5.84
3	GMC	-8.84	-28.53	7.62	-2.64	-3.46	0.65	0.20
4	VGW	-35.15	-32.08	8.15	20.78	-5.11	-38.58	-19.35
5	VNCS	-9.28	3.16	-0.81	-18.05	-19.45	5.23	0.21
6	VSC	1.14	0.67	-2.47	-3.86	-2.16	3.24	-8.08
7	VTSS	-3.80	-6.51	-7.56	-9.95	0.12	0.04	0.05
8	DAS	-5.95	-49.23	-33.70	5.24	-2.45	-0.74	0.09
9	SBBS	-1.51	-1.20	-2.83	-2.42	-1.52	-122.14	-10.85
10	SSV	-0.97	-3.84	-5.94	-10.37	-3.19	6.46	6.79

(Source: compiled from financial statements of the member securities companies of Ho Chi Minh Stock Exchange)

From the statistics, it can be inferred that there are many securities companies with ROE < 0 for many years (4 years or more). The saddest thing is that SBBS (Saigonbank-Berjaya Securities Joint Stock Company) has ROE < 0 in the whole period from 2013 to 2019, even ROE in 2018 is -122.14%, an alarming number in terms of earnings power of this company. This is owing to the fact that the company's management costs are quite large (accounting for nearly half of the total expenses), even in 2018, this expense spiked more than 16 times compared to 2017. Meanwhile, the company's operating revenue is not sufficient to cover costs, typically the continuous losses from its brokerage activities have been recorded over the years, of which the revenue is always lower than brokerage operating expenses. Besides, there are also securities companies with ROE < 0 for 5 consecutive years such as APSC (ALPHA Securities Joint Stock Company) and SSV (Shinhan Securities Vietnam Co., LTD). However, SSV has made a highly positive change in enhancing ROE in 2018 and it occupied over 6% in the next year. It is for the reason that SSV's NPAT increased from -14.7 billion to 52.5 billion in 2018 and 58.9 billion in 2019. Thus, 2018's NPAT increased by 457% compared to 2017, which is due to the increase in net revenue from 8.8 billion in 2017 to 88.8 billion in 2018 (by 909%). In which, the company's revenue mainly comes from the profit from financial assets at fair value through profit or loss (FVTPL) including dividends, profit arising from financial assets at FVTPL and profit from held-to-maturity securities (HTM); additionally, consulting activities also brought fairly high revenue for the company over the past 2 years, which was free or very low in previous years. It is concluded that the effort to increase net revenue has greatly improved and enhanced the business efficiency of the company.

D. Assess Liquidity Quality (L)

The criterion that represents the liquidity of securities companies selected is the short-term solvency ratio (the ratio of short-term assets to short-term liabilities). The short-term solvency ratios of Vietnamese securities firms are as follows:

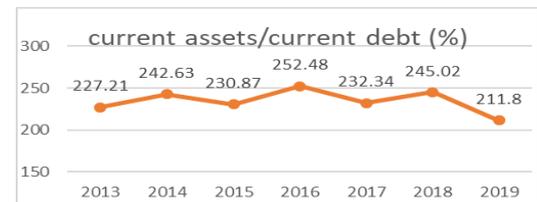


Figure 4. Current assets to current debt ratio of securities companies
(Source: compiled from financial statements of the member securities companies of Ho Chi Minh Stock Exchange)

From the statistics, the short-term solvency ratio of the Vietnamese securities company system is always much higher than the safety threshold (120%). However, this ratio has changed over the years and decreased the most in 2019. Therefore, in the coming time, securities companies need to regularly manage current assets as well as current liabilities to avoid a decline below the safe threshold.

Most securities companies in the market meet the requirements of this indicator, only Phuong Dong Securities Joint Stock Company (ORS) has not achieved the safety threshold until 2016 (116.9%). This is also a securities company that has suffered losses for 3 consecutive years and is facing a high risk of losing financial safety.

According to international practice, the ratio of short-term assets to short-term liabilities must reach 200% or more to be considered safe. Accordingly, on average, only 8 securities companies did not achieve the safety level in 2016 but still did it in accordance with Vietnam's regulations.

Limitations that need to be overcome in ensuring financial safety of Vietnamese securities companies

In addition to the achieved results, in recent years, Vietnamese securities companies have still dealt with some shortcomings and limitations in the financial safety situation and supervision, specifically:

First, there is a clear difference between securities companies in terms of financial safety.

Considering the whole system of Vietnamese securities companies, most of the average finance criteria meet the required threshold. However, in the market, the number of securities companies currently operating normally and not meeting the safety thresholds of the criteria still accounts for a high proportion. It lacks consistent development in the system of the securities firms in the market, in other words, there is a clear differentiation among them. Most large securities companies are able to ensure highly secure finance, on the contrary, small firms always fall into the versa situation. Therefore, challenges and competitive pressure are increasingly weighing on small and medium sized securities companies. As a consequence, a weak and inefficient business will be eliminated. In the market economy, under the pressure of competition, it is inevitable that a weak and inefficient business will be removed. However, if that process happens suddenly on a large scale, it will cause highly seri-

ous consequences, especially in the financial services sector in general and the securities sector in particular.

Second, some Vietnamese securities businesses have not met capital adequacy and asset quality.

The available capital ratio of some securities companies is lower than 180%, not meeting the requirements of sufficient capital. The low ratio illustrates that the amount of available capital of the securities company is not enough to cover the total risk value including market risk, liquidity risk and operational risk. Thus, if these businesses do not propose any solutions to increase the rate of available capital and secure finance, they will be at risk.

Moreover, the receivable to total asset ratio of some securities firms is still high (over 75%). It shows that the risk will be very high if it takes long to recover the receivables or they are converted into doubtful or irrecoverable debts. If these securities companies continue to finance customers at a high rate, there is a potential risk of losing finance safety.

Third, the earnings power of Vietnamese securities companies is still low.

The profitability of securities companies in the market has been improved significantly, but in general, it is still low and fluctuates quite erratically, depending mainly on the volatility of the stock market. Many businesses still suffer from long-term losses, deeply ingraining in the charter capital, leading to a decrease in equity. In comparison with other financial services such as banking, insurance, etc., securities trading is still a less efficient business with low ROE.

Fourth, there are still some securities companies that have not yet ensured liquidity quality.

A majority of securities companies ensure short-term debt solvency in the period from 2013 to 2019, which is a relatively positive point for the market. However, there are still a few securities firms with low solvency, which can pose a risk to these businesses when brokerage activities take up a large proportion, depending on customer deposits as well as much debt use.

VI. RECOMMENDATIONS

A. For securities companies

First: Improving the financial capacity of securities firms

Improving financial capacity aims to help securities companies have strong financial potential, capital structure and asset structure suitable to the company's business operations. It also aims to maintain capital adequacy for securities companies according to the CAMEL safety framework. As reviewed above, some have not yet ensured the required ratio of available capital, which is usually calculated by subtracting illiquid asset value from the equity. Therefore, to increase the ratio of available capital, securities companies need to increase equity and reduce the value of illiquid assets, such as receivables (because some securities companies still have a fairly high ratio of receivables to total assets). Securities companies can increase equity by traditional methods such as issuing more shares; or increasing retained earnings for reinvestment, reducing annual dividends to shareholders; or increasing capital through business mergers and acquisitions. In order to reduce receivables, securities

companies need to take drastic measures to collect receivables, especially bad debts. Furthermore, it is necessary to classify receivables into different groups: recoverable debts, doubtful debts and irrecoverable debts. Then, it is vital to give solutions to manage and monitor each debt group so that the firms quickly recover capital, avoid the risk of capital being appropriated for too long or the risk of losing capital due to non-recovery.

Second: Improving corporate governance and administration capacity

The capacity of corporate governance and management is a key factor in business performance, improving the competitiveness of securities companies in the market, thereby contributing to ensuring financial safety for securities companies. In essence, corporate governance and administration activities are aimed at achieving several goals such as increasing the company's value, monitoring and protecting the interests of the company's owners, protecting the interests of those related to the company as employees, partners, customers and creditors. In order to improve their corporate governance capacity, securities companies need to build their own appropriate governance model. The reality shows that, there is no universal optimal governance model for all companies in each country, but each securities company in each country needs research and adjustment to build its own model suitable to the socio-economic development of the country and to the specific characteristics of the securities business. To do so, each company itself needs to plan corporate governance policies according to best practices, develop a training strategy and attract high-quality human resources, and qualified business administrators to participate in the management and administration of the company. The strategy for training and attracting labor force should be developed to ensure a professional, stable and friendly working environment; professional ethical principles are established and promoted; having an appropriate income mechanism on the principle of being consistent with the quality and efficiency of completed work; there is an appropriate mechanism to expand income from the company's high business performance and the efficiency of completing the assigned work higher than as expected, such as the mechanism of selling shares at a preferential price for employees or bonus in cash, bonus in shares; ...

Third: Strengthening risk management at securities companies

The world financial crisis and its impact on Vietnam's stock market have left many valuable lessons for Vietnamese securities companies about the importance of risk management. Some securities companies got caught up in proprietary trading and securities lending, then suffering huge losses from investment and doubtful receivables that were no longer recoverable, typically in the case of Sacombank Securities Joint Stock Company (SBS) and Thang Long Securities Joint Stock Company (now MBS). Therefore, it is necessary for securities companies to strengthen risk management in order to detect and limit risks that have not yet occurred, and at the same time to minimize damage caused by risks, thereby contributing to ensuring financial safety. In order for risk management to be carried out effectively, securities companies must meet the following condi-

tions: Firstly, build a risk management apparatus; Second, establish and issue a risk policy; Third, develop and implement internal processes related to risk management activities that meet the following principles: Identify, measure, monitor, report and treat material risks in an appropriate manner; Ensure independent, objective, honest and consistent operation; Separate the risk management department and staff from the operational department, the person in charge of the risk management department is not concurrently with the operational department and vice versa.

Fourth, improving the earnings power of securities companies

According to the analysis above, the profitability of some securities companies is still low, even the loss of business activities lasts for many years, leading to the inability to secure finance because the capital source is gradually eroded. Therefore, securities companies need to propose solutions to improve profitability through good management of the company's revenues and expenses. Securities companies need to develop their strong activities to expand market share and increase revenue. For large securities firms with strong financial potential and ability to meet the regulations on legal capital in performing business operations, it is advisable to diversify business activities, including brokerage and investment, consulting, self-trading and securities underwriting. For securities companies with small capital scale, which do not meet the requirements for capital allocated to carry out guarantee activities (minimum charter capital is 165 billion VND), they can find their own direction by specializing in brokerage and consulting services to increase revenue. In addition, in order to best serve the customers' increasing demands, securities companies must constantly improve service quality, modern technology systems, help investors make quick, convenient and safe transactions. The staff of the Securities Company must also be highly qualified and professional, having sufficient practice certificates as prescribed and good professional ethics in order to meet the customers' needs. In addition to finding solutions to increase revenue, securities companies must also manage expenses well, including costs for securities company operations and corporate management costs. Many companies have high turnover but poor cost management leading to low or even no profit. Therefore, it is important to review expenses and have specific solutions to use them economically and effectively.

B. For state management agencies

Firstly, constantly promoting the restructuring of securities companies

It is the fact that the number of Vietnamese securities companies is too high compared to the size of the Vietnamese stock market, which results in fierce competition among securities companies; it is increasingly difficult for small-sized securities companies to exist with a potential risk of losing financial safety, thereby affecting system safety. Therefore, the State Securities Commission still needs to continuously promote the restructuring of Vietnam's securities companies in the direction of decreasing in quantity but increasing in quality, ensuring safety in the operation of securities companies and the entire stock market.

Second, strengthening financial safety supervision for securities companies

In order for the supervision of financial safety of Vietnamese securities companies to be effective, it is vital to enhance the supervisory capacity of the management agencies so that they have ability to supervise financial safety of securities companies, and simultaneously, it is necessary to constantly improve the set of criteria for assessing financial safety of securities companies in Vietnam and study and apply the system of standards for assessing financial safety of securities companies in accordance with international practices.

Third, assisting in improving the personnel's quality and professional ethics in the securities industry

Currently, securities companies are experiencing the shortage of high-quality personnel in business management and risk management, so it is necessary for specialized management agencies to contribute to training, building and completing training programs to improve corporate governance capacity and risk management capacity for securities companies.

Fourth, constantly improving the principles and legal framework for the stock market

It is essential to regularly improve the principles and legal framework to promote the stock market to develop extensively, in the direction of transparency and synchronization, ensuring the rights and interests of market participants and in accordance with the international standards; completing the principles and legal framework on the stock market in order to fully institutionalize the views and policies of the Party and the State, simultaneously in accordance with the socio-economic development conditions of the country, selectively absorbing international experiences to form a synchronous and unified stock market system in the overall financial market.

REFERENCES

- [1] Haseeb Zaman Babar và Gul Zeb, "Camels Rating System for Banking industry in Pakistan," 2011.
- [2] Hoang Thi Bich Ha, "Financial Safety of Vietnamese securities companies," doctoral thesis in economics of Academy of Finance, 2018.
- [3] IOSCO, "Capital Adequacy Standards for securities firms," 1989.
- [4] IOSCO, "Comparison of Equity Position Risk And Scope For Harmonization," 1990.
- [5] Ministry of Finance, "Circular stipulating financial safety norms and handling measures for securities trading organizations that fail to meet the financial safety criteria," *Circular No. 91/2020/TT-BTC* dated 13/11/2020.
- [6] Misha Aswini Kumar, G.SriHasha, Shivi Anand và Neil Rajesh Dhuva, "Analyzing Soundness in Indian Banking: A Camel Approach," 2012.
- [7] Nguyen Thanh Phuong, "Financial Safety of Vietnamese securities companies." *Scientific research project at the Academy level, Banking Academy*, 2016.
- [8] Philip L.Brock, "Financial Safety Nets and Incentive Structures in Latin America," 1999.
- [9] State Securities Commission, "Decision on promulgating the regulation guiding the classification of securities companies", *Decision No. 617/QĐ-UBCK* dated October 9, 2013.
- [10] Tran Thi Xuan Anh, "Application of the CAMEL system to evaluate the performance of Vietnamese securities companies," *Research project, Banking Academy*, 2014.
- [11] Truong Van Gioi – Le Khac Kieu Luc, "Sino-Vietnamese dictionary," *Social Science Publisher*, 2010.
- [12] Wirnkar và Tanko, "Camels and Banks Performance Evaluation: The way Forward," 2008.

Appendix: Criteria, scale and weight of key factors in ranking

No.	Criteria	Value	Value	Score	Weight
Capital Adequacy					
1	C ₁ – Equity/Total Assets	From 0%	To less than 51 %	20	10%
		From 51%	To less than 75%	80	
		From 75% or more		100	
2	C ₂ - Equity/Legal Capital		Less than 60%	0	10%
		From 60%	To less than 100%	30	
		From 100%	To less than 150%	60	
		From 150%	To less than 200%	80	
		From 200% or more		100	
3	C ₃ – Available Capital Ratio		Less than 120%	0	10%
		From 120%	To less than 150%	20	
		From 150%	To less than 180%	40	
		From 180%	To less than 300%	80	
		From 300% or more		100	
Asset quality					
4	A ₁ – Ratio of risk-adjusted assets/total assets (excluding fixed assets)		Less than 50%	0	5%
		From 50%	To less than 65%	20	
		From 65%	To less than 80%	50	
		From 80%	To 90%	80	
		From 90% or more		100	
5	A ₂ – Ratio of Provision/(short-term investments + long-term investments + receivables)	From 10% or more		0	10%
		From 8%	To less than 10%	20	
		From 5%	To less than 8%	50	
		Above 0%	To less than 5%	80	
		0		100	
6	A ₃ -Receivables/Total assets ratio	From 90% or more		0	10%
		From 75%	to 90%	20	
		From 50%	to 75%	50	
		From 25%	to 50%	80	
			Less than 25%	100	
Earnings power					
7	E ₁ - Profit after tax/Total revenue		Nhỏ hơn -10%	0	10%
		From -10%	To less than 0%	20	
		From 0%	To less than 5%	50	
		From 5%	To less than 20%	70	
		From 20% or more		100	
8	E ₂ - Profit after tax/Average equity		Less than -5%	0	10%
		From -5%	To less than 0%	20	
		From 0%	To less than 5%	50	
		From 5%	To less than 25%	70	
		From 25% or more		100	
Liquidity					
9	L ₁ - Current Assets/Current Liabilities		To less than 100%	0	15%
		From 100%	To less than 120%	40	
		From 120%	To less than 150%	80	
		From 150% or more		100	
10	L ₂ - Ratio of cash and cash equivalents/Current debt		To less than 10%	0	10%

(Excerpt from Appendix 01 issued together with Decision No. 617/QĐ/UBCK dated October 9, 2013)

The Influence of Work-from-home on job performance during COVID-19 pandemic: Empirical evidence Hanoi, Vietnam

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Abstract—Many enterprises have been forced to change from office work to work-from-home (WFH) so as to protect their staff from COVID-19 pandemic. This study examines the impacts of the work-from-home (WFH) on employee's job performance (JP) as well as the mediate influence of three factors: Work environment (WE), Job satisfaction (JS) and Work-family conflict (WFC). A qualitative research methodology is adopted by interviewing 10 employees who have been working from home due to the impact of the COVID-19 epidemic in 8 different companies in Hanoi, Vietnam to understand their experiences of how WFH has impacted their job performance and learning outcomes. The result is that WFH has a negative and direct influence on job performance. Work-from-home has both positive and negative impacts on the work environment of employees. Although WFH employees are satisfied with some aspects, they seem to have both positive and negative effects on their job performance. Moreover, strain-based conflict primarily doesn't influence job performance when staff work at home. The study examines impacts on employee performance working from home as a result of the epidemic. There are some recommendations and notes proposed for improving the quality of WFH in the future.

Index Terms—Work - from - home, job performance, work environment, job satisfaction, work - family conflict.

I. INTRODUCTION

SARS-CoV-2 is known as the seventh human coronavirus causing a global pandemic, which was first discovered in Wuhan, China in December 2019. Ref. [1] has updated that as of 5 November 2021, COVID-19 has infected 248.467.363 people and caused 5.027.183 deaths in the world. On 4 November 2021, a total of 7.027.377.238 vaccine doses were administered. The current outbreak has led to a great economic crisis across the whole continent and has readjusted how and where people work. Large numbers of cities were in lockdown, many businesses had been forced to close temporarily and employees had to stay at home due to social distancing policy. Facing the fear of infection and social distancing restriction, a rise in work - from - home (WFH) is inevitable.

From a business context, organizations had to identify the new procedure to assure employees' productivity while working remotely. Since the epidemic had spread, numbers

of working from home research papers were taken by Ref. [2]; [3]; [4]; [5]. In Vietnam, the productivity of workers working from home has been a currently rising concern during the outbreak. However, a few authors did some research on this topic.

The purpose of the article is to provide insights into how workers feel about their performance when working from home during the COVID-19 period. By using a qualitative approach, this article also provides the mediating factors in the relationship between work from home (WFH) and job performance (JP): work environment (WE), job satisfaction (JS), and work-family conflict (WFC). Then, solutions to improve individuals' performance would be recommended at last.

II. LITERATURE REVIEW

A. Work-from-home

From "Working from home - What is the Effect on Employees' Effort?", Ref. [6] collected that WFH is classified into two main aspects. Firstly, employees work outside the casual office. Secondly, there is a connection between home and workplace. Colleagues interchange information and communicate with each other by using information and communications technology ([7]; [8]). Today, "work - from - home" became more common in COVID 19 period. According to Ref. [9], WFH could be generally defined as workers working outside the office. It includes 4 basic characteristics: (1) an employee of a company or a staff of an organization; (2) engage in specific tasks with a company or an organization; (3) perform their work outside the physical workplace and (4) telecommunication with the boss.

In this article, the authors use the term of WFH from previous studies and clarify about the work location during social distancing restriction: "WFH happens when an employee of a company or a staff of an organization performs tasks at their home; using telecommunication to connect and exchange information with their employers".

In the period from 1980 to 2010, work from home started to emerge and become popular in developed

countries such as America, Germany, England, Australia, ... The number of people working remotely has grown significantly since COVID-19 pandemic spread at the beginning of 2020 ([10]; [11]; [12]). According to the ILO report, more than four out of five people (81 per cent) in the global workforce of 3.3 billion are currently affected by full or partial workplace closures; therefore, working from home is a temporary safety solution in the epidemic situation, contributing to controlling the infection rate as well as maintaining work. Many forecasts also showed that this WFH still increased even after the pandemic ([13]; [14]). The effects of working – from - home are also a topic of interest and concern for many researchers, the positive effects of WFH research and negative effects in the study of Ref. [15]; [16]; [17]; [18]...

B. Job Performance

Ref. [19] defined job performance as the net effect of one's efforts simplified by these abilities and characteristics and by his perception of the role. This concept emphasizes that performance in a given scenario is the consequence of interrelationships between effort, talents, and qualities, as well as role perceptions. Ref. [20] argued that results must be explained from two perspectives: behavior and outcomes. From a behavioral point of view, job performance refers to what employees do or how they behave during work. From the outcome point of view, JP refers to the outcome of the employee's behavior. The definition used by the authors in this study is based on the similar research of Ref. [21]: Job performance is the employee's ability to complete works and tasks to achieve organization's goals within a certain period.

After investigating related studies on job performance, the authors chose six criteria based on Ref. [22], with a slight modification to fit the subject and scope of this article: (1) Quantity of work; (2) Quality of work; (3) Punctuality; (4) Attitude; (5) Reliability; and (6) Cooperation.

C. The impact of Work-from-home on Job Performance

According to Ref. [2], WFH assists employees in increasing their enjoyment of work, job satisfaction, and motivation. Job satisfaction is one of the most important aspects of an employee's ability to execute given responsibilities successfully. Furthermore, as long as there is an Internet connection, employees may readily access work from wherever. Whereas the Covid-19 epidemic has not been completely controlled WFH would limit their mobility to lower the chance of infection. Ref. [4] studied the effectiveness of working from home in Canada and showed that 90 percent of the new teleworkers reported being at least as productive, i.e., doing at least as much work per hour at home as they did previously at their customary workplace. More than half (58%) reported doing approximately the same amount of work per hour, while about 32% reported doing more work per hour.

However, it appears that WFH would not always be effective. Ref. [5] showed that WFH adversely affected employee performance. Ref. [3] provided pros and cons of WFH. On the positive side, WFH assists instructors in changing their working environment, particularly when they have become bored while working in the office, and work productivity has grown dramatically., perform the prescribed duties more rapidly. On the negative side, the authors demonstrate that WFH affects work productivity; for example, teachers will easily lose motivation while working because, in the end, the working environment at home will not be quite similar to the work environment at the office; distracted by social media or other forms of entertainment.

D. The impact of Work-from-home on Work Environment

Ref. [23] argued that working from home creates a flexible environment as freely scheduled arrangement and customization on work environment. Working from home, in particular, gives workers greater location flexibility. Another consideration is schedule flexibility. Work scheduling, flexible time, flexible work schedules, and schedule management are all synonyms for schedule flexibility. Meta-analytic studies have demonstrated that schedule flexibility is associated with many positive outcomes such as employee productivity, job satisfaction, and low absenteeism (Ref. [24]).

It suggests that working from home makes people feel more comfortable with their new work environment. They can be with their families while working and save money on commuting. The chance to spend time with their families is priceless, especially for those who work in the capital city. It gives the impression that they operate in a tailored work environment that is adaptable to their own personal preferences and lifestyle.

E. The impact of Work-from-home on Job Satisfaction

Many previous studies have concluded that working remotely has a positive effect, particularly, increases job satisfaction ([25]; [26]; [7]). Workers feel less pressured and have better external interaction control because there are no unexpected interruptions from managers and colleagues (Ref. [25]). Therefore, turnover rate decreases, and employees also feel more satisfied with their daily work. Although people working from home can use technologies such as video call and online meeting software, many believe that such devices have social and technological limitations (Ref. [27]) and “no technology can duplicate the experience of working onsite together” (Ref. [28]). In other words, JS may drop if people feel isolated from society and peers ([29]; [30]).

F. The impact of Work-from-home on Work - family Conflict

Many studies concluded that WFH helps people to reduce work - family conflict due to telecommunication

bringing flexible time to manage work or family tasks (Ref. [31]). Ref. [32] applies role conflict theory, work stress models, and theories to directly connect work, family, and conflict. The study has concluded that three criteria Time-based conflict (T-WFC), Strain-based conflict (S-WFC) and Behavior-based conflict (B-WFC) with 4 out of 6 considered aspects of people working from home are lower than those working in the office. Although T-WFC and S-WFC reduced when they worked at home, Ref. [32] didn't find the impact of Work-from-home on B-WFC.

Ref. [33] found that most of the studies on the relationship between work-from-home and family conflict use an interpersonal approach but more recent individual studies found that when working remotely on a daily basis, individuals experience less conflict between work and family than working in the office. This is also supported by Ref. [34]. The results of Ref. [35] also showed that daily work from home does not have a positive or negative impact on WFC while working overtime at home has a positive effect on WFC.

On the other side, many previous research papers have proven that working from home increases work-family conflict. Studies showed that teleworkers work longer hours and have more time pressure ([36]; [37]). Besides, Ref. [38] suggested that higher self-control may cause employees working from home to work overtime, crowding out housework. Another reason pointed out by Ref. [39] is that the use of mobile devices also reduces the separation between office work and personal work, leading to WFC.

G. *The impact of Work Environment on Job Performance*

Ref. [40] cited in his research that physical layout of workplace such as furniture, noise, light, temperature, comfort, security, air quality, casual and formal meeting rooms, available quiet spaces, privacy, working areas, etc.... impact on performance of employees. The reason is that a good comfortable working environment would improve performance and in contrast a bad working environment would decrease individuals' performance. Ref. [41] conducted research on the impact of the actual work environment on performance of officers: a situation of Putrajaya Malaysia Ministry of Youth and Sports. The result showed that physical environment (comfort and temperature) influences substantially on employee performance. This can be measured based on the percentage of working capacity per degrees Celsius in actual working environments in organizations. Ref. [42] showed fairly consistent results as they found an average relationship of a 2% reduction in job performance per degree Celsius when the temperature was above 25 degrees Celsius.

H. *The impact of Job Satisfaction on Job Performance*

Job satisfaction has a positive relationship with employees' performance because if employees are more satisfied and engaged in work, the results will automatically

increase (Ref. [43]). Ref. [44] also showed that JS and JP are directly related, that is, if the satisfaction level is high, the job performance will also be good and vice versa.

However, research results of Ref. [45] in Parador hotels and resorts found that job satisfaction does not have an important role but only positive effect on the employee's work results, which means employee performance is not determined by job satisfaction. JS is not a necessary factor to promote JP because they believe that JS is not yet optimal. Ref. [46] in the study on "Evaluating the influence of working from home on job performance" in Indonesia also found that job satisfaction did not have a supportive relationship or not. important to job results.

In Vietnam, there were 547 employees in Vietnamese enterprises (Ref. [47]) and 325 employees in Ho Chi Minh City (Ref. [21]) working from home. The research was conducted in the context of the COVID-19 epidemic and both came to the conclusion about the positive and important influence of job satisfaction on employee's job results.

I. *The impact of Work - family Conflict on Job Performance*

According to Ref. [48], the association between work family conflict and performance is significant but negative. The study showed that the lack of support for the WFC appears to pose a major efficiency risk. This suggests that work-family conflict has an important link with success (Ref. [49]). Ref. [50] showed that work-family conflict has a great and negative impact on employee work performance, especially in the context of the ongoing COVID19 pandemic in this country.

In addition to the previous finding, several research studies have shown no association between WFC and employee performance. Ref. [51] discovered a substantial relationship between work-family conflict and job performance, and the study of Ref. [52] followed suit. the same, comparable.

Although most research has determined that this association is negative and substantial, Ref. [53] contends that conflict can have both good and negative consequences. Ref. [54] holds a similar viewpoint, stating that conflict may have a beneficial or detrimental influence on an individual's life. Conflict's influence may be defined as an inverted U-curve, with low-intensity conflict having a beneficial impact on work performance. According to Ref. [54], high-intensity conflict creates stress and lowers human efficiency or work performance.

III. METHODS

A. *Data Collection*

To check the appropriateness of the factors and control variables, the authors choose to use an in-depth interview qualitative method. The authors inherited the factors and

observations from previous studies, partly from studies conducted at foreign institutions and only a few domestic studies. Therefore, the author's team believes that conducting in-depth interviews with employees at enterprises in Vietnam is necessary. Employees, who work from home in Vietnam, experienced and have been experiencing work-from-home, have a thorough understanding of work and family life so that they will have reasonable statements about the suitability of variables. From the data collected, the team will draw factors that are suitable for the conditions in Vietnam. The authors conducted in-depth interviews with 10 employees who have been working from home due to the impact of the COVID-19 epidemic in 8 different companies in Hanoi. TABLE 1 is the personal information of those 10 employees.

B. Data Analysis

The authors proposed in-depth open-ended questions based on statements of different previous quantitative research. In detail, questions about work-from-home, job performance and work environment were referred from Ref. [2]. We majorly measured five aspects of job satisfaction including work, supervision, wage, promotion and co-worker, which were based on Ref. [55]. According to Ref. [32], questions about WFC will mention Time-based conflict (T-WFC), Strain-based conflict (S-WFC) and Behavior-based conflict (B-WFC).

TABLE 1
PROFILE OF RESPONDENTS

Label	Gender	Age	Status	Income per month (million VND)	Position	Employment
S1	Female	26	Single	> 15	Sale	Full-time
S2	Female	20	Single	< 5	Human Resource	Part-time
S3	Female	28	Married	5 - 10	Sale	Full-time
S4	Male	22	Single	< 5	Sale	Part-time
S5	Male	20	Single	5 - 10	Marketing	Part-time
S6	Female	30	Married	> 15	Marketing	Full-time
S7	Female	24	Single	5 - 10	Accountant	Full-time
S8	Male	35	Married	10 - 15	IT	Full-time
S9	Female	19	Single	< 5	Human Resource	Part-time

S10	Male	20	Single	< 5	Customer Care	Part-time
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In general, the interview questions were designed by the author's team (TABLE 2), with the interview content focusing on issues:

- Work-from-home
- Job performance of employees in some companies.
- The influence of Work environment on job performance when employees work from home due to COVID-19 pandemic.
- The influence of Job satisfaction on job performance when employees work from home due to COVID-19 pandemic.
- The influence of Work - family Conflict on job performance when employees work from home due to COVID-19 pandemic.

TABLE 2
IN-DEPTH OPEN-ENDED QUESTION

Label	Question
Q1	Do you feel the quantity and quality of work when working from home is different from working in the office?
Q2	How do you feel your home workspace affects your work results?
Q3	Is there any problem related to the work environment that distracts you when you work at home?
Q4	What role do you feel technology plays in your job success?
Q5	Do you feel energetic every day working-from-home?
Q6	Is the supervision, wages and promotion opportunities when working-from-home different from office work? Are you satisfied with that supervision, wages and promotion?
Q7	Do you think that interaction with colleagues has a significant influence on job performance while working from home?
Q8	If you can choose to work from home after the pandemic is over, would you agree to choose it? Why?
Q9	Are there any factors at work that you feel interfere with family life or vice versa?
Q10	Do you feel that your time spent with work and family is better or worse when working from home than working in the office?
Q11	When you experience strain at work while working from home, do you feel your productivity decreases and vice versa?

Q12	Have you ever applied your problem-solving behaviors you use in your job to solve family problems or vice versa? If yes, did you feel effective with that approach?
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IV. RESULTS

A. Theme 1: Work-from-home impacts Job Performance

Most of participants agreed that Work-from-home negatively impacts on their job performance:

My performance when working at home is different from working at the office. Sometimes, when working from home, I delay the tasks more because of the manager's weak supervision. (S1)

Actually, it's much more effective for job performance if I can work offline since my kind of work is specific. (S4)

When I am at the office, I work more productively. (S3)

However, the remains didn't agree with that:

I feel no change in quantity and quality of tasks between working-from-home and working at the office. (S5)

I feel I can complete the job as well as what my manager expected during the time working-from-home. I still finish all the jobs my boss gave promptly and faultlessly. (S7)

B. Theme 2: Work-from-home, Work Environment and Job Performance

Most of respondents gave statements that they like their workspace at home:

Work environment has a significant influence on my attention to work and my ability of creation. (S2)

I feel convenient and familiar with working at my own house. (S3)

I can finish my work faster when working from home because I want to do other stuff such as doing chores or my hobby. (S10)

But they reported that work environment at home negatively influence their job performance, especially the sound:

The home space is comfortable. However, it isn't a true work environment. The space is much narrower than the office and I have to lie on my bed to work. That is difficult for me to keep focusing on work for hours. (S1)

There are a lot of factors which can distract my concentration when working at home like TV sounds, chores, relatives,pets,... (S4)

...Children are the biggest distraction in my work environment when I work at home. (S6)

The problem of sound around my house strongly affects my job performance. For example, the soundproof of my house is not good so I can hear clearly honking sounds on the street, the talking sound of other people in my family as well as my neighbors,... That annoys me while working at home. (S9)

Some remarkable statements about technology given:

...Technology plays a key role in supporting me completing tasks exactly and quickly when I work at home. (S8)

Thanks to the Internet, I can connect and communicate with my colleagues, who give me a lot of motivation while I feel tired of working alone in my house. (S7)

...However, I am confused by using technology not only for working purposes but also solving personal problems or simply surfing social networks such as Facebook, Instagram,...because there is no one controlling me at home as strictly as at offices. (S8)

C. Theme 3: Work-from-home, Job Satisfaction and Job Performance

Some of the participants gave opinion about work/tasks:

Working- from-home: My boss gives me less quantity of work than working offline. I'm satisfied with that.(S9)

I receive less work at home from my manager because some tasks in my job can't be finished without meeting face to face. (S4)

I am satisfied with the quantity and quality of work when working-from-home and it's the same as when I go to work. (S10)

There are two main kinds of viewpoint about the loosened supervision:

Manager can't supervise as tightly as at the office because we only interact through a smart device. It must be hard for him even if he wants to improve his control. However, I feel better with this controlling level. I can arrange my work more flexibly... (S7)

Although the supervision loosened compared to working offline makes me happy, I feel that there is a delay in my mind, which prevents me from working punctually...(S6)

They gave different statements about wage:

They cut down on my wage when I must stay at home working due to social distance and I am really dissatisfied with that although I know it deserves the quantity of tasks they give me at this time. (S6)

My salary wasn't cut down, which makes me happy because I know many employees have been cut down or even received no wage during this period. Therefore, my job performance at home is more effective than at the company. (S5)

Some of the respondents's opinions about promotion:

There is no change in promotion opportunities. However, it doesn't seem to impact my job performance. (S3)

As I see, it's a bit easier for me and my colleague to be promoted when we work from home. (S7)

Some of their viewpoint about co-workers:

I can only communicate with my co-workers through a laptop or smartphone. Therefore, the quality of interaction has been limited. However, I'm satisfied with that because I

know this limitation is to protect us from COVID-19 pandemic. (S8)

It is essential for me to keep in touch with my colleagues during working hours. I need their support to complete tasks faster and more effectively. (S10)

There are a lot of smart apps today allowing us to see and hear other people obviously like in a meeting such as Google Meet, MS Teams...So I don't feel isolated when working-from-home. (S9)

It takes me some minutes to hours to wait for them to reply to my message about work. That's a waste of time and a weakness of work-from-home. I don't like it, especially when I'm in a hurry at work, which negatively influences my performance. (S5)

Some of their feelings when they work from home:

I always feel energetic and comfortable during the period of working at home. (S2)

I am energetic everyday working at home because I no longer have to wake up to prepare and leave home early and go to one place only to start working. I can wake up at any time and work anywhere I want in my house as long as I complete the tasks on time. (S1)

I don't feel energetic every day. However, I can focus on work immediately after waking up. That's better than at the office where I usually hang out with my colleagues and do other errands before beginning working seriously. (S4)

Some of participants gave statements:

I will choose to work-from-home again because I'm used to it and my income is stable. (S1)

...I can make good use of time to do a lot of things rather than my tasks. (S5)

I prefer to work at the office because I don't worry much about COVID-19. I believe that the government has good policies to prevent the epidemic. (S3)

I choose to work offline because I want to interact and learn more skills and knowledge from my co-workers. (S4)

D. Theme 4: Work-from-home, Work - family Conflict and Job Performance

Some of the respondents said that they didn't have work-family conflict:

I definitely don't see any impact of work-family conflict on my daily life. I think the reason is that I haven't got children. (S1)

In fact, I don't usually face the work-family conflict even when I work at the office or at home. (S6)

Respondents who faced work - family conflict shared their personal feelings about time-based conflict:

Generally speaking, working at home improves the ability of balancing work and family. The working time is flexible and I can freely arrange time spent with family and work as long as I can complete all tasks to meet the deadline. However, sometimes, unexpected meetings will interfere with the time spent with family. (S2)

In my opinion, work-from-home is not as good as work at an office because I am distracted by worrying about my children. (S8)

I have my own tips to manage my timetable and obviously know when I should prioritise time for work or family. That's why I nearly avoid all work-family conflicts. (S1)

Some of participants gave statements about strain-based conflict:

If I am stressed with my work, I still handle the housework well. (S7)

When I am stressed with work at the office, my performance will be worse than I expected. But when I am in trouble with work at home, I still gain good performance because the environment in my house helps me relieve stress. Moreover, I don't need to face my boss or hear him grouse at that time - it's a big satisfaction to me. (S4)

When I quarrel with my partner or I am under pressure with the family responsibilities, I feel too exhausted to work so I will be late in the deadline or my quality of work will reduce. (S5)

Some of participants gave statements about behavior-based conflict:

The problem-solving behaviors I use in my job are effective in resolving problems at home. (S8)

I sometimes apply the same problem-solving behaviors in work and family when I work from home and I feel it works well. (S3)

V. DISCUSSION AND CONCLUSION

As the results noted above, work-from-home have a negative and direct influence on job performance. The sudden change in working method from offline to online caused the reduction in employee's performance. There are two reasons why performance has been reduced when they work at home. Firstly, they become delayed with work because they haven't gotten used to considering their house as the second workplace instead of a relaxing place after working hours. Secondly, their work requires them to solve problems only at the office or by meeting face to face.

In general, work-from-home has both positive and negative impacts on the work environment of employees. They feel more convenient and familiar when working in their own house. They can work at any place they want such as the living room, bedroom and so on instead of sitting stably at one position in the office day by day, which improves their job performance. Moreover, technology is highly appreciated as a useful means supporting them to finish their tasks. By contrast, technology is also a serious distraction with employees when they work at home without supervision. They will be appealed to social networks like Facebook, Instagram with nonwork chats... rather than concentrate on the jobs. Another noteworthy factor of the work environment when they work at home is the sound.

Everybody in a house has different things or activities to do, which don't focus only on work as at the office. Therefore, it is hard for employees to avoid hearing the sound from TV, from people talking, children shouting and playing and so on. Those negatively influence their concentration during working hours.

It can be seen that the quantity and quality of work employees receive when they work from home satisfies them whether it is reduced or not. It can be explained that they adapted to the quantity of work so they rarely have unexpected troubles handling them. Although employees are satisfied with manager's supervision, some of them show less effective job performance due to that. Therefore, supervision has an important influence on employees' job performance. About wages, they are really sensitive to this factor. Cutting down on their wages dramatically decreases their job satisfaction but it doesn't impact their job performance much because they know the serious influence of COVID-19 pandemic on their company. There is nearly no change in promotion when employees work at home. In addition, there is also no relationship between promotion opportunities and job performance. That's maybe because the period of working-from-home hasn't lasted long enough so they haven't seen the difference clearly. Thanks to technology, employees still can interact with their colleagues. Co-workers play an important role in their job performance. Sometimes, work-from-home dissatisfied employees about the quality and the time of interaction because they are not always online to answer every question immediately, which negatively affects their job performance.

With the respondents who manage their time well, they don't find the relationship of work-from-home, work-family conflict and their job performance. Work-from-home negatively affects work-family conflict, which means that the schedule becomes more flexible for them to arrange work and family activities in the order they want. The home space also helps them relieve stress. However, the flexibility also can increase work-family conflict because they easily lose control and spend too much time on one thing, which overwhelms the time for another. The findings show strain-based conflict primarily doesn't influence job performance when staff work at home. There is another interesting feature in the results that work-from-home has a negative but not significant relationship with work-family conflict in the behavioral aspect.

From the discussion above, we want to list some features that employers should notice to create suitable work-from-home policies for staff. They should have a policy related to technology, which keeps staff always ready to interact, receive and respond to information quickly and effectively. An increasingly tight policy of supervision will help to improve job performance. Employers also should care about providing a compensation policy which is enough

to encourage and increase the satisfaction as well as the loyalty of their staff. Finally, a working time-limited method should be applied to prevent employees from overspending time on work or family which causes work-family conflict.

VI. RESEARCH LIMITATIONS

This study has a limited scope of research in Hanoi, which is one of areas affected seriously by the epidemic in Vietnam. The number of participants in this qualitative research is also small and is not randomly chosen. Although authors collected data with some control variables such as age, education, income, position and so on, we haven't investigated how differences in those factors may influence the job performance of people who work from home, which may provide further insights into the phenomenon. Further studies should widen the scope of research as well as the number of samples to achieve more exact and reliable results.

REFERENCES

- [1] WHO Health Emergency Dashboard <https://covid19.who.int/>
- [2] Susilo, D. (2020). Revealing the Effect of Work-From-Home on Job Performance during the Covid-19 Crisis: Empirical Evidence from Indonesia. *Journal of Contemporary Issues in Business and Government*, 26(1), 23-40.
- [3] Purwanto, A., Asbari, M., Fahlevi, M., Mufid, A., Agistiawati, E., Cahyono, Y., & Suryani, P. (2020). Impact of work from home (WFH) on Indonesian teachers performance during the Covid-19 pandemic: An exploratory study. *International Journal of Advanced Science and Technology*, 29(5), 6235-6244.
- [4] Mehdi, T., & Morissette, R. (2021). Working from home: Productivity and preferences. *StatCan COVID-19: Data to Insights for a Better Canada. Available online at: https://www150.statcan.gc.ca*, (1).
- [5] Prodanova, J., & Kocarev, L. (2021). Is job performance conditioned by work-from-home demands and resources?. *Technology in Society*, 66, 101672.
- [6] Rupiatta, K., & Beckmann, M. (2016). Working from home: What is the effect on employees' effort? (No. 2016/07). WWZ Working Paper.
- [7] Bélanger, France. 1999. Workers' propensity to telecommute: An empirical study. *Information and Management* 35(3): 139-153.
- [8] Bailey, Diane E., and Nancy B. Kurland. 2002. A review of telework research: Findings, new directions, and lessons for the study of modern work. *Journal of Organizational Behavior* 23(4): 383-400.
- [9] Savić, D. (2020). COVID-19 and work from home: Digital transformation of the workforce. *Grey Journal (TGJ)*, 16(2), 101-104.
- [10] Bartik, A. W., Cullen, Z. B., Glaeser, E. L., Luca, M.,

- & Stanton, C. T. (2020). What jobs are being done at home during the COVID-19 crisis? Evidence from firm-level surveys (No. w27422). National Bureau of Economic Research.
- [11] Brynjolfsson, E., Horton, J. J., Ozimek, A., Rock, D., Sharma, G., & TuYe, H. Y. (2020). COVID-19 and remote work: an early look at US data (No. w27344). National Bureau of Economic Research.
- [12] Dubey, A. D., & Tripathi, S. (2020). Analysing the sentiments towards work-from-home experience during covid-19 pandemic. *Journal of Innovation Management*, 8(1), 13-19.
- [13] Bloom, N. (2020). The bright future of working from home. *SIEPR blog*.
- [14] Analytics, G. W. (2020). What is your work-from-home forecast for after Covid-19?.
- [15] Kurland, N.B. and Cooper, C.D. (2002) Manager Control and Employee Isolation in Telecommuting Environments, *Journal of High Technology Management Research*, 13, 107-126.
- [16] Gajendran, R.S. and Harrison, D.A. (2007) The Good, the Bad, and the Unknown About Telecommuting: Meta-Analysis of Psychological Mediators and Individual Consequences, *The Journal of Applied Psychology*, 92, 6, 1524-41.
- [17] Scholefield, G. and Peel, S. (2009) Managers' Attitudes to Teleworking, *New Zealand Journal of Employment Relations*, 34, 3, 1-13.
- [18] Hodder, A. (2020). New Technology, Work and Employment in the era of COVID-19: reflecting on legacies of research. *New Technology, Work and Employment*, 10.1111/ntwe.12173.
- [19] Porter, L. W., & Lawler, E. E. (1968). Managerial attitudes and performance.
- [20] Campbell, J. P., McCloy, R. A., Oppler, S. H. and Sager, C. E. (1993) 'A theory of performance', in C. W. Schmitt and W. C. A. Borman (eds), *Personnel Selection in Organizations*. San Francisco: JosseyBass, pp. 35-70
- [21] Vuong, B. N. (2021). Ảnh hưởng của làm việc tại nhà đến hiệu quả công việc trong bối cảnh đại dịch covid-19: Bằng chứng thực nghiệm tại Thành phố Hồ Chí Minh
- [22] Ghozali, M., Zarkasyi, H. F., Jayanti, K. F., & Wulandari, Y. (2019). Employee Performance Appraisal in Business.
- [23] Baltes, B. B., Briggs, T. E., Huff, J. W., Wright, J. A., & Neuman, G. A. (1999). Flexible and compressed workweek schedules: A meta-analysis of their effects on work-related criteria. *Journal of applied psychology*, 84(4), 496.
- [24] Allen, T. D., Golden, T. D., & Shockley, K. M. (2015). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological science in the public interest*, 16(2), 40-68.
- [25] Dubrin, A. J. 1991. Comparison of the job satisfaction and productivity of telecommuters versus in-house employees: A research note on work in progress. *Psychological Reports*, 68: 1223-1234.
- [26] Norman, P., Collins, S., Conner, M., Martin, R., & Rance, J. 1995. Attributions, cognitions, and copying styles: Teleworkers' reactions to work-related problems. *Journal of Applied Social Psychology*, 25(2): 117-128.
- [27] Rice, R. E., & Gattiker, U. E. 2001. New media and organizational structure. In F. Jablin & L. Putnam (Eds.), *Handbook of organizational communication: Advances in theory, research and methods*: 544-581. Thousand Oaks, CA:Sage.
- [28] Shapiro, D. L., Furst, S. A., Spreitzer, G. M., & Von Glinow, M. A. 2002. Transnational teams in the electronic age: Are team identity and high performance at risk? *Journal of Organizational Behavior*, 23: 455-467.
- [29] Pool, I. 1990. *Technologies without boundaries: On telecommunications in a global age*. Cambridge, MA: Harvard University Press.
- [30] Yap, C. S., & Tng, H. 1990. Factors associated with attitudes towards telecommuting. *Information and Management*, 19: 227-235.
- [31] Ten Brummelhuis, L. L., Bakker, A. B., Hetland, J., & Keulemans, L. (2012). Do new ways of working foster work engagement?. *Psicothema*, 113-120.
- [32] Madsen, S. R. (2003). The effects of home-based teleworking on work-family conflict. *Human Resource Development Quarterly*, 14(1), 35-58.
- [33] Delanoëije, J., Verbruggen, M., & Germeys, L. (2019). Boundary role transitions: A day-to-day approach to explain the effects of home-based telework on work-to-home conflict and home-to-work conflict. *Human Relations*, 72, 1-26
- [34] Darouei, M., & Pluut, H. (2021). Work from home today for a better tomorrow! How working from home influences work-family conflict and employees' start of the next workday. *Stress and Health*.
- [35] Eng, W., Moore, S., Grunberg, L., Greenberg, E., & Sikora, P. (2010). What influences work-family conflict? The function of work support and working from home. *Current Psychology*, 29(2), 104-120.
- [36] Peters, P., & Van der Lippe, T. (2007). The time-pressure reducing potential of telehomeworking: The Dutch case. *The International Journal of Human Resource Management*, 18(3), 430-447
- [37] Glass, J. L., & Noonan, M. C. (2016). Telecommuting and earnings trajectories among American women and men 1989-2008. *Social Forces*, 95(1), 217-250.
- [38] Sullivan, C., & Lewis, S. (2001). Home-based telework, gender, and the synchronisation of work and

- family: Perspectives of teleworkers and their co-residents. *Gender, Work and Organization*, 8(2), 123–145.
- [39] Mazmanian, M., Orlikowski, W. J., & Yates, J. (2013). The autonomy paradox: The implications of mobile email devices for knowledge professionals. *Organization Science*, 24(5), 1337–1357.
- [40] Ramli, A. H. (2019). Work environment, job satisfaction and employee performance in health services. *Business and Entrepreneurial Review*, 19(1), 29-42.
- [41] Ismail, et al. 2010. The Influence of Physical Workplace Environment. *Voice of Academia*.
- [42] Niemela, R., Hannula, M., Routio, S., Reijula, K., & Railio, J. (2002). The effect of indoor air temperature on labour productivity in call centers: A case study. *Energy and Building Journal*. 34, 759-764.
- [43] Velnampy, T. (2008). Job attitude and employees performance of public sector organizations in Jaffna district, Sri Lanka. *GITAM Journal of Management*, 6(2), 66-73.
- [44] Pushpakumari, M. (2008). The impact of job satisfaction on job performance: An empirical analysis. *City Forum*, 9(1), 89-105.
- [45] Pawirosumarto, S., Sarjana, P. K., & Gunawan, R. (2017). The effect of work environment, leadership style, and organizational culture towards job satisfaction and its implication towards employee performance in Parador Hotels and Resorts, Indonesia. *International Journal of Law and Management*.
- [46] Hutajulu, R. S. Evaluating the impact of “work from home policy” on job performance (Study Case in Indonesia).
- [47] Loan, L. (2020). The influence of organizational commitment on employees’ job performance: The mediating role of job satisfaction. *Management Science Letters*, 10(14), 3307-3312.
- [48] Karakaş, A., & SAHİN, N. (2017). The relation between work family conflict and employee performance: a research on hotel employee. *Sosyoekonomi*, 25(32), 51-69.
- [49] Geroda, M. K. B., & Puspitasari, E. (2017). The impact of work-family conflict toward job performance – the case of external auditor. The 3rd PIABC (Parahyangan International Accounting and Business Conference).
- [50] Novitasari, D., Sasono, I., & Asbari, M. (2020). Work-family conflict and worker’s performance during Covid-19 pandemic: What is the role of readiness to change mentality. *International Journal of Science and Management Studies (IJSMS)*, 3(4), 122-134.
- [51] Netemeyer, R. G., Boles, J. S., & McMurrian, R. (1996). Development and validation of work-family conflict and family-work conflict scales. *Journal of Applied Psychology*, 81, 400-410.
- [52] Bhuian, S. N., Menguc, B., & Borsboom, R. (2005). Stressors and job outcomes in sales: A triphasic model versus a linear-quadratic-interactive model. *Journal of Business Research*, 58, 141-150.
- [53] Rivai, H., Sagala, E.J., 2011. *Manajemen Sumber Daya manusia Untuk Perusahaan dari teori ke Praktik*, Edisi Kedua, Jakarta: Rajawali Pers.
- [54] Usman, H., 2013. *Manajemen, Teori, Praktik, dan Riset Pendidikan*, Edisi 4, Jakarta: PT. Bumi Aksar
- [55] Smith, P.C., Kendall, L.M. and Hulin, C.L. (1969), *The Measurement of Satisfaction in Work and Retirement*, Rand McNally, Chicago, IL.

Impact of training quality on expected training service prices of learners at Vietnamese public universities

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Abstract—The research measured and evaluated the influence of 6 factors, namely: program coordination organization, lecturers, training programs, teaching and learning methods, facilities, and personal expectations of students to the expected price of higher education services at Vietnamese public Universities. The results show that all 6 factors had positive effects on the expected price of higher education services. The training program had the strongest impact on the expected price of higher education services, followed by the lecturer factor. On that basis, we propose appropriate recommendations to improve and enhance the quality of higher education services towards sustainable development of higher education for Vietnamese public Universities.

Index Terms—Price of services, Training, University, Expectations, Learners

JEL code—C30, C34, C51, C91

I. INTRODUCTION

IN THE current period of comprehensive and deep international integration, higher education quality at institutions must be evaluated by customers. The evaluation results are the basis for institutions to develop improvement plans while continuously improving the training quality. The socialization of education requires education and training to be considered a type of service; however, it is not an ordinary service but a special type of service. It is special because it is related to the product of human knowledge, policy, and society as a whole. With the view that training is a service, the issue here is to manage the cost of that service. Besides, in line with the view that higher education is a type of service, it is also necessary to calculate the operational efficiency of this service. To achieve financial sustainability in teaching and learning, higher education institutions must improve training cost management efficiency based on determining the reasonable price of higher education services. Therefore, besides improving the training quality and building their own "brand", all educational institutions want to solve the issue of determining the price of higher education services so that they have a scientific and practical basis in determining the appropriate tuition fees, which can both offset the training costs and be highly persuasive to be accepted by society and learners.

In the process of the comprehensive reform of higher education in Vietnam, determining the price of higher education services in universities is one of the important issues that require breakthrough management solutions to fully determine the costs of teaching and learning fees and to reasonably

share payment responsibilities among the government, the society and learners. Willingness to pay more is measured as the amount or percentage of extra payment for a product with superior performance over those of regular prices. Therefore, the price of higher education services must be determined based on sharing training costs of training institutions with learners or payers through a monitoring mechanism so that they can see if the quality of training activities is worth the cost they have spent or not, thereby deciding whether to continue to choose that institution's services. To contribute to the socialization of finding financial resources for sustainable development of public universities, the price of higher education services needs to be determined appropriately, otherwise, it will affect the quality, content of the training program, the income of the lecturers, etc. (in case the determined price is lower than the training cost). On the other hand, if the price of higher education services offered is higher than the learner's ability to pay, the student may drop out or choose another university, making it difficult to cover the regular expenses and reinvest in the university.

Therefore, the main objectives of this study are: (1) examining the impact of training quality on the expected price of higher education services of learners; (2) evaluating the level of impact of each factor on the expected price of higher education services at Vietnamese public universities.

II. LITERATURE REVIEW

The birth of training service price (tuition) comes from the concept of cost-sharing [10]; students and parents contribute a part of the cost to the institution to maintain its operations and generate revenue for salary payment, investment in facilities to improve education quality and create favorable learning conditions for learners. The prices of higher education training services can be approached from many different angles. According to [11], they are called tuition fees - a source of revenue for universities that play a role in allocating available resources and giving price signals to consumers (learners). The difference in tuition fees happens when an organization provides products and services with different tuition rates for different learners of the same product - service. The difference is tuition fee requires the provider to understand the efficiency of market segmentation, or the buyer at a low tuition rate will gain profit by offering to another buyer who is charged a higher fee. The study by [13] suggested that the

difference in university tuition fees is the different rate of tuition fees paid by learners for different universities, majors, types of classes, depending on many influencing factors, to realize the university's goals and mission as well as to fulfill the educational and training functions and roles of that university.

From the point of view of learners and tuition fee payers, higher education services are first and foremost the fees that students have to pay to attend universities. The price of higher education services provides a signal about the average cost or marginal cost of attending college, as well as the financial returns that graduates will receive [11]. The signals provided by higher education service prices help students use resources more rationally [15]. Based on that, students choose programs that are suitable for themselves and their families, as well as their expectations about career and income in the future. If the tuition fee for an educational program is higher than what students can afford and what they expect for future income, they may consider not attending universities, or choosing a different program at a more suitable university. Research by [4] concluded that through paying tuition fees, students are aware of their rights. The higher the tuition fees students pay, the greater the benefits they expect from the university. Thus, it can be seen that the price of higher education services has an impact on both universities and students in improving the quality of teaching and learning, thereby contributing to improving the quality of the entire higher education system.

According to [9], the student-lecturer ratio is negatively related to the tuition rates. Universities in big city centers have higher tuition rates. If the student retention rate in the following year is low compared to the previous year, the tuition rate will increase. When the unemployment rate in the city where the university is located is high, the fees are reduced. The total cost per student is positively related to the tuition rate. The percentage of applicants admitted to universities is inversely related to tuition rates. The group of variables \bar{i} related to government policy; when universities receive financial subsidies from the government, tuition fees are reduced.

[18] used cross panel data for multivariable regression with 9 independent variables affecting tuition fees: annual expenditures, type of institution, major, the geographic region, academic reputation ranking, the average SAT scores for incoming freshman, the number of full-time faculty, the number of full-time undergraduate students, and university presidents' pay and benefits. Research results show that all 9 factors have a positive effect on tuition rates, in which the strongest correlation is academic reputation ranking and SAT scores.

[14] suggested that the university size, education quality, geography, competition, and the factors of geographical location and competition and subsidies from the government have a positive impact on identifying tuition rates at universities in Japan [14]. Empirical research results show that tuition fees at prestigious universities will be higher than those at lower prestigious universities. In addition, the size of large universities and the possibility of greater government subsidies tend to reduce tuition fees for students. Thus, it can be

seen that the reputation of universities in Japan also affects the tuition fees at these educational institutions.

Through the Hedonic model, [15] quantified the relationship between learners' willingness to pay and some quality factors of Vietnamese public universities, including disciplines, groups of training disciplines, forms of training by year and credit, learners' ability to find jobs [15]. According to that study, learners do not want to pay for several quality factors, which higher education institutions are currently very interested in: conditions of facilities, the ratio of faculty members, the percentage of lecturers holding the titles of associate professor and professor; number of internationally published works of education and training institutions...

Through 662 student surveys at 5 public universities, the experimental study by [5] points out that the factor of the ability to accumulate has a negative impact on tuition fee; the factors of lecturers, facilities, program organization and coordination, program content and teaching methods all have a positive impact on expected tuition fees [5]. The study also shows that facilities have the strongest impact on expected tuition while organization and coordination have almost negligible impact on expected tuition fees.

Thus, the above studies show that factors related to the quality of training affect the expected price of higher education services of learners. Students are seen as customers of the university. Students' expectations will be the desire to enjoy high-quality training services. Therefore, universities need to focus on developing and improving endogenous factors affecting the quality of training, which will have the effect of increasing financial resources from the price of higher education services.

III. PROPOSED WORK

A. Research Model

This study inherits the research results of [8], the scale in the HEDPERF model, and the calibrated scales of [13] in line with the actual situation of higher education in Vietnam. The authors use assessment scales for training quality to measure the price expectations of higher education services, thereby giving the proposed research model as shown in Figure 1.

The model of expected price of higher education services

$$\text{PRI} = \beta_0 + \beta_1 \text{OAC} + \beta_2 \text{LEC} + \beta_3 \text{PRO} + \beta_4 \text{TLM} + \beta_5 \text{FAC} + \beta_6 \text{EXP} + \varepsilon \quad (1)$$

In which:

- PRI: Expected price of higher education services
- OAC: Organization and co-ordination
- LEC: Lecturer
- PRO: Training program
- TLM: Teaching and learning methods
- FAC: Facilities
- EXP: Student expectation
- $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$: Regression coefficient
- ε : error tolerance

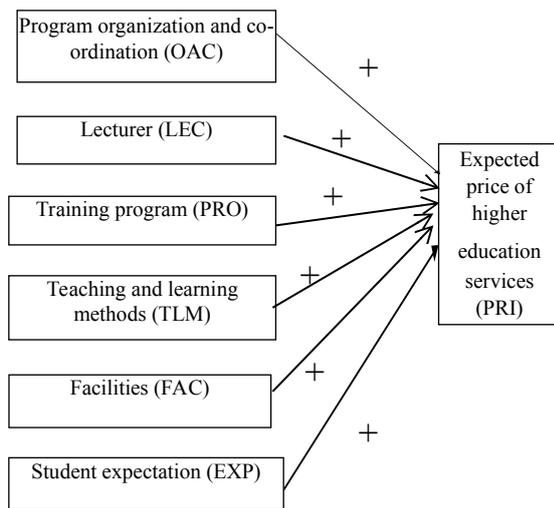


Fig 1. Research model

B. Creating the research scale and hypotheses

1) Program organization and co-ordination

According to [11], [6] and [13], when students are satisfied with the service quality and timely support from the university's officers and staff regarding program organization and coordination, they are willing to pay higher prices for higher education services.

Hypothesis H1: There is a positive correlation between program organization and coordination and the expected price of higher education services.

2) Lecturer

[11], [17], [2], [3], [6] and [13] all confirm university faculty is an important factor in determining the improvement and development of training quality in universities. Through professional competencies (professional knowledge, teaching methods, professional ethics of lecturers) and soft skills (actively showing interest in students; encouraging the love of learning, listening skills, skills to adapt well to unexpected situations) applied in teaching, faculty members can ensure positive learning outcomes and stimulate students' interest in learning. Therefore, enhancing the capacity and quality of faculty can lead to an increase in the level of satisfaction and perception of service quality of students [6]. As a result, students are willing to pay for higher prices of higher education services

Hypothesis H2: There is a positive correlation between lecturer and the expected price of higher education services

3) Training program

According to [8] and [13], the content of training programs aims towards standardization - modernization suitable to universities in the region and business requirements, towards the balance between theory and practice of each field and subject in line with requirements of learners and the labor market. Thanks to that, theoretical training is combined with practical applications to build close relationships with businesses, create conditions for students to participate in learning, visiting, and exposure to the real environment. Therefore, when customers are satisfied with the training program they are enjoying, they are willing to pay higher prices for higher education services.

Hypothesis H3: There is a positive correlation between the training program content and the expected price of higher education services

4) Teaching and learning methods

In higher education, the teaching and learning methods play an important role in forming and developing professional competence for students. Studies by [8] and [13] show that learners are very interested in the teaching and learning methods of teachers because it directly affects the knowledge that learners receive in the learning process. Therefore, hypothesis H4 is stated as follows:

Hypothesis H4: There is a positive correlation between teaching and learning methods and the expected price of higher education services

5) Facilities

[3] and [13] believe that when students are fully provided with relevant support services at universities, this will create the most favorable conditions for learning activities. Although support services do not directly affect the quality of training students receive, when they enjoy better support services, it can increase the level of satisfaction and perception of training service quality of universities. As a result, they will be willing to pay higher tuition fees.

Hypothesis H5: There is a positive correlation between facilities and the expected price of higher education services.

6) Student expectation

The educational product that students receive while studying at universities is a complex product, which includes both tangible product and intangible service aspects. Student expectation is students' belief that after graduation they have jobs that are suitable for their professional qualifications and help improve their self-worth [7], [13]. Therefore, hypothesis H6 is stated as follows:

Hypothesis H6: There is a positive correlation between student expectation and the expected price of higher education services.

7) Expected price of higher education services

The willingness of customers to pay for a service when using it depends on the economic value received and the usefulness of the service [1]. Accordingly, economic value and utility are the two factors that determine the price that a person is willing to accept to pay is the limit price or the maximum price. Thus, the level of willingness to pay (expectation) for higher education services is defined as the highest price that an individual is willing to accept to pay for a service [13].

There is an overview of the observed variables in the research model described in Table 1

TABLE 1
DESCRIPTION OF THE VARIABLES IN THE MODEL

Variable code	Variable name	Source
1. Program organization and co-ordination		
OAC 1	When students have problems, the administrative staff does care to help students solve problems	[8], [6]
OAC 2	The administrative staff always cares and takes good care of students	

Variable code	Variable name	Source
OAC 3	The administrative staff shows a positive attitude towards students.	
2. Lecturer		
LEC1	Faculty members are always polite	[8], [17]
LEC 2	Faculty members always show a positive attitude towards students.	[8], [2]
LEC 3	Faculty members have good teaching manners.	[8], [3]
LEC 4	Faculty members always provide feedback on students' progress during their studies	[8], [3]
LEC 5	Faculty members are highly qualified	[8], [6], [13]
LEC 6	Faculty members provide adequate materials for students	
LEC 7	Faculty members give correct evaluation and mark	
3. Training program		
PRO 1	Training programs are updated regularly	[8], [13]
PRO 2	The modules in training programs are linked together.	
PRO 3	Time is allocated for different subjects in a way that facilitates student learning	
PRO 4	The objectives of the training programs are in line with the students' expectations	
PRO 5	The duration of the courses is suitable	
4. Teaching and learning methods		
TLM 1	Teaching methods are appropriate	[8], [13]
TLM 2	Teaching methods are based on practice	
TLM 3	Teaching methods are modern and apply information and communication technology	
TLM 4	Teaching methods are student-centered	
TLM 5	Teaching methods promote positivity, initiative, creativity, and application of students' knowledge and skills	[13]
5. Facilities		
FAC 1	Classrooms make students feel comfortable	[3]
FAC 2	The library has enough seats and group study rooms	[13], [16]
FAC 3	There are enough teaching and learning facilities	
FAC 4	There are facilities and grounds for cultural, artistic, and sports activities	
6. Student expectation		
EXP1	Studying at the university helped me gain the professional knowledge needed to work	[8], [3]

Variable code	Variable name	Source
EXP 2	Studying at the university helps me to have the necessary social knowledge	
EXP 3	Studying at the university helps me acquire career skills suitable for today's labor market	
EXP 4	Studying at the university helps me develop soft skills for work	
EXP 5	Studying at the university helps me improve my awareness and attitude in life	

(Source: compiled by the group of authors)

IV. RESEARCH METHODS

A. Data collection

This study uses the quantitative method with a survey questionnaire and a 5-level Likert scale (1-Strongly disagree; 5-Strongly agree) to assess independent factors that affect the expected price of higher education services.

In this study, the sample was selected according to the convenient sampling method, which is disaggregated by university, industry, year, living area to ensure representativeness in assessing the price expectations of higher education services of learners, gender, and gender. For example, students of public universities in Hanoi are summarized in Table 2. The sample size was determined according to [12] based on the minimum sample size (min = 50) and the number of variables in the model. The research model of this paper has 6 variables, so the minimum sample size is 120. The sample selected for the survey includes 526 students at 5 private universities as follows:

TABLE 2: SAMPLE CHARACTERISTICS

Criteria	Quantity	Percentage (%)	Criteria	Quantity	Percentage (%)
University			No of Year		
Hanoi University of Industry	101	19.2	1	67	12.74
Vietnam Trade Union University	134	25.48	2	211	40.11
Academy of Finance	82	15.59	3	192	36.5
Thuongmai University	115	21.86	4	56	10.65
University of Labour and Social Affairs	94	17.87	Total	526	100
			Living area		
			KV1	145	27.57
Total	526	100	KV2	227	43.16
			KV3	154	29.27
			Total	526	100

(Source: the survey done by the group of authors)

B. Processing survey results

Data from the survey results are classified and cleaned. After that, analytical tools are used to: (i) calculate the average value of each variable and variables; (ii) verify the reliability of the scale, (iii) perform exploratory factor analysis (EFA); (iv) perform correlation analysis; (v) perform multi-variate regression analysis. Based on the results of the analysis, the study conducts a discussion and made recommendations to improve the training quality for universities in line with the roadmap to increase tuition fees when implementing financial autonomy.

V. RESULTS AND DISCUSSION

A. Scale evaluation

Cronbach's Alpha test results of the scales show that all of them are from 0.6 or more (Table 3) and the total correlation coefficients of the scales are all higher than the allowed level (greater than 0.3). Therefore, all the scales met the requirements.

TABLE 3 CRONBACH'S ALPHA COEFFICIENT

No	Scale	Name of factor	Cronbach's Alpha
1	OAC	Organization and co-ordination	0,899
2	LEC	Lecturer	0,912
3	PRO	Training program	0,887
4	TLM	Teaching and learning methods	0,918
5	FAC	Facilities	0,853
6	EXP	Student expectation	0,913

(Source: Data processing results from SPSS 22.0)

B. Exploratory factor analysis (EFA)

Cronbach's alpha coefficient ensures the reliability of the scales. To analyze the convergence value and discriminant value of the factors affecting the expected price of higher education services at universities, the factors OAC, LEC, PRO, TLM, FAC, EXP are included in EFA analysis; also matrix rotation is used to determine the number of extracted factors to find new factors through Table 4.

TABLE 4. KMO RESULTS AND BARTLETT TEST

KMO coefficient (Kaiser-Meyer-Olkin)		0,921	Acceptance
Bartlett's test model	Chi-squared value	5708.671	
	Degree of freedom	406	
	Sig. (p-value)	.000	Accepted

(Source: Data processing results from SPSS 22.0)

The results of Table 4 show that: With $0.5 < KMO = 0.921 < 1$, factor analysis is accepted with the data set of factors. At the same time, with Bartlett test = $0.000 < 0.05$, factor analysis is appropriate. This shows that the scales of 6 factors (OAC, LEC, PRO, TLM, FAC, EXP) are eligible for EFA analysis. The extracted variance value is 57.09%, which

means that 57.09% of the variation of the factors is explained by the observed variables (Table 5).

TABLE 5 RESULTS OF EXPLORATORY FACTOR ANALYSIS

Observed variables	Factor						Factor name
	1	2	3	4	5	6	
LEC 3	.855						Lecturer
LEC 5	.800						
LEC 1	.784						
LEC 4	.732						
LEC 2	.681						
LEC 7	.666						
PRO 3		.798					
PRO 2		.765					
PRO 1		.709					
PRO 4		.696					
PRO 5		.679					
TLM 4			.812				Teaching and learning methods
TLM 5			.799				
TLM 3			.765				
TLM 2			.764				
TLM 1			.601				
FAC 3				.808			Facilities
FAC 4				.729			
FAC 1				.727			
FAC 2				.632			
OAC 3					.873		Organization and co-ordination
OAC 2					.855		
OAC 1					.796		
EXP 1						0,912	Student expectation
EXP 2						0,905	
EXP 3						0,883	
EXP 5						0,825	
EXP 4						0,820	

(Source: Data processing results from SPSS 22.0)

In Table 5, the factor loading coefficients all reach values > 0.6 , so 29 observed variables of 6 independent factors are accepted. The factors do not change, only the order of the variables in each factor changes. The exploratory factor analysis results are consistent with the original study design, proving that scales ensure convergent and discriminant validity.

Evaluation of the value of the scale of the dependent variable on the expected price of higher education services.

Because KMO result = 0.725, satisfying the condition $0.5 < KMO < 1$, the exploratory factor analysis is suitable for survey data. Bartlett's test has Sig.=0.00<0.05, so the use of the EFA model to evaluate the value of the scale of expecta-

tion of the price of higher education services is appropriate. The extracted variance value is 66,697 or 66.69% of the change of the factor explained by the observed variables. It is concluded that the EFA model is suitable and the scale is accepted.

C. Multivariate regression analysis

The results of the regression coefficient test show that the independent variables all have Sig values less than 0.05. It is concluded that independent variables are significantly and positively correlated with the expected price of higher education services.

TABLE 6. ANALYSIS OF FACTORS AFFECTING THE EXPECTED PRICE OF HIGHER EDUCATION SERVICES

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.892 ^a	.795	.791	.28091	1.284

a. Predictors: (Constant), OAC, LEC, PRO, TLM, FAC, EXP

b. Dependent Variable: PRI

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	70.292	6	14.058	178.159	.000 ^b
Residual	18.070	229	.079		
Total	88.362	234			

a. Dependent Variable: PRI

b. Predictors: (Constant): OAC, LEC, PRO, TLM, FAC, EXP

TABLE 7. ANALYSIS OF FACTORS AFFECTING THE PRICE OF HIGHER EDUCATION SERVICES

Model	Unnormalized coefficient		Normalized coefficient	T-Test	Significance level	Multicollinear Statistics	
	B	Standard error	Beta			Acceptance of the variable	Variance inflation factor (VIF)
1 (Constant)	.124	.117		1.058	.291		
OAC	.063	.025	.101	2.529	.000	.693	1.443
LEC	.276	.032	.333	8.531	.000	.587	1.703
PRO	.329	.040	.360	8.207	.000	.464	2.155
TLM	.202	.040	.224	5.042	.000	.454	2.202
FAC	.184	.035	.195	2.338	.000	.541	1.849
EXP	.093	.069	.125	1.192	.000	.674	1.483

a. Dependent variable: Expected price of higher education services (PRI)

From the results in the regression weight table, the regression equation through the normalized beta coefficient can be determined as follows:

$$\text{PRI} = 0.360 \text{ PRO} + 0.333 \text{ LEC} + 0.224 \text{ TLM} + 0.195 \text{ FAC} + 0.125 \text{ EXP} + 0.101 \text{ OAC} \quad (2)$$

The model has 6 variables FAC, OAC, LEC, PRO, TLM, EXP all have Sig. < 0.01, so these variables are significantly correlated with the variable EXP with 99% confidence.

D. Multicollinearity test

Table 7 shows that the VIF coefficients of the independent variables are in the range from 0 to 4, thereby concluding that the model of factors affecting the expected price of higher education services at universities does not have multicollinearity phenomenon [19].

The results show that the F test value = 178,159 with the Sig significance level. = 0.000 < 0.05. This proves that the built regression model is suitable for the collected data set. The adjusted R2 value of the regression model is 79.1%, showing that the independent variables included in the model explain 79.1% of the change of the dependent variable which is the expected price of higher education services, the remaining 20.9% is the effect of factors other than the model and random error. The analysis results for the VIF coefficients of the independent variables included in the model are all less than 4, so it can be concluded that there is no multicollinearity phenomenon. Thus, the independent variables are not correlated with each other.

VI. CONCLUSION AND RECOMMENDATION

The results show that all 6 hypotheses H1, H2, H3, H4, H5, H6 are accepted because the factors have a positive effect (positive Beta coefficient) on the expected price of higher education services with the significance level Sig. < 0.05. However, the importance of each factor according to the degree of influence decreases as follows: training program, faculty, teaching and learning methods, facilities, student expectations, organization and co-ordination contribute 27.1%, 25.1%, 16.87%, 14.68%, 9.41%, and 7.6%, respectively, to the impact on increasing the expected price of higher education services. This proves that the better the factors of training quality are and the more they are appreciated, the higher the expected price of higher education services with the increase by 27.1%, 25.1%, and 16.87%, 14.68%, 9.41%, and 7.6% from the current price.

Therefore, when public universities improve these factors, this will lead to an increase in financial resources from higher education service prices, specifically:

Firstly, universities should pay attention to improving and renovating the training program content towards standardization - modernization suitable to universities in the region and business requirements, towards the balance between theory and practice of each field and subject in line with requirements of learners and the labor market. Career and start-up centers should be established to train soft skills for students. They should closely link with businesses, thereby promoting theoretical training combined with practical applications and creating conditions for students to participate in learning, visiting, and interacting with the real environment.

Secondly, universities need to improve the quality of faculty by creating conditions for learning opportunities, promoting the selection of faculty to ensure stability in quantity and quality for a long time, increasing research time, adjusting the allowance regime to limit overtime

work outside the university, and focusing on improving professional qualifications and teaching methods. The reward and promotion regime also needs to change so that salaries and bonuses are calculated based on teaching results, research works, and activities other than teaching.

Thirdly, universities should increase investment in modern facilities to meet the needs of accommodation and practice. It is necessary to ensure ventilation and a reasonable number of seats in classrooms. Professional projector and microphone equipment for teaching are required to adapt to the development of the Industrial Revolution 4.0 and in line with new teaching methods. Such actions will contribute to improving the quality of training - the fourth strongest factor affecting the expected price of higher education services

Fourthly, universities need to improve the role and attitude of the coordination and management department towards students. With the trend of comprehensive innovation in higher education and quality universities moving to a model of full autonomy, operating like businesses, learners need to be cared for in their material and spiritual life... so that they really feel comfortable in all activities at universities.

This article has investigated the influence of factors of higher education service quality on the expected price of higher education services from the point of view of learners. According to research results, when the quality of training is improved to meet the satisfaction of learners, they are willing to pay higher prices for higher education services. Therefore, determining the price of higher education services at universities in general and universities in particular must match the quality of training services, improve competitiveness, ensure training costs and provide accumulation to reinvest in resources of universities. Future studies can use this result and may expand the sample, discover new factors or use the Probit model in combination with a random utility function to consider the impact of factors related to the characteristics of parents and students on the expected price of higher education services, etc., to add scientific value and enrich this research topic.

REFERENCES

- [1] Breidert, C. (2006), *Estimation of Willingness-to-Pay: Theory, Measurement, Application*, (Springer e-books.) Wiesbaden: Deutscher Universitäts-Verlag.
- [2] Campos, D. F., dos Santos, G. S., and Castro, F. N. (2017), *Variations in student perceptions of service quality of higher education institutions in Brazil*, Quality Assurance in Education.
- [3] Chikazhe, L., Makanyeza, C., and Kakava, N. Z. (2020), 'The effect of perceived service quality, satisfaction and loyalty on perceived job performance: perceptions of university graduates', *Journal of Marketing for Higher Education*, 1-18.
- [4] Callender, C. (2006), Access to higher education in Britain: The impact of tuition fees and financial assistance. In: Teixeira, P.N., Johnstone, D.B., Rosa, M.J. and Vossensteyn, J.J. (eds.) (2006), *Cost-sharing and accessibility in higher education: A fairer deal?* Douro Series: Higher Education Dynamics, Vol. 14. Dordrecht, The Netherlands: Springer.
- [5] Dung, V.X., Hoa, N., Hang, T.T. (2019), <https://tapchitaichinh.vn/nghien-cuu-trao-doi/yeu-to-tac-dong-den-muc-hoc-phi-ky-vong-tai-cac-truong-dai-hoc-cong-lap-viet-nam-310312.html>.
- [6] Farahmandian, S., Minavand, H., & Afshardost, M. (2013), 'Perceived service quality and student satisfaction in higher education', *Journal of Business and Management*, 12(4), 65-74
- [7] Fatima, S., Ahmed, A., Fatima, S., and Fatima, N. (2018), 'The Role of Student Expectation and Service Quality in Higher Education Institutions of Pakistan', *Journal of Management and Research*, 5(2), 1-20.
- [8] Firdaus A. (2005), 'HEdPERF versus SERVPERF: The quest for ideal measuring instrument of service quality in higher education sector', *Quality Assurance in Education*, Vol. 13, no. 4, pp.305 – 328.
- [9] Jackson, M.T. (2012), *The production of new potato varieties: technological advances*, Cambridge University Press, 248-261
- [10] Johnstone, B. (2003), 'Cost Sharing in Higher Education: Tuition, Financial Assistance, and Accessibility in Comparative Perspective', *Czech Sociological Review*, 39(3), 351-374.
- [11] Jongbloed, B. (2004), *Tuition Fees in Europe and Australasia: Theory, Trends and Policies*. In Smart, J.C. (ed.), Higher Education, Handbook of Theory and Research, Vol. XIX. Dordrecht: Kluwer, 2004, pp. 241–309.
- [12] Hair, J. F., Black, W. C., Babin, B. J. & Anderson, R. E. (2010), *Multivariate Data Analysis: A Global Perspective*, New Jersey, Pearson Prentice Hall.
- [13] Hung, T.Q. (2016), Policy on university tuition fees in Vietnam', Doctoral thesis, VNU University of Economics and Business
- [14] Mizutani, F., Nakayama, N & Tanaka, T. (2015), *Determinants of University Tuition on Japan*, Kobe University. OECD [Organization for Economic Co-operation and Development] (2010), *Trends Shaping Education-2010*, Paris: OECD Publishing.
- [15] Nha, P.X. and Hoan, P.X. (2016), 'Scientific basis for determining higher education fees: Results from the HEDONIC model', *Journal of Economics and Development*, Vol 226, April 2016.
- [16] Pedro, J. E., Mendes, L., và Lourenço, L. (2018). Perceived Service Quality And Student's Satisfaction In Higher Education: The Influence Of Teaching Methods. *International Journal for Quality Research*, 12(1).
- [17] Pheunpha, P. (2019), A Factor Analysis Of Student' Perceived Service Quality In Higher Education. *ABAC Journal* Vol.39 No.4(October-December, 2019 pp 90-110).
- [18] Tang, T.L., Hsiung, D.S & Tang, C.S. (2012), 'College tuition and perceptions of private university quality', *International Journal of Educational Management*, 18(5), 304-316.
- [19] Tho, N.D. (2011), *Scientific research methods in business: Design and implementation*, Labour and Social Publishing House.

Impact of the Vietnam – EAEU FTA on the trade between Vietnam and Eurasian Economic Union

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Abstract—This study uses a structural gravity model of trade to examine the impact of the Vietnam - Eurasian Economic Union free trade agreement (FTA Vietnam - EAEU) on exports and imports between Vietnam and its member countries before and after the agreement. The model is tested on a sample of industry-level panel data from 2001 to 2019, the author estimates the fixed-effects model (FEM) in the country - paired with the number of observations obtained is 5,386 observations forming a repeat sample, unbalanced. The paper also performs Pseudo Poisson maximum likelihood estimation (PPML) is also applied to solve the zero trade issue and the presence of heteroskedasticity. The results indicate that the agreement leads to "trade creation", import and export turnover increases compared to before the agreement. The authors propose that the two sides need to boost to produce and export the comparative advantage products in order to seize preferential treatment from the agreement without affecting competition and complementing each other.

Index Terms—FTA, Structural Gravity, Vietnam and EAEU.

I. INTRODUCTION

FREE trade liberalization is the process of reducing and removing tax barriers in international trade, creating opportunities to promote growth, improve productivity through specialization and promote competition. In the context of strong globalization and integration, like many countries in the world, Vietnam has pursued trade liberalization (TL) by joining or forming bilateral or plurilateral trade agreements to achieve the various economic benefits that come from creating trade and expanding markets through removing trade barriers, improving productivity, and attracting foreign investment among member countries.

Cassing [10] assesses the impact of FTAs on Vietnam's trade. The results show that the FTAs have different effects on trade, but the benefit that Vietnam gets from the ASEAN FTAs with China, Japan and Korea is the largest, while the FTAs with Australia and Korea are the largest. New Zealand, India bring less benefits. Industries with high output growth rates such as apparel (32%), vegetables and fruits (29%), leather products (22%), transportation and communication services (15%), textiles (14%), manufactured goods (12%). Furthermore, looking to the future, the Vietnam-EU FTA provides an opportunity to access a large market that can generate significant benefits [44].

The Eurasian Economic Union (EAEU) is a regional economic union of the Sodrujestvo Nezavisimykh Gosudarstv (SNG) comprising the countries of the former Soviet Union

(Russia, Belarus, Kazakhstan, Armenia, Kyrgyzstan), in which Russia Countries that play an important role in the alliance are all traditional partners of Vietnam. The EAEU is a market with 180 million people and has a GDP of more than \$1.9 trillion, but the reality is not as deeply integrated into the global economy as other regions, which makes the EAEU attractive to many trading partners globally and especially in the Asia-Pacific region. Vietnam is considered an important partner of the EAEU countries in this region both politically and economically. Promoting cooperation with Vietnam will create opportunities for EAEU countries to access the ASEAN market. The EAEU is a market for Vietnam's export of agricultural and aquatic products, textiles, footwear, and electronic equipment, as well as a market for low-cost, high-quality energy supplies for Vietnam. The EAEU's selection of Vietnam as the first partner to sign a free trade agreement at the end of 2015 aims to create an open legal corridor, increase the competitiveness of goods, and open up trade flows between the two sides. When this agreement comes into effect, the average tax rate for EAEU goods will be reduced from 10% to 1%, goods of EAEU members will enjoy the same incentives as other countries on the Vietnamese market [18].

The objective of the article is to assess the impact of the agreement on trade between Vietnam and the EAEU. From the theoretical basis and research review, the author uses the commercial gravity model of [2], [30] with product-level panel data by industry extracted from UNCTAD for the period 2001 to 2019 and estimated the fixed-effects model (FEM) by country pair [7]. The paper also uses the Pseudo Poisson maximum probability estimation method (PPML) to solve the trade data with zero values and the appearance of heteroskedasticity due to [38] proposed.

The article is structured as follows. Section 2 research overview and theoretical background. Section 3 deals with Vietnam Trade and the EAEU. The research model and methodology will be analyzed in Section 4. Section 5 presents experimental research results and discussion. Section 5 will make conclusions and offer some policy implications.

II. LITERATURE REVIEW

Free trade agreements have an economic impact on participating members as well as non-member countries. Viner [43] pointed out the impact of TL on economic restructuring

stemming from trade creation and trade diversion. Trade creation occurs between member countries by reducing trade barriers. When low-cost imports from a non-member country are replaced by imports from a higher-cost member country because the bloc's members enjoy preferential market access and are not taxed, taxes, trade diversion will occur. Viner [43] also demonstrated that trade diversion makes member countries less efficient in using resources, this effect changes trading partners without increasing welfare and driving production away from benefits. comparative position. Meanwhile, trade creation increases the economic benefits of member countries because it facilitates specialization in production activities through comparative advantage.

Fukao [17] quantitatively analyze the trade diversion effects of NAFTA using HS2 digit level data and using a partial equilibrium framework for industrial products, but the authors are new. Estimates for US imports only. The results show a trade diversion for textiles and some footwear products but no trade diversion for vehicles and television sets.

[47] provide a relative market share index and an increased trade index in FTAs, calculating the volume of trade in goods within the EU and NAFTA (Canada, Mexico and the US) respectively 58.4% and 43% in 2005, the trade flows of ASEAN region also increased from 17% before AFTA came into effect to 25% after AFTA came into effect. And at the same time, it has an impact on creating trade in regional free trade agreements such as the North American Free Trade Agreement (NAFTA), the ASEAN Free Trade Area (AFTA), the South American Market Community (MERCOSUR).

[29] show the impact of AFTA and CEPT related to tax reduction leading to trade promotion of ASEAN members. [9] also points out that in addition to the trade creation effect there is also a trade displacement effect that manifests as an increase in intra-regional trade which is completely replaced by a corresponding decrease in imports from the rest of the world.

In addition, the FTA affects the economic restructuring and the distribution of production resources in the economy [26], the reduction of trade barriers brings opportunities for the developing countries to promote economic growth and economic restructuring towards promoting advantageous sectors [19]. FTAs also have a positive effect on industries that promote exports and hinder the development of import-protective industries [37]. The impact of trade liberalization promotes economic restructuring and resource allocation of each member country in the implementation of FTAs [6]. Sectors in the economy always have uneven growth under the impact of FTAs, leading to shifts and changes in the economic structure of industries. Therefore, all countries seek to promote the competitiveness and growth of industries with comparative advantage and narrow down industries without advantages on the basis of allocating and shifting resources to other countries. sectors can be effective [5]. Although FTAs are recognized to have positive effects on trade for member countries, the economic benefits achieved by countries are not entirely the same [11].

Krugman [20] emphasizes that countries with small economies are vulnerable to the effects of international trade. In addition, the benefits of FTAs are also affected by the difference in the export structure of FTA partner countries and other partner countries, especially key partner countries. If the export structure of these two groups of countries is significantly different, the possibility of trade deviation will be reduced, thereby increasing social welfare for FTA member countries [40]. The impact of the agreement on economic benefits, welfare as well as trade in goods in general or some industries with comparative advantages such as industry, agriculture... of a country. However, the degree of impact of FTAs on the economy and competitive industries is different for each country and in different stages of economic development. Vietnam and Russia are comprehensive strategic partners, both members of the Vietnam - EAEU FTA, to assess the impact of this agreement on the trade of the two sides to proactively identify advantages and guide policy. trade to take advantage of the benefits and promote economic growth of each country.

Studies assessing the impact of free trade agreements on Vietnam's economy are based on a posteriori approach, using econometric models such as [33], [3]. Ramstetter & Phan [36] studied the impact of economic integration and the implementation of FTA commitments in tariff reduction on Vietnam's economic growth, in which in-depth analysis of the shift of a number of sectors in the economy. The impact of international trade and investment on economic restructuring by sectors is also mentioned in the studies of [41]. In addition, the studies mention that the change of bilateral, multilateral trade and a number of sectors is Vietnam's strength in the context of FTAs such as [13], [27], [28], [45], [42]. Their research results demonstrate how tariff reductions can lead to trade creation or trade diversion; tariff cuts lead to trade diversion from lower cost countries. to higher cost FTA partners. When the export prices of existing trading partners (including tariffs) are higher than those of the higher-cost FTA countries, this diversion becomes more appropriate. Baier and Bergstrand [7] used the gravity model to test the impact of FTAs on trade flows, in this study the author uses a weighted model. Gravity with fixed effect model (FEM) based on the approach of [35] on a pair of countries to assess the impact of the Vietnam - EAEU FTA and the reduction of tariffs on trade between Vietnam and EAEU countries before and after the agreement.

III. TRADE BETWEEN VIETNAM AND THE EURASIAN ECONOMIC UNION

The free trade agreement between Vietnam and the Eurasian economic union took effect from October 5, 2016, and will ease market access within the framework of trade between member countries. The Agreement also creates new conditions for economic and trade activities for businesses of the EAEU and Vietnam. For the EAEU,

this is the first trade agreement with a third country. The selection of Vietnam as the first country in concluding a free trade agreement with EAEU member countries due to a combination of political importance and factors such as trade risks with Vietnam. The main export products of Vietnam and EAEU member countries do not compete with each other on the domestic market of the member states in the agreement. This will facilitate the parties to achieve a balance of interests, which is the basis for the formation of a free trade area. In the period 2012 - 2019, the value of trade turnover between Vietnam and EAEU member countries increased from 2.71 billion USD in 2012 to 4.85 billion USD in 2019 (accounting for 0.94% of the trade turnover of Vietnam). Vietnam and 0.58% of the EAEU in 2019), with a growth rate of 44.1%, of which Russia accounted for 90.9% of the total trade turnover between Vietnam and the EAEU. After a decline during the 1990s, trade relations between Vietnam and the EAEU, including Russia, had a slow recovery and started to increase slightly. After Vietnam and the EAEU negotiated and signed a free trade agreement in 2015, the average growth rate of trade turnover was 15.1%, equivalent to a turnover of 4.15 billion USD compared to 1.41% or 2.79 billion USD in the period before and after the agreement. In which, Vietnam's export turnover to the EAEU increased by an average of 2.7%, equivalent to a turnover of US\$ 1.84 billion to 13.7%, equivalent to US\$ 2.42 billion. Men from the EAEU increased on average from 16.2% or 1.72 billion USD compared to a decrease of 1.16%, equivalent to 948.4 million USD of the period before and after the signing of the agreement.

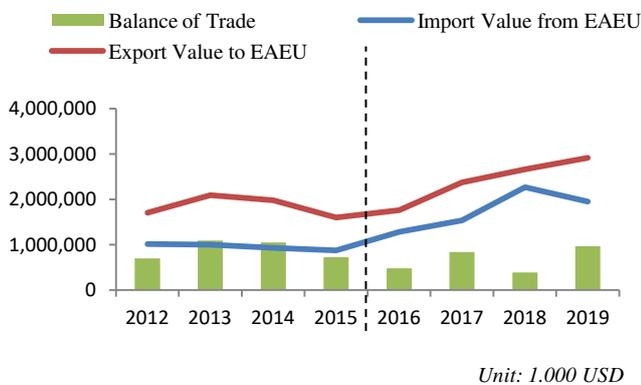


Figure 1. Trade between Vietnam and the Eurasian Economic Union
 Source: Author's calculations from ITC data – <http://www.trademap.org>

In 2019, export turnover between Vietnam and EAEU increased by 18.6% and 8.7% compared to 2017 and 2018 respectively, import turnover increased by 22.7% compared to 2017 but decreased compared to 2017 with 2018 being 14.9%. According to the Ministry of Industry and Trade (2020), bilateral trade between Vietnam and Eurasian countries is constantly developing, in 2019 two-way trade turnover reached 10.4 billion USD compared to 2018, accounting for 2 billion USD. % of Vietnam's total trade turnover with the world, of which trade turnover between Vietnam and the Eurasian economic union reached US\$4.85 billion, accounting for 46.6%. Vietnam's

import-export turnover is still very modest compared to the total trade turnover of about 1.4 trillion USD, equivalent to 0.5% market share, of countries in this region. In the context of the implementation of the Vietnam - EAEU FTA, making effective use of this FTA will be the driving force to further promote trade, industrial and investment cooperation between Vietnam and EAEU countries.

IV. MODEL AND METHODOLOGY

In Tinbergen's [39] basic model for trade between two countries (i and j), where F flows between the two countries (gravity), M is the size of the economy (measurement of equal to GDP or GNP) of each country, D is the distance between the two countries, G is a constant, expressed as follows:

$$F_{ij} = G \frac{M_i M_j}{D_{ij}} \tag{1}$$

To measure the distance between two countries, the studies use trade cost measures. [16], [2], [12] has measured the cost of trade by using variables such as the border effect in trade. The authors have shown that the cost of bilateral trade between two countries is affected by the cost of bilateral trade and the level of multilateral resistance. [2] pointed out that the multimodal resistance factors need to be empirically studied to avoid a biased estimate of the parameters in the model. Similarly, Matyas [24] suggested that bilateral trade flows should be estimated in three ways including time effects, fixed effects of exports and imports to avoid inconsistent model results caused by missing variables or unobserved variables. As time-varying multilateral resistance factors, [7] found that time-invariant fixed effects were insufficient to know the observations in the gravity model. They [7] followed the methods of [2] and extended the data series from cross-sectional to panel data to estimate time-fixed effects. To eliminate endogenous variables in the model derived from the FTA dummy, Baier and Bergstrand [7] used country-pair fixed effects in addition to the effects mentioned above to estimate the variable cost of trade. time to obtain unbiased estimates.

From studies on the impact of FTAs, in this study the author uses the model of [2]:

$$F_{ij} = \frac{Y_i Y_j}{Y_w} \left(\frac{T_{ij}}{P_i P_j} \right)^{1-\sigma} \tag{2}$$

Where F_{ij} is the trade volume between country i and country j. Y_i , Y_j and Y_w are the GDP of country i, j and world, respectively. The cost of trade between two countries is T_{ij} . P_i , P_j is the country's overall equilibrium price index i and j. And $\sigma > 1$ is the elasticity of substitution for all goods, showing that the cost of trade between two countries will have a negative effect on bilateral trade. However, based on previous empirical studies, it is not possible to collect aggregate equilibrium price index data P_i , P_j , so this study will consider these price indexes to be a random effect. random effects in the model.

From the general gravity model (2), the trade between countries i and j can be expressed as follows:

$$X_{ijt} = \alpha Y_{kt}^{\beta_1} Y_{lt}^{\beta_2} DIST_{kl}^{\beta_3} F_{hkl}^{\beta_4} \mu_{klt} \quad (3)$$

Where X_{ijt} is the trade flow or import-export turnover from country k to country l in year t . Y_{kt} is the GDP of country k in year t , Y_{lt} is the GDP of country l in year t , POP_{klt} is the population of country k , l in year t , $DIST_{kl}$ is the geographical distance between 2 countries k and l , F_{hkl} are other factors such as population, per capita income, exchange rate, tariffs and FTAs, etc. that can promote or restrict trade flows, μ_{klt} is a random variable

The gravity model formulated by [39] has been used by many studies, but lacking theoretical justification, studies have attempted to develop the economic theory of the gravity model. Further studies have extended the basic gravity model and added some suitable variables. Linnemann [21] added population as a proxy for market size, [34] measured the impact of exchange rate fluctuations. [22], [16] and [48] found the effect of average tariffs on bilateral trade. To assess the impact of the Vietnam - EAEU FTA on trade between Vietnam and EAEU countries through export and import turnover, the article selects a structural gravity model to analyze the impact of the FTA and economic factors affecting trade between two parties such as the study of [2], [30]. From equation (3) take the logarithm and rewrite it as follows:

$$\begin{aligned} EX_{klt} = & \beta_0 + \beta_1 \ln \ln (GDP_{Vnt} * GDP_{lt}) + \beta_2 \\ & \ln \ln (POP_{Vnt} * POP_{lt}) + \beta_3 \ln \ln INCGAP_{Vnt} + \beta_4 \\ & \ln \ln DIST_{Vnl} + \beta_5 FTA_{EAEU_{kl}} + \beta_6 \ln TAR_{klt} + \\ & \beta_7 \ln REER_{Vnt} + \varepsilon_{klt} \end{aligned} \quad (4)$$

$$\begin{aligned} IX_{klt} = & \beta_0 + \beta_1 \ln \ln (GDP_{Vnt} * GDP_{lt}) + \beta_2 \\ & \ln \ln (POP_{Vnt} * POP_{lt}) + \beta_3 \ln \ln INCGAP_{Vnt} + \beta_4 \\ & \ln \ln DIST_{Vnl} + \beta_5 FTA_{EAEU_{kl}} + \beta_6 \ln TAR_{klt} + \\ & \beta_7 \ln REER_{Vnt} + \varepsilon_{klt} \end{aligned} \quad (5)$$

Where:

Index k is of industry k .

l is the index of country l .

t is the time

EX_{klt} is the export turnover of industry k from Vietnam to country l in the year t .

IX_{klt} is the import turnover of industry k of Vietnam from country l in year t .

GDP_{Vnt} and GDP_{lt} is the gross domestic product of Vietnam to country l in year t .

POP_{Vnt} and POP_{lt} are the populations of Vietnam and country l in year t .

$\ln INCGAP_{Vnt}$ is the income difference per capita between Vietnam and its trading partners l .

$\ln DIST_{Vnl}$ is the distance from Vietnam to country l .

$REER_{Vnt}$ is the exchange rate the actual exchange rate between Vietnam and country l at time t .

TAR_{klt} is the tax rate of Vietnam applied to goods imported/exported from country l for goods k at time t .

$FTA_{EAEU_{kl}}$ is a dummy variable, measuring the impact of FTAs on exports and imports, takes the value equal to 1 if Vietnam and the EAEU have signed the agreement and comes into force, the value 0 otherwise.

For zero trade issue: A problem that has been recently discussed by many researchers in gravity modeling is how to deal with the "0s" in the dependent variable, specifically in bilateral trade between a given pair of countries. Statistical "0" values in trade can occur for a number of reasons such as: (i) rounding errors due to missing observations being incorrectly recorded as "0"; (ii) results of companies deciding not to export to a certain point, especially when dealing with trade data by industry, ect. To solve this problem, several methods have been tried such as: (1) convert the original model to a Log-Log model, trade flows with "0" or missing data will be excluded from the model's estimate; (2) Pseudo Poisson maximum probability estimate (PPML) proposed by Santos Silva and Fenreyro (2011). Assuming that the numbers "0" are the result of rounding errors and that the missing observations are misreported as "0", this approach however does not provide a truly accurate result; (3) implement the method of testing the two-step estimator Heckman model proposed by Helpman, including: Step 1, perform a probability regression model (probit) so that the import-export is positive. Step 2, perform regression estimation on positive import and export turnover based on 2 regression tools: (i) correction for selection bias, (ii) correction for heterogeneity of variables. The disadvantage of the model is that it is difficult to find the exclusion variable for the exogenous Probit model with commercial value and to keep

In the table data, the value "0" appears, according to the observed statistics collected, it is shown that in the list of imported or exported product codes, Vietnam does not always export or import all the products. the product to the EAEU countries. Therefore, to reduce the problem of trade to zero, the author builds the data instead of the product level, which is moved to the industry level. Vietnam's trade statistics with the EAEU are not evenly distributed by product level and by industry, so the study uses unbalanced tabular data.

In order to know the heterogeneity of all time-invariant and time-varying unobserved variables among trading partners, the indicative model form was estimated unbiased and consistent. First, we estimate equations (4), (5) by pooled OLS technique and remove individual country and time dummy variables from the model. The OLS estimate merely aggregates all available data, but it does not reveal differences between individual pairs of trading countries. To clarify the difference between countries in trade exchange, the author will estimate the above equation according to fixed effect method (FEM) and random effect method (REM). According to [14], the random effects model (REM) is more appropriate when estimating trade flows between randomly sampled samples of trading partners from a larger population. However, a fixed effect model (FEM) would be a better choice than REM when one is interested in estimating trade flows between predefined choices of countries. Since the sample of the study includes only the value of trade between Vietnam and the five EAEU countries, FEM is

likely the best estimate [7]. To determine whether the format of the estimation method is a fixed-effects model (FEM) or a random-effects model (REM), the author uses the Hausman Test to determine. In addition, the author will also estimate the model with strong variance selection (robust) to get better estimation results.

V. RESULTS AND DISCUSSION

A. Descriptive statistics

The trade data collected in this study is secondary data under the 2-digit industry code (HS2) between Vietnam and the EAEU countries (including Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia). The research data used are tabular data for goods classified by international and Vietnamese industry codes from code 1 to code 99 (from HS code to ISIC code). Trade data collected for 19 years (from 2001 to 2019) is used for quantitative model estimation, in which there are countries related to import and export of industries and there are countries that are not related, so the number of observations obtained is 5,386 observations forming an unbalanced repeating pattern. The total number of observations included in the quantitative research model is 5,386 observations. Data on import and export turnover, gross national income (GDP), per capita income, population, distance, tariffs and exchange rates are collected from the UNCTAD statistical database, WB Indicators, CEPII, WITS and Brugel, FTA data from WTO center of Vietnam Chamber of Commerce and Industry (<https://trungtamwto.vn/fta/174-da-ky-ket/1>).

TABLE 1. DESCRIPTIVE STATISTICS OF THE VARIABLES IN THE MODEL

Variables	Obs.	Mean	Std.	Min	Max
lnex	5,386	18.15	1.90	12.72	20.08
lnim	5,386	17.89	1.43	13.27	19.57
ln(GDPVnt, *GDPjt)	5,386	51.72	2.15	45.48	54.45
ln(POPVnt, *POPjt)	5,386	35.84	1.48	33.14	37.17
lnincgap	5,386	-1.57	0.50	-2.31	0.67
Indist	5,386	8.77	0.19	8.20	8.91
lnreer	5,386	6.81	2.14	3.28	11.57
Intarsimp	5,386	1.91	1.22	-3.91	4.81
FTA_EAEU	5,386	0.32	0.47	0.00	1.00

Source: Author's compilation from Stata 15.0 software

B. Regression analysis

Estimation results of structural gravity model (4), (5) with panel data are presented in Table 2 by fixed effect estimation method (FEM), and performed to estimate the corresponding strong variance (robust) in column (2). In which, columns (1) and (2) present the results of estimating the export and import equations in order to measure the impact of the agreement and the factors on Vietnam's import and export with countries in the EAEU. The author performed a Hausman test (Hausman test) to choose between FEM and REM models for the import-

export equation, the results show that Prob>chi2 are both less than 5%. Thus, the fixed-effects model (FEM) is suitable. At the same time, the author also conducted Wald test to show that Prob>chi2 is less than 5%, the model has variable variance phenomenon. To overcome this, the study performed estimation with strong variance (robust) to get better estimation results.

TABLE 2. MODEL ESTIMATION RESULTS BY FIXED EFFECTS METHOD (FEM), LOGARITHMIC DEPENDENT VARIABLE OF EXPORT AND IMPORT

Independent variables	Lnex		Lnim	
	FEM (1)	FEM (robust) (2)	FEM (1)	FEM (robust) (2)
ln(GDPVnt,*GDPjt)	0.488** *	0.488***	0.375** *	0.375***
	(0.002)	(0.002)	(0.003)	(0.004)
ln(POPVnt,*POPjt)	0.190** *	0.190***	0.671** *	0.671***
	(0.002)	(0.002)	(0.004)	(0.005)
lnincgap	- 0.443** *	-0.443***	- 0.692** *	-0.692***
	(0.008)	(0.013)	(0.014)	(0.027)
Indist	- 0.103** *	-0.103***	- 1.148** *	-1.148***
	(0.012)	(0.020)	(0.021)	(0.030)
FTA_EAEU	0.018** *	0.018**	0.211** *	0.211***
	(0.007)	(0.008)	(0.011)	(0.016)
Intarsimp	- 0.009** *	-0.009***	- 0.013** *	-0.013**
	(0.002)	(0.003)	(0.004)	(0.005)
lnreer	0.129** *	0.129***	0.221** *	0.221***
	(0.001)	(0.001)	(0.002)	(0.002)
Constant	16.593* **	16.593***	17.868* **	17.868***
	(0.100)	(0.183)	(0.172)	(0.270)
Hausman Test				
Chi2	29.53		31.86	
Prob>chi2	0.0001		0.000	
Wald test				
Chi2 (212)	7.1e+28		230,000	
Prob>chi2	0.0000		0.000	
Observations	4,230	4,230	4,230	4,230
R-squared	0.995	0.995	0.992	0.992
Number of products	212	212	212	212

Source: Author's compilation from Stata 15.0 software

Note: Standard errors in parentheses (p-values in parentheses): * p<.1, ** p<.05, *** p<.01, expressed at the 10%, 5% and 1% significance level, respectively

The estimated results are statistically significant and consistent with the hypotheses of the gravity model, the

model's R-squared index shows that it can explain the relationship between Vietnam's exports and imports with EAEU countries are 99.5% and 99.2% respectively, this relationship is similar to previous studies [22], [16], [2].

The coefficients of the explanatory variables in column (2) have similar results with column (1). In the two columns of the model results, the agreement has a positive impact on Vietnam's imports and exports to EAEU countries, increasing by 0.018% and 0.021% respectively compared to before the agreement. This result is also consistent with the predictions when Vietnam and the EAEU signed a free trade agreement to facilitate increased trade between the two sides, which also helped Vietnam to expand and access the EAEU market. The analysis of the effect of the agreement on the trade of member countries is also consistent with previous studies [2], [7], [15], [4].

In addition, according to the gravity model's hypothesis, distance is negatively related to trade flows between the two sides [39], [1], [2], [7], previous studies estimated the elasticity of trade by distance between -0.42 and -1.4. However, the coefficient of the distance variable depending on the country or a group of countries is the focus in particular studies. In this study, the coefficient of the distance variable between Vietnam and its EAEU partners is - 0.103 and - 1.148 and has statistical significance at 1%, showing that distance has an inverse relationship and has a positive effect. negative impact on Vietnam's import and export to the countries in the agreement. For variables of economy size (GDP), population (POP) of Vietnam and partner countries have a positive impact on Vietnam's exports. Specifically, with the statistical significance level of 1% of the variables of economic size and population, there is a positive correlation between Vietnam and the countries in the agreement.

The economic growth (GDP) of both Vietnam and the partner country increases Vietnam's exports to the partner country. This is completely consistent with international trade theory and gravity model related to economic growth, market access and size of partner market when participating in trade agreements. international.

For the variable of income per capita of Vietnam compared with partner countries, although it is statistically significant at 1%, the coefficient of this variable is - 0.44 and - 0.69 has a correlation. inversely related to the import and export turnover of Vietnam with the countries in the agreement. This shows that Vietnam is a middle-income country, lower than EAEU countries, so the level of economic development is still low, the level of specialization and labor productivity in industries in the economy is still low. low affects the import and export turnover of Vietnam in general.

The variables related to the factors of attractiveness or trade barriers including the variable tariff (tarsimp) and the exchange rate (reer) are statistically significant at 1%, the coefficient of the tarsimp variable is negatively correlated. With export turnover, it shows that a 1% tariff reduction according to the agreement's roadmap will increase Vietnam's export and import turnover to the countries in the agreement, which is also consistent with other studies. earlier by [22], [16], [4] on the relationship

of tariff liberalization leading to higher trade flows. When EAEU countries cut 1% tariffs on goods imported from Vietnam, it will make Vietnam's exports to the EAEU market 0.09% and imports increase 0.013%. Thus, it can be seen that the tariff reduction has increased Vietnam's imports and exports, but this increase is relatively low compared to other FTAs such as the EVFTA and CPTPP, the reduction of 1% of tariffs in each period. The agreement will increase Vietnam's exports to member countries by 1.69% and 0.016%, respectively [45], [46].

For the exchange rate variable (reer), the coefficient has a positive, which shows that Vietnam's stable exchange rate policy creates favorable conditions to promote exports to partner countries.

VI. CONCLUSION

The Vietnam - EAEU FTA is one of the important factors promoting trade in goods between Vietnam and the countries in the agreement. Import and export turnover between Vietnam and EAEU tends to increase after the agreement comes into effect in 2016, the average growth rate in the period after the agreement comes into force is higher than in the previous period, Vietnam's exports to the EAEU increased by 0.018% and imports from the EAEU increased by 0.021% compared to before the FTA. At the same time, the tariff reduction under the agreement also had a positive effect, specifically, reducing the tariff by 1% made Vietnam's exports to the countries in the agreement and EAEU increased by 0.009%, while the EAEU increased by 0.009%. With a 1% tariff reduction, Vietnam's imports from the EAEU and Russia are 0.013% respectively. Thus, it can be seen that the tariff reduction according to the roadmap of the agreement until 2019 has increased import and export or "created trade" between Vietnam and countries in the Eurasian economic union (EAEU).

Vietnam and EAEU countries need to take measures to promote bilateral trade within the framework of the Vietnam - EAEU free trade agreement. Up to now, this agreement has been implemented and is in the process of reducing tariff barriers, non-tariff barriers have contributed to increasing bilateral trade turnover in recent years and brought high efficiency. However, it is still not commensurate with the potential of cooperation between the two sides. Therefore, Vietnam and the EAEU countries continue to remove difficulties and facilitate trade, implement the roadmap according to commitments as well as adjust policies in line with the economic - political situation in the context of the current situation. new in the region and the world. At the same time, the two sides need to step up the production and export of products with comparative advantage in order to enjoy the incentives from the agreement. influence competition and complement each other to increase "trade creation". Vietnam needs to increase its scale and specialize in the production of products with comparative advantages such as textiles and garments, footwear, bags, seafood and wooden furniture, high-quality agricultural products, these are consumer products that the market cannot afford. EAEU schools are in great demand. In addition, the Vietnam - EAEU FTA has created a large and highly

liberalized market in trade exchange between the two sides, so Vietnam and EAEU countries need to have specific policies and regulations related to the trade. In particular, it is necessary to consider recognizing the conversion between the ruble and the Vietnamese dong as well as stabilizing the exchange rate in order to limit risks and promote trade exchange between Vietnam and EAEU countries. At the same time, Vietnam and the member countries of the Eurasian economic union further accelerated the process of reducing administrative tariffs and non-tariff barriers (tariff and non-tariff quotas), threshold safeguard) for goods and products in which the two sides have competitive advantages. Improve the competitiveness of Vietnamese goods when implementing the Vietnam - EAEU FTA by identifying advantageous and attractive products, creating favorable conditions for enterprises to invest in production. In international trade, both relative advantage, absolute advantage and competitive advantage must be considered. In regional and global production value chains, goods include not only end products, but also inputs, components and intermediate products. Thus, it can be affirmed that this agreement and the reduction of tariffs have a positive impact on the trade of the two sides.

REFERENCES

[1] Anderson, J. (1978), A Theoretical Foundation for the Gravity Model of Factor Flows (No. 85), Boston College Department of Economics.

[2] Anderson, J.E., and Van Wincoop. E. (2003), Gravity with gravitas: A solution to the border puzzle, *American Economic Review*, 93(1), pp 170 – 192.

[3] Athukorala, P.C. (2006), Trade policy reforms and the structure of protection in Vietnam, *World Economy*, 29(2), pp. 161 – 187.

[4] Adarov, A. and Ghodsi, M. (2020), The impact of the EAEU – Iran preferential Trade Agreement, Working Paper 179, The Vienna Institute for International Economic Studies.

[5] Bhagwati, J. and Srivinivasan, T.N. (2002), Trade and poverty in the poor countries, *American Economic Review*, No92(2), 180 – 183.

[6] Berg, M.A. & Krueger, A.O. (2003), Trade, growth and property: A selective survey, *International Monetary Fund*.

[7] Baier, S.L. & Bergstrand, J.H. (2009), Do Free Trade Agreements Actually Increase Members’ International trade?, *Journal of International Economics*, Vol.71, pp. 72-95.

[8] Baldwin, R., and Taglioni, D. (2006), Gravity for dummies and dummies for gravity equations, *National Bureau of Economic Research Working Paper No. 12516*.

[9] Carrere C. (2006), Revisiting the effect of regional trading agreements on trade flows with proper specification of the Gravity model, *European Economic Review*, No.50, pp.223 – 247.

[10] Cassing, J., Trewin, R., Vanzetti, D., Truong Dinh Tuyen, Nguyen Anh Duong, Le Quang Lan, Le Trieu Dung (2010), Impact assessment of Free Trade Agreement on Vietnam’s Economy, MUTRAP.

[11] Diao, X. & Somwaru, A. (2000), A Dynamic Evaluation of the Effects of A Free Trade Area of the Americas – An Intertemporal, Global General Equilibrium Model, *Journal of Economic Integration*, Vol. 16, No1, pp. 21 – 47.

[12] Deardoff, A. V. (2004), Local Comparative Advantage: Trade Costs and the Pattern of Trade, University of Michigan Research Seminar in International Economics, Working Paper No. 500

[13] Do, Tri Thai (2006), A gravity model for trade between Vietnam & twenty – three European countries, Doctor Department of Economics & Society, Dalarna University.

[14] Egger P. (2000), A Note on the Proper Econometric Specification of the Gravity Equation, *Economics Letters* Vol. 66 (1), pp.25-31.

[15] Evans D., M. Gasiorek, A. Ghoneim, P. M. Haynes, P. Holmes, L. Iacovone, K. Jackson, S. Iwanow, S Robinson and J. Rollo (2006), Assessing regional trade agreements with developing countries:

Shallow and Deep Integration, Trade, Productivity, and Economic Performance, University of Sussex Press, United Kingdom

[16] Feenstra, R.C. (2002), Border Effects and the Gravity Equation: Consistent Methods for Estimation, *Scottish Journal of Political Economy*, Volume 49, Issue 5, pp. 491 – 506.

[17] Fukao, K. Okubo, T. and Stern, R. M. (2003), An Econometric Analysis of Trade Diversion under NAFTA, *Research Seminar in International Economics*, The University of Michigan, Discussion Paper No.491

[18] Fedorov, N.V. (2018), The free trade agreement between the EAEU and Vietnam as a factor of Russia – Vietnamese relations, *Comparative Politics Russia*, No. 1, pp. 74-90.

[19] Krueger, A.O. (1997), Free Trade Agreements versus Customs Unions, *Journal of Development Economics*, 54(1), pp 169 – 187.

[20] Krugman, P.R. (2009), *International Economics: Theory and Policy*, 8/E: Pearson Education India.

[21] Linnemann, H. (1966), *An Econometric Study of International Trade Flows*, North – Holland Publishing, Netherland.

[22] Learner, E.E. (1988), Cross – section estimation of the effect of trade barriers, in Feenstra, R. (Ed): *Emperical Methods for International Trade*, The MIT Press, Cambridge.

[23] Leke, S.K. (2012), Economic integration and the internal governance of member states: A case study of CEMAC and Cameroon, University of Witwatersrand, Johannesburg, South Africa.

[24] Matyas, L., (1998), The gravity model: Some econometric considerations, *The World Economy*, 21 (3), pp. 397 – 401.

[25] Martínez-Zarzoso, I., Nowak-Lehmann, D. F. and Horsewood, N. (2009), Are Regional Trading Agreements Beneficial? Static and Dynamic Panel Gravity Models, *North American Journal of Economics and Finance*, Vol. 20 (1), pp. 46-65.

[26] MacMillan, M., Rodrik, D. & Verduzco – Gallo, I. (2014), Globalization, structural change, and productivity growth, with an update on Africa, *World Development*, Vol. 63 (1), pp 11 – 32.

[27] Nguyễn Tiến Dũng (2011), Tác động của khu vực thương mại tự do ASEAN – Hàn Quốc đến thương mại Việt Nam, *Tạp chí Khoa học ĐHQG Hà Nội, Kinh tế and Kinh doanh*, số 27, trang 219 – 331.

[28] Nguyen Hai Tho (2013), Determinants of Vietnam’s exports: A gravity Model approach, Master of Science in Finance and Economics, Martin De Tours School of Management and Economics.

[29] Hapsari, I.M and Mangunsong, C. (2006), Determinants of AFTA Members’ Trade Flows and Potential for Trade Diversion, Working Paper Series, No. 21, Asia-Pacific Research and Training Network on Trade (ARTNeT), Bangkok.

[30] Head, K. and Mayer, T. (2014), Gravity equations: Workhorse, Toolkit and Cookbook, In *handbook of International Economics*, Vol.4, pp. 131 – 195, Elsevier.

[31] Poyhonen (1963), P., A Tentative Model for the Volume of Trade Between Countries, *Welwirtschaftliches Archiv* 90, No 1, pp. 93 – 100.

[32] Plummer, M. G., Cheong, D., and Hamanaka, S. (2010), Methodology for Impact Assessment of Free Trade Agreements, Asian Development Bank (ADB).

[33] Riedel, J. (1997), The Vietnamese economy in the 1990s, *Asia – Pacific Economic Literature*, 11(2), pp. 58 – 65.

[34] Rojdi, S. (2006), Comesa Trade Potential: A Gravity Approach, *Applied Economics Letters*, Vol.13, No.14, pp. 947 – 951.

[35] Romalis, J., (2007), NAFTA’s and CUSFTA’s impact on international trade, *The Review of Economics and Statistics* (2007) 89 (3): pp.416-435.

[36] Ramstetter, E.D. & Phan, N.M. (2013), Productivity, ownership, and producer concentration in transition: Further evidence from Vietnamese manufacturing, *Journal of Asia Economics*, No 25, pp. 28 – 42.

[37] Santos – Paulino, A. & Thirlwall, A.P. (2004), The impact of trade liberalization on export, imports and the balance of payments of developing countries, *The Economic Journal*, 114 (493), 50 – 72.

[38] Santos Silva, J.M.C., Tenreiro, S. (2011), Further simulation evidence on the performance of the poisson pseudo-maximum likelihood estimator, *Economic Letters*, Vol. 112, pp. 220-222.

[39] Tinbergen (1962), J., *Shaping the World Economy: Suggestions for an International Economy Policy*, The Twentieth Century Fund, New York.

[40] Trần Văn Thọ (2002), AFTA in the Dynamic Perspective of Asia Trade, *Jeer Discussion Paper No 77*, Japan Center for Economic Research.

- [41] Tran, K.N. & Heo, Y. (2009), Impact of trade liberalization on employment in Vietnam: A system generalized method of moments estimation, *The Developing Economies*, 47(1), 81 – 103.
- [42] Thu, L.A, Fang, S. and Kessani, S.S (2019), Factors influencing Vietnam's handicraft export with the gravity model, *Journal of Economics and Development*, Vol.21, No.2, pp. 156 – 171.
- [43] Viner, J. (1950), *The Customs Union Issue*, New York: Carnegie Endowment for International Peace.
- [44] Vanzetti, D. and Pham, H.L (2006), Vietnam's Trade Policy Dilemmas, Paper presented at the The Ninth Annual Conference on Global Economic Analysis, Addis Ababa, Ethiopia
- [45] Vũ Thanh Hương (2017), Hiệp định thương mại tự do Việt Nam - EU: Tác động đối với thương mại giữa hai bên và hàm ý cho Việt Nam (Vietnam-EU Free Trade Agreement: Implications for two sides trade and effects for Vietnam). Luận án tiến sĩ kinh tế, Trường Đại học Kinh tế, ĐHQG – Hà Nội.
- [46] Van Su Ha and Hoi Le Quoc (2019), The impact of participation in the comprehensive and progressive trans – pacific partnership agreement on exports: The case of Vietnam, *Management Science Letters*, Vol.9, pp. 1269 – 1280.
- [47] Urata Shujiro and Okabe Misa (2007), The impacts of free trade agreements on trade flows: An application of the gravity model approach, *RIETI Discussion paper series 07 – E – 052*.
- [48] Wang, Q. (2001), Import – Reducing Effect of Trade Barriers: A cross – Country Investigation, *IMF Working Paper*, No. 1/216. Địa chỉ: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=880899 [Truy cập ngày 15/04/2019].

The impact of COVID-19 pandemic on logistics firms in Vietnam

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Abstract—The paper examines the impact of Coronavirus epidemic on logistics companies in Vietnam and firm responses. Results show that most firms are negatively affected by the pandemic, micro and small businesses are hit the hardest. Coping strategies of firms often involve COVID-prevention practices as required by the government with little investment on technological application and human resource development. Analysis concludes that Vietnamese logistics companies are not well-prepared for crises, especially firms of small sizes which partly show resistance to new digitalizing practices despite the current circumstances brought on by the pandemic.

Index Terms—logistics company, supply chain disruption, COVID-19 pandemic, crisis response

I. INTRODUCTION

THE ROLE of logistics and transportation firms in a supply chain involves moving, storing, and managing flow of goods through different channels. The COVID-19 pandemic has caused a severe disruption and makes it challenging for those firms to fulfill their role. In identifying logistics-relevant disasters, there are five external factors that affect logistics operations: infrastructure (such as port capacity or congestions), physical (such as poor weather conditions), socio-economic factors, government factors, and security factors (such as maritime piracy) [8]; these five factors are interconnected and exert a holistic impact on logistics activities. Similarly, the case of COVID-19 pandemic poses challenges to businesses due to a combination of different factors. Corona virus in the physical environment affects socio-economic factors regarding consumer behaviors [7], cross-border supply – demand [1], and business' supply chain management along with means of trade [8]. Policymakers are confronted with challenges in health care and unemployment, and in designing interventions to prevent economic shutdowns. Firms have to adapt to different situations mandated by the government (such as border close or temporary operation shutdowns) amidst the operational and financial struggles. Reduced opportunities for trade cause a strain on the performance of logistics and transportation companies. Many companies have to mitigate risks by diversifying their modes of logistics and transport such as warehousing, handling inventory, or freight forwarding [9]. In general, there is a lack of research on Vietnamese context despite the importance of logistics to economic development and the challenges logistics companies are encountering. There is also a scarcity of papers investigating logistics firms in COVID-19 pandemic. To contribute to understanding of how this global event have an impact on logistics companies, this paper will inspect the influence of the pandemic on Vietnamese logistics companies and how they respond to difficulties caused by the pandemic.

II. LITERATURE REVIEW

A. COVID-19 pandemic and global supply chain

The global interrelationship between firms, nations, and production networks has not always been in good situations in the last few decades. For example, the 2007/2008 financial breakdown that had an everlasting impact globally can be considered as a disastrous situation. The COVID-19 event can also be viewed as such a situation, but on a greater scale regarding its effect on the global supply chain and international trade. Publication by the World Trade Organization shows that COVID-19 pandemic caused an eleven-percent-decline in world merchandise trade for nearly the whole year of 2020 [14]. While this number is comparable to the decline caused by the 2007/2008 financial crisis, consequences caused by COVID-19 are more economically serious because foreign direct investment is hit the hardest—a key indicator of international production. Many investment plans are either deferred or blocked, greenfield projects are postponed, mergers and acquisitions are either cancelled or put on hold. The UN reported of the collapse of global foreign direct investment in 2020, reducing by 42% [12]. To put it simply, the corona virus has caused unprecedented global economic crisis, and global supply chain are at the heart of the crisis. Many claim that containment methods are the main reason for disruptions in the supply/value chain [3]. Regardless of domestic containment measures, purely external shocks (such as lockdown in other countries) explain for one third of overall reduction in gross domestic product of every country in total 64 examined countries across six continents [4]. Besides, the COVID-19 pandemic causes a demand shock, because businesses and individuals are cautious with purchases [2].

B. Impact of COVID-19 in Vietnamese context

The first cases of corona virus contraction in Vietnam were recorded in January 2020, the country quickly imposed containment measures such as tightening border control, visa restrictions, self-isolation, or compulsory quarantine [11]. The pandemic shock significantly deteriorates corporate profitability; real GDP growth of the country was reduced in the beginning of 2020 amid rising global uncertainties. Among the interest coverage ratio (ICR) across Vietnamese firms of different sectors to evaluate risk exposure caused by COVID-19, transportation has the highest risk. Before the pandemic, the cross-border trade of Vietnam had an average annual increase of at least 14-15%, resulting in a corresponding growth of logistics sector. However, since the beginning of 2020, the demand for logistics services has been significantly reduced. Trade activities between Vietnam and neigh-

boring countries (such as China, Laos, and Cambodia) have been congested; imports are reduced; orders from the US and Europe decrease, all of which negatively affect the manufacturing sector, logistics operation and transportation services [5]. The survey by Vietnam Logistics Association (VLA) shows that 20-50% of company members record declined revenues, where aviation, road and railway logistics are affected the most, especially during social isolation periods [13]. 80% of the members in VLA are small and medium businesses and suffer the most; many have to delay production; some even are at risks of closing if the pandemic prolongs. In the circumstances of changes brought on by the pandemic, the role of technology in enhancing performance and reducing risks is underlined more clearly. The industrial revolution 4.0 has transformed warehousing and distribution activities around the world. Logistics companies rapidly integrate technology in their operation by using modern and automated equipment to increase profitability and enhance operational effectiveness. However, most Vietnamese logistics firms are small and medium; and thus, are constrained in terms of capital, labor and technology [10] in order to get on that path. Furthermore, poor synchronous linkage between different stages of logistics activities makes it challenging for firms to satisfy customers in terms of cost [13]. Another common issue that affects the E-logistics transformation of businesses is poor quality of human resources in logistics companies; up to 95% of workers are not trained in logistics [13], and even more lack necessary technical skills.

This paper intends to identify the impact of Coronavirus pandemic on Vietnamese logistics companies and their responses, specifically examining firms' technological application in coping with difficulties brought on by the pandemic. The paper adopts the quantitative approach to facilitate a descriptive and analytic examination. A questionnaire was issued online in 2021 during the second wave of the pandemic where new variants of the Coronavirus started to be found, once again wreaking havoc worldwide. The questionnaire asked about the impact of the pandemic on firms' performance, their coping strategies and their application of technology in their responses. A total of 106 responses were sent back, all of them were valid for analysis. The data was analyzed using Statistical Package for the Social Sciences (SPSS) version 25.0 for Windows (SPSS Inc., Chicago, IL, USA). Descriptive analysis was run to summarize the characteristics of respondent firms, then identify the responses of firms in coping with the pandemic and their technological application in operation.

III. RESULTS

A. Firm characteristics

The survey was distributed to logistics companies in all regions but up to 77% of the respondents are from Northern of Vietnam, among which, the majority (64%) is in Hanoi City. The most common business type recorded in this survey is Vietnamese firms, with up to 95%, including state-owned and private companies. Regarding business size, 60% are small and medium businesses which have less than 200 employees, and 35% record a revenue of 150,000 – 2 million

USD in 2020. Table 1 shows details of respondents by different categories.

TABLE 1. CHARACTERISTICS OF STUDY POPULATION (N=106)

Characteristics	n	%
Location		
Hanoi City	68	64.2
HCM City	13	12.3
Northern Prov	18	17.0
Middle Prov	7	6.6
Business type		
State-owned	2	1.9
Vietnamese private	94	88.7
FDI enterprise	6	5.7
Business household	4	3.8
Employee size		
<10 employees	19	17.9
11-50 employees	33	31.1
51-200 employees	31	29.2
>200 employees	23	21.7
Revenue size		
<\$150K	24	22.6
\$150K-2mil	37	34.9
\$2mil-9mil	26	24.5
\$9mil-50mil	11	10.4
>\$50mil	8	7.5
Overall	106	100.0

The survey also asks about the types of services provided by logistics firms, and respondents can choose multiple options. Table 2 shows that road transportation, custom handling, and sea transportation are the most common services offered by respondent firms.

TABLE 2. SERVICE OFFERINGS

Services Frequencies

	Responses	
	N	Percent of Cases
Logistic Services ^a Sea transport	51	13.0% 48.1%
Air transport	43	11.0% 40.6%
Railway transport	17	4.3% 16.0%
Road transport	74	18.9% 69.8%
Express delivery	27	6.9% 25.5%
Warehousing	39	9.9% 36.8%
Custom	52	13.3% 49.1%
Loading	22	5.6% 20.8%
Verification	15	3.8% 14.2%
Direct delivery	21	5.4% 19.8%
Others	31	7.9% 29.2%
Total	392	100.0% 369.8%

a. Dichotomy group tabulated at value 1.

B. Impact of COVID-19 pandemic

82% of firms responded that their companies were negatively affected by the Coronavirus, 12% stated no impact,

and only 5% recognized positive impact. Despite that, 62% of firms are still operating but project a declined performance. Up to 75% of surveyed companies estimate a decrease in revenue, 24% report either unchanged or increased revenues. Table 3 showed further details on how Vietnamese logistics companies are affected by the global pandemic.

TABLE 3. IMPACT OF COVID-19 ON LOGISTICS FIRMS

COVID-19 impact	n	%
General impact		
Positive impact	6	5.7
Negative impact	87	82.1
No impact	13	12.3
Disruption estimate		
Within 2 weeks	10	9.4
Within 4 weeks	3	2.8
1-3 months	7	6.6
3-6 months	2	1.9
Unable to evaluate	18	17.0
Still operating	66	62.3
Projected revenue		
Decrease <25%	25	23.6
Decrease 25-50%	37	34.9
Decrease >50%	18	17.0
Unchanged	11	10.4
Increase <20%	10	9.4
Increase >20%	5	4.7
Overall	106	100.0

Regarding the reasons for possible stop in operation, supply chain disruption accounts for around 12%, and voluntary stop due to pandemic risks make up the largest proportion (Table 4). By location, government mandate affects logistics

companies in Northern region (including Hanoi City) the most.

C. Firm responses to the pandemic

Firms have different ways to adapt to changes brought by the pandemic. Results in Table 5 showed that most firms adopt new ways of doing things (such as adapting to changes in clients' needs) (28%), digitalize business activities (26%), and other activities (26%) in accordance with Covid-handling practices suggested by the government such as following safety mandate (mask-wearing, etc.) and educating employees about the pandemic.

TABLE 5. FIRM RESPONSES TO COVID-19

\$Response Frequencies

Coping Strategies ^a	New practices	Responses		Percent of Cases
		N	Percent	
	Digitalization	90	27.9%	84.9%
	Training	21	6.5%	19.8%
	Employee Support	43	13.3%	40.6%
	Covid response	86	26.6%	81.1%
Total		323	100.0%	304.7%

a. Dichotomy group tabulated at value 1.

D. Technological implementation

Regarding the use of technology in business operation. 40% of firms have integrated technology in their business before the pandemic happened, 17% started apply technology when the pandemic began, 22% are preparing to use, but there are still up to 20% of firms expressed no interest in

TABLE 4. CAUSES OF OPERATIONAL DISRUPTION

Causes		Location									
		Hanoi City		HCM City		Northern Prov		Middle Prov		Row Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
Voluntary stop		8	44.4%	2	11.1%	2	11.1%	6	33.3%	18	100.0%
Contraction		6	66.7%	1	11.1%	2	22.2%	0	0.0%	9	100.0%
Mandate		3	75.0%	0	0.0%	1	25.0%	0	0.0%	4	100.0%
SCM disruption		8	61.5%	2	15.4%	2	15.4%	1	7.7%	13	100.0%
Still operating		43	69.4%	8	12.9%	11	17.7%	0	0.0%	62	100.0%
Row Total		68	64.2%	13	12.3%	18	17.0%	7	6.6%	106	100.0%

logistic technology at all. Table 5 below further shows the types of technology that firms believe that can help them to overcome obstacles caused by COVID-19. Generally, technologies that assist in order management activities (such as order management system, transport management system, delivery management system) are viewed as the most useful.

TABLE 6. LOGISTICS TECHNOLOGIES

	Responses		Percent of Cases
	N	Percent	
Type ^a Smart logistics	35	7.9%	33.3%
Green logistics	14	3.2%	13.3%
Commerce logistics	19	4.3%	18.1%
E-commerce	42	9.5%	40.0%
Cloud logistics	13	2.9%	12.4%
Tracking	24	5.4%	22.9%
Delivery mgt	44	9.9%	41.9%
Order mgt	50	11.3%	47.6%
HR mgt	36	8.1%	34.3%
Warehouse mgt	34	7.7%	32.4%
EDI	17	3.8%	16.2%
Transport mgt	46	10.4%	43.8%
Custom	42	9.5%	40.0%
Barcode	21	4.7%	20.0%
Radio wave	6	1.4%	5.7%
Total	443	100.0%	421.9%

a. Dichotomy group tabulated at value 1.

IV. DISCUSSION

The prolonged pandemic has caused a negative impact on the majority of logistics firms, and very few firms benefiting from this event. This is confirmed with the findings in previous section, which shows that more than 80% of firms realize a negative impact from COVID-19 and 75% record a loss. Firms of all sizes are affected negatively by the pandemic; however, closer inspection shows that micro and small businesses record much bigger loss compared to medium and big firms. In fact, a proportion of medium and large businesses even recognize an increase in revenues. Moreover, percentage of medium and large firms in operation during the pandemic is larger than the number of smaller firms. Notably, micro and small businesses seem more likely to be unable to evaluate how long their business operation is halted, which implies a big risk of failures. Medium and large businesses have the resources to withstand the difficulties; furthermore, results show that the more revenues the companies have, the more ready they are in terms of technological application, which further assists them in time of crises. All of the firms which realize an over-twenty-percent-increase in revenue during the pandemic reported that they had integrated technology in business activities long before. Even though quite many firms are either preparing to apply technology or having started technological application since the pandemic, there is still a significant proportion of small firms showing no intention of getting on this trend. Responses of logistics firms during the pandemic in Vietnam focuses on adapting to changes in customers' demand and to changes to virus-prevention prac-

tices. It is also note-worthy that very few firms spent efforts on training employees in adaptation to changes in the workplace brought on by the pandemic, this would reduce the effectiveness of new practices when employees are not educated on how to.

V. CONCLUSION

Logistics firms in Vietnam are not well-prepared for turbulent environment, many act when the situation forces them to do so; and even then, some refuse to change the old ways of working. If businesses do not innovate to adapt to the environment, eventually, they will be driven out of the market. The paper brings attention to the need to invest in technology and human resources, both of which are crucial in helping the firms overcome obstacles. Despite the contribution to the underdeveloped literature on logistics of emerging countries and discussion of the currently sought-after topics related to Coronavirus epidemic, the paper has a limitation of small population. Larger sample would be more helpful in exploring the interplay between firm characteristics, their coping strategies, and their effectiveness in response to crises.

As there is currently a lack of research on logistics firms in Vietnam, future work should investigate business nature of logistics firms in Vietnam, their performances as well as important aspects of their operation such as strategic management, human resource management, and logistics technology.

REFERENCES

- [1] Apfalter, S., Hommes, M., Pereira Mendes, M., & Toba, N. (2020). *Lessons for electric utilities from COVID-19 responses in emerging markets*. Retrieved from <https://openknowledge.worldbank.org/handle/10986/34854>
- [2] Baldwin, R., & Freeman, R. (2020). Supply chain contagion waves: Thinking ahead on manufacturing 'contagion and reinfection' from the COVID concussion. <https://voxeu.org/article/covid-concussion-and-supply-chain-contagion-waves>
- [3] Baldwin, R., & Weder di Mauro, B. (2020). Economics in the time of COVID-19. <https://voxeu.org/article/economics-time-covid-19-new-ebook>
- [4] Bonadino, B., Huo, Z., Levchenko, A., & Pandalai-Nayar, N. (2020, June). The role of supply chains in the COVID-19 pandemic and beyond. <https://iap.unido.org/articles/role-global-supply-chains-covid-19-pandemic-and-beyond>
- [5] Bui, B. N. (2020). Solutions and international experience in dealing with the Covid-19 pandemic in Logistics Activities and Vietnam's Border Trade. *Proceedings of International Conference: The Impact of COVID-19 in Vietnam*, pp 81-95.
- [6] Dimakou, O., Romero, M. J., & Van Waeyenberge, E. (2020). Never let a pandemic go to waste: Turbocharging the private sector for development at the World Bank. *Canadian Journal of Development Studies/Revue Canadienne d'études Du Développement*, 42(1-2), 221-237.
- [7] Thilo Kroeger ; Anh Thi Ngoc Nguyen ; Yuanyan Sophia Zhang ; Pham Dinh Thuy ; Nguyen Huy Minh ; Duong Danh Tuan (2021). Corporate Vulnerabilities in Vietnam and Implications of COVID-19. IMF Working Paper. <https://www.imf.org/en/Publications/WP/Issues/2020/11/20/Corporate-Vulnerabilities-in-Vietnam-and-Implications-of-COVID-19-49893>
- [8] L'Hermitte, C., Tatham, P., & Bowles, M. (2014). Classifying logistics-relevant disasters: Conceptual model and empirical illustration. *Journal of Humanitarian Logistics and Supply Chain Management*, 4(2), 155-178.
- [9] Singh, S., Kumar, R., Panchal, R., & Tiwari, M. K. (2021). Impact of COVID-19 on logistics systems and disruptions in food supply chain. *International Journal of Production Research*, 59(7), 1993-2008. <https://doi.org/10.1080/00207543.2020.1792000>

- [10] Tue My (2021). e-Logistics: Challenges for businesses to adopt technology (Doanh nghiệp con gian nan de chuyen doi so). VNEconomy. Available at: <https://vneconomy.vn/e-logistics-doanh-nghiep-con-gian-nan-de-chuyen-doi-so.htm>
- [11] United Nations (2020). COVID-19 Socio-economic response plan for Vietnam. Available at: https://unsdg.un.org/sites/default/files/2020-10/VNM_Socioeconomic-Response-Plan_2020.pdf
- [12] UNCTAD (2021). Investment Trends Monitor. Issue 38. Available at: https://unctad.org/system/files/official-document/diaeiainf2021d1_en.pdf
- [13] Vietnam Logistics Association (2021). Available at: <https://www.vla.com.vn/hiep-hoi-doanh-nghiep-dich-vu-logistics-15-doanh-nghiep-mat-50-doanh-thu-50-doanh-nghiep-giam-manh-so-luong-dich-vu-so-voi-cung-ky.html>
- [14] WTO (2021). How COVID-19 is changing the world: a statistical perspective – Volume III. Available at: https://www.wto.org/english/tratop_e/covid19_e/ccsa_publication_vol3_e.pdf

An Investigation Into Movement of Advertising Expenditure Of India in the Backdrop of Covid-19

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Abstract—The purpose of this paper is to examine the relationship between GDP growth rate and growth rate of advertising expenditure and to analyze the advertising expenditure in different media with special focus on 2020 pandemic period. Secondary data was used for this study which was obtained from Economic survey 2020-21, Pitch Madison Report 2021 and Pitch Madison Advertising Report 2020. It was found that advertising expenditure moved in tandem with GDP and different media had experienced a major change in their share in total advertising expenditure. The study estimate an increase in advertising expenditure with growth in GDP in future.

Index Terms—Advertising expenditure, GDP, advertising media.

I. INTRODUCTION

ADVERTISING expenditures move in tandem with economic growth of a country. Advertising expenditure is an aggregate of the advertising demand in an economy. According to microeconomic theory the demand in an economy increases with an increase in the income level of that economy. In this era of competition, in order to increase their revenue and the total share in the economic pie the companies try to increase their customer base. For this purpose companies employ various techniques and advertising is one of them.

In macroeconomics the economic growth of an economy is usually measured in terms of Gross Domestic Product (GDP). According to IMF, “GDP measures the monetary value of final goods and services—that is, those that are bought by the final user—produced in a country in a given period of time (say a quarter or a year). It counts all of the output generated within the borders of a country”. Before 1990 GNP (Gross National Product) was used as the measure to estimate the economic growth of an economy. According to IMF, “GNP counts all the output of the residents of a country”. In the realm of globalisation when all the economies of the world are becoming one the distinction between products produced within a country (GDP) and products produced “by” a country (GNP) becomes important. The current study used GDP as an economic indicator as the focus is on advertising expenditures done within a country as a whole rather than advertising expenditures done by persons of a country.

II. LITERATURE REVIEW

According to [1] there is a positive relationship between GDP growth rate and advertising expenditures. [2] found that advertising expenditure and GNP moves closely with each other.

[3] studied the relationship between Gross National Product (GNP) and advertising expenditure in years from 1961 to 1983. The results showed that there is no perfect fit between the two in the examined years. According to [4] a strong relationship was observed between economic activity of a country and its advertising expenditure.

[5] observed that in Britain companies decide their advertising budget on the basis of the affordability of the consumers in a year and the percentage of expected sales. The use of these two factors in deciding the advertising budget to some extent explain the relationship between growth of an economy and advertising budget.

[6] found that at the time of recession in an economy the share of magazine in advertising expenditure decreases. While [7] found that at the time of recession the general relationship between GDP and advertising expenditure is not witnessed properly rather this relationship becomes quite weaker than the normal years.

No confirmed pattern is observed between the GDP growth rate and advertising expenditure when an economy is going under recession. According to [6] the advertising expenditure are quite postponable and thus are reduced at the time of recession. [8] also supported this view as advertising expenditure can be adjusted within less time as compared to other fixed and running cost. [9] found that at the time of recession different industries respond differently and that is the reason why some companies increase their advertising expenditure at the time of recession.

According to [7] recession in an economy affects print and OOH media more than TV, radio and cinema. According to [10] retail and classified advertising are most affected by the state of an economy. [11] stated that such advertisement are usually found in newspaper and thus newspaper get strongly affected by the downfall in an economy.

According to [12] magazines are more susceptible to recession as they cater niche audience and their demand for magazine reduces during recession. [13] found out that advertisement in TV are less sensitive to recession.

[14] found that outdoor advertising, magazine and newspaper advertising are affected by the macroeconomic development both during growth as well as recession time period. It was also found that advertising expenditure in TV and cinema are almost unaffected by the macroeconomic factors. On the basis of above two findings increasing gap between TV advertising expenditure and newspaper advertising expenditure can be explained.

III. PROPOSED WORK

The objective of this study is to:

- Analyze the relationship between GDP growth rate of India and growth rate of advertising expenditure of India over the last 9 years.
- Analyze the advertising expenditure in different media over the last 7 years with special focus on 2020 pandemic period.

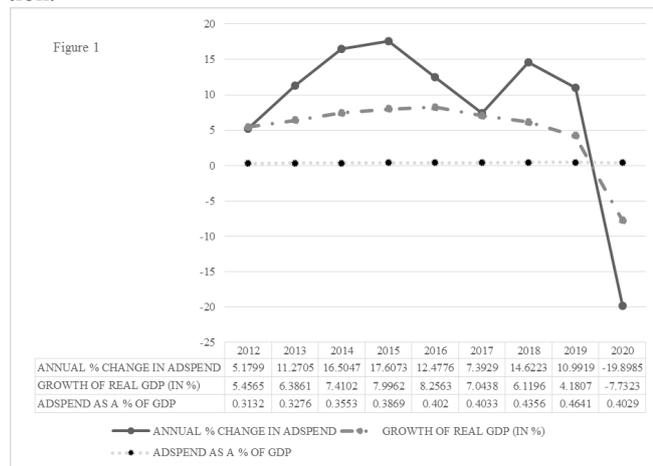
The data has been obtained from [15]; [16]; [17].

IV. RESULT AND DISCUSSION

A. Relationship between GDP growth rate and growth rate of advertising expenditure

The analysis of relationship between GDP growth rate and growth rate of advertising expenditure (Fig. 1) shows that whenever the GDP growth rate is more than 7% the advertising expenditure experiences growth of more than twice the growth of GDP. The analysis also shows that the advertising expenditure (Adspend) as a proportion of GDP has remained almost constant over the past nine years.

[15] has projected a growth of 11% in the real GDP of India in the year 2021-22. Even [18] has projected a growth of 11.5% in the real GDP of India in 2021-22. These projections are supported by the government commitment to vaccinate the whole population by December 2021 so that all economic activities can fall in line and come back to normalization.



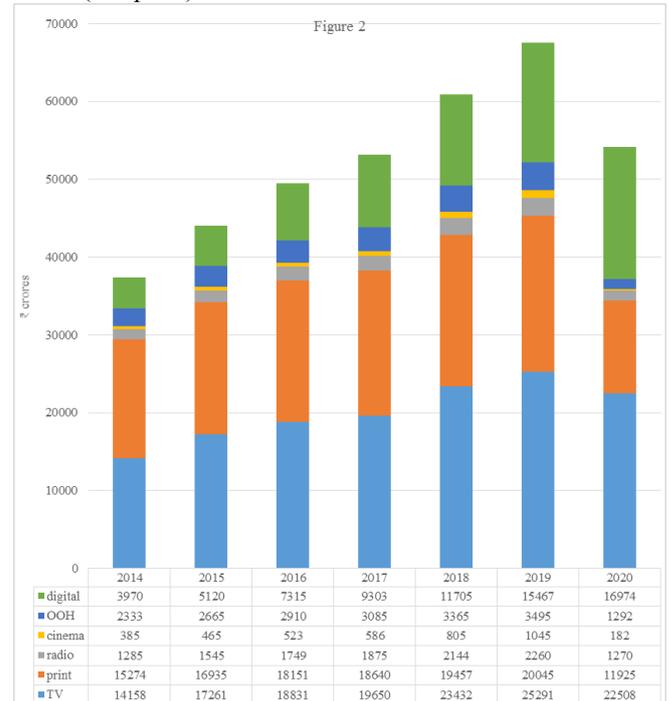
Source of data: Economic Survey 2020-21 Statistical Appendix; Pitch Madison Report 2021

Fig.1. Annual percentage change in advertising expenditure (Adspend) of India, growth in Indian real GDP at constant price, and advertising expenditure (Adspend) as a percentage of GDP

The current year budget has allocated more funds to health, infrastructure (especially rural infrastructure) and agriculture sector. This increase in expenditure by government in these sectors will lead to increase in employment and thus the consumption expenditure by the public. Because of increase in consumption expenditure the demand will increase. A higher level of aggregate demand will lead to more output, income and employment in future. Thus, on the basis of these estimates and government policies and expenditure plan for 2021-22 a growth rate of more than 22% can be expected in advertising expenditure in 2021-22.

B. Advertising expenditure in different media

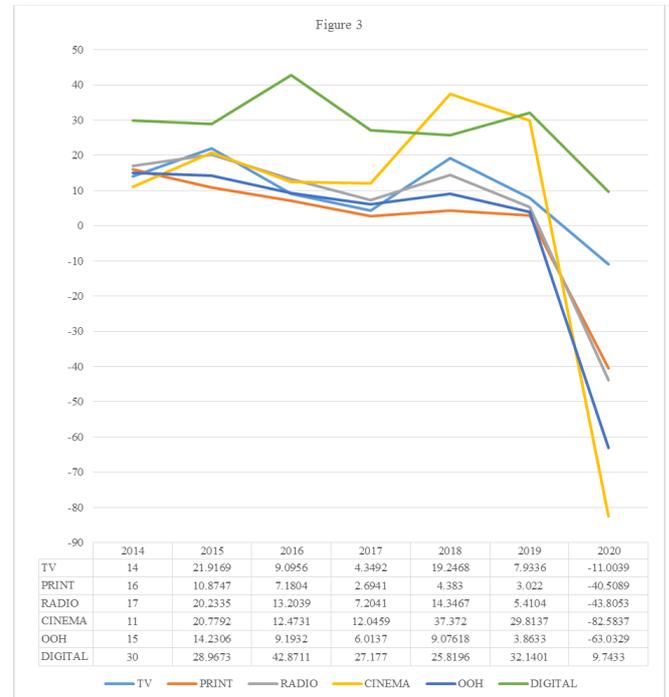
For this study, data has been collected from [16], [17]. The below figure (Fig. 2) shows the year wise advertising expenditure (Adspend) in different media in India.



Source: Pitch Madison Report 2021, Pitch Madison Advertising Report 2020

Fig. 2. Adspend in different media in India

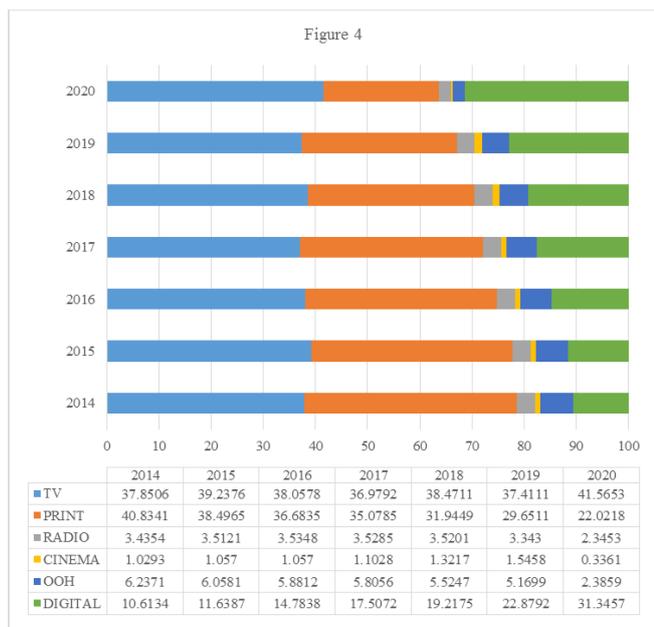
The below figure (Fig. 3) shows the year wise growth in advertising expenditure (Adspend) in different media in India.



Source: Pitch Madison Report 2021, Pitch Madison Advertising Report 2020

Fig. 3. Adspend growth in different media in India

The below figure (Fig. 4) shows the proportion of different media in total advertising expenditure (Adspend) each year.



Source: Pitch Madison Report 2021, Pitch Madison Advertising Report 2020

Fig. 4. Percentage of different media in total advertising expenditure

1) Advertising expenditure in TV media

The analysis of above three figures (Fig. 2, 3 and 4) show that advertising expenditure in TV has been growing continuously over the past years but growth rate has always been volatile. This volatility reached its bottom in the year 2020 when this media experience negative growth rate though it still remain a media with maximum share in total advertising expenditure. The reason for such trend during Covid-19 time can be understood through quarter-wise advertising expenditure which is given in Table 1.

TABLE 1: ADVERTISING EXPENDITURE IN TV MEDIA BY QUARTERS (Q1, Q2, Q3, Q4) (IN CRORES)

Period	Q1	Q2	Q3	Q4	TOTAL
Year 2018	5615 (24%)	6275 (27%)	5412 (23%)	6130 (26%)	23432 (100%)
Growth %		11.75%	-13.75%	13.27%	
Year 2019	5384 (21%)	8815 (35%)	5315 (21%)	5777 (23%)	25291 (100%)
Growth %	-12.17%	63.73%	-39.71%	8.69%	
Year 2020	4661 (21%)	3423 (15%)	5421 (24%)	9004 (40%)	22508 (100%)
Growth %	-19.32%	-26.56%	58.37%	66.09%	
Growth % (19/18)	-4%	40%	-2%	-6%	8%
Growth % (20/19)	-13%	-61%	2%	56%	-11%

Source: Pitch Madison Report 2021

The first quarter shows a negative growth rate and the previous year data shows the same trend. The nationwide lockdown was announced in the end of first quarter because of which shooting of programs stopped and many of the television channels which show daily soap had no new content to air. As a result their viewers decreased and they lost their attractiveness as advertising media. The Doordarshan decision to re-telecast 11 cult classics provided a ray of hope to the other channels and they followed the suit. Moreover, news channels also provided a support in this area as their viewership increased. Broadcasting channels also increased the

rates of advertisement slots because of which expenditure data shows decent amount with less number of advertisements. Because of all these reasons the advertisement expenditure do fall in second quarter but it re-gained in third quarter. The third quarter experienced 58% growth in advertising expenditure. Third quarter also witnessed repositioning of several products like e-commerce sites, FMCG products, learning applications etc. Then the fourth quarter broke all the records with all-time high in last twelve quarters because of IPL.

The journey of advertising expenditure in 2020 can be summarized as: the demand for certain products increased all of a sudden (like soap, hand sanitizer, cleaner, etc.) while the demand for some of the products plummeted (like travel and tourism, etc.) so the companies formulated their strategies in second quarter whose results can be seen in third quarter and then IPL gave boost in fourth quarter.

2) Advertising expenditure in print media

The analysis of figure 2, 3 and 4 show that advertising expenditure in print has been increasing at a decreasing rate over the past years and it finally experienced negative growth rate in 2020 and slipped to rank third in its share in total advertising expenditure. The reason for such trend during Covid-19 time can be understood through quarter-wise advertising expenditure which is given in Table 2.

TABLE 2: ADVERTISING EXPENDITURE IN PRINT MEDIA BY QUARTERS (Q1, Q2, Q3, Q4) (IN CRORES)

Period	Q1	Q2	Q3	Q4	TOTAL
Year 2018	4155 (21%)	4934 (25%)	4901 (25%)	5466 (28%)	19457 (100%)
Growth%		18.77%	-0.66%	15.16%	
Year 2019	4867 (24%)	5830 (29%)	4493 (22%)	4855 (24%)	20045 (100%)
Growth%	-	19.79%	-22.93%	8.06%	
Year 2020	4020 (34%)	1217 (10%)	2583 (22%)	4105 (34%)	11925 (100%)
Growth%	-	-69.73%	112.24%	58.9%	
Growth % (19/18)	17%	18%	-8%	-11%	3%
Growth % (20/19)	-17%	-79%	-43%	-15%	-41%

Source: Pitch Madison Report 2021

Print media circulation became difficult owing to the restricted movement because of nationwide lockdown. As a result print media lost its attractiveness as an advertising media and has not gained it fully even in the last quarter of 2020. Out of four quarters of 2020 advertising expenditure is maximum in fourth quarter but it is still lower that the advertising expenditure in the quarters of past two years. In order to regain its share print media offered attractive rates but in vain as unhindered movement has not been ensured and the companies remained skeptical about it. Moreover, circulation of print media had faced hit more in metros as compared to other areas because Covid-19 positive cases surged more in metros.

Overall print media had witness a downfall in 2020 but if one look at the deep roots of print media in Indian society one can't doubt the spring.

3) Advertising expenditure in radio media

The analysis of figure 2, 3 and 4 show that advertising expenditure in radio has been continuously increasing over the past years but growth rate has always been volatile. It experienced a negative growth rate in 2020 and dropped back to 2014. The reason for such trend during Covid-19 time can be understood through quarter-wise advertising expenditure which is given in Table 3.

TABLE 3: ADVERTISING EXPENDITURE IN RADIO MEDIA BY QUARTERS (Q1, Q2, Q3, Q4) (IN CRORES)

Period	Q1	Q2	Q3	Q4	TOTAL
Year 2018	473 (22%)	529 (25%)	569 (27%)	573 (27%)	2144 (100%)
Growth %		11.83%	7.56%	0.70%	
Year 2019	615 (27%)	566 (25%)	548 (24%)	531 (23%)	2260 (100%)
Growth%	7.33%	-7.97%	-3.18%	-3.1%	
Year 2020	497 (39%)	71 (6%)	260 (20%)	441 (35%)	1270 (100%)
Growth%	-6.4%	-85.71%	266.2%	69.62%	
Growth% (19/18)	30%	7%	-4%	-7%	5%
Growth% (20/19)	-19%	-87%	-52%	-17%	-44%

Source: Pitch Madison Report 2021

Though radio had seen an increase in listeners in 2020 but still experienced a downfall in advertising expenditure. The advertising expenditure fall sharply by more than 80% in second quarter but it started to recover after that, though didn't fully. The reason for this shift in second and third quarter can be because of the time taken by the companies in strategy formulation. On comparing quarter wise data of radio with other media it can be seen that the recovery is quite slow in radio. It shows that the strategy adopted by the companies is to prudentially use the available funds by focusing more on demonstration techniques through TV and digital media than the visualization techniques through radio.

4) Advertising expenditure in cinema media

The analysis of figure 2, 3 and 4 show that advertising expenditure in cinema has been increasing over the past years but plummeted in 2020. Figure 2 shows that the advertising expenditure had fallen back to years even before 2014. When considered from the side of growth percentage it is the most suffered media with a fall of more than 80% (figure 3). It is evident from figure 4 that its share in the total advertising expenditure was continuously increasing at an increasing rate but it fall to 0.3% in 2020. The reason for such downfall is the closure of cinema during Covid-19 lockdown. Though in most states cinemas were allowed to open in last quarter but at restricted capacity. So this had not really helped much as it provided less exposure opportunity to the companies and thus remained least attractive for them.

5) Advertising expenditure in OOH media

The analysis of figure 2, 3 and 4 show that advertising expenditure in OOH has been increasing at a decreasing rate

over the past years and it finally experienced negative growth rate in 2020. For detailed analysis quarter-wise advertising expenditure can be seen which is given in Table 4.

TABLE 4: ADVERTISING EXPENDITURE IN OOH MEDIA BY QUARTERS (Q1, Q2, Q3, Q4) (IN CRORES)

Period	Q1	Q2	Q3	Q4	TOTAL
Year 2018	813 (24%)	803 (24%)	929 (28%)	820 (24%)	3365 (100%)
Growth %		-1.23%	15.69%	-11.73%	
Year 2019	862 (25%)	844 (24%)	978 (28%)	811 (23%)	3495 (100%)
Growth %	5.12%	-2.09%	15.88%	-17.08%	
Year 2020	753 (58%)	8 (1%)	99 (8%)	432 (33%)	1292 (100%)
Growth %	-7.15%	-98.94%	1137.5%	336.36%	
Growth% (19/18)	6%	5%	5%	-1%	4%
Growth% (20/19)	-13%	-99%	-90%	-47%	-63%

Source: Pitch Madison Report 2021

Table 4 shows that advertising expenditure in second quarter crashed with only ₹8 crore expenditure. On-road movement was restricted, airports, metros were not providing services so the exposure in OOH media was around to nil so companies don't wish to put their money in this media advertisement. Even when some movement was allowed the companies still remain skeptical about OOH media that is why even in fourth quarter the advertising expenditure is not more than half of the expenditure in any of the quarter of previous two years.

6) Advertising expenditure in digital media

The analysis of figure 2, 3 and 4 show that digital media has come out as the winner of the game. All media whether their proportion in total advertising expenditure has increased or decreased has suffered a negative growth in 2020 but digital media is the only one which experienced positive growth rate. For detailed analysis quarter-wise advertising expenditure can be seen which is given in Table 5.

TABLE 5: ADVERTISING EXPENDITURE IN DIGITAL MEDIA BY QUARTERS (Q1, Q2, Q3, Q4) (IN CRORES)

Period	Q1	Q2	Q3	Q4	TOTAL
Year 2018	3043 (26%)	2341 (20%)	2224 (19%)	4097 (35%)	11705 (100%)
Growth %		-	-5%	84.22%	
		23.07%			
Year 2019	3867 (25%)	3093 (20%)	3403 (22%)	5104 (33%)	15467 (100%)
Growth %	-5.61%	-	10.02%	50%	
		20.02%			
Year 2020	4467 (26%)	2005 (12%)	4206 (25%)	6296 (37%)	16974 (100%)
Growth %	-	-	109.78%	49.69%	
	12.48%	55.12%			
Growth% (19/18)	27%	32%	53%	25%	32%
Growth% (20/19)	16%	-35%	24%	23%	10%

Source: Pitch Madison Report 2021

Table 5 shows that digital media do get affected in second quarter but it responded and jumped back in next quarters and attain an overall positive growth rate in the year. The fall in second quarter can be seen as a result of adjustment and strategy formulation time. Because of lockdown when the cinema was closed and TV was less attractive the viewers get shifted to OTT platform. For shopping e-commerce websites gain preference due to restricted movements. That's why the growth in third and fourth quarter can be associated with the increase in advertisement on OTT platform, online videos, shopping platforms and digital news platforms. Perforation of mobile internet into rural areas has also supported growth of digital media.

V. CONCLUSION AND FUTURE WORK

Advertising expenditure is responsive to the economic growth of India and shows a trend according to which a boom in advertising industry is expected in future. All the media respond differently to the change in economy. The choice of media during Covid time is more affected by the current situation than the economic growth as can be seen in the case of print, cinema and OOH. As the exposure rate in print, cinema and OOH decreases their attractiveness as a media of advertisement also decreases. Similarly the advertising expenditure in TV and digital media have increased because the exposure rate in these media has increased because of increase in viewership and users. Radio seems to be affected by the economic changes only as it shows fall in advertising expenditure despite of increase in number of listeners.

The current research tries to find out the impact of Covid 19 on advertising expenditure in India and for this a trend has been studied which includes previous years immediately preceding Covid 19 years and Covid 19 years. It was found that during Covid 19 economy faced a fall in percentage growth of real GDP and some types of advertising media become less important than the other media. So in order to better understand the trends in advertising spending further study can be conducted to find out the factors which influence companies' decision to choose advertising media during such period because it was found in the current study that even with the increase in number of listeners over radio the advertising expenditure on this media still decreased. The current study is limited to India. Further research can be done on cross-country data and on different groups of countries to better understand the trends and determinants of advertising expenditure

REFERENCES

- [1] B. Chang and S. Chan-Olmsted, "Relative Constancy of Advertising Spending", *Gazette (Leiden, Netherlands)*, vol. 67, no. 4, pp. 339-357, 2005. Available: 10.1177/0016549205054283.
- [2] F. Callahan, "Advertising and Economic Development", *International Journal of Advertising*, vol. 5, no. 3, pp. 215-224, 1986. Available: 10.1080/02650487.1986.11106972.
- [3] J. Jones, "Is Total Advertising Going Up or Down?", *International Journal of Advertising*, vol. 4, no. 1, pp. 47-64, 1985. Available: 10.1080/02650487.1985.11105043.
- [4] R. Swerdlow and V. Blessios, "A Model for Predicting Advertising Expenditures: An Inter-Industry Comparison", *International Journal of Advertising*, vol. 12, no. 2, pp. 143-153, 1993. Available: 10.1080/02650487.1993.11104532.
- [5] G. Hooley and J. Lynch, "How UK Advertisers Set Budgets", *International Journal of Advertising*, vol. 4, no. 3, pp. 223-231, 1985. Available: 10.1080/02650487.1985.11105065.
- [6] R. Ostheimer, "Magazine advertising during recessions", *Journal of Advertising Research*, vol. 20, no. 6, pp. 11-16, 1980.
- [7] R. Picard, "Effects of Recessions on Advertising Expenditures: An Exploratory Study of Economic Downturns in Nine Developed Nations", *Journal of Media Economics*, vol. 14, no. 1, pp. 1-14, 2001. Available: 10.1207/s15327736me1401_01.
- [8] N. Borden, "Findings of the Harvard Study on the Economic Effects of Advertising", *Journal of Marketing*, vol. 6, no. 4, pp. 89-99, 1942. Available: 10.2307/1246089.
- [9] T. Kamber, "The brand manager's dilemma: Understanding how advertising expenditures affect sales growth during a recession", *Journal of Brand Management*, vol. 10, no. 2, pp. 106-120, 2002. Available: 10.1057/palgrave.bm.2540109.
- [10] R. Picard, "U. S. Newspaper Ad Revenue Shows Consistent Growth", *Newspaper Research Journal*, vol. 23, no. 4, pp. 21-33, 2002. Available: 10.1177/073953290202300402.
- [11] R. Picard and T. Rimmer, "Weathering A Recession: Effects of Size and Diversification on Newspaper Companies", *Journal of Media Economics*, vol. 12, no. 1, pp. 1-18, 1999. Available: 10.1207/s15327736me1201_1.
- [12] R. Linnett and W. Friedman, "Magazines pay the price of TV recovery", *Advertising Age*, vol. 73, no. 35, pp. 1-2, 2002.
- [13] C. Bush, "On the substitutability of local newspaper, radio, and television advertising in local business sales (Media Bureau Staff Research Papers, 2002-2010)", Federal Communications Commission, 2002. Available: <https://docs.fcc.gov/public/attachments>
- [14] R. van der Wurff, P. Bakker and R. Picard, "Economic Growth and Advertising Expenditures in Different Media in Different Countries", *Journal of Media Economics*, vol. 21, no. 1, pp. 28-52, 2008. Available: 10.1080/08997760701806827.
- [15] Ministry of Finance, Government of India, "Economic Survey, 2020-21 Statistical Appendix", Department of Economic Affairs, Ministry of Finance, Government of India, Delhi, 2021.
- [16] Madison World, "Pitch Madison Report 2021", Verizon Media, 2021.
- [17] Madison World, "Pitch Madison Advertising Report 2020", Madison Media, 2020.
- [18] Ministry of Finance, Government of India, "Economic Survey, 2020-21 Volume 2", Department of Economic Affairs, Ministry of Finance, Government of India, Delhi, 2021.

Evaluation of Customer Satisfaction towards the Hospitality Industry: Using Kano Model

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Abstract—This paper aims primarily at customer loyalty and quality of service, and at related factors of customer satisfaction using the Kano model in the hospitality industry. At marketplace, customers are king. Modern marketing is oriented towards consumers nowadays. Studying customer satisfaction has different factors. Such factors range from physical to psychological and from negative to constructive. Nonetheless, in most cases the study is based on two constructs as consumer experience pre, post services and the subjective evaluation of post-performance. Over the years, technology has developed and helped track customer satisfaction data for the management of the hotel industry. This study uses various dimensions of the quality of service to understand customer satisfaction to identify the relevant drivers of customer satisfaction with the help of Kano model.

Index Terms—Customer satisfaction, Consumer experience, Service performance.

I. INTRODUCTION.

A. The Kano Model

FOR THIS research, we are applying the Kano model that Noriaki Kano introduced in 1984. The Kano model allows assessment and estimation of the degree of consumer service arising from the constructive correlation among perceived quality and anticipating quality. Kano offers realistic, effective approach to distinguish company and product characteristics based on the customer loyalty impacts.

The key distinctions between the Kano model and the other consumer service methods commonly used in the literature such as SERVQUAL and those of the Kano model

Kano divided product and service characteristics according to their effect on customer loyalty.

B. Kano Diagram

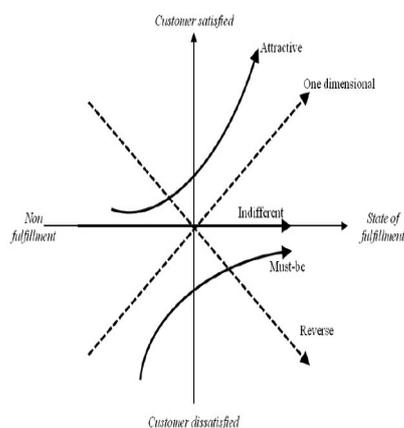


Figure No 1: Kano Diagram

II. LITERATURE REVIEW

With increasing pressure on hotel sales and profits, hotels have to adopt creative strategies to increase guest satisfaction which will achieve the best possible results. Satisfaction of customers is the crucial factor in the hotels, so we have to take a firm step in relation to how to ensure customer satisfaction [3]. This article draws the inferences that, the first and most important task of any hotels or resorts are to ensure a valuable commitment for the guest satisfaction. And the next commitment should be that they must establish a culture that says “satisfying the customers is their number one job”.

The main purpose of this paper is to develop and test a conceptual model of the relationship between service qualities constructs, behavioral intent, and emotional satisfaction within the hospitality industry. This research uses an analysis of the literature to suggest a statistical model that indicates that: quality of service is positively correlated with the emotions and behavioral intentions of the consumer; and emotions of the consumers are positively correlated with behavioral intentions. This model is validated as an observational analysis that incorporates the data available from a survey of 100 clients [6].

This paper suggests a service management system for the study of strategic advantages in Casino, considering the global increase in the popularity of sports. An exploratory case study on business environment and customer loyalty is addressed using the data obtained from 100 clients at an Australian casino hotel. These findings suggest that while the quality of service is highly correlated with customer satisfaction, internal dynamics lead to differences in the perceptions of casino customers versus non-casino customers, highlighting the need for strategies for different customer types [7].

III. RESEARCH GAP

The customer loyalty is an important part of a productive sector like the hospitality industry hotel and resorts. In that respect, any company should aim to have a good relationship with its customers in order to improve its loyalty and thereby increase its competitiveness within the sector. Most hotel and resorts owners, though, face challenges trying to please their clients and end up suffering a high degree of consumer unhappiness. This analysis void looks further into different ways to improve customer loyalty.

CONCEPTUAL FRAMEWORK DIAGRAM

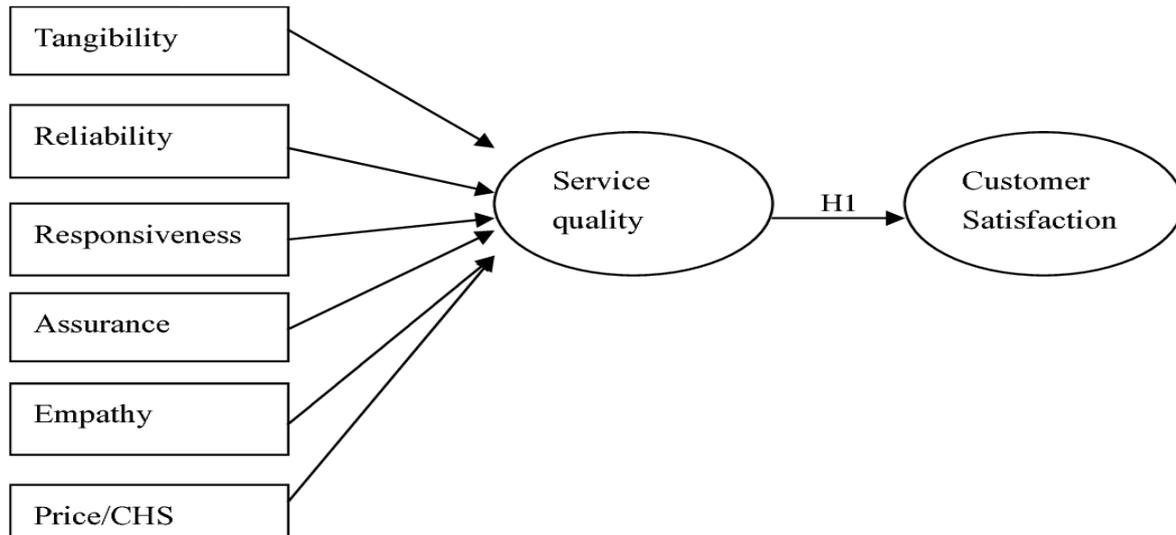


Figure No: 2 Conceptual Framework Diagram

IV. RESEARCH DESIGN

A. Statement of Problem

High-profile resorts as taken for study in Mysore region. The resorts wants to meet the customer's desires, its rivals give consumers more options at that level. Competitor offers many options to customers which make it difficult for a resorts to retain its customers. The resorts cannot therefore ensure that its customers are retained because many customers need to explore other alternatives and experience different environment. Therefore, resorts customer satisfaction is very important to retain customers. The factors considered here include the awareness and timely fulfillment of customer needs and wants to retain the customers back to the resorts, awareness of problem the customers are facing, various methods inhaled to satisfy the customers.

B. Objectives

- To implement the key attributes of Kano model to satisfy the customers.
- To investigate the outcome of customer's quality of service on customer delight.
- To examine the connection between customer service quality and customer delight.

C. Research Methodology

Descriptive Research: This study is conducted using descriptive research to describe the information and to obtain precise and relevant information about the customer satisfaction. It also delineates how customer's satisfaction is varied from each other in providing services at hospitality industry. The technique of non-probability sampling is followed since it does not involve random selection of respondents. For non-likelihood the population that is included is not known. The Sampling Technique taken for the study is Convenience sampling technique is practiced from that section of the population nearby. The Sample size taken for the study is 200 respondents chosen for the study. The tool used

in this study to collect data is questionnaire. The statistical tool used for the study is Correlation, Regression, and Kano calculations. The 100 respondents selected. Of which males are 150 percent and females are 100.

D. Hypothesis

H0: There is no positive relationship among service quality and customer satisfaction

H1: There is a positive relationship among service quality and customer satisfaction.

H0: There is no effect of service quality on customer satisfaction.

H2: There is an effect of service quality on customer satisfaction.

H0: There is no implement of the key attributes of Kano model to satisfy the customers.

H3: There is an implement of the key attributes of Kano model to satisfy the customers.

V. ANALYSIS: APPLICATION OF THE KANO MODEL

A. Questionnaire

The 7 resorts are taken for the study where customers are offered the services. The Kano model was extended to the following measures listed below in order to assess which category of service has a greater impact on customer satisfaction:

Step 1:

Step 1 includes surveying customers through questionnaire, a pair of questions (functional and dysfunctional) about the services offered at the resorts. Functional questions are answered in a constructive manner and negative questions are placed. For every question, the respondents are asked to select from within five options. 100 respondents were asked a total of 13 questions about four dimensions of the facilities and amenities. Here is an example of a Kano model used in the questionnaire:

TABLE I. KANO EVALUATION TABLE

 Customer Requirements	 Dysfunctional					
Functional		I Like It	I Expect It	I Am Neutral	I Can Tolerate It	I Dislike It
		1	2	3	4	5
I Like It	1	Q	A	A	A	O
I Expect It	2	R	I	I	I	M
I Am Neutral	3	R	I	I	I	M
I Can Tolerate It	4	R	I	I	I	M
I Dislike It	5	R	R	R	R	Q

Kano Evaluation. Customer Requirements: A: attractive, O: one-dimensional, M: must-be, Q: questionable result, R: reverse, and I: indifferent

Functional Question: “If there is always an immediate response from the resorts staff, how do you feel?”

Alternatives: I like it that way/ It must be that way/ I am Neutral/ I can live with it that way/ I dislike it that way

Dysfunctional Question: “If there is not always an immediate response from the resorts staff, how do you feel?”

Alternatives: I like it that way/ It must be that way/ I am Neutral/ I can live with it that way/ I dislike it that way

Step 2:

Phase 2 is to use the appraisal table (figure) to count the tests and summarize them. The abbreviations used in the table of evaluations represent one-dimensional requirements (O), attractive requirements (A), must-be requirements (M), indifferent requirements (I), questionable requirements (Q), reverse requirements (I). For example, if one respondent selected “I like it that way” for a functional question and replied “I can live it that way” for a dysfunctional question, it would identify the tested service functionality as an attractive requirement (A). For indifferent requirements (I), whether the operation or procedure is defective or completely functioning in respect of the particular feature, the customer is neither pleased nor dissatisfied. Questionable requirements (Q) reflect findings which show contradictory responses. Opposite specifications I think consumers don’t want service functionality and highly expect the opposite. In the Kano model study, one-dimensional, must-be and attractive requirements along with indifferent requirements are mainly what we are examining.

Step 3:

Stage 3 includes assessing the type of the utility functionality measured according to the response level. The tests are usually analyzed and translated according to the specificity of the responses. When the questions are in-depth or comprehensive, through the answers can be spread out. Therefore, it is proposed that the maximal value of (O, A, M) will be followed if (O+A+M) > (I+R+Q). Otherwise we would use the limit of (I, R, Q). Additionally, the type that should have the biggest effect on the goods or service will be selected because the tests have the same two frequency criteria. M > O > A > I will follow the target order.

B. Customer Satisfaction Dimensions

The basic concept of must-be > one-dimensional > attractive > indifferent can be followed when setting goals in making the business growth decisions. Must-be requirements should be met first. Otherwise, the disappointment would be considerable. Staff Dimension, Service Dimension, Accommodation Dimension, Food and Dining Dimension.

C. Customer Satisfaction Coefficient

The coefficient of customer satisfaction shows how much satisfaction increases if a service requirement is fulfilled or to what extent satisfaction declines if a service requirement is not met. Understanding the mean effect of a company provision on customer loyalty is useful. The coefficients is determined as follows:

$$A+O$$

$$\text{Enhanced Satisfaction Coefficients} = \frac{A+O}{A+O+M+I}$$

$$A+O+M+I$$

$$O+M$$

$$\text{Reduced Dissatisfaction Coefficients} = \frac{O+M}{A+O+M+I}$$

$$A+O+M+I$$

A positive coefficient of customer satisfaction varies in magnitude from zero to one; the lower the value is, the greater the effect on customer loyalty. Negative customer satisfaction is similar. A value of zero means this function does not cause unhappiness if it is not reached. In this way all characteristics evaluated can be visually represented in a diagram. Knowing their effect on customer loyalty and setting goals at service planning is beneficial. The coefficients for resorts customer service are seen below in table.

The coefficients for customer service are shown in the figure below. The diagram can be divided into four criteria, roughly. From the diagram it is clear that much of the personnel features and service features are between one-dimensional and attractive specifications in the field. Therefore, resorts will pay more attention to these kind of needs. There is no reason to concentrate on functionality found in the indifferent category for the other three application forms. Health and dining criteria are found in the middle of the at-

TABLE NO. 2. SUMMARY OF KANO MODEL QUESTIONNAIRE RESULTS

DIMENSIONS	ASSESSED CHARACTERISTICS	A	M	R	O	I	Q	Total	Category
STAFF	There is always an immediate response from the resorts staff.	66	40	16	34	44	0	200	A
	Staff at the resorts is very attentive for service delivery	36	40	2	42	56	4	200	I
	Is the relationship between you and the resorts staff is very good	92	16	4	28	60	0	200	A
SERVICES	The resorts has very good facilities that complement their core room service	92	12	4	26	66	0	200	A
	Resorts must always ensure good standard of service every time	70	18	4	30	78	0	200	I
	Overall impression about a resorts' operation is very strong	62	22	2	36	78	0	200	I
	Fully satisfied by the services the resorts provides	84	30	2	16	68	0	200	A
ACCOMMODATION	Ambience of the resorts is excellent	108	4	4	10	74	0	200	A
	The resorts provides space for relaxation and exercise	68	24	0	8	98	2	200	I
	Resorts checks, informs and gets approval for any changes that happen during your stay	82	24	4	28	62	0	200	A
FOOD AND DINING	Food rated very well in the resorts	130	0	2	4	64	0	200	A
	Food and dining staff are polite and respectful	60	10	4	14	104	8	200	I
	Food quality is good at the resorts	78	32	6	8	76	0	200	A

TABLE NO 3: CUSTOMER SATISFACTION COEFFICIENTS

Dimensions	Assessed Characteristics	Category	(A+O)/	(O+M)/ (A+O+M+I)
			(A+O+M+I)	
STAFF	There is always an immediate response from the resorts staff.	A	0.54	-0.4
	Staff at the resorts is very attentive for service delivery	I	0.51	-0.42
	Is the relationship between you and the resorts staff is very good	A	0.61	-0.22
SERVICES	The resorts has very good facilities that complement their core room services	A	0.6	-0.19
	Resorts must always ensure good standard of service every time	I	0.51	-0.24
	Overall impression about a resorts' operation is very strong	I	0.49	-0.29
ACCOMMODATION	Fully satisfied by the services the resorts provides	A	0.51	-0.23
	Ambience of the resorts is excellent	A	0.6	-0.02
	The resorts provide space for relaxation and exercise	I	0.39	-0.15
	Resorts checks, informs and gets approval for any changes that happen during your stay	A	0.56	-0.27
FOOD AND DINING	Food rated very well in the resorts	A	0.68	-0.02
	Food and dining staff are polite and respectful	I	0.39	-0.13
	Food quality is good at the resorts	A	0.44	-0.21

tractive and indifferent criteria. Two of those criteria tend to be of no interest towards resorts customers. Nevertheless, the “Holds special events festival” provision has a greater impact on contentment. Furthermore, it is evident that “late-evening games organized in the lawn” obviously has a small impact on customer service.

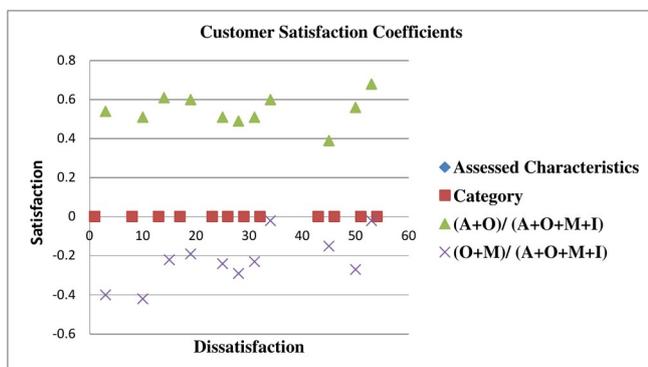


Chart No: 1 Graph Customer Satisfaction Coefficients

D. Reliability Test

The test of reliability refers to the degree to which a measurement is reliable and well balanced when measuring what is supposed to be measured. Very simply put, a test is accurate if it is consistent over time and within itself. A calculation is said to be highly accurate if, under stable conditions, it yields comparable results. We have seen from the above table that reliability checking was performed using Cronbach’s Alpha. The Cronbach’s Alpha is 0.922 in quality of service and customer satisfaction, which means that the data is reliable to the extent of 92.2 percent which is the extremely good sign of the study area.

E. Regression. Multiple Regressions

TABLE NO 4: MULTIPLE REGRESSIONS

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.878 ^a	0.771	0.759	0.449

The column ‘R’ represents the R value, the various coefficients for correlation. R can be viewed as one indicator of the accuracy of the dependent variable’s estimation; the table above shows a strong R-value prediction rating of 0.878.

The column ‘R Square’ represents the magnitude of the R Square, which is the proportion of the variance which can be described by the independent variables. The meaning 0.771 is the independent variable that accounts for 71.1 percent of our dependent variable volatility. And the modified value for the R Square is 0.759.

TABLE No 5: ANOVA TEST

	Anova				
	Sum of Squares	df	Mean Square	F	Sig.
Regression	63.825	5	12.765	63.402	.000 ^b
Residual	18.925	94	0.201		
Total	82.75	99			

The Anova table check F ratio indicates whether the overall regression model is a good match for the results. The table reveals that statistically substantially the independent variable affects the dependent variable, $F(4,145) = 63.402$, $P < 0.05$ i.e. the regression model is good for results.

TABLE No 6: COEFFICIENTS

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.201	0.275		0.731	0.466
Assurance	0.035	0.06	0.04	0.58	0.563
Reliability	0.055	0.093	0.056	0.596	0.553
Empathy	0.946	0.094	0.868	10.017	0
Tangibility	0.221	0.09	0.203	2.439	0.016
Reassurance	0.077	0.084	0.062	0.919	0.361

F. Regression Formula

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4$$

$$\text{Customer Satisfaction} = 0.201 + (0.035 \times \text{assurance}) + (0.055 \times \text{reliability}) + (0.946 \times \text{empathy}) + (0.221 \times \text{tangibility}) + (0.077 \times \text{reassurance})$$

Unstandardized variance shows how often the dependent variable is kept constant from an independent variable. Unit guarantee value is 0.035. It means that assurance has a larger effect on consumer service. This is the statistical significance test for each of the independent variables. This test examines whether the unstandardized coefficients and standardized coefficients within the population are equal to 0 (zero). If $P < 0.05$, we can assume that the coefficients vary statistically from 0 (zero). The t-value and related p-value are respectively found in column ‘t’ and ‘sig’. Through ‘sig’, column we can see that all independent variable coefficients vary statistically substantially through 0 (zero). While the intercept, B_0 , is checked for statistical significance, this result is never important or relevant

G. Correlation

Correlation approximates the power of linear variable interaction. Coefficients of association range from -1.0 (the perfect negative association) to positive 1.0 (a perfect positive correlation). The closer coefficients of correlation attain -1.0 or 1.0, the stronger correlation. The closer a coefficient of regression gets to zero, the lower the association between the two variables.

The association coefficient of tangibility is 0.748. This type of data is relatively broad for survey size. In the survey the number of respondents answering all the questions is 100. P-value for this coefficient of differentiation is to be .000. With this P-value the predictive check of hypothesis is:

HO: There’s no major association between customer loyalty and level of service.

H1: There is a statistically major association between customer loyalty and level of service.

Therefore $P < .05$ denies the null hypothesis and supports the alternate hypothesis.

TABLE No 7: CORRELATION

		Correlation					
		Customer Satisfaction	Assurance	Reliability	Empathy	Tangibility	Reassurance
Customer Satisfaction	Person Correlation	1					
Assurance	Person Correlation	.391**	1				
Reliability	Person Correlation	.533**	.686**	1			
Empathy	Person Correlation	.561**	.564**	.785**	1		
Tangibility	Person Correlation	.748**	.529**	.702**	.719**	1	
Reassurance	Person Correlation	.547**	.430**	.515**	.556**	.666**	1.653

VI. SUMMARY OF FINDINGS: KANO MODEL

Kano model has been applied in this study to the resorts and Mysore region. A positive coefficient of customer satisfaction varies in magnitude from zero to one; the lower the value is, the greater the effect of customer loyalty. Negative customer satisfaction is similar. A value of zero means this function doesn't cause unhappiness if it's not reached. Therefore, if resorts want to change the overall services, it is necessary first to consider customer's expectations and desires in relation to the services offered by the resorts. Based on the analysis of the Kano model, resorts should first prioritize the basic customer requirements, such as staff features and service features in the area between one-dimensional and attractive needs. Providing facilities for all accommodations in every aspect. If it is not met, the resorts will dissatisfy the customers very much. Next, attractive requirements such as holding special events on various occasions and treating clients with smile and identifying each client with their names and greeting them by staff should always be done with a smile. Complying with these kinds of needs can help resorts distinguish itself from other resorts competitors. Therefore, consumers find certain types of services desirable. If resorts provide these services, the chances of differentiating itself from other resorts will be greater. There are 2 coefficients used in the Kano calculation they are "enhanced satisfaction coefficients" and "reduced dissatisfaction coefficients". Where in the above calculations, enhanced satisfaction coefficients showed positive results and reduced dissatisfaction coefficients showed negative results which were lower compared to the positive values of enhanced satisfaction. The questionnaires in the above two dimensions have fall in the category of Attractive requirements (A), which have shown enhanced satisfaction with a higher positive results such as (0.54, 0.61, 0.60, 0.51). Eventually, it is necessary to be careful not to spot too much of the resorts, as most people see this feature as an indifferent necessity.

A. Regression Test

Study of regression is a mathematical approach used to estimates value of a dependent variable based on two or more independent variables. It also assumes variance of the errors is constant and the mean of the error is nil. R can be considered as one indicator of the consistency of dependent variable prediction. The R is 0.878. The value 0.771 is the independent variable that accounts for 77.1 percent of our dependent variable. And the modified value for the R square is 0.759.

B. Correlation Test

Customer satisfaction and the quality of service have a statistically important linear relationship ($p < .001$). Relationship orientation is constructive (i.e. consumer loyalty and level of service are favorably correlated), which means that both factors continue to improve together (i.e. greater customer happiness is linked with better service efficiency). The association's magnitude or strength is roughly moderate.

VII. CONCLUSION

This research has a good attempt in identifying the customer satisfaction in the resorts service and how the customers are satisfied at resorts. The results are significant and the customers are satisfied as well as not satisfied with the services and the accommodations and benefits provided by the resorts. A study on customer satisfaction towards services at resorts and spa in Mysuru region consist of practical study and reveals that communication, analysis, interpretation and evaluation of results has a major factor which influences the management to take inventiveness towards customer delight in the resorts. In every service organization customer satisfaction is very precious as it makes the customer loyal. Customer satisfaction for every service sector is a very crucial factor. Only when there is positive correlation of expectations is said to satisfy clients/customers. In many cases, however, the level of customer satisfaction between different clients is different. There are many variations among them because they each possess their own personal needs, demands and experiences.

VIII. SUGGESTIONS

Customer satisfaction should be the primary focus of any service sector, particularly the hospitality industry. It will lead to customer satisfaction leading to increased productivity and development of the resorts in question. The resorts should prepare its employees for satisfying behavior. This will build a positive impression about the resorts among customers and they can suggest their families and friends in addition. If the facilities given, do not draw and meet the needs of the client it would be necessary to invest a lot to advertise the resorts facilities. Customer friendly paperwork should be carried out i.e. testing check in and check out should be made smoother and quicker. If necessary, the resorts should invest in ads and spend money on hoardings so that it can raise visibility of its numerous lesser-known resorts facilities.

REFERENCES

- [1] G. Dominici and F. Palumbo (2013), "The drivers of customer satisfaction in the hospitality industry: applying the Kano model to Sicilian hotels". January 2013. International Journal of Leisure and Tourism Marketing 3(3):215-236.
- [2] Klaus Solberg Soilen (2017), "How to improve customer satisfaction in luxury hotel industry: based on the Kano model".
- [3] Kirwin Paul (1992), "Increasing Sales and Profits through Guest Satisfaction". Volume 33, Issue 5, October 1992, Pages 32-40.
- [4] Rebekah Bennett (2004), "Customer satisfaction should not be the only goal". December 2004. Article (PDF Available), in Journal of Services Marketing 187 (7).
- [5] Jackie L. M. Tam (2008), "The Effects of Service Quality, Perceived Value and Customer Satisfaction on Behavioral Intentions". October 2008.
- [6] Riadh Ladhari (2009), "Service quality, emotional satisfaction, and behavioral intentions: A study in the hotel industry". Publication date: 15 May 2009, Managing service quality: An International journal, ISSN: 0960-4529.
- [7] Anna Kralj, David Solnet (2010), "Service climate and customer satisfaction in a casino hotel: An exploratory case study". International journal of hospitality management 29 (4) 711-71.

The role of management capacity for the SD of small and medium enterprises in Vietnam

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Abstract—In the context of increasingly extensive international integration, the 4th industrial revolution is expanding to all areas of production. That is increasingly expanding and putting into practice, the sustainable development (SD) of enterprises of small and medium enterprises (SMEs) depends greatly on the management capacity of the team of administrators in the enterprise. The study selected research scope in Vietnam, to survey of 316 SMEs of different business sectors and territories. The study results showed that, the role of management capacity for the SD (SD) of SMEs in Vietnam very important, the influence level of management capacity has a greater than other factors as: State and local support policies, innovation consciousness, corporate social responsibility, finance and human resources.

Index Terms—Management capacity; SD; Small and medium enterprises.

I. INTRODUCTION

ENTERPRISES'S SD not only meeting the needs of businesses and stakeholders in the present but also protect and maintain the growth of available human resources and natural resources in the future (VCCI,2020). SD needs to focus on the relationship between industry capacity, technology, institutional and market development capacity. Their interaction to realize SD of enterprises. In order to maintain SD in the SMEs, it is necessary to improve the management capacity of managers from senior to grassroots level in the context of deepening international integration.

Based on the data of Vietnam Chamber of Commerce and Industry (VCCI), the whole country has 758,610 operating enterprises, of which small and medium enterprises (SMEs) account for over 95% [1]. One of the limitations of SMEs is low labor productivity, mainly manual labor. It usually only sell a number of products that are suitable for the qualifications, experience and financial capabilities of the business owner; Financial resources are limited and the ability to access credit sources from organizations is still low; In addition, they are usually employ few workers and the workers are mainly indigenous workers [2]. SMEs in Vietnam are always in the vicious circle of low competitiveness due to lack of capital, but it is difficult to access credit due to lack of collateral so investment in innovation is slowly; Outdated technology is associated with poor management capacity, so costs are high, competitiveness is low, and there is little opportunity to access production orders with high added value [3]. Therefore, the capacity of the managers is an indispensable factor to lead the organizaion [4].

Based on the current situation of SMEs in Vietnam, it is necessary to evaluate the role of management capacity for

the SD of SMEs in Vietnam. The objective of the study is to identify and measure the influence of the management capacity with the other factors for the SD of SMEs in Vietnam.

II. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

A. Literature rReview

Management capacity is usually assessed through the qualifications of the management staff from senior to grassroots level in the enterprise's apparatus. The senior managers in SMEs have limited knowledge of management and less interested in building long-term development strategies as well as building structure of enterprises. The management process of enterprises, especially the finance management have not been implemented by SMEs owner and low quality. So that, their enterprises can not manage work including financial status and business performance. This greatly affects the production and business activities of SMEs in developing countries. Achieving organizational goals through knowledge and skills of managers requires them to have good competence, certain knowledge of the legal system, education, tax in business, production line, technology [5].

In management capacity field, management skills also are very important issue. This skill includes skills from planning, organizing and evaluating business operations. Planning is the process of setting and setting goals. Difficulties, obstacles, changes in the business environment and preparation of contingency plans are issues that managers need to anticipate. [6]. These skills will help managers have a good relationship with colleagues, creating motivation to work for those around them. This allows activities in the organization to take place easily and quickly [7]. According to the research of Le Ngoc Nuong (2018) [8], The results show that most countries pay special attention to the development of SMEs in order to maximize resources and support large enterprises. This issue will help businesses increase their competitiveness in production and business activities. To create that result, the element of management capacity is very important.

Luminita. P (2020) with the research about the role of managerial, the results of the study show that, an entrepreneur will only be limited to interacting with certain people compatible with their communication style when they do not have effective communication skills thus limiting their ability to communicate effectively with the colleagues, ability

to communicate effectively with the colleagues, ability to communicate one's vision and goals further. Therefore, developing management skills is much more complex than developing other skills. It is based on diverse knowledge and skills of communication between different people in an organization [9].

It can be seen that studies have clarified the role of management capacity for SD of SMEs in Vietnam. At present, this issue has not been specifically considered and evaluated of studies in Vietnam. Therefore, the objectives of the study is necessary to evaluate the role of management capacity in practice compared with other factors affecting SD of SMEs in Vietnam.

B. Theoretical framework

Management capacity is a combination of knowledge, skills and qualities of an administrator to complete the management functions in an enterprise, including: planning, organizing, leading and controlling [10]. Management capacity is the knowledge, skills and capabilities of business owners that can help SMEs operate more effectively. Management skills of business owners are essential for the existence and sustainable growth of enterprises. If the business owner lacks management skills, it is a big barrier to the development and the cause for production and business activities being interrupted.

SD of enterprises need to focus on the relationship between industry capacity, technology, institutional and market development capacity. Their interaction to realize SD of enterprises. Can be realize the SD of enterprises, we must pay attention to the selection and orientation of the industry, technological innovation, institutional reform and capacity building for market development [11]. He shown that: SD of enterprises is to associate between external influences and internal constraints, the control process determines the sustainability, allowing the basic organization sustainable and effective methods.

III. METHODOLOGY

The business environment is considered a significant factor affecting the SD of SMEs, including factors outside the enterprise, orientation and direct influence on management activities in the enterprise. The government supporting plays a very important role in creating an attractive political and investment environment not only for SMEs but also the business system [8].

Hypothesis 1: The Government support policy factor has a positive influence for the SD of SMEs in Vietnam.

A. Research model

Most of the owners of SMEs have limited organizational and management knowledge which are less interested in building long-term development strategies, as well as building an appropriate organizational structure for the business. This greatly affects the SD process of the enterprises [12]. *Hypothesis H2:* The management capacity factor has a positively influence for the SD of SMEs in Vietnam.

The manufacturing technology of SMEs has a great influence on productivity, product quality, production efficiency, environmental pollution levels during production and discharge into the environment. There is affecting the development process of enterprises in the long term [8].

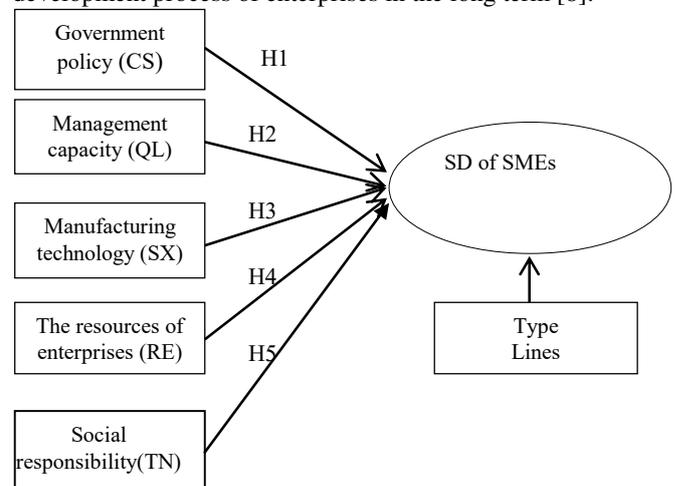


Fig. 1 Research model

Hypothesis 3: The manufacturing technology factor has a positive influence for the SD of SMEs in Vietnam.

Labor force and quality of labor force is a consideration criterion to evaluate the SD of SMEs. Besides the human resource factor, the difficulty in accessing external capital is the main obstacle to the development of SMEs, it is one of the causes of business failure [13].

Hypothesis H4: The resources of enterprises factor have a positive influence for the SD of SMEs in Vietnam.

Businesses that perform well on social responsibility will gain significant benefits, such as: increase the brand value of the business and expand the market to increase revenue, reduce costs, and increase labor productivity. Therefore, the implementation of social responsibility is increasingly recognized by businesses and considered as an indispensable requirement towards the development of enterprises in the long term [12], [14], [15].

Hypothesis H5: The social responsibility factor have a positive influence for the SD of SMEs in Vietnam.

B. Data processing method

The study applies convenience sampling method to survey collected feedback data of business managers, to assess the impact of management capacity on SD of SMEs in Vietnam.. A total of 350 votes were distributed and the number of valid votes for data processing was 316 votes.

Through Cronbach's Alpha coefficient, the research tests the reliability of the scales in the research model. Then, Exploratory Factor Analysis (EFA) was conducted to check the convergence and discriminant value of the variables in the research model.. Finally, the study uses multivariate regression methods to evaluate the impact of management capacity of enterprises compared to the following factors: Government supporting policy; Corporate social responsibility;

Manufacturing technology and resources of enterprises for the SD of SMEs in Vietnam.

IV. RESULTS

A. Descriptive statistics

From the results of primary data collection, the number of SMEs show that by geographical area participating in the survey are present in all three regions of the North, Central and South regions.

The data in Table II shown that, the results of the above survey of SMEs in Vietnam by industry and enterprise size. There were 316 valid questionnaires included in the data processing. In which, the number of SMEs in the field of trade and services accounts for 45.2%; The number of enterprises in the agricultural, forestry and fishery sector accounts for 13.3%.

TABLE I
STATISTICS OF SALARIES OF SURVEY ENTERPRISES BY GEOGRAPHIC LOCATION

Geographical Area	Size			Density by region (%)
	Micro	Small	Medium	
Northern region	56	45	24	39,6
Central region	35	37	15	27,5
Southern region	40	41	23	32,9
Total number of Enterprises	131	123	62	100

Source: Research sample statistics of the authors.

TABLE II
STATISTICS OF SURVEYED ENTERPRISES BY INDUSTRY AND SCALE

Scale Business lines	Super small	Small	Medium	Total	Proportion by industry (%)
Industry and Contribution	35	66	30	131	41,5
Trade services and	40	72	31	143	45,2
Total enterprises of	91	157	68	316	100
Proportion of scale (%)	28,8	49,7	21,5	100	100

Source: Research sample statistics of the authors.

B. Verify the reliability of the scale

The results of Cronbach's Alpha (CA) reliability coefficient (after removing observed variables QL3 and RE2 due to their total correlation coefficients less than 0.4) showed that all coefficients CA of all groups of observed variables is greater than 0.6. Therefore, after testing Cronbach's alpha coefficient, the scales of the independent and dependent variables in the research model are eligible for EFA analysis.

C. Exploratory factor analysis

Based on the results of exploratory factor analysis (EFA), the model research have seven factors extracted from 30 observed variables. Eigenvalues = 1,162 > 1. From the above results, it can be confirmed that the number of factors extracted in the results of EFA analysis is appropriate. The total explanatory variance of the factor analysis was 68.211% > 50%.

The research variables with extracted variance >50% were satisfactory and kept. At the same time, the observed variables must ensure the convergence value and distinguish between the groups of factors, the observed variables all have load system > 0.4.

From the results of EFA analysis, the KMO value = 0.785 > 0.6. Bartlett's test value with hypothesis (H0) is "uncorrelated variables" with Sig value = 0.00 < 0.05. The results of the EFA analysis for the group of dependent factors that are give the results: KMO coefficient = 0.768 > 0.5 and significance level is 0.000 < 0.05. From the above analysis results, it is shown that the results of factor analysis are consistent with the research data.

From the groups of factors extracted in the EFA analysis, the group of enterprise resource factors is divided into two separate groups of factors, which are factors: financial resources (TC) and human resources (NL).

D. Regression analysis

After linear regression analysis, the value of R = 0.726 and adjusted R2 was 0.703. This value shows that, the independent variables in the research model explain 70.3% of the variation of the dependent variable as "SD of SMEs in Vietnam". Through the results of ANOVA analysis, the F value = 61,225 has statistical significance Sig = 0.002 < 0.05. Thereby, it shows that the research model ensures reliability.

TABLE III
BETA COEFFICIENTS AFTER PERFORMING REGRESSION

	The coefficient is not standardized		Standardized coefficient	Testing value t	Level of significance Sig.
	B	Standard errors			
(Constant)	-1,435	0,265		-4,251	0,000
SX	0,461	0,068	0,289	6,623	0,000
CS	0,452	0,038	0,215	5,651	0,002
NL	0,118	0,035	0,188	3,232	0,015
TC	0,102	0,057	0,252	3,412	0,003
TN	0,285	0,026	0,152	5,213	0,001
QL	0,105	0,052	0,243	4,253	0,002

(Source: Results of data analysis of the authors).

Based on the data in Table III, it can be seen that the manufacturing technology factor (SX) has the most influence for the SD of SMEs in Vietnam, with the largest value $\beta = 0.289$. The corporate social responsibility (CS) has the lowest ($\beta = 0.152$). Sig value of all variables in the model research < 0.05. Especially, the factor of management capacity has a greater influence than 3 factors in the research model ($\beta = 0.243$), included: Financial, Government policy and Corporate social responsibility. It can be explained here that, the management capacity of the managers in the organization has a clear and it has positive impact for the SD of SMEs in Vietnam. The role of management capacity clearly shown through the results of this study.

E. Testing statistical hypotheses

To determine the difference of types of enterprises in terms of factors affecting the management capacity of SMEs, the study uses Anova analysis method. If the Sig coefficient > 0.05, then the hypothesis H0 is rejected, accept hypothesis H0 when Sig < 0.05. This explains that, there are

differences in business types and industries in the influence of management capacity for the SD of SMEs in Vietnam.

The test results show that, the H0 hypothesis is rejected because testing the difference by type of enterprise with value Sig = 0.012; The difference test by business line has the value Sig = 0.001.

It can be seen that, the role of management capacity factor has been clearly shown through the results of this study. Management capacity has a greater influence than the factors of enterprises's financial, corporate social responsibility and government policy in the SMEs sector in Vietnam. Before businesses receive good support from the government's policies or well implement social responsibility for the community, the issue of corporate management so that efficiency is always a top priority.

V. CONCLUSION AND FUTURE RESEARCH DIRECTIONS

The enterprise have a team of managers from senior to grassroots level with good ability, it will help their business to orient well the organization's operational goals. In addition, it will help to effectively coordinate and promote the productivity of all resources in the organization, to help the organization adapt to the negative impacts of the governance environment .

How to improve the production technology process and where is start to improve this problem? If managers have good thinking skills, staff skills and technical skills, they will greatly contribute to helping businesses orient their strategies to operate effectively.

Through this study, the authors propose some solutions to improve management capacity for the SD of SMEs in Vietnam. Firstly, to improve the quality of management, the quality of human resources in the enterprises, detail as: Actively associate and cooperate with educational and training institutions, especially universities related to the field of manufacturing to improve professional qualifications and management skills for business managers. With that to have a HR vision such as effectively attracting and retaining a skilled workforce. Secondly, expanding linkages between SMEs associations and local businesses. Through this linkage activity, it will help managers access and timely update changing trends in production and business, relevant legal regulations to promptly orient business activities. Effective. Thirdly, to promote training activities in outside of the enterprise. It is necessary to actively support junior managers (direct labor managers) and middle managers need to participate in training courses in outside of the enterprise. Training activities on responding to occupational accidents in production to be able to approach and learn, improve skills to

promptly respond to incidents that may occur in the production process. The study has clarified the role of the management capacity factor for the SD of SMEs in Vietnam.

However, the study still has certain limitations and will be to improve for the future research. *Firstly*, the sample size is not large, the number of enterprises participating in the survey is still small. For the future research directions, we will be expand the research scope, expand the assessment object of enterprises in other fields for activity. *Secondly*, the results of analysis are mainly used of the regression analysis model, the research model have not to be consider intermediate and regulatory variables in the research model. For the future research directions, we will be expand the scope of the study and to consider additional intermediate variables to clarify the influencing factors in addition to those included in the current research model.

REFERENCES

- [1] General Statistics Office of Vietnam, 2019.
- [2] Trinh Duc Chieu, 2010. The impact factor influence to growth of small and medium enterprises in Viet Nam, Government Economics Research.
- [3] Phung The Dong, 2019, Supporting Vietnam's small and medium-sized enterprises in their current development. Finance Journal, No.11.
- [4] Cant, M. C., & Wiid, J.A. (2013). Establishing the Challenges Affecting South African SMEs. International Business & Economics Research Journal, 12(6), 707-716.
- [5] Hien, N . (2019). Study Factors Affecting Management Capacity and the Business Effectiveness: A Case of Small and Medium Enterprises in Vietnam. Academy of Entrepreneurship Journal.
- [6] Chen, J. (2006). Development of Chinese small and medium-sized enterprises. Journal of Small Business and Enterprise Development, 13(2), 140-147.
- [7] Chuthamas, C. (2011). Factors Affecting Business Success of Small & Medium Enterprises (SMEs) in Thailand. Asian Social Science, 7(5), 180-190
- [8] Le Ngoc Nuong, 2018. Factors affecting the development of small and medium industrial enterprises in Thai Nguyen-Viet Nam, Economic and Business Management University.
- [9] Luminita, P. (2020). The Role of Managerial Skills in the SD of SMEs in Mehedinti Country, Romania. Sustainability Journal, 2020, 12(3).
- [10] Peng, T, Zhao, C, 2019. Research on the Survival and SD of Small and Medium Enterprises in China under the Background of Low-Carbon Economy, Open Access Journal, vol. 11(5), pages 1-17.
- [11] Ministry of SD targets of enterprises, 2017-2019. Viet Nam Chamber of Commerce and Industry (VCCI).
- [12] Phan Van Dan, 2012. Building a scale for enterprise sustainability, Scientific Journal, Can Tho University.
- [13] Ibrahim, U, 2008. An analysis of strategic factors affecting the performance of small and medium industries in Borno State of Nigeria. St Clements University, Nigeria.
- [14] Hung, D&Nguyen,H.2020. Corporate Social Responsibility for SD of Small and Medium Enterprises in Vietnam. Journal of Business and Economic Development, 2020, 5(3): 157-163
- [15] Okpara, J.O., & Kabongo, J.D. (2009). An empirical evaluation of barriers hindering the growth of SMEs in a Developing Economy. African Journal of Business and Economic Research, 4(1), 7-21.

The Impact of Social Comparison on Accountants' Job Satisfaction and Turnover Intention in Hanoi, Vietnam

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Abstract—Corporate accountants might be faced with many ethical dilemmas and pressures, some of which are complex and difficult to resolve. Besides, they tend to compare themselves to others in terms of their successes at work. These comparisons may lead to their dissatisfaction and turnover intention. The purpose of this study is to explore the social comparison of accountants working in Hanoi affects their satisfaction and their turnover intention. This study uses quantitative research to analyze data collected from 243 accountants working in Hanoi. Respondents completed measures of upward comparisons, downward comparisons, job satisfaction, and turnover intention. Research results showed that social comparisons affect accountants' job satisfaction and turnover intentions. The upward comparison was found to be positively related to job satisfaction and negatively related to turnover intention. The downward comparison was found to be negatively related to job satisfaction and positively related to turnover intention. Base on the results of collected data analysis, several solutions are suggested for enterprises to improve satisfaction levels of accountants and reduce their turnover intention as the solution of designing job descriptions, solution of building up a standard system of employee appraisal, solutions of building a culture of employee respect and encouragement. The measures created to assess the degree to which individuals make downward and upward social comparisons when assessing their career progress should be tested in additional occupations and studies. Future research should investigate how social comparisons influence career attitudes beyond considering feelings of relative deprivation.

Index Terms—Social comparison, job satisfaction, turnover intention, accountants.

I. INTRODUCTION

HANOI is the capital and the second-largest city in Vietnam. Being located in the northern critical economic region, Hanoi is a dynamic economy center and an essential economic leading city of the North and the whole country. The People's Committee of Hanoi assesses that the city has improved the business environment, supported and developed enterprises, and increased production capacity from 2016 through 2020. The People's Committee of Hanoi also set out the economic development plan for the period of 2021-2025, which emphasizes the effective implementation of external activities and international integration while also enhancing the quality and efficiency of human resources usage in all fields.

Among all the properties of enterprises, human resource is the most significant property, especially those working in fi-

nance and accounting. The reason is that all financial and economic information of the enterprises is analyzed and processed by the accounting department. Managers can keep track of business and production activities through the accounting department to evaluate further business development decisions. However, accountants are often under job stress which consequently results in their dissatisfaction. Moreover, one of the most crucial concerns in personnel management is making a convenient, fair, self-motivational working environment.

There are many external and internal factors affecting employees' job satisfaction and their commitment to their organizations. Among those factors, Kulik and Ambrose [1] researched that an individual's attitude is affected by peer pressure. They usually compare their salary, bonus, benefits and other promotional opportunities with each other. Besides, managers usually compare the staff's working effectiveness to appraise the operational performance [2]. Understanding the social comparison of each individual in a particular situation can contribute to decisions improving employees' job satisfaction as well as their commitment with the organization. Acknowledging the relationship between social comparison, staffs' job satisfaction, and the organization commitment will help business managers find solutions to push the working motivation and increase the operational performance of employees.

On that basis, this study will apply the theory of social comparison to study the influence of upward and downward peer comparisons of accountants on their turnover intention.

II. LITERATURE REVIEW

A. Empirical Research

It is necessary to have an accounting information system of many years to compare, evaluate the financial situation of an enterprise, and predict future developments. Therefore, the personnel stability of the finance-accounting department is vital for enterprises. Based on the desire of enterprises to retain qualified accountants, Many researches have been conducted on the factors that influence accountant job satisfaction and turnover intentions. Chatzoglou and his fellows [3] have researched a model to check the job satisfaction of accountants working for various companies in the region of East Macedonia, Greece. Research results show that organi-

zational and professional engagement factors such as working motivation and job features impact the job satisfaction of accountants. In the factor of working motivation for accountants, scales are used to measure the salary and self-motivation of accountants based on comparison and appraisal of their job performance. Koh, Ong, and Samuel [4] built a research model with three groups of factors affecting job satisfaction of accounting and auditing professionals in Malaysia, namely physical factors, psychological factors, and environmental factors. The results of data analysis indicate that remuneration, the relationship between supervisors and colleagues, job security, opportunities for improvement, leadership style, and organizational culture are critical factors in accountants' job satisfaction. According to this research, job satisfaction also appears to buffer not only the link between supervisors and colleagues and organizational commitment but also the relationship between job security and employee loyalty. In a study done by [5], accountants working for various organizations in Ghana were asked to rate their job satisfaction and turnover intentions. The authors built a research model including independent factors affecting job satisfaction of accountants: salary and bonus, working conditions, autonomy at work, relationship at work, and opportunity to use communication skills and ability. In the studies on the career satisfaction and turnover intentions of accountants, there is no research that mentions the factor of social comparison.

Some previous studies implemented the use of social comparison theory to self-assess job satisfaction and turnover intention. For example, in [6], the author applied social comparison theory to the study of managers in the United States evaluating their career development to other individuals' performance. Research results indicate that social comparisons affect the intention of enterprise change and the job satisfaction of managers. Their turnover intention and work satisfaction are negatively impacted by upward comparison. Their turnover intention and work satisfaction suffer as a result of the downward comparison. Later, some studies use comparative theory in appraising employee performance, such as [7], [8], the research results of these studies show that social comparison orientation is positively related to job performance (performance in each specific task and overall efficiency). However, there has not been any research on social comparison affecting the group of employees in the accounting department of enterprises.

There have been some studies about the influence of social comparison on employee satisfaction and resignation intention through the overall previous research, but not for accountants. On the contrary, there are many studies on accountants' satisfaction level and turnover intention, but not for social comparison factors. Therefore, this research focuses on the effect of social comparison on the turnover intention of accountants.

B. Social Comparison Theory

The social comparison theory was first developed by Festinger [9] to reflect the motivation for an interpersonal comparison. The interpersonal comparison is caused by self-evaluation, self-improvement, self-enhancement. An individual usually tends to desire an accurate view of his capabilities

and position in the organization, thus performing a self-evaluation. Self-improvement reflects an individual's desire of improving himself, and it is also both a motivation and a direction to find ways to improve his performance at work. Self-enhancement plays the role of protecting or enhancing the personal image. These reasons are closely connected. When an individual can self-evaluate, he will have accurate information about his current position and capacity. On that basis, he can ultimately make self-improvement. In addition, self-improvement can satisfy the motivations of self-enhancement.

Research by Wood [10] has indicated that when carrying on social comparison, an individual can both compare oneself with more successful others (upward comparison) as well as worse-off others (downward comparison).

In studies on the affection of social comparison on individuals in the process of self-improvement, Buunk and Gibbons [11] have indicated that upward comparison is closely connected to the self-improvement motivation of an individual, as it can help that person learn from more successful and capable others. In addition, upward comparison can create positive role models, helping inspire individuals to make comparisons and more efforts. Therefore, when the motivation to try better is consistent with the employees' goals, they will have an upward comparison [12].

Downward comparison or self-comparison to worse-off others is often related to increased self-motivation [11]. Downward comparison helps each individual feel better about themselves and their status. Wood and Taylor [13] assert that individuals motivated to maintain and increase self-satisfaction tend to have a downward comparison.

According to [1], individuals use upward and downward comparisons at different levels because most of them will meet better individuals and worse-off others. According to researchers, individual factors get connected with specified groups of people as a result of socialization. Because upward and downward comparisons are frequently made in the same direction, the tendency of social comparison can affect an individual's attitude towards one's career [14]. Buunk [15] proved that the frequency of upward or downward comparisons plays an essential role in understanding how individuals assess their careers. Therefore, the social comparison has been proposed as a predictor of job satisfaction and compensation expectation [16]. Each person's sentiments about their job or organization are influenced not just by their genuine organizational goals, but also by the social comparison criteria they employ [14]. On this basis, the study will explore the effect of social comparisons on an individual's intention to change jobs.

Various researchers have developed the concept of job satisfaction. In one of the most popular concepts in research [17], researcher defined job satisfaction as a happy or positive emotional working state or working experience appraisal of an employee. According to [18], job satisfaction is defined as the feeling and emotional response to various aspects of an employee's job. With the same point of view, Price [19] also defined job satisfaction as a level in which employees perceive and have positive orientations towards employment in the organization.

According to [20], a qualified organization is demonstrated by paying attention to humanity, training human resources, caring about employees' happiness and providing them with happy workplaces. He also emphasized the importance of human resources in creating a production environment with outstanding efficiency. Juran [21] also defined that an increased level of employee job satisfaction will benefit the organization in terms of both quality and productivity. Therefore, the study of employee satisfaction at work will help leaders get the real needs, the things that create satisfaction and dissatisfaction, disagreement of employees in the organization. Therefore, executives may develop, adapt and supplement personnel policies of the company within the authorized framework to improve job performance and employees in order to assure quality and sustainable staff. The enhancement of personnel policies will better match the aspirations of employees, providing the business with an opportunity to recruit and retain exceptional staff. The stable, high-quality human resources of an organization will ensure its position in the market and create a foundation for sustainable development.

The intention of changing a job or workplace is the intentional desire to leave an organization. According to [22], an employee's turnover intention is the desire to quit their present work and seek employment elsewhere. According to [23] turnover intentions are an important stage and a measure of actually leaving the current job voluntarily. The intention hereby means that before actually leaving the current work environment, these people have made a conscious decision.

The concept of turnover intention reflects an employee's attitude towards an organization, demonstrating the possibility of an employee's resignation in the near future. According to [24], The intention to quit jobs is commonly reflected in three cognitive factors: the want just to change jobs, the desire to look for another work or organization, and the willingness to better occupations. Resignation is always a focus and interest matter in an organization. Resignation intention is the last cognitive stage in leading to actual resignation action and is a crucial decision-oriented factor for employee's leaving or staying in the organization [25]. When an employee resigns, the performance of the remains in the organization will be seriously affected. They have to take account of the working burden of leavers, so they are overloaded, resulting in reducing job satisfaction. Consequently, the chain reactions will influence the resignation consideration of the remains if the organization does not take any timely measures. Thus, when employees resign, there are many risks in an organization. Turnover intention is an employee's intention before their official resignation. The willingness, capacity, and preparation to resign are all part of this goal. Although the turnover intention is not the actual conduct, managers may understand and forecast the actual resignation behavior by studying the turnover intention in order to plan for workers to quit the company or move employees.

III. HYPOTHESIS AND RESEARCH METHOD

A. Hypothesis

According to [15], individuals who have a tendency of upward comparison frequently will focus on how others do bet-

ter than them and have behavior of new job search more than those who have a regular downward comparison. Although an upward comparing individual can admire others better, this can induce envy and inadequacy, resulting in turnover intention [26].

In contrast, Finegold et al. [27] have shown that individuals who focus on their career achievements more than their colleagues are less likely to leave their organization. In addition, the downward comparison helps individuals improve their mood and job satisfaction resulting in decreasing the turnover intention [28].

In the study [6], it was demonstrated that social comparison affects employee satisfaction and turnover intention. In this study, the upward comparison has a negative impact on employee job satisfaction, but the downward comparison has a positive impact. In contrast, the upward comparison has a positive influence on the turnover intention, but the downward comparison has a negative influence on the turnover intention of employees.

According to the hypothesis of previous studies, the author proposes the following research hypotheses:

H1a: The upward comparison has a negative impact on the job satisfaction of accountants in Hanoi.

H1b: The downward comparison has a positive impact the on job satisfaction of accountants in Hanoi

H2a: The upward comparison has a positive impact on the turnover intention of accountants in Hanoi.

H2b: The downward comparison has a negative impact on the turnover of accountants in Hanoi.

B. Research Method

The author uses the quantitative method as the primary research method. The author inherits the study [6] and professional characteristics of accounting to build up a scale for the influencing factors: upward comparison, downward comparison and the job satisfaction of accountants. The upward comparison consists of four items: contrast your career with that of someone in a higher position, assess development by comparison with more successful people, motivated to achieve success is more similar to more successful people, evaluate career success based on comparison with more successful people. The downward comparison consists of four items: consider your success rather than your colleagues when evaluating your career, I am satisfied with myself when comparing my achievements with colleagues, I perceive myself as more successful than my colleagues, evaluate career success based on comparison with less successful people. The job satisfaction consists of four items: I am receiving a higher salary compared to people working in the same position in other companies, I was promoted to hold a management position in the company, I am appreciated in the field in which I work, I got promoted faster than my colleagues. The author inherits the study [29] and the working context of accountants in Hanoi to build up a scale for the target factor of turnover intention. This factor consists of four items: planning to change jobs within the next six months, looking for a new job, thinking of moving to another organization, turnover if possible.

The survey subjects were current accountants in small and medium enterprises in Hanoi city to supply the required in-

formation for the research. This study aims to test the scales and research hypotheses using the 5-level Likert scale to design the questionnaire. First, a preliminary survey was conducted on 50 accountants in small and medium commercial enterprises in Hanoi to detect mistakes in the preliminary questionnaires from qualitative research. After that, the authors continue to correct the mistakes to have a formal interview table and conduct formal quantitative research. The results of 26 preliminary analyses indicated that the scales were quite good, with a confidence of more than 0.75. Therefore, these 50 samples continued to be used as part of the formal survey and the questionnaire without further editing. The authors sent the questionnaire in 3 ways: sending online questionnaires via Google Form, sending them by email, and distributing the pre-printed questionnaire directly. The authors have collected information with 300 samples to ensure the necessary sample size. Survey subjects are employees in Hanoi's small and medium commercial enterprises, and the survey duration was from March 2021 to April 2021.

IV. RESULTS AND DISCUSSION

After the survey duration, the authors received 252 answer sheets, of which 243 were valid and full of information corresponding to 243 samples used. With 16 observed variables, this number of samples is completely reliable in the statistics aspect. These valid questionnaires were coded by SPSS and AMOS 20 software for analysis.

A. Testing the Reliability of the Scale

The Cronbach Alpha coefficient was used to test the scale's reliability, with the goal of eliminating variables having a corrected item-total correlation of less than 0.3. Criteria choose the scale with the reliability Cronbach's Alpha greater or equal 0.6 [30]. Cronbach's Alpha of the component scales is presented in table 1.

TABLE 1
SUMMARY OF TESTING CRONBACH'S ALPHA

Factors	Number of Items	Corrected item – total correlation	Cronbach's Alpha
Upward comparison	4	0.706	0.869
Downward comparison	4	0.623	0.819
Job satisfaction	4	0.720	0.886
Turnover intention	3	0.740	0.874

After testing the scale for the factors of upward comparison, downward comparison, and job satisfaction, Cronbach's Alpha coefficient is more than 0.6, and all observed variables have a corrected item-total correlation that is more than 0.3 but less than Cronbach's Alpha. Thus, all of these scales meet their reliability. When testing the scale for the factors of turnover intention the initial 4 scales, Cronbach's Alpha value is more than 0.6, as shown., but the item TURN4 has a correlation coefficient with the corrected item-total correlation of 0.064 (lower than 0.3), so it should be eliminated from the research models. After eliminating the observed variable TURN4, the Cronbach's Alpha value is 0.874 (greater than 0.6) and the corrected item-total correlation of remaining items of the factor of the turnover intention are all greater than 0.3, so meeting the reliability.

B. Exploratory Factor Analysis

The component analysis was performed on 15 items of the scales in the study model based on the results of the aforesaid scale's reliability analysis. (after eliminating TURN4)

Obtaining the coefficient KMO = 0.830 > 0.5 and the Bartlett's test has the Chi-Square value = 1894.157 with the significant level Sig= 0.000 < 0.05, indicating that the factor analysis is appropriate. Simultaneously, the total variance extracted by the Principal Axis Factoring method is 63.866% > 50%, indicating that these extracted factors explain 63.866% of the variation of the data set, and the Eigenvalues = 1.328 > 1 is qualified to factor analysis.

TABLE 2
SUMMARY OF FACTOR ANALYSIS

Items	Factors			
	1	2	3	4
SAT3	,885			
SAT1	,840			
SAT2	,808			
SAT4	,724			
UP4		,921		
UP2		,773		
UP1		,752		
UP3		,703		
DOWN3			,858	
DOWN4			,705	
DOWN2			,675	
DOWN1			,667	
TURN1				,890
TURN3				,810
TURN2				,801
KMO measure of sampling Adequacy				0,830
Sig.				0,000
Eigenvalue				1,328
Total variance explained				63,866

We can see that the items match the following constraints based on table 3, a rotation matrix table created using the Promax rotation method:

Convergent value: The items are grouped together with the factor loadings in the same column with the same scale as the initially proposed scale.

Discriminant value: The items have just one-factor loading that is all more than 0.5, indicating that they should have discriminatory value with practical importance and may be used to design a regression model to test the initial hypothesis.

C. Confirmatory Factor Analysis

A critical model in which the research concepts are freely related to each other was established to test all the concepts in this research [31]. The results of CFA factor analysis for the critical model, as follows:

Test for unidirectionality and coherence with data

To test the measurement model, CFA by AMOS 20 was performed by the ML method, which is the most popular method to estimate parameters in SEM [32]. Figure 1 above shows the output path diagram of the CFA model, and accordingly the overall coherence statistics in the following table:

The results of CFA analysis show that Chi-square statistical value in this model is 130.321 with 84 degrees of freedom ($p=0.001$), CMIN/df= 1.551 < 3. In addition, other indicators should be considered such as GFI; IFI; TLI; CFI IFI,

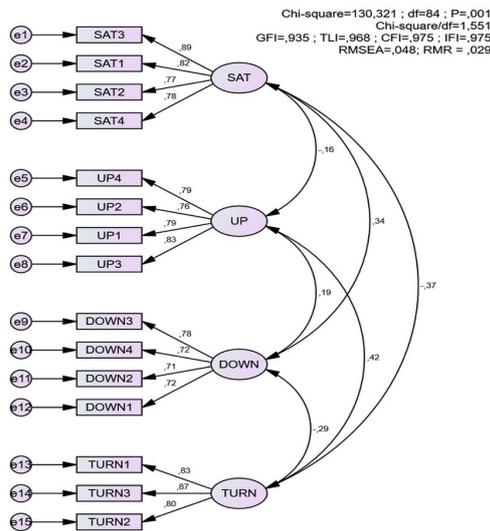


Fig.1: Results CFA the enterprise's ability to access credit (normalized)

TABLE 3
 MODEL FIT SUMMARY

Model fit	Value
CMIN/df	1,551
RMSEA	0,048
RMR	0,029
GFI	0,935
IFI	0,975
NFI	0,933
CFI	0,975
TLI	0,968

NFI being all greater than 0.9 and RMSEA = 0.048 < 0.08 and RMR = 0.029 < 0.08. Therefore, the scale in the model achieves unidirectionality, and the market data is coherent with the model.

Test the convergence value of the scale

The scale reaches convergence value if the standardized regression weights are all higher than 0.5 and the variance extracted is ≥ 0.50 [31]. Table 4 shows that the observed variables' standardized regression weights are all substantial. The smallest is also $0.709 > 0.5$, and the variances extracted are ≥ 0.50 so it can be concluded that the scales of the research concepts all reached convergent value. The results of testing the convergence value of the model are presented in the following table.

Test the discriminant value of the scale

The correlation coefficients with standard deviation show all are different from 1 (table 5). In other words, the scales reach a discriminant value.

With the above test results, the developed critical CFA model is coherent with the collected data and has statistical significance. Therefore, it is qualified to analyze the SEM linear structure model to prove the hypothesis of the study.

D. Structural Equation Modeling

To assess the study theoretical model, structural equation modeling (SEM) is utilized. This approach has many more benefits than typical multivariable regression since it may be

TABLE 4:
 TEST THE CONVERGENCE VALUE OF SCALE

	Estimate
SAT3 <--- SAT	,890
SAT1 <--- SAT	,822
SAT2 <--- SAT	,769
SAT4 <--- SAT	,775
UP4 <--- UP	,790
UP2 <--- UP	,763
UP1 <--- UP	,789
UP3 <--- UP	,828
DOWN3 <--- DOWN	,777
DOWN4 <--- DOWN	,724
DOWN2 <--- DOWN	,709
DOWN1 <--- DOWN	,718
TURN1 <--- TURN	,829
TURN3 <--- TURN	,875
TURN2 <--- TURN	,802

performed after the measurement number. The ML (Maximum Likelihood) estimation approach is used to estimate the model's parameters, similar to how it is used to evaluate scale models via CFA. The SEM model's results are depicted in the figure below.

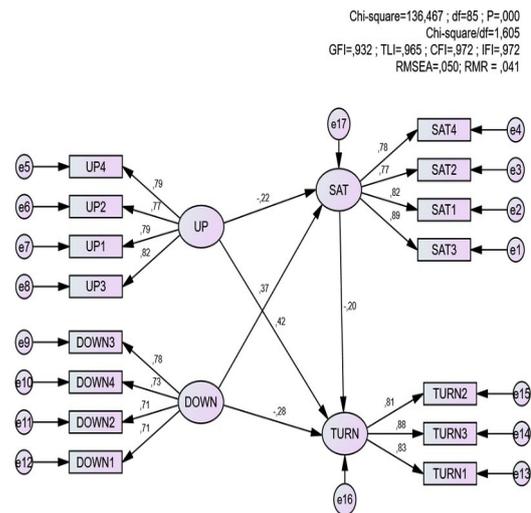


Fig. 2. Result of research model (SEM – standardized estimates)

Test the model coherence

The model has 85 degrees of freedom, according to the findings of the linear structure analysis, with a Chi-squared

TABLE 5
 TEST THE DISCRIMINANT VALUE OF THE SCALE

	R	SE	I-r	CR	P
SAT <--> UP	-0,160	0,109	1,160	10,641	0,000
SAT <--> DOWN	0,340	0,104	0,660	6,355	0,000
SAT <--> TURN	-0,373	0,102	1,373	13,400	0,000
UP <--> DOWN	0,187	0,108	0,813	7,494	0,000
UP <--> TURN	0,416	0,100	0,584	5,815	0,000
DOWN <--> TURN	-0,286	0,106	1,286	12,153	0,000

statistical value of 136.467 (P-value = 0.000); Chi-squared/df= 1.605 (less than 3); hence, we evaluate more meaningful measurement indicators. Besides, we must consider other indicators such as GFI; IFI; TLI; CFI IFI, NFI all greater than 0.9 and RMSEA = 0.050 < 0.08 and RMR = 0.041 < 0.08. Therefore, the scale in the model achieves unidirectionality and the market data is coherent with the model. According to the above criteria, the research model is coherent with the market data. Specifically, the measurement indicators of the coherence level of the model are shown in the following table.

TABLE 6
EVALUATION INDICATOR SYSTEM AND FITTING RESULT OF SEM OVERALL MODEL FIT

	Actual fitting value	Standard
CMIN/df	1,605	<3
RMSEA	0,050	<0.08
RMR	0,041	<0.08
GFI	0,932	>0.9
IFI	0,972	≥0.9
NFI	0,930	>0.9
CFI	0,972	>0.9
TLI	0,965	>0.9

Test the relationship between the factors of the model

Table 7 displays the estimated outcomes of the parameters. This indicates that the associations are statistically significant (p less than 5%).

TABLE 7
UNSTANDARDIZED COEFFICIENTS FOR SEM MODEL

			r	SE	CR	P
SAT	<---	UP	-.361	.115	-3,144	.002
SAT	<---	DOWN	.401	.079	5,064	***
TURN	<---	UP	.712	.118	6,012	***
TURN	<---	DOWN	-.308	.080	-3,848	***
TURN	<---	SAT	-.203	.071	-2,843	.004

However, the unstandardized regression coefficient only shows the positive or negative impact of the independent factor on the dependent factor (indicated +/-). This has greater relevance in mathematics than in economics since it simply represents the change in the dependent variable when each independent variable changes, as long as the remaining variables remain constant.

To examine the affecting amount of influence ratio of the independent factors on the dependent variable, the standardized regression coefficient is utilized. The larger the value is, the more important the independent variable to the dependent one is. We consider the table of regression coefficients with the normalized beta:

TABLE 8
STANDARDIZED COEFFICIENTS FOR THE SEM MODEL

			Estimate
SAT	<---	UP	-.215
SAT	<---	DOWN	.371
TURN	<---	UP	.418
TURN	<---	DOWN	-.281
TURN	<---	SAT	-.200

Referring to Table 8, we see that there is an influence of social comparison on the job satisfaction of accountants: Upward comparison affects job satisfaction with a standardized regression coefficient of -0.215 (negative effect); Downward comparison affects job satisfaction with a standardized regression coefficient of 0.371 (positive effect).

Besides, the SEM results also prove that there is an influence of social comparison on the turnover intention of accountants: Upward comparison affects turnover intention with a standardized regression coefficient of 0.418 (positive effect); downward comparison affects the turnover intention with a standardized regression coefficient of -0.281 (negative effect).

Finally, the SEM results also indicate that there is an impact of job satisfaction on the resignation intention of accountants by the regression coefficient expressing the impacting level of -0,200 (negative effect).

V. CONCLUSION AND RECOMMENDATIONS

According to the findings, there was a causal association between UP and SAT. The regression coefficient representing this relationship is -0.215 with statistical significance at a significant level of 5%. Thus, hypothesis H1a is accepted. There is a causal relationship between DOWN and SAT. The regression coefficient of this relationship is 0.371 with statistical significance at the significant level of 5%. Thus, hypothesis H1b is accepted. So in consideration of the size of the regression coefficient, the downward comparison will have a higher influence on job satisfaction than upward comparison.

There is a causal relationship between UP and TURN. The regression coefficient of this relationship is 0.418, with statistical significance at significant level of 5%. Thus, hypothesis H2a is accepted. There is a causal relationship between DOWN and TURN. The regression coefficient of this relationship is -0.281, with statistical significance at significant level of 5%. Thus, hypothesis H2b is accepted. In consideration of the size of the regression coefficient, upward comparison will have a higher influence on the turnover intention than downward comparison.

Based on the research results, business managers can refer to the following implications:

* Solution of designing job descriptions

The human resources department of the enterprise needs to coordinate with the finance-accounting department to design a decentralized management model of the finance-accounting department by the size and workforce of this department. Then, based on the designed management model, the person in charge of accounting needs to develop a detailed job description for each job position in the department.

* Solution of building up a standard system of employee appraisal.

In order to ensure appraisal fairness of the employee performance, it is necessary that enterprises must have a system of specific appraisal and classification standards. For example, for the appraisal of accountants, the human resources department and the accounting department need to work together to develop suitable appraisal criteria for job characteristics, positions and titles.

* Solutions of building a culture of employee respect and encouragement

Managers should not compare an employee's results directly with better others because it causes pressure on unachieved employee and reduces their job satisfaction.

When an employee's job performance declines with their past performance or their results are under the enterprise's set of standards, managers need to give the employee motivation and find out the reasons to help them complete their tasks if necessary.

Managers should also build a common ideal role model for the employees to encourage and motivate them. The employees should be motivated to achieve the role model's standards when performing the assigned jobs and tasks. Simultaneously, managers need to show employees' possibility of achieving a job promotion if they improve their performance.

REFERENCES

- [1] C. T. Kulik, M.L. Ambrose, "Personal and situational determinants of referent choice," *Academy of Management Review*, vol. 17, no. 2, pp. 213-237, 1992.
- [2] J. Greenberg, C.E. Ashton-James, Ashkanasy N.M, "Social comparison processes in organizations," *Organizational Behavior and Human Decision Processes*, vol. 102, pp. 22-41, 2007.
- [3] P. D. Chatzoglou, E. Vraimaki, E. Komsiou, E. Polychrou, "Factors affecting accountants' job satisfaction and turnover intentions: A structural equation model," in 8th International Conference on Enterprise Systems, Accounting and Logistics, Thassos Island, Greece, Thassos Island, 2011.
- [4] S. Y. Koh, T.S. Ong, A.B.Samuel, "The impacts of Physical, Psychological, and environmental factors on employees job satisfaction among public accounting professionals in Malaysia," *Asia – Pacific management accounting journal*, vol. 12, no. 2, pp. 129-15, 2017.
- [5] J. S. T. Zotorvie, M.B. Kudo, T.C. Adade, "A Survey of Factors that Influence the Level of Job Satisfaction and Turnover Intention of Professional Accountants in Ghana," *International Journal of Academic Research in Business and Social Sciences*, vol. 7, no. 10, pp. 41-56, 2017.
- [6] K. A. Eddleston, "The effects of social comparisons on managerial career satisfaction and turnover intentions," *Career Development International*, vol. 14, no. 1, pp. 87-110, 2009.
- [7] L.T. Dai, R. Xiao, "The influence of social comparison on job performance," *Open Journal of Social Science*, vol. 4, pp. 147-151, 2016.
- [8] N.S. Gigarasi & J. Hassaskhah, "The effect of social comparison tendencies on EFL teachers' experience of burnout and instructional self – efficacy," *Cogent Psychology*, vol. 4, pp. 1-21, 2017.
- [9] Festinger, "A theory of social comparison process," *Human relations*, vol. 7, pp. 117-140, 1954.
- [10] J.V.Wood, "What is social comparison and how should we study it?," *Personality and Social psychology Bulletin*, vol. 22, pp. 520-537, 1996.
- [11] B.P. Buunk, F.X. Gibbons, "Social comparison; the end of a theory and the emergence of a field," *Oganizational Behavior and Human Decision Processes*, vol. 107, pp. 3-21, 2007.
- [12] J.W. Gastorf, J. Suls, G.S. Sanders, "Type A coronary-prone behavior pattern and social facilitation," *Journal of Personality and Social Psychology*, vol. 38, pp. 773-800, 1980.
- [13] J.V.Wood, K.L. Taylor, "Serving self-reference goal through social comparison. in Suls, J. and Wills, T.A. (Eds), *Social Comparison: Contemporary Theory and Research*," Erlbaum Associate, Hillsdale, NJ, pp. 23-50, 1991.
- [14] D.J. Brown et al., "Antecedents and consequences of the frequency of upward and downward social comparisons at work," *Organization Behavior and Human Dwcision Processes*, vol. 102, pp. 59-75, 2007.
- [15] B.P. Buunk, R. Zurriaga, V. Gonzalez-Rona, M. Subirats, "Engaging in upward and downward comparisons as a determinant of relative deprivation at work: a longitudinal study," *Journal of Vocational Behavior*, vol. 62, pp. 370-388, 2003.
- [16] G.R. Oldham, C.T. Kulik, M.L. Ambrose, L.P. Stepina, J.F. Brand, "Relations between job facet comparisons and employee reactions," *Organizational Behavior and Human Decision Process*, vol. 38, pp. 28-47, 1986.
- [17] E.A. Locke, "The Nature and Causes of Job Satisfaction. In: Dunnette, M.D., Ed," *Handbook of Industrial and Organizational Psychology*, vol. 1, pp. 1297-1343., 1976.
- [18] J. Schermerhorn, *Management for productivity*, Canada: JohnWiley & Sons, Inc., 1993.
- [19] J.L. Price, "Handbook of organizational measurement," *International Journal of Manpower*, vol. 18, pp. 303-558, 1997.
- [20] K. Ishikawa, *What Is Total Quality Control? The Japanese Way*, New Jersey: Prentice-Hall, Englewood Cliffs., 1985.
- [21] J. Juran, *Juran on Leadership for Quality*, The Free Press: New York, 1989.
- [22] J.C.L. Chew, , *Influence of human resources management practices on the retention of core employees of Australia organizations: An empirical study. [Doctoral Thesis]. Murdoch University, 2004.*
- [23] C. M. Kinnoin, *An examination of the relationship between family-friendly policies and employee job satisfaction, intent to leave, and organizational commitment.. [Performance]. Nova Southeastern University, Florida, 2005.*
- [24] A. Carmeli, J. Weiberg, "Exploring turnover intentions among three professional groups of employees," *Human Resources Development International*, vol. 9, no. 2, pp. 191-206, 2006.
- [25] M. Mari, *Job satisfaction and turnover intention among the skilled personnel in TRPlc berhad. [Master Thesis]. Universiti Utara Malaysia, 2009.*
- [26] F. E. Diener, *Journal of Personality and Social Psychology*, vol. 68, pp. 926-935, 1995.
- [27] D. Finegold, S. Mohrman, G.M. Spreitzer, "Age effects on the predictors of technical workers' commitment and willingness to turnover," *Journal of Organizational Behavior*, vol. 23, pp. 655-674, 2002.
- [28] B. Major, M. Testa, W.H. Bylsma, "Responses to upward and downward social comparisons: the impact of esteem-relevance and perceived control. in Suls, J. and Wills, T.A. (Eds),," *Social Comparison: Contemporary Theory and Research*, Erlbaum Associates, Hillsdale, pp. 237-260, 1991.
- [29] A. Pradana & I. Salehudin, "Role of work overloas toward turnover intention among newly hired public accountants," in 8th International conference on Business and Management reseearch, Seoul, South Korea, 7th November 2013, Seoul, 2013.
- [30] J.C. Nunnally, I.H. Bernstein, *Psychometric theory. (3rd ed.)*, New York: McGraw-Hill, 1994.
- [31] J.C. Anderson, D.W. Gerbing " *Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach*," *Psychological Bulletin*, vol. 103, pp. 411-423., 1988.
- [32] K. Schermelleh-Engel, H. Moosbrugger, H. Muller, "Evaluating the fit of structural equation models: tests of significance and goodness-of-fit models," *Methods of Psychological Research Online*, vol. 28, pp. 23-74, 2003.

Application of Technology in Management and Operation of Agricultural Products Supply Chain in Vietnam During the Covid-19 Pandemic

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Abstract—Agricultural products are one of the important products in Vietnam's agricultural industry and contribute significantly to the value of economic growth. Under the direction of the Government, many businesses have taken solutions to remove difficulties in maintaining production, circulation and transportation of goods to ensure the supply of agricultural products during the covid-19 pandemic. In which, the application of technology in chain management and operation is a solution that brings positive effects to Vietnam's agricultural product industry.

Index Terms—technology, supply chain, agricultural products.

I. INTRODUCTION

IN RECENT years, the agricultural product industry is strongly participating in the globalization process with many trade agreements. The covid 19 pandemic with new strains has disrupted global trade, changed the consumption trend of agricultural products and caused the supply chain of agricultural products in Vietnam to be broken. Therefore, the application of technology in management is necessary. In this article, the authors study an overview of technology, its application in the operation and management of agriculture products supply chains in Vietnam and lessons learned from some countries around the world.

II. OVERVIEW

1. Agricultural products

Agricultural products are the main products of the agricultural industry. Agricultural products are the products or semi-finished products of the commodity-producing and growing industry (WTO).

Cash crops is a concept used to refer to agricultural products that farmers produce for the purpose of selling to the market (Nguyen Van Ngoc).

A. Characteristics of agricultural products

Firstly, varieties, bulky and easily damaged: agricultural products are diverse in types including diversity in varieties, diversity in ecosystems in agriculture [7]. In addition, agricultural products are mainly harvested in the form of fresh products, which are very perishable and difficult to preserve. Therefore, the stages of harvesting, transporting, preserving and processing are very important and play a decisive role in exporting agricultural products to foreign countries.

Secondly, strongly influenced by natural conditions: Land, soil, water and weather conditions are the factors that directly determine the yield and quality of agricultural products. If natural conditions are favorable, it will help plants grow well, give high yields, agricultural products meet the prescribed standards and vice versa [5].

Third, agricultural products are often seasonal: Each crop and plant variety have its own specific climatic conditions to grow [13]. Therefore, the seasonality of agricultural products is clearly shown. Therefore, to ensure the long-term and regular supply of agricultural products, it is necessary to have a good process of preserving and storing goods. If we can do that, the process of supplying goods will be stable and long-term.

Fourth, dispersed and local agricultural products: The production of agricultural products is mainly based on natural and weather conditions, which are specific to the region. Therefore, agricultural products are often dispersed into different production areas based on natural conditions, soil as well as climate of each region. This has made the collection, transportation, storage and processing of goods take more time and cost.

B. Impact of the Covid-19 pandemic on the agricultural product industry

The Covid-19 pandemic has negatively affected production and harvesting. The export value of many agricultural products tends to decline sharply. Moreover, many agricultural import markets have tightened technical barriers and trade safeguard measures, requiring product traceability, issuing export certificates, inspecting goods and quality at exporting country. This also causes significant difficulties for enterprises purchasing and processing agricultural products.

Unpredictable disease developments have seriously affected the production of agricultural products. The situation often occurs: where it is needed, it is not available, where it is available, it cannot be consumed. The disruption of the supply chains of agricultural products is also a big barrier affecting the consumption of goods.

2. Supply chain management and operations

The term “supply chain management” appeared long ago and was commonly used in the 1990s [10]. According to Laura Rock Kopczak and M. Eric Johnson [3], in the early 1990s, supply chains were limited to managers of a few global companies who were having difficulty coordinating internal

information and raw materials. Therefore, supply chain management is also understood in a very narrow sense. Over time, along with the development of science and technology and specialization in the production process, companies gradually realized that a single department or an individual company could not meet the needs of the customers. Customer needs that require the alignment of all members of the supply chain [1]. Supply chain management and operations are getting more and more attention. According to Lambert and Cooper (2000), supply chain management is the integration of business processes from consumers to suppliers of raw materials to create products, services, and information to benefit both customers and supply chain members. As such, a supply chain by this definition pertains to the life cycle of a product or service. Supply chain management is therefore an activity of many actors with close interrelationships and towards the ultimate goal of bringing value to customers.

For different products, the supply chain has different characteristics. In the agricultural sector, FAO [12] defines: "Agricultural value chain includes the set of actors and activities that bring an agricultural product from production to the final consumer, whereby the value of product is increased in each intermediate stage. A value chain can be a vertical link or a network of independent actors involved in processing, packaging, storage, transportation, and distribution. Activities in the value chain of agricultural products include production, collection, processing, wholesale and retail as well as supporting functions such as supply of inputs, financial services, logistics services, packaging, and marketing.

3. *The relationship between technology and supply chain management*

Along with the development of society, technology is also constantly changing. The great achievements of technology development include: the introduction of the internet of things (IoT); big data, artificial intelligence (data science); blockchain (blockchain); 3D printing technology (additive manufacturing); robotics technology, etc. [10]. Technology is not only a common term, but it is in fact related to supply chain management [11].

IoT is capable of connecting all customers, suppliers, etc. on technological devices [2]. IoT can collect large volumes of product and market related data from source to consumer and vice versa [10].

By combining customer data and their operations, data and AI technology can create a superior competitive advantage for companies [8]. AI technology helps to present information that reflects market needs and specific customer requirements. As changes in customer needs and preferences are captured and analyzed, new production and distribution technologies, especially 3D printing and robotics, will become more flexible [10].

Blockchain technology has the potential to significantly reduce the need for verification, thereby increasing the efficiency of supply chain management [10]. 3D printing could suggest new supply chain design options, whereby customers customize or personalize online orders and manufacturers can manufacture products in nearby factories

and deliver goods to customers in very short cycle times [9]. The combination of computers with more powerful processors, the capture of detailed data through the IoT, and the use of AI has spurred the faster development and adoption of robots in a number of fields, creating new possibilities and potential improvements in supply chain planning, execution and control [6], [10].

Supply chain management from a modern customer-centric perspective. Therefore, technology makes it possible for customers to experience many different purchasing methods. Through technology, customers can also know full information about products, prices, locations, promotions, etc. to make appropriate purchasing decisions [4], [10]. Technology will also make it possible for every customer to give feedback on their shopping experience with the product. Therefore, receiving good feedback from customers will help companies gain a competitive advantage. In addition to focusing on product development, companies need to focus on good supply chain management and operation design.

In summary, technology is a factor that has a huge impact and plays a particularly important role in supply chain management and operation.

III. RESULT AND DISCUSSION

1. *The current situation of technology application in the management and administration of the supply chain of agricultural products in Vietnam during the Covid-19 pandemic*

A. *The current situation of Vietnamese agricultural products supply*

In 2021, the fourth wave of Covid-19 epidemic broke out in Vietnam, many localities implemented social distancing, resulting in the supply chain of agricultural products in many localities being broken. According to VCCI Can Tho's statistics, in just 3 months, 7, 8, 9, the whole Mekong Delta region has over 10,000 enterprises leaving the market. In order for agricultural products to reach the end consumer, a complex supply chain with the participation of many parties must work together in harmony, only one link disruption will cause the whole chain to stall. During the current outbreak of disease in Viet Nam, not only one but many links in the supply chain of agricultural products have been broken.

According to 78/NQ-CP dated July 20, 2021 of the Government on the prevention and control of the Covid-19 pandemic, the Ministry of Agriculture and Rural Development (MARD) established the Southern Working Group (the 970) and Northern Working Group (the 3430) to coordinate with localities. According to statistics of MARD, the main indicators reflected are: Agriculture decreased by 2%, of which the South decreased by more than 5.6%, livestock decreased by 3.8%. Aquaculture in August alone decreased by 7.4%, pulling the overall situation to increase by 5.6%. General statistics: Compared to July 2021, only 3 product groups increased: cassava and cassava products (+26.6%), cereal products (+1.1%), milk and products The rest of dairy products (+0.8%) all dropped sharply in export value. The

biggest decrease was in pangasius and shrimp products (-29.7%), vegetables (-25.8%), etc. The main cause was the Covid-19 epidemic which had a great impact on the production and processing activities of the company. Many enterprises/factories for export processing, many enterprises/factories only operate at 30-40% capacity, even have to close due to F0.

Currently, there are 3 groups of agricultural products that are difficult to consume: fruits and vegetables, livestock products and aquatic products.

The specific situation in some important provinces is as follows: With crop products, Binh Duong currently has a surplus of about 80 tons of melons, 70 tons of bananas and 30 tons of seedless lemons. In particular, leafy vegetable products are in excess and facing difficulties in consumption. The complicated situation of the Covid-19 pandemic led to many material areas being blocked due to the distance, greatly affecting production and harvesting, and the capacity at seafood processing factories decreased to 50%. According to data from the Tien Giang Statistics Department, in the first nine months of 2021, seafood exports of enterprises in the province only reached about 65,656 tons, down more than 23% over the same period; export value reached just over 144 million USD, reaching 45% of the plan, down 29% over the same period. In Ca Mau province, local reports said that due to the impact of the epidemic, the entrance and exit of the sea estuary was strictly controlled, the prices of fishery products decreased, some items decreased deeply 30-40% on average.

Reflected by Working Group 970 of MARD, in terms of seafood production in the southern provinces, there are not enough human resources to take part in caring, harvesting and transporting products. Due to the impact of the pandemic, employees do not want to participate, fearing infection, while the participants do not have medical conditions (have not been vaccinated, ...). In addition, labor does not or is difficult to move from one locality to another to care for and harvest products, increasing the risk of disruption in the production and supply chain from seed to commercial product. The supply of input materials (seedlings, feed, drugs, chemicals, products to treat and improve the aquaculture environment) did not respond in time, resulting in increased costs due to transshipment and COVID-19 testing. The difficulty of calling and calling traders, factories to buy seafood, lack of drivers, means of transport ... has made the purchase price drop sharply, especially raw shrimp. Besides, MARD said that only 30% of seafood processing enterprises in the South operate with average capacity reduced to 30-35%. Aquatic raw materials for processing and export only reach 40-50% compared to external raw materials. Currently, there are 15 aqua feed factories, 120 seafood processing factories with case F0 that have to stop operating.

B. The current status of technology application in the management and administration of the supply chain of agricultural products in Vietnam during the Covid-19 pandemic

Some cities are starting to accelerate the application of technology in the management and administration of the

supply chain of Vietnamese agricultural products during the Covid-19 pandemic. Ho Chi Minh City is building a software to coordinate information on demand for agricultural products continuously in order to coordinate with southern provinces and cities providing food to produce according to the city's needs, creating close links in agriculture. Karma. Covid-19 has impacted farmers' awareness. In the past, wholesale market traders made all deliveries at the market, then distributed to the traditional market. But now, they trade through social networks. Sellers can ship directly to buyers via online platforms reducing costs and time. The epidemic has promoted e-commerce activities and technology application more.

In addition, the Ministry of Industry and Trade organized the implementation of a solution to apply blockchain technology in product traceability for a number of agricultural products in order to improve the brand and promote the export of agricultural products. production in developed countries in the context of the EVFTA agreement being ratified; Building a total solution for the logistics service exchange system between logistics service enterprises and agricultural product trading enterprises in order to facilitate delivery services associated with e-commerce; At the same time, the Ministry of Industry and Trade has digitized the market information system, upgraded the Vietnamese export support platform ECVN.com.

In general, the application of technology in the management and administration of the supply chain of agricultural products in Vietnam is only at the beginning stage and still lacks many legal frameworks and supports from the State.

2. Lessons learned from countries around the world in protecting and developing the supply chain of agricultural products during the Covid-19 pandemic

A. Lessons from China

China is a major producer and consumer of agricultural products in the world. When the Covid 19 pandemic occurred, it also impacted the supply chain of agricultural products of this country. However, to face the negative impacts on the agricultural sector, China has some adaptive solutions.

China has established a "green stream" and applied technology to market and distribute goods. When the Covid-19 pandemic spread strongly in China, the country applied many blockade measures, causing the supply chain of agricultural products to be broken at many stages. At this point a series of measures are put in place to solve the problem. China's Ministry of Agriculture and Rural Affairs organizes online conferences to help businesses sell goods. Information and communication technology is fully utilized. The China Agricultural Products Market Association cooperates with a number of media platforms and e-commerce sites to set up an online service platform to support the sale of agricultural products during the pandemic. Besides the website platform, chat groups on mobile devices, WeChat accounts and 24/7 hotline are also available to provide necessary information related to the supply of agricultural products. In addition, an important platform is the online sale of agricultural products of poor areas, established by the Ministry of Finance and the

Poverty Alleviation Department of the State Council, focusing on supporting disadvantaged localities.

In addition to supporting consumer online channels, the Chinese government also encourages e-commerce enterprises to actively participate in selling agricultural products. Many e-commerce businesses have initiated projects to support farmers, mobilizing various resources in purchasing, logistics, shipping and marketing to maximize benefits for both farmers and businesses. To drive sales, the platforms set up special sales portals with well-designed graphics and slogans like "take care of the farmers" and offer coupons and discounts to customers. agricultural transactions. In addition, they also use marketing tools such as live streams of short videos like tick Tok, using the influence of celebrities to introduce the good characteristics of agricultural products. The above solutions of the Chinese government have also had obvious effects in solving the problem of goods supply in this country.

B. Lessons from Thailand

Thailand has been making a significant contribution and plays an important role in international trade. Thailand is also a leading producer and exporter of agricultural products in the world. In the Covid 19 pandemic, Thailand is also a country that has strongly applied digital technology in goods supply chain management and operation, bringing positive effects. They use a number of digital technologies and electronic data systems to manage the supply of agricultural goods. The continuous development of technology and application of technology in the production and circulation of goods in Thailand allows supply chain activities to flow and be efficient. In addition, the digital economy is one of the core pillars of management in Thailand..., the "Digital Thailand Policy" was launched by the Thai Government with the ambition of building a digital society and economy, helping Thailand can become a "digital leader". Thailand plans to deploy broadband to every village, providing 10,000 free Wi-Fi points, doubling international bandwidth.

Investment in building smart cities is also an important focus of Thailand to promote agriculture and tourism industry, contributing to narrowing income gap, promoting economic growth.

During the covid 19 pandemic, the increase of blockchains has brought about significant efficiencies in the supply of agricultural goods: goods supply companies can verify goods supply information in a more efficient way. Businesses can also verify their products for foreign customers easily. Technology can also automate activities in the agricultural supply chain in Thailand. For example, factories and enterprises only need 2 to 3 people to operate machines, which helps to cut production costs and improve production efficiency. In addition, thanks to the application of technology in price management of agricultural products in Thailand, which are updated online, traders and exporters can optimize their profits. Besides, digitization such as e-commerce and online shopping has opened new doors for the agricultural product market in Thailand in foreign markets such as China, ASEAN countries, the United States and the EU.

3. Lessons for Vietnam and recommendations

A. Lessons for Vietnam

From practical experience in China and Thailand on applying technology in supply chain management of agricultural products, Vietnam also needs lessons in chain management and operation:

From Thailand's experience, to succeed, it is necessary to define the digital economy as not merely promoting the development of information technology but also a comprehensive digitalization process in the production and supply of agricultural products. Therefore, there is a need for a consensus on the position, role and connotation of the digital economy in policy formulation and making, especially in government agencies. From there, there is an accurate positioning and orientation, right on the agenda for the digital economy, as well as a reasonable and effective allocation of resources for implementation in reality.

Vietnam needs to focus on training and developing information technology human resources. The information technology human resource training program should aim to accelerate the socialization of information technology education, especially updating information technology training curricula in association with new technology trends, such as IoT, artificial intelligence, robotics. In particular, it is necessary to build a core digital workforce, sufficient in quantity and satisfying in quality to serve the requirements of digitizing all areas of social life from agriculture to industry and services. service.

From practical experience in China, Vietnam also needs to make flexible adaptations in applying technology to supply goods such as: applying internet software, organizing a series of introduction events, supplying goods to customers. digitalization helps businesses find their customers. Guide farmers can use e-commerce to sell goods instead of the traditional way of supplying goods as before. That will promote a smooth supply chain of goods and minimize disruptions in circulation.

B. Recommendations

Firstly, Build a brand development strategy for Vietnamese agricultural products. Currently, Vietnamese agricultural products are exported to foreign countries mainly in the role of processors and exporters. Local brands occupy the most profitable position in the value chain. They are the importers and distributes to the end customer in the host country. The government and Vietnamese agricultural product exporters need to work together to make more and more Vietnamese brands occupy the last position in this supply chain. Businesses can be more active in participating in the Intellectual Property Development Support Program of the National Office of Intellectual Property of Vietnam. Initially, businesses can join the association, develop a joint brand with a local retailer, then gradually expand and build their own brand.

Secondly, promote linkages in agricultural areas for Vietnamese agricultural products. Regional linkage is the connection between members in the region and between members in the region with other members outside the region. This is a solution for specialization among localities in the

region, focusing on effectively exploiting the strengths of each locality, closely linking in the value chain of agricultural products from production investment to consumption. Localities can set up working groups of each province to connect and solve problems on production and consumption of agricultural products in the area; coordinate with localities to promote the circulation and consumption of agricultural products between provinces and cities in the region.

Third, promote the application of high technology and digital transformation in the supply chain of agricultural products. This application should be invested by businesses trading and distributing agricultural products synchronously or linked with a group of businesses in the region to perform at all stages such as: 1-Strengthening the stamping with QR codes for source traceability origin of agricultural products. This QR code should be detailed to identify each farmer household, quantify the type of fertilizer, and date and time to use chemicals in farming. 2-Building a set of rules for production, digitization and aggregation into a data warehouse and uniformly applied to all units participating in the chain. 3-Associating logical infrastructure with the access chain in terms of time and location of delivery. 4-Build your own e-commerce platform or cooperate more with domestic e-commerce products.

Fourth, build short supply chains according to regional links. Some forms of short supply chain of agricultural products are suitable in Vietnam, such as: Model of selling products directly from producer, farm to consumer, model through an intermediary stage of production cooperatives. agricultural production with the motto of investment, direct purchase of agricultural products and supply in large quantities to industrial parks, collective kitchens of schools, agencies and hospitals. The state needs to develop a legal framework, mechanisms and policies for short supply chains, to avoid the current situation where models develop spontaneously, with no agency responsible for specific management.

IV. CONCLUSION

The Covid-19 pandemic has greatly affected the process of globalization in general and the increasingly complex

supply chain flows in the world in particular. However, the adoption of the latest technologies in commodity supply chain management seems to be an irreversible trend. Agricultural goods are also not out of that game. Whether Vietnamese agricultural products can occupy a higher position in the global value chain is a difficult question. And technology is an important link that businesses as well as managers and policy makers need to use to solve that problem.

REFERENCES

- [1] Barratt, M., Barratt, R. (2012). "Exploring internal and external supply chain linkages: Evidence from the field", *Journal of Operations Management*, 29 (5), 514-528.
- [2] Kranz, M. 2017. "Success with the Internet of Things Requires More Than Chasing the Cool Factor", *Harvard Business Review*.
- [3] Laura Rock Kopczak and M. Eric Johnson. (2003), "The supply-chain management Effect", *Mit Sloan management review* (Spring 2003), 27-34.
- [4] Lambert, D. M., Cooper, M. C. (2000). "Issues in Supply Chain Management", *Journal of Industrial Marketing Management*, 29 (1), 65-83.
- [5] Nguyen Thi Tan Loc (2016), *Research on vegetable consumption through markets and supermarkets in Hanoi city*. Doctoral thesis in Economics, Vietnam Academy of Agriculture.
- [6] Nguyen Van Ngoc, *Dictionary of Economics*, National Economics University
- [7] Renma M.A. Singnore, F. F. Montesono, M. Gonnella & P. Santamaria (2019). "Biodiversity of vegetable Crops, A Living Heritage", *Agriculture* 2019, 9, 47, Retrieved from <http://doi.org/10.3390/agriculture9030047> on 13/10/2021.
- [8] Sanders, N.R. 2016. "How to Use Big Data to Drive Your Supply Chain", *California Management Review* 58(3):26-48.
- [9] Sodhi, M.S., and Tang, C.S. (2017). "Social Responsibility in Supply Chains" New York: Springer, 465-83.
- [10] Soonhong Min, Zach G. Zacharia, and Carlo D. Smith, 2019. "Defining Supply Chain Management: In the Past, Present, and Future", *Journal of Business Logistics*, 2019, 40(1): 44-55
- [11] Waller, M.A., and Fawcett, S.E. (2014). "Click Here to Print a Maker Movement Supply Chain: How Invention and Entrepreneurship Will Disrupt Supply Chain Design", *Journal of Business Logistics* 35(2):99-102.
- [12] FAO (2010), "Agricultural Value Chain Finance. Tools and Lessons", Retrieved from <http://www.https://www.fao.org/policy-support/tools-and-publications/resources-details/en/c/423759/> on 21/11/2021
- [13] FAO (1998). "Basic understanding of horticulture", Retrieved from <http://www.fao.org/3/x5642e/x5642e06.htm> on 13/10/2021.

The Factors Influencing Bank Credit Capital Accessibility of Enterprises in Hanoi in the Context of the Covid Pandemic

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Abstract—Lack of funds and difficult to access to formal loans from banks are problems faced by Vietnamese enterprises in general and Hanoi enterprises in particular. There have been many domestic and international studies on accessing to bank credit capital. While the research works focused on the analysis from a corporate perspective, no specific corporate disclosure has been made in Hanoi, in the context of the Covid pandemic. This study aims to identify the important factors affecting access to bank credit capital in Hanoi, through interviews with 200 customers, and to use a quantitative study method (linear regression). The results showed that there were five factors affecting access to bank credit capital in Hanoi: (1) Economic background, (2) Secured Assets (3) Business Plan, (4) Productivity and (5) the relationship between companies with banks.

Index Terms—credit, access to credit capital, enterprise.

I. INTRODUCTION

FUNDING is one of the factors influencing the growth of Vietnamese enterprises in general, as well as those in Hanoi in particular. Among the funds borrowed from banks, credit funds, and the stock market, bank credit has always been the most preferred source of funds by companies due to its advantages such as large loan limits and high guarantees. In the face of the negative impact from the fourth Covid outbreak, demand for bank credit has become more urgent. Statistics show that in the first nine months of 2021, compared to the same period of the previous year, the number of businesses dissolved, decreased by 7.5 percent in registered capital, and decreased by 13.8 percent in labor due to insufficient capital to resume business production [1].

Although the State Bank of Vietnam, financial institutions have implemented a number of measures to support a variety of credit and loan rate cuts, the number of loaned enterprises has not increased significantly. The causes come from many sides, including limitations from the enterprise itself.

The article is the result of a study aimed at identifying factors affecting access to Bank credit capital by enterprises in Hanoi. Based on the research results, the author aims to propose solutions to help increase access to bank credit capital. businesses in Hanoi.

II. THEORETICAL BASIS

A. Definition of bank credit

Bank credit is a relationship in which the right to use capital from the bank is transferred to the customer for a period of time at a certain cost (Nguyen, 2013) [2]. Thus, bank credit consists of three items: (1) transfer of the right to use capital from one person to another, (2) transfer is temporary

or takes place during the period and (3) transfer involves costs.

Credit rating is the arrangement for an organization or individual to use a money or commitment to allow the use of a money in principle to be repaid by loan, discount, financial lease, payment coverage, bank guarantee and other credit transactions (Credit Organizations Act, 2010).

B. Types of bank credit

Short-term credit financing for business: loans with a maturity of 12 months or less. The purpose is to meet the demand for floating capital generated in the production process of the enterprise for raw materials purchase, production costs or consumption needs, payments of small individuals, etc.

Mid- and long-term credit financing for investment: loans with a maturity of more than 12 months. The purpose of borrowing is to repair, repair, replace fixed assets or improve technology, coordinate production processes, renew technology processes and newly build small and large-scale (for medium-term credit) and long-term credit [2].

C. The role of bank credit in the enterprises

Bank credit plays a very important role in the supply of funds to the economy, especially to enterprises. Banking credit is a financial lever to support enterprises: Banking credit affects capital transfer: transfer of investment. From companies with high returns and limited funding to those with low returns, bank credit contributes to changing the supply and demand of goods as well as changing the country's economic balance.

Bank credit contributes to the improvement of the efficiency of the Company's use of funds. Because in order to access bank capital, Enterprises need to develop a business production plan, ensure the purposeful use of capital, and efficiently. Bank credit is also a guaranteed factor for a company's continuous business production activities, contributing to the improvement of the efficiency of its use of business funds [2].

III. OVERVIEW

Access to bank credit capital is influenced by a number of factors. The internal factor of the enterprise is an important factor influencing access to credit capital according to Beck and his colleagues, (2016) [3], Ricardo (2004) [4], Qian (2009) [5], Vo Tri Thanh (2011) [6], Ajagbe (2012) [7], Khalid (2014) [8], Dang Thi Huyen Thuong (2016) [9] Enterprises as well. Operating hours, sales, guaranteed assets.

They all have a direct impact on the ability of companies to borrow money. Some studies have shown that there is a positive relationship between the size of the enterprise and the ability to borrow funds: Fama and French (2002) [10]; Chen (2004) [11]; Tran Dinh Khieu Nguyen and Ramachandran, (2006) [12], ect.

The Relationship Factor between Enterprises and Banks by authors Gamage Pandula (2011) [13] and Khalid Hassan Abdesamed (2014) [8], Dang Thi Huyen Thuong (2015) [14] pointed out that when Enterprises have a good relationship with the Bank, they have easier access to credit financing. Using the correlation regression method, author Dang Thi Huyen Thuong (2015) showed a positive relationship between the relationship between the enterprise and the bank and the access to capital of the enterprise.

Guaranteed Asset Factor: The larger assets a company has, the easier it is to borrow, due to lower financial risk Mukiri (2016) [15], Dang Thi Huyen Thuong (2015) [14]. The study by Nguyen Hong Ha and his colleagues [16] also highlighted the factors influencing access to capital from the characteristics of the enterprise and the "debt repayment" of the enterprise.

Business Alternative Factor: Nguyen Hong Ha (2013) when researching factors affecting the accessibility of small and medium-sized enterprises to credit capital in Tra Vinh province came to the conclusion that a good business plan would make it easier for the business to borrow Banks funds with higher credit limits. According to Ho Ky Minh (2013) [17], developing a business plan is in fact only in response to requests from NH. This reduces bank's confidence in business's management capabilities and debt repayment, affecting business's access to Banks capital.

According to Qian (2009) [5], Tran Dinh Khoi Nguyen and Ramachandran (2006) [12], it is pointed out that the business productivity of a company has a positive effect on the access to capital of the company (Ha Dieu Thuong and Nguyen Thu Nga (2014) [18].

The economic background factor mentioned in the study of Ha Dieu Thuong and Nguyen Thu Nga (2014) suggests that the economic background at the time of the study did not have a significant impact on the accessibility of capital for enterprises.

On an overview basis, the author's study develops the following research models:

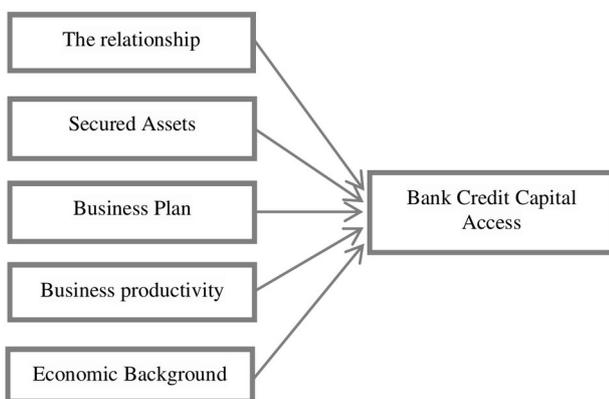


Fig 1. The study process analysis.
Source: Author's simulation

Research hypothesis:

H1: "The relationship" has a positive effect on enterprises access to bank credit in Hanoi.

H2: "Secured Assets" have a positive effect on enterprises access to bank credit in Hanoi

H3: "Business Plan" has a positive impact on enterprises access to bank credit in Hanoi

H4: "Business productivity" has a positive effect on enterprises access to bank credit in Hanoi

H5: "Economic Background" has a positive effect on enterprises access to bank credit in Hanoi

IV. RESEARCH METHODS AND MODELS

A. Sample design and data collection

A Study Using the Most Convenient Sampling Method, Randomized Survey of Companies Operating in Hanoi City Observation sample size to satisfy conditions: $N \times \max [5x, 50 + 8m]$

+ For EFA exploratory factor analysis, $N \times 5x$ (Hair and Co-operation, 2006

+ For multivariate regression analysis: $N \times 50 + 8 m$

Therefore, sample size $N [[5 \times 29; 50 + 8 \times 5] = 145$.

The number of samples needs to be greater than 145, in order for the sample size to be large enough for the author group to distribute 200 copies of questions to enterprises in Hanoi.

B. Research method

After collection, the questionnaires were reviewed and eliminated from the required questionnaires. The data will then be encrypted, entered, cleaned, and processed using SPSS statistics software. The data analysis process proceeds through the following steps:

(1) Evaluating the reliability of the scale:

To use a scale for analysis Statistics in the study, the reliability of the scale should be verified. The reliability of the scale was tested in a way consistent with the Cronbach's Alpha coefficient. The larger the Cronbach's Alpha coefficient, the more closely the variables observed on the scale are correlated with each other. However, the analysis results for the Cronbach's Alpha coefficient do not tell which observation variables are appropriate or inappropriate, so it is necessary to examine and remove the observation variables that do not match the factors to be measured and those that have a coefficient with the overall correlation (Item Total Correlat.Ion) less than 0.3 will be eliminated (Hoang Trong and Chu Nguyen Mong Ngoc, 2008) [19].

(2) Analysis of EFA Exploration Factors

Remove variables that are not sufficient. Confidence and EFA exploratory factor analysis were conducted to verify the convergence of conceptual and component variables. EFA analysis is a technique used to miniaturize and summarize data. This method is useful for identifying sets of variables required for research problems and is used to find relationships between variables.

Implementation: Since the scales are all unidirectional scales, the Principal Components element extraction method with Varimax rotation is used to produce a rotated factor matrix, which identifies the number of factors extracted and

the number of initial observation variables belonging to the factors. At the same time, a follow-up analysis is performed by multiplying the factors by the regression method.

(3) Multivariate regression analysis:

Correlation Analysis: Implementation Pearson correlation analysis between independent variables and dependent variables is intended to confirm that there is a linear relationship between dependent and independent variables, indicating that the use of multivariate regression is appropriate between variables. The closer the absolute value of the Pearson coefficient is to 1, the closer the two variables have a linear correlation. Here we use significance level 2 verification with significance level $\alpha \pm 0.01$ to determine the linear relationship between independent variables and dependent variables before performing regression analysis (Hoang Trong and Chu Nguyen Mong Ngoc, 2008).

Multivariate regression: To model the linear relationship between variables using a linear regression model. This model will describe the form of the relationship and thus help predict the extent of the dependent variable (with accuracy within a limited range) when knowing the value of the independent variable in advance (Hoang Trong and Chu Nguyen Mong Ngoc, 2008).

Construct a regression equation: $Y = \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_5 X_5$

Hypothesis test for the fit of the regression model With the data set i through the corrected coefficient of determination R^2 , it is necessary to perform an F-value test to determine the fit of the regression model to the whole.

Hypothesis test for the significance of the regression coefficient by t Partly to affirm or refute the original hypothesis.

V. RESEARCH RESULTS

A. Assess the reliability of the scale

First of all, the intrinsic consistency of the scale should be evaluated with the Cronbach's Alpha coefficient to eliminate "waste". Reliability refers to the degree to which measurements can avoid random errors, and to the accuracy and consistency of the results. As a reliability test method, the Cronbach's alpha coefficient is used as a criterion for removing garbage variables to perform a reassessment of the reliability of the scale in each factor. Variables with a correction item-total correlation coefficient less than 0.3 are excluded with the condition that the Cronbach's alpha coefficient should be greater than 0.6. The results are summarized in the table below:

After verifying the reliability of 29 observation variables of 6 factors, all factors were suitable for inclusion in the EFA exploratory factor analysis

B. Exploratory factor analysis

Exploratory analysis is to understand the components that make up the concepts from the collected data. With this analysis, the variables are freely loaded onto the factors and based on the load coefficient (the correlation coefficient between the variables and the factors) to determine which concepts the variables explain.

In this step, 24 observation variables representing five independent variables are analyzed jointly with Principle

TABLE 1. RESULTS OF THE RELIABILITY EVALUATION OF THE SCALE

Factors	Observed variables	Corrected Item - Total Correlation	Cronbach's Alpha if Item Deleted
Business productivity ($\alpha = 0.685$)	BPR1	0.427	0.641
	BPR2	0.438	0.640
	BPR3	0.466	0.623
	BPR4	0.380	0.664
	BPR5	0.503	0.606
Secured Assets ($\alpha = 0.906$)	SA1	0.777	0.882
	SA2	0.823	0.866
	SA3	0.796	0.875
	SA4	0.757	0.888
The relationship between business and Bank ($\alpha = 0.847$)	RE1	0.512	0.852
	RE2	0.743	0.792
	RE3	0.667	0.813
	RE4	0.627	0.824
	RE5	0.737	0.793
Business Plan ($\alpha = 0.850$)	BPL1	0.669	0.818
	BPL2	0.756	0.779
	BPL3	0.697	0.806
	BPL4	0.636	0.831
Economic Background ($\alpha = 0.818$)	EB1	0.593	0.788
	EB2	0.558	0.797
	EB3	0.512	0.810
	EB4	0.713	0.750
	EB5	0.676	0.763
Bank Credit Capital Access ($\alpha = 0.930$)	EA1	0.794	0.918
	EA2	0.853	0.906
	EA3	0.856	0.906
	EA4	0.806	0.915
	EA5	0.770	0.922

Source: Results of model

Component extraction and Varimax rotation. The results of exploratory factor analysis are as follows: KMO coefficient = 0.778; sig. = 0.000, components extracted with 5 or more factors, Eigenvalue = 1.12; extractive error reached 70.595%.

TABLE 2. COMPONENT, INITIAL EIGENVALUE AND TOTAL VARIANCE EXPLAINED

	Component				
	1	2	3	4	5
SA3	.893				
SA2	.871				
SA1	.856				
EB3	.842				
SA4	.805				
BPR5	.663				
BPR4	.618				
RE5		.845			
RE2		.839			
RE3		.797			
RE4		.776			
RE1		.659			
BPL2			.876		
BPL3			.842		
BPL4			.776		
BPL1			.768		
BPR1				.785	
BPR3				.772	
BPR2				.729	
EB5					.651
EB1					.628
EB2					.612
EB4					.603

Source: Results of model

As a result of numerical analysis, variables with a factor load coefficient of 0.55 or more were extracted as five repre-

sentative factor groups out of 24 observation variables. Includes:

Group 1: The "SA" factor consists of variables: SA1, SA2, SA3, SA4, NSSX4, NSSX5, EB3.

Group 2: The factor "The relationship between Business and Bank (RE) includes variables: RE1, RE2, RE3, RE4, RE5

Group 3: "Business Production Plan (BPL)" factors include BPL1, BPL2, BPL3, BPL4

Group 4: The "Business Productivity (BPR)" factor includes: BPR1, BPR2, BPR3

Group 5: Economic Background (EB) factors include: EB5, EB1, EB2, EB4.

C. Regression analysis

To verify the model ngThe author conducts regression analysis to test hypotheses. The results of the regression analysis will show the extent to which the factors "Business-to-Bank Relationship (RE), Business Plan (BPL), Corporate Assured Assets (SA), Business productivity (BPR), and Financial Background (EB) are affected.

Regression analysis is possible. Perform at a significance level of 5%, with the variable selection procedure inserting one-time (enter). Considering the model that shows the linear correlation between the dependent variable and the five independent variables, we construct the following linear regression equation:

$$EA = \beta_1 SA + \beta_2 RE + \beta_3 BPL + \beta_4 BPR + \beta_5 EB$$

Results of Q analysisThe multivariate variables summarized in Table 4 are as follows:

TABLE 3 RESULTS OF MODEL FIT ASSESSMENT

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.732 ^a	.536	.520	.69275560	1.508

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	81.453	5	16.291	33.945	.000 ^b
	Residual	70.547	147	.480		
	Total	152.000	152			

Dependent Variable: Access to Bank Credit Capital
 Predictors: (Contant), Economic Background, Productivity Export, Guaranteed , Assets, Business Plan, Relationship between Business and Banks

Source: Results of model

The adjusted R2 coefficient is 0.536, that is, the model. 53.6 percent of the total associations that affect "Bank Credit Capital Access (EA)" can be explained.i 46.4 percent are affected by non-modular variables. Figure and random error.

Durbin Watson test results for coefficient d = 1.508, located. in about a mile and a mile

Hypothesis test for fit of model: We have F.5; 152) = 33.945; Sig = 0.000±0.05. In this way, the constructive linear model fits the whole.

The results of the regression model shown in Table 5 are as follows.

TABLE 4 COEFFICIENTS

Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	8.181E-17		.000	1.000		
	Secured Assets	.331	.056	.331	5.891	.000	1.000
	The relationship between business and Bank	.158	.056	.158	2.807	.006	1.000
	Business Plan	.328	.056	.328	5.843	.000	1.000
	Business productivity	.227	.056	.227	4.040	.000	1.000
	Economic Background	.492	.056	.492	8.756	.000	1.000

a. Dependent Variable: K enterprises' access to bank credit in Hanoi

Source: Results of model

As a result of the analysis, the VIF error magnification coefficient of each independent variable was all required (less than 10), so the multicollinearity phenomenon did not occur or was insignificant in this study.

The results of the regression analysis also show the verification values of five factors: "Secured Assets (SA), Relationship between Business and banks (RE), Business Plan (BPL), Productivity Capacity (BPR), and Contingency.Economic Photo (EB)" is statistically significant because the significance level is less than 0.01. Therefore, "Secured Assets (SA), Relationship between Business and banks (RE), Business Alternatives (BPL), Productivity (BPR), and Economic Background (EB) have an effect on "Bank Credit Capital Access (EA).

Check for residual with a standard distribution: when the model is incorrectly used, or the method is not constant, the number of residual parts is not large enough for analysis, the residual may not be distributed.Implicit. Therefore, a survey on the distribution of residual parts is needed, which is done by constructing histograms and P-Plots. It is also important to note that it is not reasonable to expect that the observation residuals have a completely standard distribution because there are always differences in sampling, even if the real error has a standard distribution in the whole, the observation sample has only a standard approximation distribution.

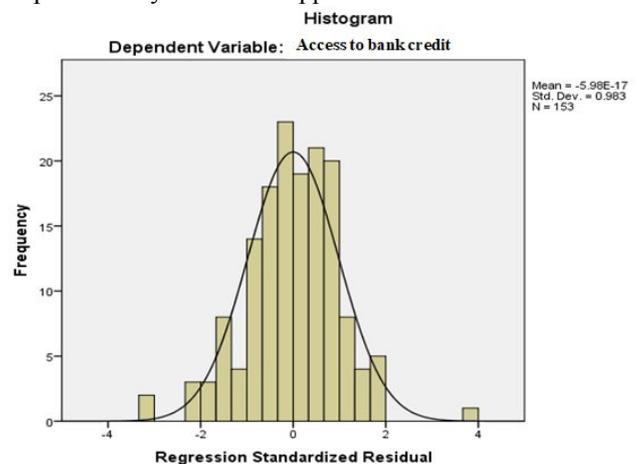


Fig 2 . Frequency Histogram

Source: Results of model

From the graph in Figure 2, we see that the standard deviation (Std.Dev) in the regression model is 0.983 approximating to 1, and the mean is close to 0. Because it is not possible to expect that the observed residual to have a complete standard distribution because there are differences in sampling, or when the real error has a standard distribution in the whole, the residual has only a standard approximation distribution. Therefore, it can be concluded that the standard distribution hypothesis is not violated.

Normal P-P Plot of Regression Standardized Residual

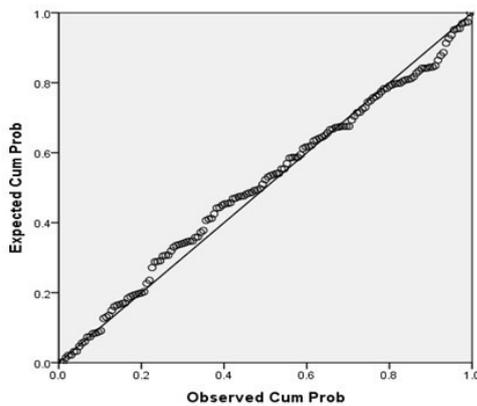


Fig. 3. P – P Plot Histogram

Source: Results of model

The P-P Plot shows that the observed variables do not scatter too far from the expected straight line in the model, so we can argue that the standard distribution hypothesis is not violated.

After examining the violation of the assumptions in regression model analysis, the results of the regression model of the sample can use estimates for the overall regression coefficients. The accepted regression equation is as follows:

$$EA = 0.331SA + 0.158RE + 0.328BPL + 0.227BPR + 0.492EB$$

Based on the results of the regression analysis, we found that the most influential factor in "Bank Credit Capital Access (EA)" was the "Economic Background (EB), followed by "Secured Assets (SA)", and "Business Plan (BPL)", "Business productivity (BPR)" and finally, "Relationship Between business with Banks (RE)"

Based on the results of multivariate regression analysis (Table 5), the hypotheses tested are as follows: The independent variable "Secured Assets (SA)" with a standardized regression coefficient $\beta = 0.12$ is significant. If the other factors remain unchanged, on average, when "Secured Assets (SA)" increases by 1 unit of standard deviation, " Bank Credit Capital Access (EA)" increases by 0.32 units of standard deviation (33.1%) and Sig = 0.000\times0.01 proves that this conclusion is statistically significant. "Bank Credit" is accepted

The independent variable " The relationship between business and Bank" (RE) with a standardized regression coefficient of $\beta = 0.12$ means that when other factors remain unchanged, " The relationship between business and Bank" (RE) increases by 1 unit of standard deviation, " Bank Credit Capital Access " increases by 0% on average. 0.06 ± 0.01 proved this conclusion statistically significant, and therefore the hypothesis that "the relationship between Business and

banks has a positive effect on access to bank credit capital" was accepted.

The independent variable "Business Plan (BPL)" with a standardized regression coefficient of $\beta = 0.13$ means that when other factors remain unchanged, on average, when "Business Plan (BPL)" increases by 1 unit of standard deviation, "Bank Credit Capital Access (EA)" increases by 0.32%. This is statistically significant, so the hypothesis that "business plans have a positive effect on access to bank credit capital" is accepted.

The independent variable "Business productivity (BPR)" with a standardized regression coefficient of $\beta = 0.227$ means that the average deviation of "Business productivity (BPR)" to 1 unit of standard deviation increases "Bank Credit Capital Accessibility (EA) by 0.227%" when other factors remain constant. It is statistically significant, so the hypothesis that "productivity has a positive effect on access to bank credit" is accepted.

The independent variable "economic background (EB)" with a standardized regression coefficient $\beta = 0.492$ means that when other factors remain unchanged, on average, when "economic background (EB)" increases by 1 unit of standard deviation, "Bank Credit Capital Access (EA) 49.2%" increases. It is statistically significant, so the hypothesis: "The economic background has a positive effect on access to bank credit" is accepted.

VI. IN CONCLUSION

Based on theoretical and practical research, we see that enterprises in Hanoi want access to credit capital from banks. However, access to these funds by companies is difficult, in addition to the difficulties inherent in them: small businesses, small guarantees, weak business Business productivity, insufficient clarity, insufficient information, and lack of confidence in banks. Debt and corporate development are also attributable to the bank's credit policy mechanisms such as interest rates, borrowing procedures, loan maturities and loan review periods, which also contribute to increasing difficulties for companies in accessing capital.

Through the use of the regression analysis method, the study identified the factors affecting the accessibility of bank credit capital of enterprises in Hanoi. The study found that five factors influencing access to bank credit capital were summarized in order of strong influence: "economic background (EB), "relationship between Business and banks," "Secured Assets (SA), and "Business productivity (BPR)." These results contribute to enhancing coordination among businesses, banks, industries and related organizations in the implementation process so that business can access bank credit more easily.

REFERENCES

- [1] General Statistics Office of Vietnam, The number of new start-up registrations plunged in September 2021, 2021, <http://www.gso.gov.vn/dulieu-va-so-lieu-thong-ke/2021/10/doanh-nghiep-dang-ky-thanh-lap-moi-sut-giam-manh-trong-thang-9-va-9-thang-nam-2021/>
- [2] V. T Nguyen, "Banking Credentials Textbook", Ha noi, Publisher statistics, 2013.
- [3] T. Beck, & A. Demircuc-Kunt, "Small-medium enterprise sector: access to finance as a growth constrain"t, 2006, Journal of Finance and Banking, 30(11), 2931-2943.

- [4] Ricardo N. Bebczuk, "What Determines the Access to Credit by SMEs in Argentina?", 2014, Department of Economics, Universidad Nacional de La Plata, Argentina, 48, pp15-30.
- [5] Y. Qian, Y. Tian, and T.S Wirjanto, "Do Chinese publicly listed companies adjust their capital structure toward a target level?", 2009, China Economic Review, Vol. 20, No. 4, pp. 662676.
- [6] V. T Thanh, *Small and Medium enterprise access to finance in Vietnam, 2011*, Central Institute for Economic and Management, Chapter 6.
- [7] F. A Ajagbe, "Features of small scale entrepreneur and access to credit in Nigeria: a microanalysis", 2012, American Journal Of Social And Management Sciences, Pages 39- 44.
- [8] H. Khalid Abdesamed and K.A Wahab, "Financing of Small and Medium Enterprises (SMEs) in Libya: Determinants of Accessing Bank Loan", 2014 Middle-East Journal of Scientific Research, 21 (1), pp. 113-122, 2014 ISSN 1990-9233
- [9] D. T. H Thuong, "Factors affecting access to loans by small and medium-sized enterprises in Hanoi", 2016, Doctor of Economics Philosophy, Foreign Trade University, Ha noi.
- [10] E. F Fama and K. R French, "Testing Trade-Off and Pecking Order Predictions About Dividends and Debt", 2002, Review of Financial Studies, Vol. 15, No.1, pp. 1-336.
- [11] J. J Chen, "Determinants of capital structure of Chinese-listed companies". 2004, Journal of Business Research, Vol. 57, pp. 1341-1351.
- [12] K. N Tran Dinh, & Ramachandran, N., "Capital Structure in Small and Medium-sized Enterprises", 2006, ASEAN Economic Bulletin, Vol. 23, No. 2, pp. 192-211.
- [13] Gamage and Pandula, "Bank Finance For Small And Medium-Sized Enterprises In Sri Lanka: Issues And Policy Reforms", 2015. Studies in Business and Economics. Vol. 18, No. 1, pp. 98 - 112.
- [14] D. T. H Thuong, "Factors Influencing Small and Medium Businesses' Access to Loans", 2015, Economic and Forecasting Journal of Forecasts, Vol.10, No.1, pp.15- 18.
- [15] W. G Mukiri, "Determinants of access to Bank credit by micro and small enterprises in Kenya", 2011, Beacon Consultant Service, Kenya.
- [16] N. H Ha, H. T. N Tuyen, D.C. Binh "Analysis of Factors affecting access to credit capital of small and medium-sized enterprises in Tra Vinh Province", 2013. Social and Humanities Press, Vol. 09, No.1, pp. 37 - 45.
- [17] H. K Minh, V. T. T Anh, L. T. H Cam, "An Assessment of Corporate Access to Banking in South Central Coast and Central Highlands", 2013, Da Nang Journal of Social Economy, Vol.33, pp. 33-39.
- [18] H. D Thuong, N. T Nga, "a study on access to bank capital by small and medium-sized enterprises in Thua Thien Hue, 2014, Journal of Economics and Development, Vol. 202, No. 2, pp. 45 - 57.
- [19] H. Trong, C. N. M Ngoc, "Analyzing Research Data with SPSS", Ho Chi Minh city, Publishing company Hong Duc, 2008.

Optimizing Search Results Using Taguchi Design of Experiments: Case Study of the Distribution of COVID-19 Names in Vietnam

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Abstract—Taguchi design of experiments is a method used in engineering, especially in the field of new product development, for optimizing production processes and improving product quality. The Taguchi method is widely used in the field of industrial engineering. The purpose of this study is to investigate the applicability of the Taguchi method for other tasks, such as optimizing search results. Using the Taguchi method, we assess the popularity of three names for COVID-19 that have been used by scientists in research related to COVID-19 in the context of Vietnam. The results show the positive value of using the Taguchi method to optimize search results. The keyword COVID-19 is found to be the most-used keyword. The results also show that disease prevention, spread, infection, transmission, treatments, preparation, and responses to the disease are particularly interesting research topics in Vietnam at present.

Index Terms—COVID-19, Design of Experiments, Taguchi, Vietnam.

I. INTRODUCTION

ASSOCIATED with the development of mankind is the manufacturing industry. Manufacturers prefer to have the best product quality at a reasonable cost, and a process of quality management is needed to achieve quality control. It is crucial that consumers are satisfied with their purchases; however, if the partial targets deviate from the target value, customers will feel dissatisfied and the cost of loss will also increase. A system of statistical tools, including the Taguchi method, has been developed for quality control.

Because quality control is of concern in engineering, most of the previous research has been based on the application of the Taguchi method in engineering fields. The main research question of this study is whether the Taguchi method can be applied to other fields. To answer this question, we consider the interesting case study of searching for the most common name of COVID-19 in Vietnam.

II. LITERATURE REVIEW

The Taguchi design of experiments is a statistical method developed by its inventor, Genichi Taguchi, who refined his ideas in the 1950s. His method was virtually unknown outside of Japan until the early 1980s [1]. The challenge of modern industry is mainly focused on achieving high quality, saving costs, and increasing production efficiency. The Taguchi method is a useful tool, widely used in manufacturing, to optimize designs for performance and quality, limit product defects, and minimize production costs with limited experiments [2]–[5]. To confirm this, we obtained 4,020 re-

sults from the Scopus database, nearly 90% of which are research studies published in the field of engineering and technology. The results are shown in Fig. 1.

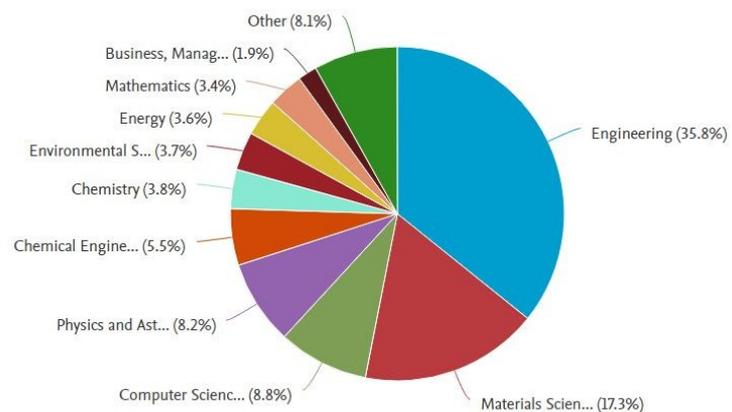


Fig. 1 The pie diagram shows the distribution among various fields of the use of the Taguchi method (Source: Scopus, extraction date: 1 July 2021)

Since the Taguchi method is based on statistics rather than modeling, it is very popular in engineering. In discussing the Taguchi method, one immediately thinks of technical systems development [6]. When it comes to quality management, it was W. Edwards Deming who first recognized the importance of reversing quality control from inspection to process control. However, Taguchi enhanced quality control when he devised the control tool at the design stage. Broadly speaking, the Taguchi method should not be limited to manufacturing engineering alone as it can be applied to any process where controlling the early design phase is important.

The COVID-19 epidemic, the name given by the World Health Organization (WHO), also known as coronavirus 2019 and SARS-CoV-2, is an infectious disease caused by a newly discovered coronavirus [7]–[9]. The disease originated in Wuhan, China, spread throughout many provinces and cities in that country, and not long afterward spread widely to many other countries. At the present time, in mid-July 2021, there have been millions of cases. Consequently, with the ongoing COVID-19 outbreak, healthcare systems across the world have been pushed to the brink. Furthermore, it costs low- and middle-income countries nearly US\$52 billion (US\$8.60/person) every four weeks to deliver an effective

healthcare response to COVID-19 [10]. The epidemic is posing unprecedented challenges and creating enormous difficulties in all aspects of life. This has encouraged scientists to conduct research. According to the Dimensions database, about 4% of the world's research output was devoted to coronavirus in 2020, and a sharp increase in the number of articles submitted to scientific journals on coronavirus can be expected [11]. Vietnam is no exception. At present, Vietnam is experiencing a fourth fast-spreading wave of infections, and there have been several reputable studies related to COVID-19 in the Vietnamese context.

The name for the COVID-19 epidemic has not been agreed upon by scientists [12]. As explained by the WHO, viruses and diseases often have different names. For example, HIV is the virus that causes AIDS. People often know the name of a disease, but not the name of the virus that causes it. There are different procedures and purposes for naming viruses and diseases. Viruses are named based on their genetic makeup to facilitate the development of diagnostic tests, vaccines, and drugs. Diseases are named so that prevention, transmission, severity, treatments, preparations, and responses can be discussed [13]. Therefore, it is important to utilize the prevailing name to assess current research and to identify research gaps that need to be filled.

Conducting a systematic review in any field of scholarly research is paramount. In the research design phase, it can be difficult to deliver a meticulous summary of all available primary research in a succinct and readable form in response to a research question. There are many ways to locate search terms. Therefore, the purpose of this study is to investigate the use of the Taguchi method to evaluate search terms. To illustrate this approach, this paper presents an experiment on optimizing search results given the distribution of COVID-19 names in Vietnam.

III. PROPOSED WORK

Design of experiments is a statistical approach to investigate a system or process to assess the relationship between multiple input variables (factors) and key output variables (responses) so that the influence can be found. Taguchi experimental design can be used at the point of greatest leverage to reduce design costs by speeding up the design process, as the Taguchi method is designed to solve this problem with a small number of trials [5], [14]. It is not necessary to perform all test cases for all scenarios. Results show that the Taguchi method gives similar results and saves 88.9% on test runs compared with other methods [5].

TABLE I. KEYWORD AND TRIAL EXPERIMENTS

Term Experiment		SARS-COV-2	COVID-19	Coronavirus 2019
1	Vietnam	AND	AND	AND
2		AND	AND	NOT
3		AND	NOT	AND
4		AND	NOT	NOT
5		NOT	AND	AND
6		NOT	AND	NOT
7		NOT	NOT	AND

The details of the seven trials are shown in Table 1. In the trials, we specified the following search terms: "SARS-COV-2," "COVID-19," "Coronavirus 2019," and the fixed keyword, "Vietnam."

Scenarios for a full factorial design (Table 1) are as follows:

- 1) "Vietnam" AND "SARS-COV-2" AND "COVID-19" AND "Coronavirus 2019."
- 2) "Vietnam" AND "SARS-COV-2" AND "COVID-19" NOT "Coronavirus 2019."
- 3) "Vietnam" AND "SARS-COV-2" NOT "COVID-19" AND "Coronavirus 2019."
- 4) "Vietnam" AND "SARS-COV-2" NOT "COVID-19" NOT "Coronavirus 2019."
- 5) "Vietnam" NOT "SARS-COV-2" AND "COVID-19" AND "Coronavirus 2019."
- 6) "Vietnam" NOT "SARS-COV-2" AND "COVID-19" NOT "Coronavirus 2019."
- 7) "Vietnam" NOT "SARS-COV-2" NOT "COVID-19" AND "Coronavirus 2019."

Data on COVID-19 research questions were collected from a variety of sources in selected journal databases. In choosing databases for the experiment, we selected three reputable, multidisciplinary publishers/databases as data sources: Taylor and Francis, Emerald, and ScienceDirect. Specifically, Taylor and Francis is a UK publisher providing access to more than 2,700 high-quality, multidisciplinary journals in the humanities and social sciences, natural sciences and technology, engineering, and medicine and healthcare. Emerald, dating back to 1967, is a long-established UK publisher of journals and books in the fields of management, business, education, healthcare, and engineering. ScienceDirect is a website that provides access to a large database of multidisciplinary scientific and medical publications by the Dutch publishing house, Elsevier. The database stores more than 18 million articles from more than 4,000 academic journals and 30,000 e-books. Thus, the selection of data sources provides the assurance of large size, inclusiveness, and academic reliability. The search time was 16h00' on 15 July 2021 (GMT +7). Statistical results are shown in Table 2. The results were processed with Minitab 18 software.

IV. RESULTS AND DISCUSSION

Evaluating keyword changes means looking at how adding or subtracting keywords affects the results. Fig. 2 shows a downward-sloping line for the keyword "COVID-19" from the first level (AND) to the second level (NOT). A

TABLE II. DESIGN OF EXPERIMENT RESULTS

Database Experiment	Taylor and Francis	Emerald	ScienceDirect
1	0	0	0
2	0	0	1
3	0	0	0
4	0	0	2
5	0	0	0
6	16	8	23
7	1	0	0

line that is not horizontal (not parallel to the x-axis) indicates that there is an effect. By comparing the slopes of the lines, it is possible to compare the relative magnitude of the factor effects. The larger the slope, the greater the difference in results when changing one or more keywords. This difference can be clearly seen if we remove the design parameter keywords, “SARS-COV-2” or “Coronavirus 2019,” in a search string. As can be seen in Fig. 2, the steeper lines for the two keywords, “SARS-COV-2” and “Coronavirus 2019,” are parallel to each other. The parallelism shows non-interaction, which means they have a similar result or consequence. However, the longer line representing the keyword “Coronavirus 2019” indicates that if this word is removed, the settings will be optimal. The figure also shows that the keyword “COVID-19” has a positive signal when it exists in the search string; in other words, it makes one of the most significant contributions.

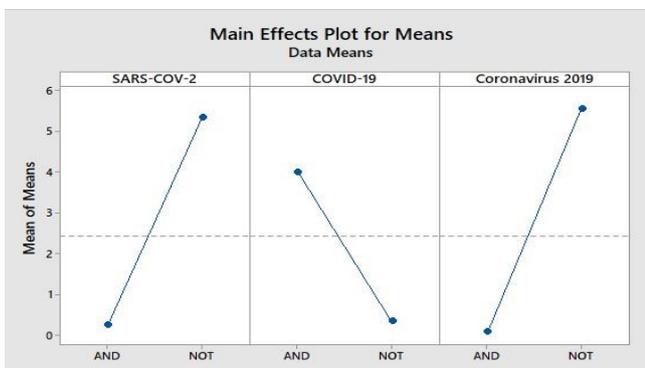


Fig. 2 Main effects plot for the case study.

In the search results, the phrase “COVID-19” generates the most responses across the databases. According to the WHO definition, the word “COVID-19” implies disease. Problems currently discussed in the context of Vietnam are disease prevention, disease spread with transmission, and illness severity. It can be suggested that pandemics prompt the government to find ways to treat, prepare for, and respond to diseases.

V. CONCLUSION AND FUTURE WORK

The Taguchi method is a technique to optimize the product design phase in manufacturing, in particular, and engineering, in general. This article has demonstrated the use of the Taguchi method for optimizing search array strings as a way of applying the technique to another field. The results

of the case study show that the keyword “COVID-19” returns the optimal syntax. Hopefully, this can answer the question of whether the Taguchi method can be applied to other fields.

The fight against COVID is not over yet. The case study shows that the response to prevent and control the COVID-19 epidemic remains a matter of concern. In the future, we suggest empirical research to test the effectiveness of the Taguchi method for different nonengineering fields, such as education, healthcare, etc.

REFERENCES

- [1] J. Antony, D. Perry, C. Wang, and M. Kumar, “An application of Taguchi method of experimental design for new product design and development process,” *Assem. Autom.*, vol. 26, no. 1, pp. 18-24, Jan. 2006.
- [2] A. Jerbi, A. Ammar, M. Krid, and B. Salah, “Performance optimization of a flexible manufacturing system using simulation: The Taguchi method versus OptQuest,” *Simulation*, vol. 95, no. 11, pp. 1085-1096, Jan. 2019.
- [3] I. Choudhury and M. El-Baradie, “Surface roughness prediction in the turning of high-strength steel by factorial design of experiments,” *J. Mater. Process. Technol.*, vol. 67, no. 1-3, pp. 55-61, 1997.
- [4] J. Antony and F. Jiju Antony, “Teaching the Taguchi method to industrial engineers,” *Work Study*, vol. 50, no. 4, pp. 141-149, July 2001.
- [5] M. Islam and A. Pramanik, “Comparison of design of experiments via traditional and Taguchi method,” *J. Adv. Manuf. Syst.*, vol. 15, no. 3, pp. 151-160, Sept. 2016.
- [6] V. Silva, *Statistical approaches with emphasis on design of experiments applied to chemical processes*. IntechOpen, 2018, p. 142.
- [7] B. Hu, H. Guo, P. Zhou, and Z. Shi, “Characteristics of SARS-CoV-2 and COVID-19,” *Nat. Rev. Microbiol.*, vol. 19, no. 3, pp. 141-154, Oct. 2020.
- [8] T. Singhal, “A review of coronavirus disease-2019 (COVID-19),” *Indian J. Pediatr.* vol. 87, no. 4, pp. 281-286, Apr. 2020.
- [9] Y. Wu, C. Chen, and Y. Chan, “The outbreak of COVID-19: An overview,” *J. Chin. Med. Assoc.*, vol. 83, no. 3, pp. 217-220, Mar. 2020.
- [10] A. Kaye et al., “Economic impact of COVID-19 pandemic on healthcare facilities and systems: International perspectives,” *Best Pract. Res. Clin. Anaesthesiol.*, vol. 35, no. 3, pp. 293-306, Nov. 2021.
- [11] H. Else, “How a torrent of COVID science changed research publishing — in seven charts,” *Nature*, vol. 588, no. 7839, 553, Dec. 2020.
- [12] S. Jiang et al., “A distinct name is needed for the new coronavirus,” *The Lancet*, vol. 395, no. 10228, p. 949, Feb. 2020.
- [13] “Naming the coronavirus disease (COVID-19) and the virus that causes it,” WHO, 2021. [Online]. Available: [https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-\(covid-2019\)-and-the-virus-that-causes-it](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it).
- [14] N. Fei, N. Mehat, and S. Kamaruddin, “Practical applications of Taguchi method for optimization of processing parameters for plastic injection moulding: A retrospective review,” *ISRN Ind. Eng.*, vol. 2013, 462174, June 2013.

Developing High Quality Human Resources Of High-Tech Agricultural Enterprises In Vietnam

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Abstract—Globalization and Industrial revolution 4.0 impact increased to the businesses in general and agricultural high-tech enterprises in particular. Businesses focus on applying high technology to improve efficiency in production, business activities and create a sustainable competitive advantage for businesses. Therefore, the human factor, especially the development of high-quality human resources for high-tech agricultural enterprises, should be concerned and play a decisive role. This paper focuses on analysing the current situation of developing high-quality human resources through Recruitment and Selection, Training and Development and Compensation of enterprises. The results show that the above activities still have many limitations, especially Recruitment, Selection and Compensation. From there, the author proposes some suggestions to improve the development of quality human resources of high-tech agricultural enterprises in Vietnam.

Index Terms—high quality human resource, developing high quality human resources, high-tech agricultural enterprises.

I. INTRODUCTION

HIGH quality human resources are always the driving force of socio-economic development. In Vietnam, at the Resolution of the thirteenth Party Congress, it was stated that “Developing human resources, especially high-quality human resources, prioritize the development of human resources for leadership, management and key fields on the basis of improving and creating a strong, comprehensive and fundamental change in the quality of education and training, recruitment and selection, use and treatment of talents...”.

Nowadays, many businesses and organizations have invested in developing high-quality human resources. That is a way to increase the scale, improve the quality and ensure the suitability of the human resource structure, especially in the context of the rapidly growing pace of science and technology development. Human resources must regularly update knowledge, skills, and expertise to operate new production technologies.

In the field of agriculture, developing high-tech agriculture is one of the important tasks in the socio-economic development strategy of our country today. The government issued many policies to encourage businesses to invest in agriculture, especially in high-tech agriculture. Agricultural enterprises are identified as playing the role of “pillars” in promoting the development of agricultural production of our country, towards commodity production, improving the competitiveness of Vietnamese agricultural products. Vietnam aims to develop about 200 high-tech agricultural enterprises by 2030. To do this, besides meeting the criteria to be recognized as a high-tech agricultural enterprise such as labor productivity, research activities, high-tech application testing, or total revenue of the enterprise, ... The factor of

the enterprise’s labor force must have a bachelor degree or higher to directly conduct research and development out of the total number of employees of the enterprise is at least 2.5%. Therefore, those enterprises need to concentrate on developing quality human resources.

The research content of the article is the actual situation of human resource development activities. This article will have 5 main parts: (1) Introduction; (2) Literature review; (3) Methodology and data; (4) Result & discussion; (5) Conclusions and Recommendation.

II. LITERATURE REVIEW

A. High – tech agricultural enterprise

High-tech agricultural enterprise is one of three forms of hi-tech management organization today. Developing high-tech agricultural enterprise is a new development trend of agriculture in order to encourage enterprises to invest in agriculture and rural areas; bring high labor productivity to society

High-tech Law number 32/VBHN-VBQH gave the definition of high-tech agricultural enterprise. It is an enterprise applying high technology in the production of agricultural products with high quality, productivity and added value [1]. In addition, the law also specifies criterias for an high-tech agricultural enterprise. The enterprise must meet all the conditions:

+ High-tech applications on the list of high technologies prioritized for development investment specified in Article 5 of the Law (including the following fields: Information technology; Biotechnology; New material technology; Technology automation) for the production of agricultural products

+ To create agricultural products of high quality, productivity, value and efficiency, the enterprise’s revenue from hi-tech applied agricultural products must reach at least 60% of the total annual net revenue.

+ Having research and testing activities on the application of high technology to produce agricultural products, to total expenditure on research and development activities carried out in Vietnam, the total annual net revenue reaches at least 0.5%. The number of employees with professional qualifications from university or higher who directly conduct research and development out of the total number of employees of the enterprise is at least 2.5%

+ Applying environmentally friendly and energy-saving measures in production and quality control of agricultural products up to Vietnam’s standards and technical regulations.

High-tech agricultural enterprises that fully meet the above conditions are entitled to: enjoy the highest incentives in accordance with the provisions of the law on land, corporate income tax, value-added tax, and export tax; be considered for funding for research, testing, training and technology transfer from the funding of the National High-tech Development Program.

In the dictionary of the Market Economy: “High quality human resources are those who have a certain level of knowledge, expertise, ability and skill with their own creative work in practical conditions. It can contribute to the development of society and of humanity” [9].

High quality human resource in the period of industrialization and modernization includes leaders and managers; scientific and technological staffs - those who have university or college degrees or higher and a group of skilled technical workers [7].

B. Developing high quality human resources

Developing high quality human resources plays an extremely important role and is the driving force for socio-economic development. High quality human resource development is also associated with the human resource development of society, but focuses on exploiting brainy labor with high skill level, capable of meeting the requirements of international economic integration and industrial revolution 4.0 (Nguyen Phan Thu Hang, 2015).

In the ILO’s view on labor, “the development of high quality human resource is not only about skillful occupation but also of capacity development, which is to make people have the need to use that capacity to advance to get a good job as well as satisfy the career and personal life”.

Developing high-quality human resources is the process of creating a change in quantity, improvement of quality and restructuring of a high-quality human resource group in order to meet business requirements and operational efficiency and organizational development.

There are 3 evaluation criteria for the developing high quality human resource

(1) Evaluation criteria for developing the quantity of high quality human resources: expressed through the increase in quantity and growth rate over the years, through the stages of high quality human resources.

(2) Evaluation criteria for developing the quality of high quality human resource: expressed through the level of education, expertise, skills and health of employees

(3) Criteria for the structure of high quality human resources to meet the production and business requirements: structure of human resources according to the professional and technical qualifications over the years; structure of management staff according to the qualifications over the years.

C. Requirements on the capacity of workers in high-tech agricultural enterprises

Human resources are a special resource that plays a decisive role in the success or failure of an organization. In order to develop human resources, it is necessary to evaluate the internal capacity of employees. Lucia and Lepsinger (1999) argued that competency models describe a particular combination of knowledge, skills and personal characteristics required to effectively perform a task in the organization and

are used as an effective tool for selection, training and development, employee evaluation and human resource planning. According to the competency model of Bass BM (1990), competency standards include an individual’s attitude, skills, and knowledge necessary to undertake a specific job position. This is a very popular model in human resource management to develop personal capacity.

In the period of industrialization, modernization and international integration, along with the scientific and technological revolution, especially the 4.0 industrial revolution taking place on a global scale, high-tech development agriculture is considered the right step to achieve the set goals. It requires a highly skilled workforce, proficient in the application of scientific and technical advance... to create economic efficiency. The competency of employees is reflected in the following aspects:

(i) *Knowledge*: the high-tech agriculture industry has a characteristic that focuses on the field of information technology; biotechnology; new material technology; automation technology for the production of agricultural products. Besides, science and technology are constantly changing. Therefore, in addition to the knowledge that workers are trained at specialized facilities, workers in agriculture 4.0 need practical knowledge to keep up with the trend as well as create new products of higher quality.

Besides professional knowledge, having legal knowledge is also very important. The global economy is opening up great opportunities for Vietnamese businesses to access markets around the world; goods are exchanged between countries more; it’s the reason for increased complexity in international trade. In addition to current legal documents such as the High Technology Law 2019; the Enterprise Law 2020; the Commercial Law 2005; the Law on Import and Export Tax 2016... requires that human resources in the high-tech agriculture industry know the international laws and treaties when conducting transactions with foreign companies.

(ii) *Skill*: The ability to apply information technology well at work is a necessary requirement in the current digital technology. With the application of technology in production, it is required that human resources in the agricultural industry 4.0 need knowledge of science and technology, and know how to apply in work to work effectively.

In addition, foreign language skills also need attention and importance. Because, the trend of globalization requires the exchange of goods between countries in the world. The working environment will not only be limited to a single country, but also expand globally. Therefore, current high-quality human resources must regularly use foreign languages, contact foreign partners to learn experience, bid and sell products to foreign partners. They must constantly improve their foreign language skills, especially English, in order to meet the requirements of each job.

(iii) *Attitude*: They are people who are always self-learning, self-development and desire to perfect themselves; curious, creative thinking to discover problems and find ways to solve them. In addition, employees need to be disciplined and professional in their work. It is a basic condition to help improve labor productivity, help employees to have the abil-

ity to advance, and fight bad habits that are barriers to personal development.

III. METHODOLOGY AND DATA

A. Data collection methods

1) Documentary research methods

Secondary data is collected and aggregated from studies and reports of organizations and agencies, such as: Association of Advanced Technology Enterprise in Agriculture (ATE), Ministry of Agriculture and Rural Development, Ministry of Planning and Investment Portal, General Statistics Office of Vietnam, High-tech agricultural enterprises... These documents are synthesized, analyzed and compared to find out the characteristics, strengths and weaknesses of human resources in agriculture.

2) Survey method

The survey questionnaire is used for the purpose of collecting survey information on the quantity and quality of human resources of high-tech agricultural enterprises. The author sent to managers, administrative staff, agricultural engineers, and workers. In order to ensure the representativeness of the study, the author tried to collect as many questionnaires as possible. 800 questionnaires were distributed and 696 valid votes were collected, accounting for 87% of the total number of votes.

B. Methods of processing and analyzing data methods

Based on primary and secondary data collected, the research conducted data cleaning, information coding in the survey questionnaire data, entries and processed by SPSS software.

IV. RESULT AND DISCUSSION

A. The situation of high quality human resource of high-tech agricultural enterprises

According to the report of the Ministry of Agriculture and Rural Development, from December 2011 to April 2020, there were 66 enterprises recognized as high-tech agricultural enterprises; in which, there were 20 enterprises in the field of cultivation, 25 enterprises in the field of fisheries, 21 enterprises in the field of animal breeding. However, according to regulations, the certificate of high-tech agricultural enterprises in Vietnam is valid for 5 years. After that, enterprises must apply for re-issuance of the certificate if they are eligible. Therefore, in December 2020, in Vietnam, there were 46 enterprises whose certificates are still valid, and these enterprises still enjoy the benefits under the provisions of the High Technology Law.

Through the above table, the number of human resources of high-tech agricultural enterprises has increased over the years. About gender, due to the specificity of agriculture, the percentage of female workers in high-tech agricultural enterprises accounts for the majority (about 60%). Female workers are characterized by industriousness, diligence, meticulousness and ingenuity, so they are suitable for jobs requiring diligence such as production in line, with high specialization. About the professional qualifications, workers at high-tech agricultural enterprises have a low percentage of employees trained in technical qualifications, mainly still

TABLE 1. HUMAN RESOURCE STATISTICS OF HIGH-TECH AGRICULTURAL ENTERPRISES

	2016	2017	2018	2019	2020
Total number of employees	10356	11328	12469	13491	13803
Gender:					
- Male	3841	4101	4691	4797	4980
- Female	6515	7227	7778	8694	8823
Trained in technical qualifications					
(1) Skilled and technical workers	2721	3315	3860	3990	4057
- University or higher	687	882	1038	1099	1214
- College	762	926	1078	1179	1235
- Intermediate level	758	920	1152	1191	1130
- Elementary level	514	587	592	521	478
(2) No trained in technical qualifications	7635	8013	8609	9501	9746

(Source: Enterprises' report – Ministry of Agriculture and Rural Development)

human resources without technical qualifications. The number of workers without technical qualifications is concentrated on the number of workers who are directly engaged in agriculture; there are very few people who have been trained in schools.

For high-quality human resources, based on the High Technology Law, the criteria for recognition of high-tech agricultural enterprises and the results of interviews with managers, it is found that the human resources have a college degree or higher and a good health according to decision No. 1613/QD-BYT reaching grades 1 and 2 who is eligible to meet the requirements of high-quality human resources of high-tech agricultural enterprise.

The workforce at high-tech agricultural enterprises can be divided into 4 main groups: managers, administrative staff, agricultural engineers, and workers. In which, workers have the largest number with an average number of employees of 79%. They are mainly people directly involved in production activities of enterprises, this is also the position with the most fluctuations. They work in farms, product processing factories, so the demand for recruiting human resources for this position is also more.

B. The actual content of developing high quality human resource of high-tech agricultural enterprises in Vietnam

1) Developing a high quality human resource of high-tech agricultural enterprises through recruitment and selection

Recruitment and selection is the first step that determines the quality of human resources in high-tech agricultural enterprises in Vietnam. High-tech agricultural enterprises have a need to recruit and select many agricultural engineers. There are many businesses, including large corporation that need a lot of human resources in this field. Many businesses have linked to colleges and universities to recruit, even "order students" to work for the company after graduation. According to the study, high-tech agricultural enterprises use many sources for recruitment. In which, recruitment source through training facilities such as colleges, universities is currently chosen by many companies. During the training period, the company will create conditions for students to practice at the company, so they can grasp the technology and understand the professions that they will join later.

The specific survey results on evaluation recruitment and selection activities of high – tech agricultural enterprises are show in the table below.

TABLE 2. THE RESULT ON EVALUATING RECRUITMENT SELECTION

No.	Criteria	Mean	Standard Deviation
TD1	The company's policy of recruitment and selection ensures high science	2.84	0.890
TD2	Selection criteria are clearly and objectively defined	3.48	0.938
TD3	The person being recruited is qualified and capable to perform the job	3.01	0.908
TD4	The current policies of enterprises to attract, arrange and use laborers are reasonable	2.77	0.936

Employees' evaluation of the recruitment and selection of enterprises is only average. This is also consistent with the study on recruitment sources of high-tech agricultural enterprises today, when most enterprises use the source associated with universities and colleges in "ordering" graduates. There is no diversification through external recruitment source. Besides, for new graduated student, the recruited people still need to be retrained in practical job knowledge and skills. So, the person being recruited is not enough qualified and capable to perform the job.

2) *Developing a high quality human resource of high-tech agricultural enterprises through training and development*

Training is considered an effective measure to improve the quality of high-quality human resources in enterprises, thereby turning the established goals and implementation plans of enterprises into reality. The result on evaluating training and development of high-tech agricultural enterprises is shown as below

TABLE 3. THE RESULT ON EVALUATING TRAINING AND DEVELOPMENT

No.	Criteria	Mean	Standard Deviation
DT1	The training needs are identified as realistic, useful and based on the organization's business strategy	3.36	0.867
DT2	Employees in each job undergo annual training programs	3.37	0.953
DT3	Training and development programs for employees in enterprises have a good quality	3.83	0.836
DT4	Employees have many opportunities for advancement in the company	3.43	0.947
DT5	The promotion policy of the enterprise is fair	3.84	0.894

Training and development activities of high-tech agricultural enterprises have achieved a good level. In which, identifying training needs is important in the process of training and developing human resources. However, the training

needs are evaluated with the lowest average score. For the program and methods of training and development. Enterprises focus on training programs on knowledge and skills related to current jobs. In addition, enterprises also have training programs on occupational hygiene and safety, knowledge of laws and policies... which are updated and trained regularly. However, the frequency of employees training depends on the job position

- For workers, high-tech agricultural enterprises hire workers for positions that do not require a high level such as processing, care and animal husbandry areas. When new employees come in, enterprises use on-the-job training methods. Experienced employees or managers will guide and mentor new employees.

- For administrative staff, agricultural engineers, enterprises have long-term training plans for those employees, especially the agricultural engineer. The method is used for long-term training to improve professional qualifications such as sending to study abroad or domestically at universities and colleges.

- For managers, in order to do their job well, in addition to general management skills, managers need to have some specialized technical knowledge such as: production line management skills, product quality management skills.

The promotion for employees is good. The promotion, on the one hand, is based on working seniority and qualifications; on the other hand, based on the performance results of employees after training. This has helped employees to see opportunities for advancement. Currently, there are also quite a few high-tech agricultural enterprises that have performed this activity well, thereby helping to increase employee satisfaction with enterprises.

3) *Developing a high quality human resource of high-tech agricultural enterprises through compensation*

a) *Direct Financial Compensation*

Because the majority of employees in high-tech agricultural enterprises are workers (accounting for 79%) with low qualifications. Salary is their main source of income. In order to be able to maintain motivation for employees, improve their working performance and business efficiency of enterprises, enterprises have used financial policy as a necessary tool to achieve the above goals. Bonuses are a kind of positive material stimulation to help employees strive more at work.

In addition, allowances are also an important factor constituting the monthly income of employees. In high-tech agricultural enterprises, employees not only receive the usual allowances such as lunches and responsibility allowances, but also receive allowances for specific jobs according to the provisions of Circular 11/2020/TT-BLDT-BXH.

According to the survey results in Figure 2 above, the income of employees has a marked difference corresponding to their working position. For workers, the average salary is 5 million dong/month. For administrative staff, it is from 5-10 million dong/month. The average salary for agricultural engineers is higher, from 10-20 million dong/month. And for managers, it is above 20 million dong/month. The agricultural industry has more recruitment needs for the agricul-

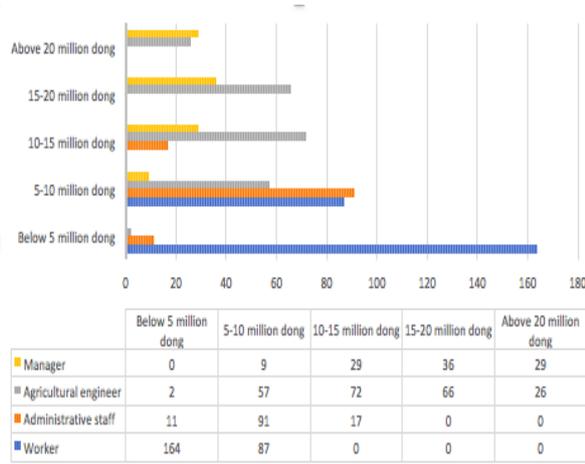


Figure 2. The income of employees in high-tech agricultural enterprises

tural engineer position, but the supply of high-quality human resources is low. Therefore, business often pay a favorable salary for this position in order to attract and recruit human resource as well as retain them.

b) *Non-financial Compensation*

Non-financial compensation is actually taking care of the spiritual life of employees through tools that are not money. The spiritual life needs of employees are diverse and increasingly demanding, such as: joy at work, excitement, passion for work, fair treatment, respect, communication with people, with colleagues. To demand those needs, enterprises need to have a good working environment for employees.

TABLE 4. THE RESULT ON EVALUATING NON-FINANCIAL COMPENSATION

No.	Criteria	Mean	Standard Deviation
MT1	Safe and comfortable working conditions and time	3.55	1.021
MT2	Employees are treated fairly	3.38	0.959
MT3	The relationship between superiors and subordinated is friendly and trustworthy	3.21	1.028
MT4	The level of technology (machinery and equipment) of the enterprise is very modern	3.66	0.916
MT5	In the enterprise, there is close association and cooperation between employees	3.22	1.020
MT6	Workers' work is not too stressful	3.40	0.957

For high-tech agricultural enterprises, machinery and equipment are a new type with high productivity. Therefore, the products produced have high competitiveness and good productivity. Criteria of the level of technology of the enterprises is evaluated at the best level.

According to the provisions of the law, in order to ensure the safety and health of employees, the employer is responsible for fully equipping labor protection equipment, ensuring occupational safety and health, and improving the working conditions for employees. In high-tech agricultural enterprises, the safe and comfortable working conditions and

working time achieved an average good score. Since then, safe and comfortable working conditions and time have created a working spirit for employees, making them feel not too pressured when working at the enterprise.

However, the relationship between superiors and subordinates, between employees, is assessed at an average level. So, enterprises need to have a policy to create relationships among members of the organization.

V. CONCLUSIONS AND RECOMMENDATIONS

High-quality human resource is considered an important factor and the core for organizational development, increased competitiveness and long-term development in the future. Because of that, many businesses and organizations have invested in developing high quality human resources. That is a way to increase the scale, improve the quality and ensure the suitability of the human resource structure, especially in the context of the rapidly growing science and technology development. Human resources must regularly update knowledge, skills and expertise to operate new production technology. Hi-tech agricultural enterprises are no exception to this trend. When international integration, the current scientific and technological revolution 4.0 have strong impact, it is necessary to focus on developing high quality human resources. This study focuses on analyzing the situation of developing high quality human resources of high-tech agricultural enterprises in Vietnam. In order to develop high quality human resource, some solutions as follows:

The first, recruitment and selection

This is the process to find the most suitable people, ensure the right number of employees for the job, reduce hiring costs, save time and a part of training costs. So, enterprises need to establish specific criteria in hiring policies, specific criteria for each job position. Depending on the actual situation of the enterprise, the number and positions for vacancy to recruit from internal or external sources. However, enterprises always give priority to recruit inside the enterprise first. In case the enterprise is not enough or doesn't match the expertise and job requirements, the new enterprise should conduct recruitment from external sources.

Because labor in the high-tech agricultural sector is a scarce human resource, hi-tech agricultural enterprises can diversify their recruitment sources from foreign workers. The policies and measures to recruit foreign workers with high professional and technical qualifications to perform key management and technical tasks in enterprises. This will also help internationalize and improve the qualifications of human resources at hi-tech agricultural enterprises.

The second, training and development

Human resource training and development has a significant impact on developing high-quality human resource of hi-tech agricultural enterprises in Vietnam. In order to develop the capacity to perform work for human resources in general and high-quality human resources in particular, training is considered a necessary and important activity to improve the quality of human resources of the organization. Faced with the requirement to improve productivity and product quality, hi-tech agricultural enterprises must invest in new technologies to keep up with the development trend and improve their competitiveness. Therefore, in order to

build a capable and responsive staff compared to the competition, the training and development needs to have a good implementation plan. In which, the identification of training needs should be done well and according to the process; enterprises need to diversify forms of training, update the appropriate training program contents, organize training and conduct effective training evaluation.

Developing high-quality human resources requires high tech agricultural enterprises to have a development plan for their employees. Enterprises need to have specific plans on career development programs for employees. Regularly organizing career seminars, especially with new employees, will help them to see career opportunities clearly. Besides, enterprises need to build a lifelong learning environment in the workplace for human resources.

The third, compensation

High-tech agricultural enterprises need to have a compensation policy that is fair and consistent with work performance, each person's ability to work. At the same time, they need to strengthen material and spiritual incentives to motivate employees and to complete their work and strive to develop themselves. To do this, enterprises need to start from the achievements of employees in the enterprise. Enterprises should develop performance evaluation criteria for employees of each department and subordinate unit. 3P compensation policy can be applied, in which: P1: Position – pay for position; P2: Person – Pay for Person (Competency-based pay) and P3: Performance – Pay for performance

Diversify forms of bonuses for employees such as material rewards in cash according to work performance, initiative rewards, and rewards for completing goals at work. Reward and encouragement should be timely, with the right level of dedication, and should be determined as regular and continuous work.

A comfortable and safe working environment will create conditions for employees to complete their work better. Enterprises need to apply a reasonable and flexible working time regime, ensure facilities and working conditions for individuals; especially workers in the breeding and care areas,

the processing area. Enterprises regularly check, improve and upgrade the quality of machinery, equipment to ensure safety and hygiene at work. High tech agricultural enterprises need to build more separate rest areas for employees to create conditions for them to live and rest at the workplace. Good resting conditions will help employees reduce stress and fatigue, improve health and fitness after every long working hour.

In addition to ensuring material life, ensuring spiritual life is also very important. It helps create peace of mind at work, stabilizing the mind during the working process, improving labor productivity and the employee commitment with enterprises.

REFERENCES

- [1] Congress Office (2019), *High Technology Law number 30/VBHN-VPOH*
- [2] Barber, A. E. (1998). *Recruiting employees: Individual and organizational perspectives*.
- [3] L. Borghans, and B. Ter Weel, Computers, skills and wages, *Applied Economics*, vol. 35, no. 14, pp. 1561-1576.
- [4] E. Berman, J. Bound, and S. Machin, Implications of skill-biased technological change: International evidence, *Quarterly Journal of Economics*, vol. 113, no. 4, pp.1244-1279, 1998.
- [5] B. P. Cozzarin, and J. C. Percival, Complementarities between organisational strategies and innovation, *Economics of Innovation and New Technology*, vol. 15, no. 3, pp. 195-217, 2006.
- [6] C. Francalanci, and H. Galal, Information technology and worker composition: Determinants of productivity in the life insurance industry, *MIS Quarterly*, vol. 22, no. 2, pp. 227-241, 1998.
- [7] B. J. L. Landry, S. Mahesh, and S. Hartman, The changing nature of work in the age of e-business, *Journal of Organizational Change Management*, vol. 18, no. 2, pp. 132-144, 2005.
- [8] S. Machin, and J. Van Reenen, Technology and changes in skill structure: Evidence from seven OECD countries, *The Quarterly Journal of Economics*, vol. 113, no. 1, pp. 1215-1244, 1998.
- [9] Tabibi SJ, Khah SV, Nasiripour AA, Vahdat S, and Hessam S (2011). Factors affecting human resource development in the Iranian social security organization's hospitals. *World Applied Sciences Journal*, 15(2): 164-173.
- [10] Thousand Oaks, CA: Sage Publications, Inc. Benmore, G., & Palmer, A. (1996). Human resource management in small firms: Keeping it strictly informal. *Journal of Small Business and Enterprise Development*, 3(3), 109-118

Factors affecting the accounting information quality in commercial enterprises in Hochiminh City

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Abstract—The accounting information quality has become an urgent need in the whole society and all fields. In particular, the accounting information quality in trading companies is being paid attention to. To achieve this goal, it is necessary to have studies to understand the factors, as well as the extent to which these factors affected the accounting information quality. To conduct the research, the authors have used a combination of qualitative and quantitative research methods. Research results have pointed out that 5 factors affecting the accounting information quality in trading companies in Hochiminh City, which are the Involvement of managers (QT), Tax policy (TU), qualification of accountants (TD), Application of information technology (CN), and Internal control system (KS).

Index Terms—quality, accounting information, business, trade, trading companies.

I. INTRODUCTION

RESEARCH on “Factors affecting the accounting information quality in trading companies in Hochiminh City” is implemented with specific objectives:

(1) Determining the factors affecting the accounting information quality in trading companies in Hochiminh City.

(2) Measuring the influence of factors on the accounting information quality in trading companies in Hochiminh City.

(3) Proposing management implications to improve the accounting information quality of trading companies in Hochiminh City.

The study was conducted by collecting data through a survey questionnaire with a sample size of 130 companies in Hochiminh City, and at the same time applying the method of testing the reliability of the scale, exploratory factor analysis (EFA), and linear regression to evaluate the influence of factors on the accounting information quality in trading companies in Hochiminh City.

Research results have identified five factors that favorably affect (+) the accounting information quality in trading companies in Hochiminh City, in which the most influential factor is: The involvement of managers ($\beta = 0.306$); follows are factors: Tax policy ($\beta = 0.278$); Accounting staff qualification ($\beta = 0.272$); Information technology application ($\beta = 0.229$). The factor: Internal control system ($\beta = 0.162$) is the weakest influence.

Most companies in Vietnam are small and medium-sized ones, so the accounting information quality is very simple, the input data is sketchy, not systematic, the content is outdated and duplicated. The technical method applied is very simple, has not paid attention to exploiting modern information processing facilities and techniques, has not yet created the connection, stability, and orientation between informa-

tion serving management. With the information needs of users, the level of knowledge about accounting information of managers is still limited, there is no specialized staff in handling and providing accounting information. Besides, the accounting information quality scale of previous studies was built by inheriting the scales from overseas studies, it is necessary to adjust the scale to suit companies in Vietnam.

From the gaps of previous studies, the authors have identified the research direction “Factors affecting the accounting information quality in companies in Hochiminh City.” Therefore, the study of the authors has no overlap compared with the studies of the previous authors.

This study contributes to generalizing and developing theoretical issues about the accounting information quality, theoretically contributing to building models of factors affecting the accounting information quality in commerce companies in the city.

II. LITERATURE REVIEW

As in [1], the study surveys of leaders of state agencies in Indonesia. The research results confirm that the understanding of the chief accountant and the support of the senior management affects the accounting information system. The accounting information system affects the accounting information quality. The author builds a model of some factors affecting the quality of the accounting information system.

The research [2] was conducted in the public sector in Indonesia. The objective is to determine the influence of factors on the quality of the accounting information system and its impacts on the accounting information quality. The results obtained from the study confirm that the factors of management commitment, organizational culture, and organizational structure directly affect the accounting information system, the accounting information system has an impact on the quality of the accounting information system.

As in [3], the quality of the accounting information system is measured by a combination of two criteria: system quality and information quality. The author's research has contributed to the development of a more basic theoretical framework on the accounting information quality systems in the environment of small and medium-sized companies in Hanoi, thereby improving the accounting information quality.

As in [4], the research results have created a strong theoretical foundation on the impact of some factors on the accounting information quality in the ERP environment. However, there are still shortcomings in measuring and testing

the impact of these factors on the accounting information quality.

As in [5], the author focuses on understanding the impact of corporate governance characteristics on the accounting information quality of listed companies in Vietnam. The results show that all 7 factors of corporate governance have an impact on the accounting information quality of listed companies.

As in [6], the study identifies the factors affecting the accounting information quality of listed companies in Vietnam. The results have confirmed that 5 factors that directly affect the accounting information quality on the financial statements of listed companies. This study has a reference value on the theoretical basis in the field related to information on financial statements.

As in [7], the author asserts that the accounting information quality with additional attributes is more important than the basic attribute in the accounting information quality in the financial statements of listed construction and installation companies. It is further confirmed that listed construction and installation companies, who are audited by Big4 and those long-standing and large-scale companies have a better accounting information quality on financial statements.

As in [8], the objective of the study is the quality of financial reporting information in Vietnamese companies. This study is the theoretical foundation on the impact of factors on the quality of financial reporting information of companies.

III. RESEARCH METHODS AND MODELS

A. Research methods

In this study, the authors mainly choose the quantitative research method because the factors of the model have been built on previous studies, been measured, and tested through many studies in and around the world.

Quantitative method: the authors have used an online survey tool via email designed by the Google doc tool, then made statistics with Excel and SPSS 20.0. A survey questionnaire is built on a Likert scale with 5 levels (according to increasing agreement): (1) Strongly disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly agree. After that, the survey results will be collected for analysis through SPSS 20.0 software combining several methods such as descriptive statistical analysis, reliability analysis, exploratory factor analysis (EFA), and linear regression analysis.

B. Research model and regression equation

In the study, the authors used the exploratory factor analysis (EFA) model to determine and test the relationship between factors (independent variables) affecting the accounting information quality in trading companies in Hochiminh City (dependent variable).

The authors inherit from previous studies to propose a group of factors (independent variables) affecting the accounting information quality in trading companies in Hochiminh City includes the involvement of managers, tax policy, internal control system, application of information technology, qualification of accountants.

Based on the proposed theory, the regression equation is expected to reflect the correlation between the factors affecting the accounting information quality at trading companies in Hochiminh City. The regression equation is as follows:

$$CL_i = \alpha_0 + \beta_1 QT + \beta_2 TU + \beta_3 KS + \beta_4 CN + \beta_5 TD + \delta$$

Of which:

- **CL**: dependent variable describes the accounting information quality in trading companies in Hochiminh City
- **QT**: involvement of managers
- **TU**: tax policy
- **KS**: internal control system
- **CN**: application of information technology
- **TD**: qualification of accountants
- α_0 : intercept factor
- $\beta_1, \beta_2, \dots, \beta_5$: regression coefficients
- δ : standard deviation.

Research hypothesis:

- + Hypothesis H1: The involvement of managers has a favorable influence on the accounting information quality.
- + Hypothesis H2: Tax policy has a favorable influence on the accounting information quality.
- + Hypothesis H3: Internal control system has a favorable influence on the accounting information quality.
- + Hypothesis H4: The application of information technology has a favorable influence on the accounting information quality.
- + Hypothesis H5: Qualification of accountants has a favorable influence on the accounting information quality.

IV. RESEARCH RESULTS AND DISCUSSION

A. Research results

Testing quality of the scales

The results of analyzing the quality of the scale with Cronbach's Alpha coefficients

Scale	Variables	Cronbach's Alpha	Conclusions
QT	None	0,834	Good
TU	None	0,897	Good
KS	None	0,873	Good
CN	None	0,837	Good
TD	None	0,860	Good
CL	None	0,899	Good

(Source: compiled by authors)

The scale reliability of the variables is of good quality and Cronbach's Alpha coefficient is > 0.8 and up to 1, the author concludes that the scales have good quality, high reliability, and are of good use.

Exploratory factor analysis (EFA) for independent variables

KMO and Bartlett's Test	
KMO (Kaiser-Meyer-Olkin of Sampling Adequacy)	0,751
Bartlett's Test of Sphericity	Approx, Chi-Square
	Df
	Sig.
	235,610
	3
	0,000

(Source: SPSS)

The results of exploratory factor analysis (EFA) of the dependent variable with the scale with the coefficient KMO =

0.751 are suitable, reaching the conditions of $0.5 < KMO < 1$ and $Sig. = 0.000 < 0.05$. This proves that the survey data meets the conditions of exploratory factor analysis (EFA). From there, it is possible to determine the observed variables that are linearly correlated with each other in the accounting information quality in trading companies in Hochiminh City. The scales are appropriate.

Exploratory factor analysis (EFA) of the independent variable

KMO and Bartlett's Test		
KMO (Kaiser-Meyer-Olkin of Sampling Adequacy)		0,836
Bartlett's Test of Sphericity	Approx, Chi-Square	1695,920
	Df	210
	Sig.	0,000

(Source: SPSS)

According to the above results, all the conditions for exploratory factor analysis (EFA) are satisfied. The coefficient scale $KMO = 0.836$ is good, satisfying the conditions that $0.5 < KMO < 1$ and $Sig. = 0.000 < 0.05$. This proves that exploratory factor analysis (EFA) is consistent with the actual survey data of the topic. That is, the reliability of the scales in the research model on the factors affecting the accounting information quality in trading companies in Hochiminh City is suitable.

Testing multivariable linear regression model
Multivariable regression test results

		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1,821	0,261		-6,990	0,000
	TU	0,270	0,046	0,278	5,931	0,000
	QT	0,457	0,068	0,306	6,679	0,000
	KS	0,179	0,053	0,162	3,357	0,001
	TD	0,326	0,058	0,272	5,577	0,000
	CN	0,257	0,056	0,229	4,630	0,000

a. Dependent variable: CL

(Source: SPSS)

With the hypothesis of the research model, the results of testing the regression coefficients showed that all variables possess Sig values. < 0.05 . Thus, the research model consists of 5 independent variables: Involvement of managers (QT), Tax policy (TU), Qualification of accountants (TD), Application of information technology (CN), Internal control system (KS). All of these 5 independent variables and the dependent variable (the accounting information quality at trading companies in the HCM city) are statistically significant.

Thereby, the authors built a standardized regression equation describing the variation of factors affecting the accounting information quality in trading companies in Hochiminh City as follows:

Regression equation:

$$CL = TU*0,278 + QT*0,306 + KS*0,162 + TD*0,272 + CN*0,229$$

To compare the influence of each independent factor, we base it on the standardized Beta coefficient. Accordingly, the larger the standardized Beta weight, the stronger the influence of that factor on the dependent variable. As seen in

the regression equation, of the 5 factors affecting the accounting information quality:

1. Factor *Involvement of managers* has the strongest influence with the standardized Beta coefficient $QT = 0.306$.
2. Factor *Tax policy* has the second strongest influence with the standardized Beta coefficient $TU = 0.278$.
3. Factor *Qualification of accountants* has the third strongest influence with the standardized Beta coefficient $TD = 0.272$.
4. Factor *Application information technology* has the fourth-strongest influence with the standardized Beta coefficient $CN = 0.229$.
5. Factor *Internal control system* has the fifth strongest influence with the standardized Beta coefficient $KS = 0.162$.

Evaluate the relevance of multivariable linear regression model

The results show that the model has a satisfactory fit with $R^2 = 0.809$, equivalent to $80.9\% > 50\%$, so this is an appropriate model to use to evaluate the relationship between the dependent variable and the independent variables. However, to measure the fit of the linear regression model, researchers often use the adjusted R^2 coefficient (Adjusted R Square). In this study, the adjusted R^2 coefficient = 0.801 means that the linear regression model built is suitable for independent variables, explaining 80.1% of the change of the dependent variable, which is the accounting information quality.

B. Discussions

From the research results, all 5 groups of factors influence the accounting information quality on the financial statements of trading companies in Hochiminh City. With the above data analysis results, the author concludes that:

First, the involvement of managers

There is a positive impact on the accounting information quality at trading companies in Hochiminh City with a standardized Beta coefficient = 0.306. Indeed, the participation of managers influences the accounting information quality in financial statements at trading companies in Hochiminh City. Actually, in today's diversified and difficult integration economy due to the epidemic (Covid-19), it is impossible not to deny the importance of managers in companies, because these are the leading of each business, their business decisions will directly affect the business situation of the company. For today's investors, they are very sensitive to the unusual changes of senior personnel of the enterprise, even a small change in the senior management board can have a great impact on the company's business.

Second, Tax policy

There is a positive impact on the accounting information quality at trading companies in Hochiminh City with a standardized Beta coefficient = 0.278.

The tax policy affects the quality of the accounting information at trading companies in Hochiminh City. If the tax policy is clear and tight, the company complies well, and the tax authorities issue many policies to support companies, the higher the quality of the financial statements of the enterprise.

Promulgated policies need to follow closely and be consistent with current accounting standards and regulations, and update according to the general trend of the world. From

that, we can see that the relationship between tax policy and accounting standards and regimes is always a matter of concern to the state. From the perspective of trading companies in Hochiminh City, this is also completely consistent with the current situation.

Third, Accounting staff qualifications

Accounting staff qualifications have a positive impact on the accounting information quality in trading companies in Hochiminh City with a standardized Beta coefficient = 0.272.

The authors believe that the qualification of accountants affects the accounting information quality in financial statements at trading companies in Hochiminh City. The human factor is an important one for success in operating an organization. The capacity of accounting staff is reflected in their knowledge and ability to meet the requirements of accounting work. With the current 4.0 economy, accountants must always learn and update new accounting standards, thereby improving the accounting information quality in the financial statements.

Fourth, Application of information technology

Information technology application has a positive impact on the accounting information quality in trading companies in Hochiminh City with a standardized Beta coefficient = 0.229. Entering the digital technology era, every business is aware of the importance of information technology application and is widely applied in agencies, people, and businesses. The use of computers and information technology equipment to edit documents, browse the Internet, and serve professional work has become a daily necessity of most civil servants, public employees, and officials of various departments in the companies. On the other hand, using digital devices to communicate and exchange information becomes a common need of employees in the company.

The accounting industry is no exception, typically large-scale businesses are now using enterprise resource planning (ERP) systems, which entails all accounting work through unified software.

Fifth, Internal control system

The internal control system has a positive impact on the accounting information quality in trading companies in Hochiminh City with a standardized Beta coefficient = 0.162.

An effective internal control system has a positive effect on the accounting information quality. That means the more effective the internal control system, the better the accounting information quality will be.

CONCLUSION AND POLICY IMPLICATIONS

The standardized regression equation and its descending order according to factors affecting the accounting information quality in trading companies in Hochiminh City are as follows: 1. QT ($\beta = 0.306$), 2. TU ($\beta = 0.278$), 3. TD ($\beta = 0.272$), 4. CN ($\beta = 0.229$), 5. KS ($\beta = 0.162$). Specifically described as below:

Standardized regression equation:

$$CL = TU*0,278 + QT*0,306 + KS*0,162 + TD*0,272 + CN*0,229$$

The authors' study hopes to make a positive contribution to improving the accounting information quality for busi-

Beta coefficients of the factors

No	Factor	Beta	Sig.	(%)
1	Involvement of managers (QT)	0,306	0,000	24,54
2	Tax policy (TU)	0,278	0,000	22,29
3	Qualification of accountants (TD)	0,272	0,000	21,81
4	Application of information technology (CN)	0,229	0,000	18,36
5	Internal control system (KS)	0,162	0,001	13,00

(Source: compiled by the authors)

nesses in general and trading companies in Hochiminh City in particular.

Policy implications

The involvement of managers is the most influential factor ($\beta = 0.306$) on the accounting information quality in trading companies in Hochiminh City. In addition to information from managerial accounting, managers in trading companies also rely on information in financial statements to make business decisions for their companies. Financial statements provide a source of general information about the company's performance, so relying on this information will ensure more accurate and correct decisions.

To improve the accounting information quality of trading companies in Hochiminh City in particular and trading companies across the country in general, perfecting the tax policy system is extremely necessary. The tax sector needs to perfect, improve and modernize the tax administration structure. To improve its operational efficiency, tax officials must have management skills and professional qualifications.

The qualification of accountants affects the accounting information quality. They are the ones who directly gather documents, use methods to prepare financial statements. Accountants need to be responsible for accounting work, ensure honesty, be careful in accounting, and prepare reports. In the preparation and presentation of financial statements, accountants not only need to have experience but also skills. The preparation of financial statements should be assigned to long-term, experienced, and highly qualified accountants.

Information technology applications need to be implemented in a well-organized manner from each stage: user assessment, application selection, application deployment, and solving problems arising in the implementation process. The application of information technology should be carried out synchronously in all parts of the enterprise if the funds are sufficient. If not, the enterprise considers and sets out a unified roadmap to apply technologies in important departments, avoiding the case of applying many different technologies at the same time leading to conflicts between applications.

Trading companies need to develop an effective internal control department to be able to check the operations of the company, quickly detect mistakes of the management board as well as errors and weaknesses, limiting risks in operation.

REFERENCES

- [1] A. R. Komala, "The influence of the accounting manager's knowledge and the top management support on the accounting information system and its impact on the accounting information quality: a case of Zakat institutions in Bandung," *Journal of Global Management*, vol. 4, no. 1, pp. 57-73, 2012.

- [2] Rapina, "Factors influencing the accounting information quality system and its implications on the accounting information quality research," *Journal of finance and accounting*, vol. 5, no. 2, 2014.
- [3] V. T. T. Binh, "Research on factors affecting the accounting information quality systems in small and medium companies in Hanoi city," Hanoi City, 2020.
- [4] N. B. Lien, "Identifying and controlling the factors affecting the accounting information quality in the application environment of enterprise resource planning (ERP) systems in Vietnamese companies," Hochiminh City, 2012.
- [5] N. T. Nguyen, "The impact of corporate governance on the quality of financial reporting information in listed companies in Vietnam," Hochiminh City, 2016.
- [6] P. M. Nguyet, "Determining and measuring the influence of factors on the accounting information quality presented in the financial statements of listed companies in Vietnam," Hochiminh City, 2014.
- [7] D. T. Nhung, "Study on factors affecting the accounting information quality in financial statements of construction and installation companies listed on Vietnam's stock market," Hanoi, 2020.
- [8] P. Q. Thuan, "Factors affecting the quality of financial reporting information in companies in Vietnam," Hochiminh City, 2016.

Factors affecting the organization of accounting work in manufacturing enterprises located in VSIP1 industrial park in Binh Duong province

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Abstract—Through the mixed and descriptive analysis research methods, the authors study the impact of factors on accounting work in manufacturing enterprises located in VSIP1 Industrial Park in Binh Duong province. The research results show that 6 factors affect the accounting work in these enterprises, arranged from high to low, including requirements for IT application, internal control system, professional qualities of accountants, company size, legal regulations, demand for accounting information. From the research results, the authors offer solutions for accounting work in these organizations.

Index Terms—organization of accounting work, internal control, IT application, legal regulations, manufacturing enterprises.

I. INTRODUCTION

IN THE current context of international integration, Vietnamese enterprises and foreign ones in VSIP1 industrial park not only compete fiercely with domestic companies but also with foreign companies that are strong in terms of capital, brand name, and management skills. Therefore, to survive and develop, businesses must be autonomous in their production and business activities, maximizing profits and finding reasonable directions. One of the solutions is to constantly innovate, improve efficiency and perfect the management apparatus, improve facilities, invest in the application of scientific advances, and improve the qualifications of the management team, employees, ... of which, the important things serving the basis for implementation is accounting information. Therefore, if enterprises want to develop sustainably, they need to organize the accounting work and operate effectively.

II. LITERATURE REVIEW

The research [1] measures the success of an information system by the following factors: system quality, information quality, quality of service, user satisfaction, net benefits. This is a model newly developed based on the author's previous research model.

The research [2] shows that the factors that determine the quality of accounting information when applying IFRS include: legal and political systems, accounting standards, and the presentation of financial statements. In which, the legal and political system is the factor affecting accounting quality in different directions. It can directly affect the quality of information or indirectly affect the quality of accounting in-

formation through accounting standards and the presentation of financial statements.

The research [3] has identified and measured the factors affecting the organization of the accounting work in small and medium enterprises in Tra Vinh city. The research results show that 8 factors affect the organization of the accounting work in small and medium enterprises in Tra Vinh city. These factors are listed herein from the most influential ones to the least ones: financial and accounting services, users of accounting information, management requirements, internal control system, legal systems, sizes of enterprises, application of information technology (IT), owner's concern, and accounting human resources.

The research [4] presents the theoretical basis related to the organization of the accounting work in the food processing companies in Ho Chi Minh City, then describes and analyzes the current situation of organizing the accounting work in those companies. From there, the author proposes recommendations to improve the organization of accounting work in food processing companies.

In summary, with the literature review of domestic and foreign researches, it can be seen that there has not been any research that aims directly, fully, and systematically to the organization of accounting work in manufacturing companies in VSIP1 Industrial Park in Binh Duong province.

III. RESEARCH METHODS

A. Data and data collection methods

Secondary data is collected through articles and researches done at home and abroad on the organization of accounting work in the enterprises, factors affecting the organization of accounting work in enterprises. Primary data is collected from 03/2020 - 05/2020 by the survey questionnaires sent directly to the respondents. The contents of the questions are those variables used in the research model and using the Likert scale for the questionnaire: 1 - Totally disagree, 2 - Disagree, 3 - Neutral, 4 - Agree, 5 - Totally agree. Respondents are directors, deputy directors, heads/deputy heads of departments, and officials and employees working in manufacturing companies in VSIP1 industrial park of Binh Duong province.

To achieve the proposed sample size and ensure that the research results are representative of the overall population, 200 surveys were sent out. 6 surveys that were invalid be-

cause they answered the same level for all questionnaires or lacked a lot of information out of the total 185 surveys collected. As a result, 180 valid surveys were used as data for the study. Data are entered, encrypted, cleaned, and analyzed through the SPSS. 20.

B. Research hypothesis and research model

In the study, the authors used the exploratory factor analysis (EFA) model to determine and test the relationship between factors (independent variables) affecting the quality of accounting information in commercial enterprises in Ho Chi Minh City (dependent variable).

1) Legal regulations

For enterprises in general and manufacturing companies in particular, organizing accounting work in these units to suit the unique characteristics of this type of business requires specific documents. Specific legal regulations on the contents of the organization of accounting work such as organizing the accounting apparatus appropriately, applying the system of vouchers, the system of accounting accounts so that it is reasonable and regulated. on methods, techniques for preparing and presenting financial statements,... The right legal environment will create favorable conditions for enterprises to develop business activities, but to do this, public organizations Effective accounting is not to be missed. Therefore, the establishment of a legal framework for the organization of accounting work in these enterprises is an urgent requirement.

Hypothesis H1 is given as Current legal regulations positively affect the organization of accounting work in manufacturing companies in VSIP1 industrial park of Binh Duong province.

2) Internal control system

Internal control systems are procedures used to achieve the organization's objectives. Two important goals in organizing accounting work are to ensure the safety of assets and ensure that accounting data is highly accurate and reliable. Evaluate the system of internal control to determine how it affects the accuracy of accounting information. An understanding of internal control is essential for any accountant who specializes in assessing how internal control affects the amount of work they are required to perform when conducting an audit. accuracy of accounting information. However, several enterprises today build an ineffective internal control system because the business owner hardly pays attention to the internal control system; lacks of understanding of the internal control system; not enough human resources to divide responsibilities; ... affecting the operational efficiency of the enterprise in general and the effectiveness of the organization of accounting work in particular.

Hypothesis H2 is given as Effective internal control systems positively affect the organization of accounting work in manufacturing companies in VSIP1 industrial park of Binh Duong province.

3) Requirement for applications of IT

In today's business activities, the quality of accounting organizations has a great influence on business performance. Therefore, a fast and strong accounting organization system, providing accurate and timely information, as a basis for leaders to make decisions quickly and effectively is ex-

remely necessary. Due to the diversity and complexity of business activities, accounting software has become the most effective and accurate support tool to help businesses process information quickly and safely, provide accounting reports. timely and effective accounting. The application of information technology in accounting work needs to be implemented effectively according to the investment in information technology, the application of technology in accounting activities needs to balance between the benefits that technology brings and costs incurred to obtain that benefit.

Hypothesis H3 is given as Requirement for applications of IT in accounting positively affect the organization of accounting work in manufacturing companies in VSIP1 industrial park of Binh Duong province.

4) Professional qualifications of accountants

The qualifications of accountants have a great influence on the organization of accounting work in enterprises. If the accounting staff is not professional and not highly qualified, it can affect the stages in the accounting work such as collecting incomplete information, reflecting inaccurate and untimely accounting information. providing inaccurate, dishonest, and objective information... In addition, if the accounting staff has low qualifications, it will also affect the organization of the accounting apparatus such as having to have many new employees to take over. do all the work of the accounting department, the accounting work is not efficient.

Hypothesis H4 is given as Professional qualifications of accountants positively affect the organization of accounting work in manufacturing companies in VSIP1 industrial park of Binh Duong province.

5) Demand for using accounting information

The need to use accounting information greatly affects the organization of accounting work in enterprises. The organization of accounting work in enterprises must meet the needs of business administrators. The accounting information needs of a business include financial accounting information and management accounting information. In principle, the provided management accounting information must comply with the accounting regime and per the Accounting Standards. Management accounting information is provided according to the needs of the internal use of the enterprise. Both financial accounting and management accounting meets the information needs of different subjects, but are related to each other in corporate governance activities and carry out procedures according to prescribed regimes.

Hypothesis H5 is given as: Demands for using accounting information positively affect the organization of accounting work in manufacturing companies in VSIP1 industrial park of Binh Duong province.

6) Size of enterprise

According to the research of Ismail (2009), the different size units, the organization of accounting work are also different, specifically according to this study, for small and medium-sized units, the organization requirements are also different. Accounting is certainly different from large enterprises.

To organize the accounting work in an enterprise, it is necessary to base on the scale of operation, the characteris-

tics of the industry and the field of operation; The characteristics of production organization and management as well as the nature of the production process in the enterprise must be based on the policies and regimes promulgated by the State. Organizing accounting work per the operating situation of the business not only saves costs but also ensures the provision of fast, complete, and quality information with different management requirements.

Hypothesis H6 is given as Sizes of enterprises positively affect the organization of accounting work in manufacturing companies in VSIP1 industrial park of Binh Duong province.

C. Data processing method

Descriptive statistical techniques are used to describe the basic characteristics of the data collected from the surveys such as gender, experience, and qualifications of the respondents. On the other hand, data collected through quantitative steps are processed on SPSS. 20.

IV. RESEARCH RESULTS

A. Verifying the quality of the scale

TABLE 1: THE RESULTS OF ANALYZING THE QUALITY OF THE SCALE WITH CRONBACH'S ALPHA COEFFICIENTS

No.	Variables	No of items	Cronbach's
Independent variables			
1	Requirement for applications of IT in accounting	4	0.885
2	Professional qualifications of accountants	4	0.721
3	Legal regulations	5	0.818
4	Internal control systems	5	0.807
5	Demands for using accounting information	4	0.842
6	Sizes of enterprises	4	0.854
Dependent variables			
7	Organization of accounting work in manufacturing companies in VSIP1 industrial park of Binh Duong province	4	0.872

Through testing the reliability of the scale of the observed variables in the research model, the observed variables all have Cronbach's Alpha coefficients greater than 0.6. This shows that the observed variables of the scales ensure reliability. Therefore, all observed variables are retained for EFA analysis.

Exploratory factor analysis (EFA) for independent variables

B. Testing EFA conformity

TABLE 2: KMO AND BARTLETT'S TEST

KMO Measure of Sampling Adequacy.	.793	
Bartlett's test	Approx. Chi-Square	2216.954
	df	325
	Sig.	.000

We see that KMO = 0.793. It satisfies the condition $0.5 < KMO < 1$, EFA is suitable for actual data.

C. Testing the correlation between observed variables.

Through Table 2, we see that Sig. < 0.01 . It means that observed variables have a linear correlation with representative factors.

D. Testing the interpretation of observed variables for the factors.

TABLE 3: VARIANCE

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	6.031	23.198	23.198	6.031	23.198	23.198
2	3.087	11.874	35.071	3.087	11.874	35.071
3	2.834	10.901	45.972	2.834	10.901	45.972
4	1.990	7.654	53.626	1.990	7.654	53.626
5	1.521	5.851	59.478	1.521	5.851	59.478
6	1.377	5.297	64.775	1.377	5.297	64.775

After calculating the fixed number of factors, we find out that the extracted variance of $64.775% > 50%$, satisfying the requirement. With the Principal components extraction method and Varimax rotation, there are 6 factors extracted from the observed variables. This also means that the 6 extracted factors show the ability to explain 64.775% of the change of the dependent variable in the population.

E. Results of EFA:

TABLE 4: ROTATED COMPONENT MATRIX

	Component					
	1	2	3	4	5	6
YCCN2	.887					
YCCN1	.872					
YCCN3	.866					
YCCN4	.814					
QDPL5		.764				
QDPL2		.749				
QDPL1		.681				
QDPL3		.676				
QDPL4		.668				
QMDN4			.833			
QMDN1			.763			
QMDN2			.747			
QMDN3			.723			
KSNB4				.807		
KSNB2				.806		
KSNB3				.801		
KSNB5				.677		
KSNB1				.639		
NCTT2					.811	
NCTT1					.809	
NCTT4					.762	
NCTT3					.707	
TDCM3						.749
TDCM2						.726
TDCM4						.697
TDCM1						.629

The results of EFA showed that the variables were gathered into 6 groups. Factor loading of the variables is greater than 0.5 and the difference between the components of the same factor is greater than 0.3. Then the groups of factors are collected into 6 groups with 26 observed variables.

F. EFA analysis for the dependent variable

The dependent variable "Organization of accounting work at manufacturing companies in VSIP1 industrial park in

Binh Duong province" with 6 observed variables, the EFA shows that all conditions of exploratory factor analysis are met, KMO coefficient = 0.735 > 0.5; Sig. = 0,000 < 0.05; factor loading > 0.5; and total variance is quite high 60,665% > 50% and satisfactory (Table 5).

TABLE 5: KMO AND BARTLETT'S TEST

KMO Measure of Sampling Adequacy		.735
Bartlett's test	Approx. Chi-Square	209.28
	df	3
	Sig	.000

Table 6: Variance

Component	Total variance explained			Extraction Sums of Squared Loadings		
	Initial Eigenvalues					
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.427	60.665	60.665	2.427	60.665	60.665
2	.699	17.464	78.129			
3	.541	13.522	91.651			
4	.334	8.349	100.000			

G. Regression analysis

Findings from previous research steps and the EFA analysis results show that the following factors on factors affect the organization of accounting work in manufacturing companies in VSIP1 industrial park of Binh Duong province: requirements for application of IT in accounting, internal control systems, professional qualifications of accountants, sizes of enterprises, legal regulations, demands for using accounting information.

The regression equation is written as follows:
 $CTKT = 0.360YCCN + 0.258TDCM + 0.219QDPL + 0.285KSNB + 0.164NCTT + 0.239QMDN$

Of which:

CTKT: Organization of accounting work in manufacturing companies in VSIP1 Industrial Park of Binh Duong province

QDPL: Legal regulations

KSNB: Internal control systems

YCCN: Requirements for application of IT in accounting

TDCM: Professional qualifications of the accountant

NCTT: Demand for using accounting information

QMDN: Sizes of enterprises

H. Testing the suitability of the model

TABLE 7: TESTING THE SUITABILITY OF THE MODEL

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.787 ^a	.619	.606	.29859	1.945

Research results show that the value of adjusted correlation coefficient R^2 is 0.606 > 0.5. Therefore, this is a suitable

model to be used to evaluate the relationship between the dependent variables and the independent variables.

The coefficient of the adjusted R square R^2 is 0.606 > 0.5. That means the built linear regression model is consistent with the 60.6% data. This shows that about 60.6% of the variation of the dependent variable is due to the impact of the independent variables, the rest is due to the error of other factors. Durbin Watson test = 1.945, which is in the range allowed $1 < D < 3$, so there is no correlation phenomenon of residues.

TABLE 8: ANOVA ANALYSIS

ANOVA ^a					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	25.061	6	4.177	46.848	.000 ^b
Residual	15.424	173	.089		
Total	40.484	179			

TABLE 9: REGRESSION ANALYSIS

Model	Unstandardized coefficient		Standardized coefficient	t	Sig.
	B	Std. Error	Beta		
	-.163	.208		-.781	.436
YCCN	.158	.021	.360	7.637	.000
TDCM	.213	.044	.258	4.848	.000
QDPL	.181	.048	.219	3.777	.000
KSNB	.199	.033	.285	6.000	.000
NCTT	.119	.040	.164	2.949	.004
QMDN	.179	.044	.239	4.045	.000

From the regression results table, we see that the Sig coefficient of 6 independent factors is less than 5% and the magnification coefficient VIF is very low (<2). This proves that the multicollinearity phenomenon does not occur with the independent variables.

Regression equation:

$$CTKT = 0.360YCCN + 0.258TDCM + 0.219QDPL + 0.285KSNB + 0.164NCTT + 0.239QMDN$$

To compare the impact level of each independent factor for CTKT, we base on the standardized Beta coefficient. Accordingly, the larger the standardized Beta, the more strongly that factor affects the dependent variable. As can be seen in the regression equation, among the 6 factors that affect the CTKT, factor - "Requirements for application of IT in accounting" has the strongest influence on CTKT with Beta = 0.360; factor - "Internal control systems" has the second strongest influence with Beta coefficient = 0.285; factor - "Professional qualifications of the accountants" has the third strongest influence with the coefficient Beta = 0.258; factor - "Sizes of enterprises" has the fourth-strongest influence with the coefficient Beta = 0.239; factor - "Legal regulations" have the fifth strongest influence with Beta coefficient = 0.219; and lastly, factor - "Demand for using accounting information" has the lowest impact with Beta coefficient = 0.164.

V. DISCUSSING RESEARCH RESULTS

According to the results, 6 factors affect the organization of accounting work at manufacturing companies in VSIP1 in Binh Duong province. Each factor is discussed below.

H1: The factor "Legal regulations" has a positive impact on the organization of accounting work in manufacturing companies in VSIP1 in Binh Duong province. Through Beta coefficient = 0.219, legal regulations have a positive impact on the organization of accounting work at manufacturing companies in VSIP1 in Binh Duong province. Currently, the State has promulgated a legal system such as the Law on Accounting, a system of accounting standards, and an accounting regime to ensure a sufficient basis to help businesses across the country operate in a unified manner. Our country's economy is integrating more and more deeply with the world economy. Therefore, to help businesses develop well in the future, the State needs to issue new or additional accounting standards to be more consistent with international accounting standards.

H2: The factor "Internal control system" has a positive impact on the organization of accounting work in manufacturing companies in VSIP1 in Binh Duong province. Through the coefficient of Beta = 0.285, the internal control system has a positive impact on the organization of accounting work at manufacturing companies in VSIP1 in Binh Duong province. An internal control system is an effective tool in checking, controlling, preventing, and detecting frauds and errors, preparing truthful financial statements, and ensuring the implementation of legal regimes. , comply with laws and regulations. Through the implementation of the above functions, internal control, on the one hand, contributes to ensuring the quality of the accounting work of companies, contributing to improving the quality of accounting work.

H3: The factor "Requirements for information technology application" has a positive impact on the organization of accounting work at manufacturing companies in VSIP1 in Binh Duong province. The application of information technology to accounting helps companies to perform accounting functions more efficiently and effectively by reducing the time and labor of manual recording and processing. Requirements on information technology application have the first effect on the organization of accounting work at manufacturing companies in VSIP1 in Binh Duong province through the Beta index = 0.360. Thus, the more effective the application of information technology is, the more it will improve the organization of accounting work at manufacturing companies in VSIP1 in Binh Duong province.

H4: The factor "Professional qualification of accountants" has a positive impact on the organization of accounting work in manufacturing companies in VSIP1 in Binh Duong province. Through the Beta coefficient = 0.258, the professional qualifications of accountants have a positive impact on the organization of accounting work at manufacturing companies in VSIP1 Binh Duong Industrial Park. Accountants have an important role in the quality of accounting work because they are directly involved in the organization and operation of accounting. At the same time, when accounting staff has high professional qualifications, they can advise and support the Board of Directors on what to do to

create a quality accounting organization. Therefore, it is necessary to focus on improving the quality and professional qualifications of accounting staff.

H5: The factor "Demand for using accounting information" has a positive impact on the organization of accounting work in manufacturing companies in VSIP1 in Binh Duong province. Through the Beta coefficient = 0.164, the demand for accounting information has a positive impact on the organization of accounting work at manufacturing companies in VSIP1 Binh Duong Industrial Park. The need to use accounting information is an indispensable condition for the establishment, maintenance, and improvement of the efficiency of the organization of accounting work at companies, to meet the increasing requirements of users. use information inside and outside the company.

H6: The factor "Enterprise size" has a positive impact on the organization of accounting work in manufacturing companies in VSIP1 in Binh Duong province. Through Beta coefficient = 0.239, enterprise size has a positive impact on the organization of accounting work at manufacturing companies in VSIP1 Binh Duong Industrial Park. Each company with different sizes will organize accounting work in different ways.

VI. CONCLUSION AND POLICY IMPLICATIONS

Based on the above model testing results, the authors give several recommendations to help improve the accounting organization in manufacturing companies in VSIP1 Industrial Park of Binh Duong province as follows:

A. Requirements for application of IT in accounting

Organizing the application of IT in accounting to improve accounting labor productivity and provide adequate and timely accounting information to serve the management requirements of manufacturing companies in VSIP1 industrial park of Binh Duong province.

One of the first requirements for the successful application of IT to accounting is human resources. Manufacturing companies need to improve and pay more attention to training and retraining employees who directly handle the accounting job. They must also make a long-term plan for the training of the successor teams and promote the application of IT to management in general and accounting in particular.

B. Internal control system

Internal control has an important effect in improving the quality of accounting information by minimizing errors and frauds. However, sufficiently organized control will significantly increase the companies' operation costs. Therefore, the authors believe that combining the accounting work with the internal control system is essential.

The accounting systems of manufacturing companies in Vietnam in general and in VSIP1 Industrial Park of Binh Duong province, in particular, have integrated some control procedures. However, these procedures are based on empirical or emotional nature. As a result, they have not achieved high efficiency.

C. Professional qualifications of the accountant

As far as the companies are concerned, the authors would like to propose several solutions to improve the quality of human resources as follows:

- + Regularly organize training courses and refresher courses in the profession and IT for accountants, at the same time update policies and new regimes on accounting for the accounting team.

- + Accounting staff recruitment process: recruiting employees with professional qualifications and ethics

- + Building a positive working environment, creating harmonious and healthy labor relations; promptly solving internal conflicts when arising. Organizing collective activities to strengthen interpersonal bonding. Commendation, discipline must be applied to the right person, the right job, and at the right time.

D. Sizes of business

Based on the accounting regime promulgated by the state, manufacturing companies located in VSIP1 Industrial Park of Binh Duong province base on the specific characteristics of their business type to set up a suitable accounting process, especially the management accounting work, fully regulating the functions, tasks and specific responsibilities of each accounting department, each accountant in the accounting apparatus. For small companies, it is possible to put the parts together to make the accounting apparatus more compact. For companies with many facilities operating far away from head-office and obtaining qualified accountants, it is possible to choose a scattered accounting apparatus organization model or a combination model that is both concentrated and scattered.

E. Legal provisions

Vietnam's economy is in the process of deep integration with the world economy; policies, economic and financial regimes, and taxes have always been completed, supplemented, and revised. Consequently, the process of organizing the accounting work of manufacturing companies must promptly and fully grasp the current provisions of the policies and regimes on economic and financial management, taxation, and trade law. In the trend of economic integration, Vietnam must build a legal framework of accounting, espe-

cially accounting standards to be consistent with other countries' practices, per international accounting standards and specific characteristics of Vietnam's economy in each period in line with a suitable roadmap.

In the process of drafting new accounting standards, it is necessary to absorb the opinions of accounting experts such as teaching experts at accounting training institutions, research institutes, and experts working in organizations, businesses. After the implementation period, it is necessary to review and evaluate for amendment and supplement.

F. Demand for using accounting information

In society, many people need to use the information provided by accountants such as business managers, outsiders who have direct financial interests in the business, and outsiders who have indirect financial interests in the business. Therefore, to meet the needs of using accounting information, companies need to understand the needs of specific information of each subject to properly organize the accounting work through the following solutions:

- + Hold meetings among departments and divisions to determine the need for information related to the financial situation that the subjects wishing to use accounting information are interested in.

- + Coordination between departments in providing information, selecting documents, and saving costs.

- + Develop a long-term plan in providing effective information to internal as well as stakeholders so that information users who are not accounting savvy can also grasp.

REFERENCES

- [1] W. H. Delone and E. R. McLean, "The Delone and McLean Model of information system success: A ten-year update," *Journal of Management Information System*, vol. 19, no. Spring 2003, pp. 9-30, 2003.
- [2] Rapina, "Factors influencing the quality of accounting information system and its implications on the quality of accounting information research," *Journal of finance and accounting*, vol. 5, no. 2, 2014. N. S. Soderstrom and K. J. Sun, "IRFS adoption and accounting quality: A review," *European Accounting Review*, vol. 16, no. 4, pp. 675-702, 2007.
- [3] P. T. Huyen, "Analysis of factors affecting the accounting organization in small and medium enterprises in Tra Vinh city," Hochiminh city University of Technology, Hochiminh City, 2018.
- [4] H. T. Thao, "Factors affecting the organization of accounting work at food processing companies in Hochiminh City," Hochiminh city University of Technology, Hochiminh City, 2016.

Influence of Critical and Economic Motivations on the Intention to Buy Second Hand Clothes of Vietnamese Consumers

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Abstract—This study focuses on the impact of critical and economic motivations on the intention to buy second hand clothes (SHC) of Vietnamese consumers. Using quantitative research methods to conduct research. Survey sample of 823 consumers aged 18–41 years living in Vietnam. The data was analyzed and processed by SPSS 23 and Amos 23 software. The research results have shown that the critical and economic motivations have impacts on the attitude, which in turn influence the purchase intention of consumers. Besides, the low-price motive, which was mentioned as the main reason why consumers buy SHC, now only indirectly affects the intention to buy through the mediating variable. Especially for Vietnamese consumers, the critical motivation includes both the perception of sustainability and the anti-ostentation dimension.

Index Terms—second hand clothes, critical motivation, economic, motivation, attitude, intention.

I. INTRODUCTION

ACHIEVING environmental sustainability is an important issue for companies, even more so in some industries of development. Globally, the fashion industry is one of the industries with the most negative impact on the environment [26]. The explosive growth of fast fashion has made new styles quickly replaced and addition to low prices and the incentive for consumers to buy new clothes regularly [19]. A large amount of fashion products are not reused or recycled, but end up as waste in landfills or incinerated [26].

How to reduce the amount of fashion waste into the environment towards sustainable production and consumption is one of the issues that many countries, scientists, businessman and consumers are interested in. Buying SHC instead of buying new clothes is one of the solutions mentioned. Even shopping for SHC is said to be one of the most environmentally sustainable clothing choices[9]. Because, reusing clothes helps to extend the life of the clothes, reduce the amount of clothing thrown away, thereby reducing environmental pollution and waste of resources [12]. In addition, shopping for SHC is also said to be a measure to carry out a revolt against the fashion waste disposal phenomenon stemming from fast fashion consumption and usage trends [6,30,35] as well as demonstrating resistance to the development of modern channels and avoiding large corporate chains [5]. Instead of buying clothes at the manufacturer's official sales channels such as retail stores, mail order / Internet, consumers buy SHC from informal channels such as buying from charity shops, stores and stalls selling SHC [5,38]. Several international reports actually predict that the

second-hand clothing market can grow rapidly in fashion in the next 10 years [24].

Academic research on SHC consumption has received a lot of attention since the 2000s. Especially, when the consumption motivations or reasons to buy SHC are still not understood[3]. In addition, research directions that suggest critical motives as an official motive for the behavior of consuming SHC have been called for [4]. However, there are still many controversies surrounding the influence of this motive on consumers' intention to buy SHC. Therefore, this article is designed to understand the impact of economic motivations and critical on the attitude and intention to buy SHC of consumers in Vietnam.

II. THEORETICAL BACKGROUND AND HYPOTHESES

A. Buy Second hand clothes

Although historical evidence for secondhand traditions is well established (Hansen, 2000), marketing research on secondhand purchases is still scarce [7,10,13,14,29, 34]. SHC is that has been used before and returned to the next consumption cycle. Therefore, previous studies have shown that one of the driving forces behind buying this product is the low price [6]. Other views of SHC have also been formed as unique products, in a fashion style that loves nostalgia or as ethical products whose consumption behavior is contributed to reducing the impact of environmental pollution on human life, as well as the waste of resources[12]. Therefore, consumers' buying behavior of SHC is changing and becoming more complex than before, requiring scholars and administrators to have deeper research to have appropriate solutions [14].

Previous studies identified different types of motivations for consumers to engage in second-hand shopping defined as psychological and physical motivations that drive consumers to second-hand products and/or channels [13]. This study focuses on economic and environmental reasons as these factors are likely to influence consumers' attitudes and intentions to buy second-hand clothing. Therefore, this study did not take into account constructs related to emotions and self.

B. Critical motivations

Many studies have shown that in modern society, the buying behavior of SHC is also influenced by critical motivations, which mainly come from two groups, the ethical and ecological dimension and the anti-ostentation[13].

1) Ethical and ecological dimension

Environmental and ecological issues have been addressed in the social fields [36], marketing [8, 25, 33], psychology [11], consumer behavior [14, 22, 28, 32]. Empirical evidence from these studies suggests that among the factors influencing consumer purchase of second hand, there may be reasons related to environmental sensitivities, such as trust or attitudes towards sustainability issues.

[8] found that the natural orientation, ecological influence and ecological knowledge of Chinese consumers, in addition to the collective level, also influence their attitudes towards green purchases. Based on a case study of Danish dairy consumers at two different points of sale, [33] found that people who buy organic milk display different selection methods compared to those who buy conventional milk. More specifically, an attribute of green consumption appears to enhance consumer participation in decision-making and signal greater consideration in their decision-making process. These results seem to be consistent with the literature on green purchasing behavior [32]. A more recent study of Indian consumers found that environmental concerns were associated with more positive attitudes towards purchasing green products[27]. Environmental reasons also emerged as the third appropriate motivation to buy second-hand products in a study focusing on IKEA consumers in Sweden [14].

Attitude towards performing a behavior refers to the degree to which a person has favorable or unfavorable judgment or evaluation towards that behavior in question [1]. It can therefore be argued that this would also apply to environments that may be dominated by environmental sustainability concerns, which could be reflected in a more positive view of purchasing SHC. So, it is suggested that:

H1a: Ethical and ecological dimension sustainability has a positive influence on attitudes towards buying SHC.

H1b: Perceived ethical and ecological dimension durability has a positive influence on the intention to buy SHC.

2) Anti-ostentation motivations

The literature reviewed [10, 13, 29] shows that key drivers play a paramount role in triggering second-hand purchases. [13] identify an important feature of relationships related to how second-hand shoppers seriously participate in the broader market system, issues of consumerism, society consumption and consumption, and features and offers traditional channels.

Buying or consuming new goods is considered a typical waste of resources in a consumer society, while buying second-hand goods is tantamount to escaping the classical consumer market system, deliberately rejecting mass consumption and re-establishing consumers' sense of sovereignty, as well as adopting alternative channels to avoid conventional market channels [23]. Therefore:

H2a: Anti-ostentation motivations has a positive effect on the attitude to buy SHC.

H2b: Anti-ostentation motivations as a motivation to buy SHC positively affects attitude towards SHC purchase.

C. Economic motivations

The peer-reviewed literature on second-hand consumption suggests that economic drivers play an important role in

influencing attitudes toward second-hand purchases [38]. [13] found that economic incentives are potentially relevant antecedents of second-hand purchase, whereas, [7] found that secondhand fashion purchases are positively influenced by thrift and bargain hunting. [34] revealed that the attractiveness of the price, specifically the lower price, positively affects the luxury purchase attitude of the former. Similarly, in a sample of university students, [39] show that price sensitivity or fair price is positively related to the frequency of purchases in second-hand clothing stores. [14] indicate that the main motivations for buying second hand products for IKEA customers are economic in nature. Therefore:

H3a: Low price motive to buy second hand positively affects buying attitude of SHC.

H3b: Low price motive has a positive effect on intention to buy SHC.

H4a: Fair price motive has a positive influence on buying attitude of SHC.

H4b: Fair price motive has a positive influence on the intention to buy SHC.

D. Attitude and intention to buy second hand clothes

Attitudes and purchase intentions have been examined by applying a number of models and frameworks rooted in psychology. Among these theoretical frameworks, the theory of reasoned action (TRA)[2] and the theory of planned behavior (TPB)[1] have gained considerable scientific recognition. Both of these theories postulate that a positive attitude towards performing a certain behavior precedes the actual intention to perform that behavior. For example, in the context of green product consumption, [27] shows that a positive attitude towards buying green products leads to a stronger purchase intention.

As such, consistent with TRA and TPB, this study hypothesizes that the drivers and perceptions identified in the previous subsections (perceptions of sustainability, distance from the consumption system, and economic force) positively affects second-hand purchases, which in turn positively affects behavioral intentions towards second-hand purchases. Thus, attitudes work as mediators between antecedents and intentions. Therefore, this research hypothesis that:

H5: Attitude towards buying second hand has a positive influence on behavioral intention to buy SHC

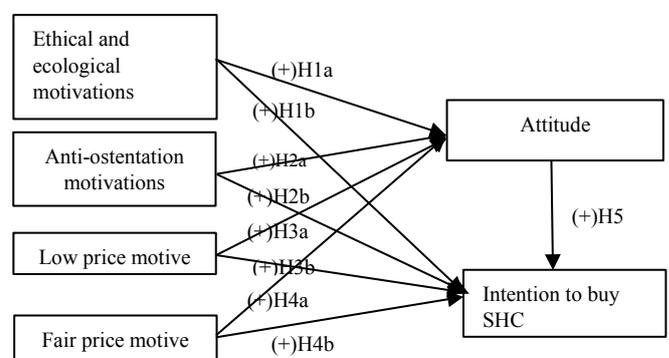


Figure 1. Proposed research model

III. RESEARCH METHODS

To test the proposed hypotheses, this study uses a quantitative research method through questionnaires. The study applies a linear structural model with the support of SPSS 23 and Amos 23 software. The scales in the research model are selected from previous studies and adjusted and re-designed accordingly with the context of SHC consumption of Vietnamese consumers (Table 1). In order to improve the reliability of the scales, the research applies the reverse translation method with the support of 3 experts in language and marketing. The scales are translated from English to Vietnamese and then translated back to English for comparison, contrast and change accordingly. The questions in the survey are in the form of 5-point Likert scale with 1 being "strongly disagree" and 5 being "strongly agree".

In the exploratory factor analysis (EFA), the sample size is usually determined based on two factors: the minimum size and the number of observed variables included in the analysis. [15] suggested that for exploratory factor analysis (EFA), the sample size should be at least 50 and the observation/items ratio should be 5:1, that is, 1 measurement variable requires 5 observations. In this study, the author designed a survey with 31 questions. Thus, to carry out research with Cronbach's Alpha reliability analysis and exploratory factor analysis (EFA), the research sample needs at least 150 questionnaires.

The study sample was selected by convenience sampling method. The questionnaire was designed in google form, with the link sent to the consumers aged 18-41 years old living in Vietnam via email and messenger on Facebook. The investigation was conducted between March 18, 2020 and April 28, 2020. The results obtained 823 valid questionnaires. The sample size qualifies for the follow-up analysis of this study.

TABLE 1. THE SCALES USED IN THE RESEARCH MODEL

	Scales	Number of variables	Source of the scale
1	Low price motive	7	Lichtenstein et al. (1990).
2	Fair price motive	8	Roux v& Guiot (2008)
3	Ethical and ecological	2	Shim (1995)
4	Anti-ostentation motivations	5	Roux & Guiot (2008)
5	Attitude	3	Hazen et al. (2017)
6	Intention to buy SHC	5	Holak & Lehmann (1990)

Source: Compiled by the author

IV. RESEARCH RESULTS

A. Measurement validation and reliability

Evaluate the reliability of the scale through Cronbach's Alpha coefficient. The test results based on SPSS.23 software showed that: the scale of Low price motive eliminated one observation (Lop5), the rest of the scales were satisfactory.

Then perform EFA exploratory factor analysis. The KMO coefficient calculated from the survey sample is $0.960 > 0.5$. Thus, the survey sample size is eligible to perform exploratory factor analysis. Barlett's test with the hypothesis H_0 : the correlation level between the observed variables is zero in the population is statistically significant because the P-value (Sig.) determined from the survey sample is 0.000 smaller than the significance level of 0.05. Therefore, it is possible to reject the hypothesis H_0 or it can be concluded that the observed variables are correlated with each other in the population. With Promax rotation and displaying only load factors > 0.5 , it shows that all observed variables have load coefficients > 0.5 which are considered to have practical significance (Hair et al., 2014), so All these observed variables were kept for use in the next analysis steps. In which, the results of EFA analysis for ethical and ecological and anti-ostentation motivations are downloaded with the same factor. Ethical and ecological and anti-ostentation motivations are two drivers of critical motives (Guiot and Roux 2010). Thus, through exploratory factor analysis with a dataset collected from a Vietnamese consumer survey, it has been shown that for Vietnamese consumers, Ethical and ecological and anti-ostentation motivations convergence on one factor. Therefore, naming this new factor is a critical motivation, the observed variables keep their original symbols.

To evaluate whether the model and the scale meet the requirements of a model, it is necessary to use confirmatory factor analysis (CFA). Hair et al. (2010) the indicators considered to evaluate Model Fit include: $CMIN/df \leq 2$ is good, $CMIN/df \leq 5$ is acceptable; $CFI \geq 0.9$ is good, $CFI \geq 0.95$ is very good, $CFI \geq 0.8$ is acceptable; $TLI \geq 0.9$ is good, $TLI \geq 0.95$ is very good; $GFI \geq 0.9$ is good, $GFI \geq 0.95$ is very good $RMSEA \leq 0.08$ is good, $RMSEA \leq 0.03$ is very good. CFA analysis results from the survey sample have $TLI = 0.940 > 0.9$; $CFI = 0.946 > 0.9$; $CMIN/df = 3.3745 < 5$; $RMSEA = 0.058 < 0.08$. Therefore, the calculated results show that the model's indexes are satisfied, the model is accepted with the research data.

TABLE 2. THE RESULTS OF THE DISCRIMINANT AND RELIABILITY TEST IN THE CFA ANALYSIS

	CR	AVE	MSV	SQRAVE	MaxR(H)	Itb	Cit	Fpr	Lop	Att
Itb	0.899	0.642	0.489	0.801	0.908	1.000				
Cit	0.899	0.599	0.404	0.774	0.903	0.613	1.000			
Fpr	0.932	0.662	0.489	0.814	0.934	0.699	0.601	1.000		
Lop	0.916	0.646	0.381	0.804	0.921	0.542	0.598	0.617	1.000	
Att	0.891	0.733	0.410	0.856	0.901	0.640	0.636	0.630	0.584	1.000

Source: Data analysis results by AMOS 23.0

According to [15], the thresholds for comparison of the indicators should be as follows: composite reliability $CR \geq 0.7$; AVE convergence ≥ 0.5 ; discriminant response when the maximum individual variance MSV is less than the extracted mean variance AVE; index square root of average variance extracted (Square Root of AVE - SQRAVE) $>$ index determining correlation (Inter Construct Correlations). Looking at the results in Table 2, it shows that the values in the CR column are all > 0.7 , so the reliability of the

scale is guaranteed; the values in the AVE column are all > 0.5 so convergence is guaranteed; MSV values < AVE; SQRTAVE values (numbers in bold above diagonal) > correlation indices (numbers below diagonal), so discriminability is guaranteed. Therefore, all these scales are eligible for further use for further studies.

B. Moderation tests

The results of running the SEM model for the research model to evaluate the motivations affecting the intention to buy used clothes of consumers are shown in Figure 2. The model's suitability assessment indicators are valuable. Value as follows: CMIN/df = 3.745 < 5; TLI = 0.940 > 0.9; CFI = 0.946 > 0.9; and RMSEA = 0.058 < 0.08. As such, the model is considered acceptable for performing SEM analysis.

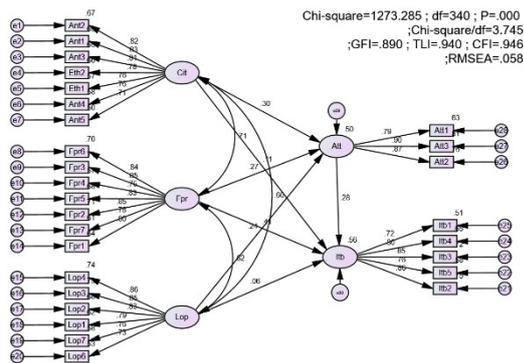


Figure 2. Structural Model Analysis (SEM) – Normalized Form

Source: Data analysis results by AMOSS 23.0

TABLE 3. REGRESSION WEIGHT TABLE FOR RESEARCH MODEL

			Unstandardized coefficient	Standardized coefficient	S.E.	C.R.	P
Att	<---	Cit	.331	.305	.051	6.528	***
Att	<---	Fpr	.271	.268	.048	5.703	***
Att	<---	Lop	.238	.236	.041	5.845	***
Itb	<---	Att	.277	.277	.042	6.580	***
Itb	<---	Cit	.119	.110	.049	2.418	.016
Itb	<---	Fpr	.416	.409	.047	8.772	***
Itb	<---	Lop	.063	.063	.039	1.607	.108
R2							
Att				.502			
Itb				.564			

Source: Data analysis results by AMOSS 23.0

From the results of the unnormalized regression weight table for the research model (table 3), it is shown that at the 5% level of significance, the relationships between low price motivations, fair price motive and critical motivations is statistically significant in the relationship that affects the attitude to buy SHC. Fair price motives and critical motives have a direct impact on the intention to buy SHC. The low

price motive has an indirect impact on the intention to buy SHC through the intermediate variable attitude. Consumer attitudes have an influence on their purchase intention.

V. CONCLUSION

A. Implications for theory

This study also contributes to the SHC purchasing literature. More specifically, the critical motives that include both ethical and ecological motivations and anti-ostentation motivations; Fair price motive has an influence on consumers' attitude and intention to buy used clothing. The low price motive has an indirect impact on the intention to buy used clothes through the intermediate variable attitude.

Overall, consistent with TRA [1] and TPB ([2], it was found that attitude mediates the effects of three different cognitive and motivational groups on purchase intention consumer SHC.

B. Practical implications

Economic incentives (in the form of fair or lower prices) are only one of the preconditions for consumers to buy SHC.

Ecological motivations and anti-ostentation motivations to play a pivotal role in shaping attitudes towards SHC buying. So, put more emphasis on green model and develop new communication strategies and value propositions around green and/or sustainable fashion [8, 20, 25] This seems to be the way forward for fashion companies willing to incorporate environmental goals into their corporate mission.

Consumer attitudes are positively influenced by social and economic motivations. Therefore, it is advisable to focus on this impact to stimulate consumers to shop.

C. Limitations

Beside the contribution this research also exist some limitations. It is recommended to classify SHC products to have a more specific view of the impact of each motor on consumers' purchase intention Moreover, analyze the impact of demographic variables to clearly see the difference of each customer group.

REFERENCES

- [1] Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- [2] Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour*. Englewood Cliffs, NJ: Prentice-Hall.
- [3] Benoit, S., Baker, T. L., Bolton, R. N., Gruber, T., & Kandampully, J. (2017). A triadic framework for collaborative consumption (CC): Motives, activities and resources & capabilities of actors. *Journal of Business Research*, 79, 219–227. <https://doi.org/10.1016/j.jbusres.2017.05.004>
- [4] Bianchi, C., & Birtwistle, G. (2012). Consumer clothing disposal behaviour: A comparative study. *International Journal of Consumer Studies*, 36(3), 335–341. <https://doi.org/10.1111/j.1470-6431.2011.01011.x>
- [5] Brace-Govan, J., Binay, I., (2010). 'Consumption of disposed goods for moral identities: a nexus of organization, place, things and consumers'. *J. Consum. Behav.* 9, 69–82.
- [6] Carrigan, M., Moraes, C. & McEachern, M. (2013), 'From conspicuous to considered fashion: A harm-chain approach to the responsibilities of luxury-fashion businesses'. *Journal of Marketing Management*, Vol. 29, No. 11-12, pp. 1277-1307.

- [7] Cervellon, M.C., Carey, L. & Harms, T. (2012). Something old, something used: determinants of women's purchase of vintage fashion vs. second-hand fashion. *International Journal of Retail & Distribution Management*, 40, 956–974.
- [8] Chan, R. Y. K. (2001). Determinants of Chinese consumers' green purchase behavior. *Psychology & Marketing*, 18(4), 389–413. <https://doi.org/10.1002/mar.1013>
- [9] Corvellec, H. A. (2017). 'Evidencing the waste effect of Product-Service Systems (PSSs)'. *Journal of Cleaner Production*, 14–24.
- [10] Crosno, J. L., & Cui, A. P. (2018). Something old, something new: The role of partitioned pricing in consumers' preference for new versus used products. *Journal of Consumer Marketing*, 35(4), 353–365. <https://doi.org/10.1108/JCM-02-2017-2091>
- [11] Dahlstrand, U., & Biel, A. (1997). Pro-environmental habits: Propensity levels in behavioral change. *Journal of Applied Social Psychology*, 27(7), 588–601. <https://doi.org/10.1111/j.1559-1816.1997.tb00650.x>
- [12] Farrant, L., Olsen, S. I., & Wangel, A. (2011). 'Environmental benefits from reusing clothes'. *International Journal of Life Cycle Assess*, 15, 726–736.
- [13] Guiot, D. and Roux, D. (2010), A second-hand shoppers' motivation scale: antecedents, consequences and implications for retailers, *Journal of Retailing*, Vol. 86, No. 4, pp. 355-371.
- [14] Gullstrand Edbring, E., Lehner, M. & Mont, O. (2016). Exploring consumer attitudes to alternative models of consumption: motivations and barriers. *Journal of Cleaner Production* [Online]. 123: 5-15.
- [15] Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective* (7th ed.). Upper Saddle River, NJ: Pearson Education.
- [16] Hansen, K. T. (2000). Other people's clothes? The international second-hand clothing trade and dress practices in Zambia. *Fashion Theory*, 4(3), 245–274.
- [17] Hazen, B. T., Mollenkopf, D. A., & Wang, Y. (2017). Remanufacturing for the circular economy: An examination of consumer switching behavior. *Business Strategy and the Environment*, 26(4), 451–464. <https://doi.org/10.1002/bse.1929>
- [18] Holak, S. L. & Lehmann, D. R. (1990), Purchase Intentions and the Dimensions of Innovation: An Exploratory Model. *Journal of Product Innovation Management*, Vol. 7, No. 1, pp. 59-73.
- [19] Joy, A., Sherry, J. F. J., Venkatesh, A., Wang, J. & Chan, R. (2012). 'Fast Fashion, Sustainability, and the Ethical Appeal of Luxury Brands', *Fashion Theory*, 16:3, 273–295, DOI: 10.2752/175174112X13340749707123.
- [20] Lang, C., & Joyner Armstrong, C. M. (2018). Collaborative consumption: The influence of fashion leadership, need for uniqueness, and materialism on female consumers' adoption of clothing renting and swapping. *Sustainable Production and Consumption*, 13, 37–47. <https://doi.org/10.1016/j.spc.2017.11.005>
- [21] Lichtenstein, D.R., Netemeyer, R.G., Burton, S., (1990). Distinguishing Coupon Pro-neness from Value Consciousness: An Acquisition-Transaction Utility Theory Perspective. *J. Mark.*, 54–67.
- [22] Luchs, M., Naylor, R. W., Rose, R. L., Catlin, J. R., Gau, R., Kapitan, S., ... Weaver, T. (2011). Toward a sustainable marketplace: Expanding options and benefits for consumers. *Journal of Research for Consumers*, 19, 1–12.
- [23] Mano, H., & Elliott, M. T. (1997). Smart shopping: The origins and consequences of price savings. In M. Brucks & D. J. MacInnis (Eds.), *Advances in Consumer Research* (24, pp. 504–510). Provo, UT: Association for Consumer Research
- [24] McKinsey & Company. Retrieved from <https://www.mckinsey.com/industries/retail/our-insights/the-state-of-fashion-2019-a-year-of-awakening>
- [25] Pagiaslis, A., & Kroutalis, A. K. (2014). Green consumption behavior antecedents: Environmental concern, knowledge, and beliefs. *Psychology & Marketing*, 31(5), 335–348. <https://doi.org/10.1002/mar.20698>
- [26] Pal, R., & Gander, J. (2018). Modelling environmental value: An examination of sustainable business models within the fashion industry. *Journal of Cleaner Production*, 184, 251–263. <https://doi.org/10.1016/j.jclepro.2018.02.001>
- [27] Paul, J., Modi, A., & Patel, J. (2016). Predicting green product consumption using theory of planned behavior and reasoned action. *Journal of Retailing and Consumer Services*, 29, 123–134. <https://doi.org/10.1016/j.jretconser.2015.11.006>
- [28] Phipps, M., Ozanne, L. K., Luchs, M. G., Subrahmanyam, S., Kapitan, S., Catlin, J. R., ... Weaver, T. (2013). Understanding the inherent complexity of sustainable consumption: A social cognitive framework. *Journal of Business Research*, 66(8), 1227–1234. <https://doi.org/10.1016/j.jbusres.2012.08.016>
- [29] Roux, D. & Guiot, D. (2008). Measuring second hand shopping motives, antecedents and consequences. *Recherche et Applications en Marketing*, 23(4), 63–94.
- [30] Roux, D., Korchia, M., (2006). 'Am I what I wear? An exploratory study of symbolic meanings associated with secondhand clothing'. *Adv. Consum. Res.* 33 (1), 29–35.
- [31] Shim, S. (1995). Environmentalism and consumers' clothing disposal patterns: An exploratory study. *Clothing & Textiles Research Journal*, 13(1), 38–48.
- [32] Tanner, C., & Wölfing Kast, S. (2003). Promoting sustainable consumption: Determinants of green purchases by Swiss consumers. *Psychology & Marketing*, 20(10), 883–902. <https://doi.org/10.1002/mar.10101>
- [33] Thøgersen, J., Jørgensen, A.-K., & Sandager, S. (2012). Consumer decision making regarding a green everyday product. *Psychology & Marketing*, 29(4), 187–197. <https://doi.org/10.1002/mar.20514>
- [34] Turunen, L.L.M., Leipämaa-Leskinen, H., (2015). Pre-loved luxury: identifying the meanings of second-hand luxury possessions. *J. Prod. Brand Manag.* 24 (1), 57–65.
- [35] Vines, J. P., Solakis, K. & Guillen, J. (2020). 'Environmental knowledge, the collaborative economy and responsible consumption in the context of second-hand perinatal and infant clothes in Spain'. *Resources, Conservation & Recycling*, 159.
- [36] Vining, J., & Ebreo, A. (1990). What makes a recycler?: A comparison of recyclers and nonrecyclers. *Environment and Behavior*, 22(1), 55–73. <https://doi.org/10.1177/0013916590221003>
- [37] WRAP (2017). Valuing our clothes: The cost of UK fashion. The Waste and Resources Action Programme (WRAP), Banbury, Oxon. Retrieved from <http://www.wrap.org.uk/sustainable-textiles/valuing-our-clothes%20>
- [38] Williams, C.C., Paddock, C., (2005). 'The meanings of informal and second-hand retail channels: some evidence from Leicester'. *Int. Rev. Retail, Distrib. Consum. Res.* 13 (3), 317–336.
- [39] Yan, R.-N., Bae, S. Y., & Xu, H. (2015). Second-hand clothing shopping among college students: The role of psychographic characteristics. *Young Consumers*, 16(1), 85–98. <https://doi.org/10.1108/YC-02-2014-00429>
- [40] Zamani, B. S., Andin, G. & Peters, G.M. (2017). 'Life cycle assessment of clothing libraries: can collaborative consumption reduce the environmental impact of fast fashion?', *Journal of Cleaner Production*, 162, 1368-1372.

Intention of Vietnamese Enterprises' digital transformation

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Abstract—There have been many studies on digital transformation in recent times, but these studies focused on clarifying the concept, content, and implementation of digital transformation. There have not been many studies on the attitudes and intentions of enterprises to digital transformation (DT). This paper proposes factors affecting DT intention including perceived usefulness, trust, innovation, perceived risk to investigate attitudes about DT and examines the impact of attitude and subject norms factors on the digital transformation intention of enterprises. A questionnaire designed and sent to 337 Vietnamese enterprises in different fields of activity. This study uses Structural Equation Model (SEM). The perceived usefulness, Innovation factors effect to the attitude positively leading to the Intention of DT of enterprises, whereas the perception of risk has a negative impact. Attitudes towards digital transformation and Subjective Norms have a positive impact on digital transformation intention. This paper helps Vietnamese government authorities to have a basis to promote and support Vietnamese enterprises in digital transformation.

Index Terms—digital transformation, intention, Technology Acceptance Model (TAM)

I. INTRODUCTION

THE 4th industrial revolution is one of the most common topics in both industry and academy. The 4th industrial revolution plays a considerable role in digitalization. “The main motivation of DT is to raise the efficiency and productivity to improve the competitive capacity of the enterprises” [1]. In some decades, DT has emerged as a significant phenomenon in strategic information systems research [2, 3] and for practitioners [4, 5]. DT covers the changes which occur in society and industries by using of digital technologies [6, 7]. DT has been explained that companies must consider how to do to innovate technology by proposing DT strategies to promote operational performance [8].

In Vietnam, the government has been paying great attention to comprehensive digital transformation. This paper studies whether Vietnamese enterprises are interested in DT and what factors affect the DT intention of Vietnamese enterprises. Research on digital transformation approach from many different aspects, focusing on clarifying the concept and nature of DT, content of DT, impact of DT on business

administration, value chain, efficiency, ... Researching on the factors affecting DT intention, especially in emerging economies is necessary. The motivation of this research is examining the factors impacting DT intention of Vietnamese enterprises. We hope the research results will help state management agencies take measures to support and promote the digital transformation process of enterprises.

II. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

1. Digital transformation

Although DT is a common discussion now, the think of digital products and services has been deeply understood in the past two decades [9, 10]. Researchers offer different definitions of DT. Bowersox et al. defined DT is a process of re-generating a business to digitize operations and form extended supply chain relationships [11]. Westerman et al. showed that DT is using of technology to have a radical improvement about the performance of enterprise [5]. They use social media, analytic, mobility, smart embedded devices to transform relationships with customers and internal process. Others define DT to rebuild a business model according to customer needs using new technologies [12]. DT points out the basic transformation of the business world through the creation of new internet-based technologies that have an effect on whole society. DT is the intentional digital evolution of an enterprise in strategic and tactic. Schallmo et al. considered DT as the consistency network of of the economy as a whole and adjusting players to the digital economy [13]. Mergel et al. define DT is the modification of core government processes and services as a whole, beyond traditional digitizations [14]; it transforms continuously taking into consideration current policies, procedures, user needs, and leads to complete modification of existing digital services as well as creation of technical services; the result of DT is focused on satisfying customer needs, new forms of service provision and expanding user base.

Definitions of DT, involve using new technologies to rebuild business models according to customer

requirements. However, in the public sector, DT not only creates new business model but also efforts to make services more efficient, and people can access easier [15].

2. Theory of reasoned action

This theory refers the impact of Attitudes to human behaviors. Researchers often use to predict how someone will behave through their attitudes and behavioral intentions before they perform that behavior. The decision of an individual to participate in a specific behavior through the result that the individual expects to arrive because of the conduct of the behavior. According to TRA, the primary behavior can be predicted according to the individual's attitude towards the behavior being addressed through the intervention effect of behavioral intention. In this theoretical model, both personal attitudes and social or regulatory factors have an impact to behavioral intention, which is the most powerful predictor of actual behavior.

3. Theory of planned behavior (TPB)

Ajzen developed TPB from TRA [16], it assumes that a behavior be predicted or explained by behavioral tendency in order to make such behaviors. The behavioral trends are assumed including motivating factors that impact behavior, and he defined it as the level of effort that people try to make that behavior [16]. Behavioral tendency has three factors. First, Attitude is viewed as a positive or negative assessment of the behavior. Second, Social impact which mentions to social pressure experienced to make such behavior. Finally, Ajzen developed TPB through adding a sensory behavior control element into the TRA. The perceived behavioral control element reflects ease or difficulty in making behavior; it depends on available resources and opportunities to making the behavior. TPB has been widely used in many areas of behavioral prediction researches [17]. The TPB is a useful theory for pre-employment assessments of degree of readiness for change because it can provide organizations with information on employee beliefs early and the determinants of their intentions for change [18].

4. TAM

It is the most common models of predictive research about the use IT systems of users. Davis developed TAM [19, 20]. TAM is an adaptation for TRA in 1986. The TAM includes "perceived usefulness" (PU) and "perceived ease of use" (PEU), these have a considerable effect on the application of new technology. TAM has been extensively researched and validated by various studies to test the adoption of individual technology in various information system structures. According to TAM, PEU and PU factors are the most important determinants of using a system. Using attitude is related to the user's assessment of the desired behavior using a particular system application. Many studies on factors affecting behavioral intention have been based on TAM.

Because TAM explains well the difference in the willingness of consumers to accept technology and it is one of the most commonly used models in the researches on the application of technology [21].

6. PU

"PU is used a lot in the process of information system applying which is considered as an extent to which a consumer's use of new technology to improve work efficiency" [19]. In this research, PU refers to enterprises' choice to adopt the DT if they believe the adoption of DT can has positive influences.

Many empirical researches on the application of new technology in some past decades pointed out that PU has a positive impact on user's intention [22]. We have a hypothesis:

Hypothesis 1 (H1): PU has a positive effect on attitudes (AT) related to the intention of DT.

7. Trust (TRU)

TRU is an important variable of application research along with PU and PEU. TRU impacts the attitudes of potential users and their willingness to apply. TRU has been studied by researchers from many empirical studies in many difference fields [23-26]... users' trust impact behaviors [27]. Many researchers showed that TRU has an important role in the user's intention. We have a following hypothesis:

Hypothesis 2 (H2): TRU impacts on AT toward the intention of DT

8. Perceived Risk (PR)

Most researchers think that PR is a factor which negatively impact to application of technology [27]. PR mentions to the risk that the user is aware of when he adopts DT. The level of risk perception is an important factor impacting application [28]. PR can considerably affect users' willingness to DT. We have the following hypothesis:

Hypothesis 3 (H3): PR will negatively impact to AT toward the intention of DT

9. User Innovativeness

"Innovativeness is understood as the degree of early acceptance of an innovation to try new products, technologies or services" [29]. When an individual has an innovativeness, he has a more positive intention to adopt. People are less probable to PR and more open-minded to technological innovation. "Innovativeness is a basic feature of human beings, which reflects the degree of interest of users in a new field" [30]. Individuals' innovation is important in their intention to use, empirical studies have demonstrated this [31]. We have hypothesis:

Hypothesis 4 (H4): Innovativeness (INN) impacts on AT toward the intention of DT

10. Attitudes (AT)

AT mentions the user's opinion and personal trend. "Behavior intention is the power of one's intention to make a specific behavior" [32]. A positive AT toward new technology is an important to apply that technology [33]. TAM shows AT impacts on users' application intentions. Many different researches have been applied this model. Thus, we have hypothesis:

Hypothesis 5 (H5): Attitudes (AT) has a significant positive impact on intention of DT (INT)

11. Subjective Norms (SN)

Following Ajzen & Fishbein SN refers to a person's perception. when someone influence to him, they are important to him. He thinks that if those people perform the behavior, he will also do it [34]. TPB pointed out SN influences a person's INT [35]. There have been many empirical studies supporting this argument [36]. Hence, in this study, we hypothesize:

Hypothesis 6 (H6): Subjective norms (SN) have a positive impact with the intention of DT

III. METHODOLOGY

This study collected data from 337 Vietnamese enterprises. Because of Covid-19 pandemic, a survey questionnaire was sent via google form link. According to Bhattacharjee because online survey is considered as a suitable research method nowadays in technological development context, in addition to Covid - 19 pandemic online survey is more safer than other data collection method [37]. The initial items of these questionnaires were made in English. First questionnaire draft was developed by reviewing systematically extended mix models relevant determinants of behavioural intention to digital transformation, besides in-depth qualitative interview was also used to slightly modify based on the view of the firm's manager from various sectors. These practitioners assessed the validity of measurement scale. These opinions from the practitioner's help ensure the meaning of the original scale and develop the scale in order to meet the fit of this study.

Sample size was calculated using hair et al, according to this formula the minimum is calculated by 5 multiple items, so 40 items the number of respondents is more than 200 people. with 337 Vietnamese firms that meet the demand [37].

IV. RESULTS

In general Cronbach's alpha value has been considered as criteria of the reliability analysis of constructs. According to statistical experts, Cronbach's alpha values ranged from .672 to .968, which is consistent with the measures. Next step this study conducted EFA using PAF with promax rotation. After analyzing EFA 6 factors with Eigenvalues higher than 1, giving an explanation for 76,724% of the variance. In addition, factor loading values were higher than 0.5 (see table 1 below), so all items in the model were hold further data analysis, therefore the figure shows the acceptable discriminant validity for the latent variable. Following to results from table 1(see below), the AVE values of all latent variables were higher than .60, and the CR of these latent variables were higher than .80; Fornell & Larcker pointed out that "the AVE value less than .60, but CR value is higher than .60, the convergent validity of the latent variable is still sufficient" [38]. Most of the constructs have AVE values higher than 0.6. The statistical results are

consistent (CR coefficients arraying from .842 to .972, AVE are greater than .60)

Table 1: Properties of scales used in the study

	Indicators	FL	Cronbach's alpha	CR	AVE
Perceived usefulness	PU8	0,866	0,968	0,968	0,736
	PU3	0,849			
	PU2	0,853			
	PU4	0,861			
	PU5	0,877			
	PU9	0,880			
	PU6	0,866			
	PU10	0,829			
	PU1	0,840			
	PU7	0,847			
PU11	0,865				
Perceived Risk	PR4	0,896	0,672	0,946	0,745
	PR3	0,880			
	PR6	0,882			
	PR1	0,858			
	PR2	0,805			
	PR5	0,856			
User Innovativeness	INN2	0,793	0,883	0,882	0,653
	INN1	0,739			
	INN3	0,830			
	INN4	0,864			
Attitudes	AT3	0,890	0,919	0,909	0,715
	AT1	0,917			
	AT2	0,846			
	AT4	0,716			
Subjective	SN2	0,908			

Norms	SN1	0,818	0,907	0,812	0,6
	SN3	0,551			
Intention of DT	INT1	0,819	0,837	0,821	0,606
	INT2	0,824			
	INT3	0,684			

Overall evaluation

CFA technique with AMOS 20 tools is used to measure the psychometric properties of all the scales, prior to hypothesis testing. As can be seen from the table 2, four-factor and 30-items a measurement model fit the data satisfactorily: CFI = 0.959; TLI = 0.952; RMSEA = 0.054; RMR = 0.070; $\chi^2/df = 1.987$; that means better than their recommended cut-off values (CFI > .90; TLI > .90; RMSEA < .80; RMR < .80) [40]. Overall, the model index meets the standards.

Table 2: Model fit indicators

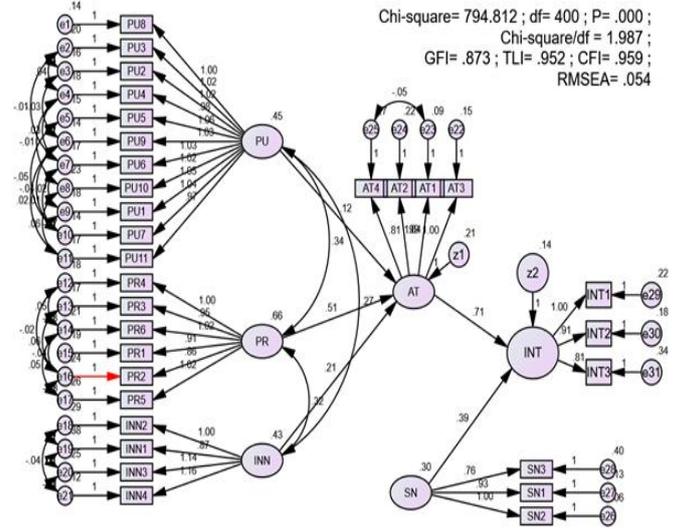
Model fit	Recommended value	Actual value
Chi – square/df	≤ 3	1,987
GFI	≥ 0.8	0.873
AGFI	≥ 0.8	0.843
NFI	≥ 0.9	0.920
CFI	≥ 0.9	0.959
IFI	≥ 0.9	0.959
TLI	≥ 0.9	0.952
RMSEA	< 0.08	0.54
RMSR	≤ 0.1	0.07

This paper use SEM to estimate the correlation among the 6 latent variables. According to Anderson and Gerbing “the minimum sample size required for SEM is greater than 200 observations” [41]. This paper collected 377 observations. It meets the requirement of SEM.

After assessing the reliability and validity, SEM needs to be estimated to analyze the predicted structural relationships.

This is consistent with [42] regarding the two-stage process in hypothesis testing. The results point out that the model is suitable: CFI = 0.959; TLI = 0.952; RMSEA = 0.054; RMR = 0.070; $\chi^2 = 794.812$; $df = 400$, $p < 0.05$; [39]

Fig. 1: SEM estimation results



Hypothesis testing

	Estimate	S.E.	C.R.	P	standardized estimate
AT <- PU	.121	.060	2.013	.044	.111
AT <- PR	-.510	.054	9.446	***	-.569
AT <- INN	.205	.064	3.204	.001	.184
INT <- AT	.707	.050	14.260	***	.763
INT <- SN	.389	.058	6.729	***	.317

The results for the hypothesis testing are represented in Table 3 above. All of the hypotheses are accepted. Specifically, H1 predicts PU has a positive effect on AT, is supported (standardized $\beta = .111$, $p = .044 < 0.05$). H3 suggested that PR will negatively impact to AT toward the intention of DT, is also supported (standardized $\beta = .569$, $p = .000 < 0.05$). H4 is also supported, which argued that there is a positive effect between INN and AT (standardized $\beta = .184$, $p = .001 < 0.05$). H5, which argued that there is positively effect between AT and INT (intention to DT) (standardized $\beta = .763$, $p = .000 < 0.05$). H6, which

contended that SN impacts positively to INT (standardized $\beta = .317, p = .000 < 0.05$). In conclusion all of the hypotheses were accepted.

Table 4: Squared Multiple Correlations of SEM model (Group number 1 - Default model)

	Estimate
AT	.601
INT	.683

3 factors perceived usefulness, perceived risk and User Innovativeness explained 60,1% variation of attitudes of Vietnamese firms. Besides, intention to digital transformation was explained by attitudes and subjective norms, this was quite rational in the TPB model.

IV. DISCUSSION AND CONCLUSIONS

Covid-19 epidemic has brought difficulties for economies all over the world. Vietnam economy has also experienced the loss. Digital transformation can be seen as a solution for enterprises to recover from crisis quickly. This study investigates the intention of digital transformation and proposes the model that explains the determinant factors of digital transformation intention based on TRA, TPB theories and TAM. The results of this study indicate that perceived usefulness and trust positively affect attitudes toward digital transformation while perceived risk negatively influences attitudes. These results are aligned with other previous studies [27], [29]. It is said that when managers believe in the benefit of digital transformation, their intention will be strengthened. Besides, our study also confirms that attitudes and subjective norms have a positive impact on digital transformation intention. Our study provides practitioners and academics with essential insights in the mechanism of decision making on digital transformation. We believed that digital transformation can be applied broadly in every field of organization management. It is necessary to understand which factors are determinants of digital transformation intention. When using new technology, the attitudes toward that experience can be formed. If it is a useful experience, the attitudes will be positive. Moreover, the belief toward usefulness of digital transformation can lead attitudes to become more positive, which, in turn, can lead users to the decision more quickly. In contrast, when users perceive any risk or harm, they will deny it. That can deter the decision to transform. At organizational levels, managers are expected to change their mind-sets to more risk-taking acceptance and more experiencing the benefits of digital transformation. Besides, to reduce the reluctance to change, there is a need to exchange information and ideas in virtual communities and networks. When managers understand the benefits of digital

transformation and perceive it from others, their intention will become stronger and lead to real actions.

V. LIMITATIONS AND FUTURE DIRECTIONS

Inspire of providing some contributions to the research field, our study still has some limitations. First, as sample used in this study is cross-sectional data, which may cause aberration when applied in a specific sector. Future studies could replicate this study in a particular industry to produce a better understanding of the factors in the proposed research model. Second, this study stressed only on the direct effects and does not consider whether there are any indirect effects. Further studies could explore the mediating effect of attitudes in the relationship between other factors and intention of digital transformation to get better understanding. Finally, this study did not control for firm size, which can cause some differences when firms apply digital transformation. Future research can pay attention to it to compare the differences between big firms and SMEs.

REFERENCES

[1] A. Ustundag and E. Cevikcan, *Industry 4.0: managing the digital transformation*. Springer, 2017.

[2] A. Bharadwaj, O. A. El Sawy, P. A. Pavlou, and N. v. J. M. q. Venkatraman, "Digital business strategy: toward a next generation of insights," pp. 471-482, 2013.

[3] G. Piccinini, *Physical computation: A mechanistic account*. OUP Oxford, 2015.

[4] M. Fitzgerald, N. Kruschwitz, D. Bonnet, and M. J. M. s. m. r. Welch, "Embracing digital technology: A new strategic imperative," vol. 55, no. 2, p. 1, 2014.

[5] G. Westerman, M. Tannou, D. Bonnet, P. Ferraris, A. J. M. M. McAfee, and M. Caggemini Consulting, "The Digital Advantage: How digital leaders outperform their peers in every industry," vol. 2, pp. 2-23, 2012.

[6] R. Agarwal, G. Gao, C. DesRoches, and A. K. J. I. s. r. Jha, "Research commentary—The digital transformation of healthcare: Current status and the road ahead," vol. 21, no. 4, pp. 796-809, 2010.

[7] A. Majchrzak, M. L. Markus, and J. J. M. q. Wareham, "Designing for digital transformation: Lessons for information systems research from the study of ICT and societal challenges," vol. 40, no. 2, pp. 267-277, 2016.

[8] T. Hess, C. Matt, A. Benlian, and F. J. M. Q. E. Wiesböck, "Options for formulating a digital transformation strategy," vol. 15, no. 2, 2016.

[9] L. Heilig, S. Schwarze, and S. Voß, "An analysis of digital transformation in the history and future of modern ports," 2017.

[10] D. R. Schallmo and C. A. Williams, "History of digital transformation," in *Digital Transformation Now!*: Springer, 2018, pp. 3-8.

[11] D. J. Bowersox, D. J. Closs, and R. W. J. S. C. M. R. Drayer, "The digital transformation: technology and beyond," vol. 9, no. 1, pp. 22-29, 2005.

[12] S. J. J. S. Berman and Leadership, "Digital transformation: opportunities to create new business models," 2012.

[13] D. Schallmo, C. A. Williams, and L. J. D. D. I. Boardman, "Digital transformation of business models—best practice, enablers, and roadmap," pp. 119-138, 2020.

[14] I. Mergel, N. Edelman, and N. J. G. i. q. Haug, "Defining digital transformation: Results from expert interviews," vol. 36, no. 4, p. 101385, 2019.

- [15] A. Meijer and V. J. G. I. Q. Bekkers, "A metatheory of e-government: Creating some order in a fragmented research field," vol. 32, no. 3, pp. 237-245, 2015.
- [16] I. J. O. b. Ajzen and h. d. processes, "The theory of planned behavior," vol. 50, no. 2, pp. 179-211, 1991.
- [17] C. J. Armitage and M. J. B. j. o. s. p. Conner, "Efficacy of the theory of planned behaviour: A meta-analytic review," vol. 40, no. 4, pp. 471-499, 2001.
- [18] N. L. Jimmieson, M. Peach, and K. M. J. T. j. o. a. b. s. White, "Utilizing the theory of planned behavior to inform change management: An investigation of employee intentions to support organizational change," vol. 44, no. 2, pp. 237-262, 2008.
- [19] F. D. Davis, "A technology acceptance model for empirically testing new end-user information systems: Theory and results," Massachusetts Institute of Technology, 1985.
- [20] F. D. Davis, R. P. Bagozzi, and P. R. J. M. s. Warshaw, "User acceptance of computer technology: A comparison of two theoretical models," vol. 35, no. 8, pp. 982-1003, 1989.
- [21] T. Oliveira and M. F. J. E. J. o. I. S. E. Martins, "Literature review of information technology adoption models at firm level," vol. 14, no. 1, pp. pp110-121-pp110-121, 2011.
- [22] M. S. Featherman and P. A. J. I. j. o. h.-c. s. Pavlou, "Predicting e-services adoption: a perceived risk facets perspective," vol. 59, no. 4, pp. 451-474, 2003.
- [23] Z. Hu, S. Ding, S. Li, L. Chen, and S. Yang, "Adoption intention of fintech services for bank users: An empirical examination with an extended technology acceptance model," *Symmetry*, vol. 11, no. 3, p. 340, 2019.
- [24] M. K. Lee and E. Turban, "A trust model for consumer internet shopping," *International Journal of electronic commerce*, vol. 6, no. 1, pp. 75-91, 2001.
- [25] J. D. Lewis and A. Weigert, "Trust as a social reality," *Social forces*, vol. 63, no. 4, pp. 967-985, 1985.
- [26] D. H. McKnight and N. L. Chervany, "What trust means in e-commerce customer relationships: An interdisciplinary conceptual typology," *International journal of electronic commerce*, vol. 6, no. 2, pp. 35-59, 2001.
- [27] A. Kesharwani and S. S. J. I. j. o. b. m. Bisht, "The impact of trust and perceived risk on internet banking adoption in India: An extension of technology acceptance model," 2012.
- [28] H. R. Khedmatgozar and A. J. E. C. R. Shahnazi, "The role of dimensions of perceived risk in adoption of corporate internet banking by customers in Iran," vol. 18, no. 2, pp. 389-412, 2018.
- [29] T. Leicht, A. Chtourou, and K. B. J. T. J. o. H. T. M. R. Youssef, "Consumer innovativeness and intentioned autonomous car adoption," vol. 29, no. 1, pp. 1-11, 2018.
- [30] A. Adeiza, N. Azizi Ismail, and M. J. I. J. o. M. S. Marissa Malek, "An empirical examination of the major relationship factors affecting franchisees' overall satisfaction and intention to stay," vol. 10, no. 1, pp. 31-62, 2017.
- [31] C. Kim, M. Mirusmonov, and I. J. C. i. h. b. Lee, "An empirical examination of factors influencing the intention to use mobile payment," vol. 26, no. 3, pp. 310-322, 2010.
- [32] Z. Hu, S. Ding, S. Li, L. Chen, and S. J. S. Yang, "Adoption intention of fintech services for bank users: An empirical examination with an extended technology acceptance model," vol. 11, no. 3, p. 340, 2019.
- [33] A. Gupta, N. J. J. o. R. Arora, and C. Services, "Understanding determinants and barriers of mobile shopping adoption using behavioral reasoning theory," vol. 36, pp. 1-7, 2017.
- [34] M. Fishbein, J. Jaccard, A. R. Davidson, I. Ajzen, and B. Loken, "Predicting and understanding family planning behaviors," in *Understanding attitudes and predicting social behavior*: Prentice Hall, 1980.
- [35] V. Venkatesh and F. D. J. M. s. Davis, "A theoretical extension of the technology acceptance model: Four longitudinal field studies," vol. 46, no. 2, pp. 186-204, 2000.
- [36] A. H. S. J. J. o. F. S. M. Zolait, "An examination of the factors influencing Yemeni Bank users' behavioural intention to use Internet banking services," vol. 15, no. 1, pp. 76-94, 2010.
- [37] A. Bhattacharjee, "Social science research: Principles, methods, and practices," 2012.
- [38] C. Fornell and D. F. Larcker, "Structural equation models with unobservable variables and measurement error: Algebra and statistics," ed: Sage Publications Sage CA: Los Angeles, CA, 1981.
- [39] L. t. Hu and P. M. Bentler, "Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives," *Structural equation modeling: a multidisciplinary journal*, vol. 6, no. 1, pp. 1-55, 1999.
- [40] B. Wheaton, B. Muthen, D. F. Alwin, and G. F. Summers, "Assessing reliability and stability in panel models," *Sociological methodology*, vol. 8, pp. 84-136, 1977.
- [41] J. C. Anderson and D. W. Gerbing, "Structural equation modeling in practice: A review and recommended two-step approach," *Psychological bulletin*, vol. 103, no. 3, p. 411, 1988.
- [42] D. W. Gerbing and J. C. Anderson, "Monte Carlo evaluations of goodness of fit indices for structural equation models," *Sociological Methods & Research*, vol. 21, no. 2, pp. 132-160, 1992.
- [43] T. Leicht, A. Chtourou, and K. B. Youssef, "Consumer innovativeness and intentioned autonomous car adoption," *The Journal of High Technology Management Research*, vol. 29, no. 1, pp. 1-11, 2018.

Data Mining for Bankruptcy Prediction: An Experiment in Vietnam

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Abstract—In the history of the world economy, the bankruptcy of some large companies has caused global financial crises. The study aimed to postulate a model of bankruptcy prediction for listed companies on Vietnam's stock market. The research used six popular algorithms in data mining to predict bankruptcy risk with data collected from 4693 observations in the period 2009-2020. The research results showed that Logistic algorithms, Artificial Neural Network, Decision Tree have a high level of predicting bankruptcy with an accuracy of 98%. The study identified the three most important indicators: inventory turnover ratio, debt to equity ratio, and debt ratio that affect the corporate bankruptcy prediction. The study showed the threshold points of 10-indicators to avoid bankruptcy likelihood. These results recommended that the model could be applied in practice to reduce risks for businesses and investors in the Vietnamese market.

Index Terms—Bankruptcy prediction, data mining, Artificial Intelligence, Decision Tree, Z-Altman index.

I. INTRODUCTION

THE REPORT of The World Bank [1] indicates that Vietnam is an active emerging economy with speedy economic growth in the East Asia area. Besides the development of business, the economy has many potential risks. The context is that the global economic growth outlook is somewhat bleak in the face of uncertain potential risks such as the US-China Trade War, Brexit, inflationary trends due to unpredictable price changes. The epidemic of Coronavirus (Covid-19 epidemic) strongly affects people's psychology in general and stock investors in particular. Measuring the health of enterprises in Vietnam is now extremely urgent. There are several models to predict corporate bankruptcy, for example, the model of market approach [2] and the model of accounting approach [3]. Employing models in practice in Vietnam's stock market is essential because of the difficulty of qualitative predictability in the increasingly unpredictable environment. The models support how to measure the bankruptcy prediction from potential business risks. In Vietnam, the quality of accounting information is not too excellent [4] and companies listed or unlisted on the stock market report losses leading to a high risk of bankruptcy. To ensure the rights and benefit of enterprises and creditors, the Law of Vietnam in which the Law on Bankruptcy 2014 and the Law on Securities 2010 (the latest being the Law on Securities 2019 takes effect from January 1, 2021) have issued and concretized these regulations.

Previous studies have given diverse criteria as financial ratios in predicting corporate bankruptcy. Some studies show that the Z-Score model has a strong practical application of financial status to the prediction of bankruptcy as

studied by Liang, Lu, Tsai, Shih [5], Barboza, et al. [6], Chou, et al. [7], Antunes, et al. [8], Le, et al. [9], Le, et al. [10], Veganzones and Séverin [11], Mai, et al. [12], Son, et al. [13], Chen, et al. [14]. However, previous studies were mainly used in developed countries to predict bankruptcy and few studies applied data mining in predicting bankruptcy, especially in emerging security markets such as Vietnam.

This study uses several data mining techniques to predict corporate bankruptcy for a Vietnamese case study. The main contributions of this study are as follows: (i) building a framework model for predicting bankruptcy, (ii) Collecting Vietnam's data sets for the past twelve years for the bankruptcy prediction, (iii) testing to compare technical performance for predicting bankruptcy on the Vietnamese dataset; and (iv) Combining Bagging and Boosting methods, the test results show the best overall accuracy of 98% to improve forecasting bankruptcy.

Adopting and combining new techniques to improve the accuracy in forecasting corporate bankruptcy is encouraged by researchers and practitioners. The results help to reinforce and enhance the bankrupting prediction model.

II. LITERATURE REVIEW

Research on predicting the financial downturn of companies through Z-score and Zeta models Altman [15], this is a handbook that presents the quantitative techniques commonly used in research papers. empirical finance research along with real, modern research examples. By referring to this handbook, the author has understood and applied it to the study of the Z-score model. Konglai and Jingjing [16] compiled a sample of failed managed groups and normally managed groups that contained 130 listed companies from Shanghai and Shenzhen exchanges in 2009. Using the MDA discriminant analysis model and the logistic model, the author chooses 5 financial factors: profitability, debt repayment ability, operating ability, growth ability, and capital structure. Ohlson [17] was the first to apply the logistic regression model in the study to predict the probability of default of enterprises. Some related studies such as Meeampol, et al. [18] in the Thai stock market. Research by Kumar and Rao [19], on a new method to estimate internal credit risk and predict bankruptcy under the Basel II regime. The results of the study showed that the Z-score could predict bankruptcy with 98.6% accuracy compared with 93.5% according to Altman's score.

Researchers use various algorithms of intelligent techniques to solve the problem of corporate bankruptcy [20]. According to Serrano-Cinca [21] and Fletcher and Goss [22], neural networks (NNs) are the most commonly used technique. And the data mining algorithms used to predict bankruptcy risk include decision trees (DT) and support vector machines (SVM) [23]. A decision tree is a structured hierarchical tree used to classify objects based on a series of rules. When given data about objects containing attributes along with their classes, the decision tree will generate rules to predict the class of the unknown objects (unseen data). Support vector machines (SVM) is a supervised machine learning model used to analyze and classify data. SVM takes incoming data and classifies them into two different classes. Many studies have used data mining techniques in predicting bankruptcy. Some studies related to predicting bankruptcy using data mining techniques are listed in Table 1.

III. METHODOLOGY

A. Measuring Variables

There are many measures for predicting bankruptcy; however, each measure has both advantages and disadvantages. Ghazali, et al. [24] state that the Altman Z-Score is probably the most popular measure of a company's financial health and has been used to determine bankruptcy prediction in numerous studies. This study will determine the bankruptcy prediction based on the Z-score approach of Altman [3]. Altman's Z-score gives a calculation of the Z-score based on the following formula:

$$Z = 0.717 * A_1 + 0.847 * A_2 + 0.107 * A_3 + 0.420 * A_4 + 0.998 * A_5$$

In which: A1- Current assets minus current liabilities, then divided by total assets; A2 - Retained profit divided by total assets; A3 - Profit before tax and interest divided by total assets; A4 - Book value of equity divided by total liabilities; A5 - Revenue divided by total assets.

If the Z-index < 1.81 , the company is in the bankruptcy prediction zone that the likelihood of bankruptcy will be assigned a value of 1. Otherwise, it will be assigned a value of 0.

This study uses 30 attributes of financial indicators including liquidity ratios, capital budgeting ratios, profitability ratios, efficiency ratios (activities ratios), market ratios, and debt ratios (leverage ratios). The properties are briefly described in Appendix 1.

B. Applying Data Mining Algorithms

Data mining has many different expressions. It is the process of automatically extracting valuable information which is predictive information hidden in the huge amount of data in reality. Data mining emphasizes automated and predictive aspects. This study uses Logistic Regression, Bayesian Network, K-nearest neighbor, Artificial Neural Network (ANN), Support Vector Machine (SVM), and Decision Tree that is commonly used to predict bankruptcy.

1) *Logistic Regression*: The Logistic regression model introduced by Berkson [25] is a commonly used tool in data analysis with binary variables. Some developments by Altman, et al. [26] and Flitman [27] are used in multivariate re-

TABLE 1
STUDIES USING DATA MINING FOR BANKRUPTCY PREDICTION

Author	Datasets	Algorithms*	Evaluation metrics	Period
Liang, et al. [5]	Taiwan	SVM, KNN, CART, ANN, NB	Accuracy 82%	1999-2009
Barboza, et al. [6]	USA, Canada	LDA, Logit, NN, SVM, Bagging, Boosting, and RF	Accuracy 87%	1985-2013
Chou, et al. [7]	Taiwan	Fuzzy clustering, BPNN	Accuracy 95.25%	
Antunes, et al. [8]	France	GP, SVM, Logit	Accuracy 94%	
Le, et al. [9]	Korea	RF, DT, MLP, SVM	84.2% (AUC)	2016-2017
Le, et al. [10]	Korea	Cluster-based Boosting, GMBost, DT, RF, MLP, AdaBoost.	86.8% (AUC)	2016-2017
Veganzones and Séverin [11]	France	LDA, Logit, ANN, SVM, RF	81.1% (Sensitivity)	2013-2014
Mai, et al. [12]	USA	Deep learning embedding S, CNN, SVM, Logit, RF	78.4% (AUC)	1995-2014
Son, et al. [13]	Korea	Logit, RF, XGBoost, LightBM, ANN	88% (AUC)	2011-2016
Chen, et al. [14]	UCI, LibSVM	Bagged-pSVM; Boosted-pSVM	Accuracy 84.42%	

gression analysis, discriminant analysis. From this binary dependent variable, a procedure will be used to predict the probability of the event occurring according to the rule if the predicted probability is greater than 0.5 (default cut-off point) then the prediction result will be "yes" occurs, otherwise, the predicted result will be given as "no". The Binary Logistic regression model is as follows:

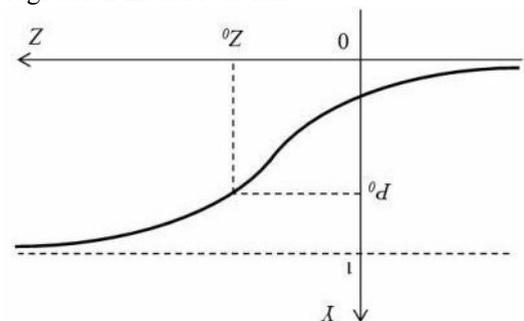


Fig. 1 Binary logistic regression model

P is the probability that $Y = 1$ when the independent variables take on a particular value. Accordingly, the probability that the event does not occur is:

$$1 - P = \text{Prob}(Y = 0) = 1 - \frac{e^z}{1 + e^z} = \frac{1}{1 + e^z}$$

The regression coefficients were estimated by the method of Maximum Likelihood (ML). The logit regression model can be used to estimate the $\log_{(\text{odds})}$ ratio for each independent variable of the model of Ohlson [17]. The parameters β_n were estimated by the method of ML.

2) *Bayesian*: Bayesian Network is applied for classification based on a probabilistic graphical model and the probability of the Bayesian Network is a value from 0 to 1. Bayesian Network is a set of variables and their conditional dependencies that are linked together by a probability association. According to Carlin and Louis [28], the Bayesian method is more about statistics than regression. For fraud detection, a Bayesian network will be built with Bayesian rule along with the condition $P(Y=1) + P(Y=0) = 1$ written as follows:

$$\begin{aligned} P(Y=1 | X) &= [P(X | Y=1)P(Y=1)]/P(X) \\ P(Y=0 | X) &= [P(X | Y=0)P(Y=0)]/P(X) \\ P(Y=0 | X) &= [P(X | Y=0)P(Y=0)]/P(X) \end{aligned}$$

In which:

$$\begin{aligned} P(X) &= P(Y=1)P(X | Y=1) + P(Y=0) \\ &P(X | Y=0) \end{aligned}$$

The components are calculated as follows: $P(Y=1)$ is the error rate of the sample used to run the model, assuming the variables are independent.

3) *K-Nearest Neighbors (K-NN)*: K-Nearest Neighbors algorithm is used in data mining. K-NN is a method to classify objects based on query points and all the objects in the training data. An object is classified based on its K neighbors. K is a positive integer that is determined before performing algorithms. Euclidean distance is often used to calculate the distance between objects.

4) *Artificial Neural Network (ANN)*: Artificial Neural Network is an information processing model that is simulated based on the activity of the nervous system of an organism. A neural network can consist of one or more neurons that each neuron is an information processing unit and the connections between neurons form a network structure. A neural network is a computational model defined by parameters: Neuron type, connection architecture, and learning algorithms. The neurons are connected by a weight matrix. The typical structure of a neural network consists of three layers: input, hidden, and output [29] (see Fig. 2).

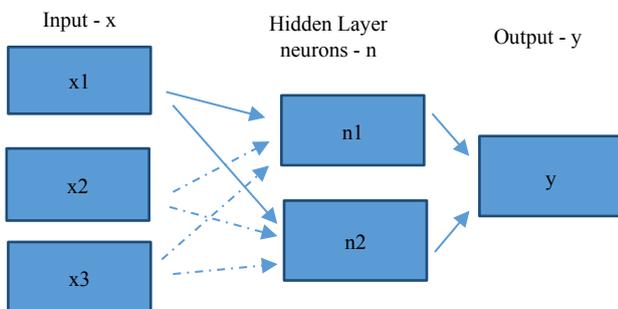


Fig. 2 Artificial Neural Network model

5) *Support Vector Machine (SVM)*: A support vector machine (SVM) is a classical algorithm that solves problems of big data classification [30]. SVM takes input and classifies

them into two different classes. With a given set of training examples belonging to two given categories, SVM builds an SVM model to classify other examples into those two categories. SVM learns a hyperplane to classify the data set into two separate classes by constructing a hyperplane or a set of hyperplanes in a multi-dimensional or infinite-dimensional space. For the best classification, it is necessary to determine the optimal hyperplane located as far away from the data points of all classes as possible.

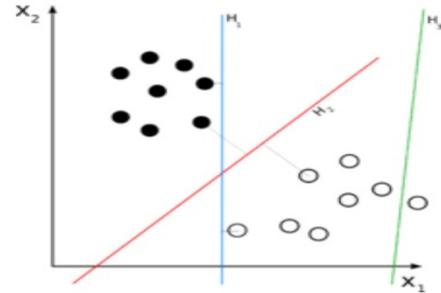


Fig. 3 Support vector machine

Fig. 3 depicts the SVM algorithm: Given a training set represented in a vector space where each document is a point, this method finds a decision hyperplane h that can best divide the points on this space into two separate layers, respectively, the layer containing the data containing the feature simulated by the black dot and the layer containing the data containing the feature simulated by the white dot. The quality of this hyperplane is determined by the boundary of the nearest data point of each layer to this plane. The purpose of the SVM algorithm is to find the maximum boundary distance.

6) *Decision Tree*: A Decision Tree is a classification model introduced by Belson [31], widely used in many different fields. After the introduction of the machine learning method system, the Decision Tree was further developed with the C4.5 algorithm by Quinlan [32] and the ID3 algorithm by Quinlan [33]. A Decision Tree is a structured classification tree that classifies objects based on sequences of rules. To determine which variable to use classification first, which variable to use later, the information weight (entropy) for each variable is calculated, the higher entropy, the more categorical information the variable carries.

C. Combining Techniques for Data Mining

For improving the accuracy of the method of hybridization of models in the classification problem, this research employed Boosting and Bagging to improve the accuracy of the classification algorithms.

Bagging comes from two abbreviations, Bootstrap and Aggregation [34]. Bagging is a combination of independent base models that leads to a significant reduction in errors. Therefore, the goal is to get as many base models as independent as possible. Bagging generates classifiers from subsets that revert to the Bootstrap samples and a machine learning algorithm, each of which generates a basic classifier. The classifiers will be combined by the majority voting method. That is, when there is an example that needs to be classified, each classifier will produce a result. And the result that appears the most will be taken as the result of the

combiner. The Bagging generates N-selected training sets with iterations from the original training data set.

Boosting is a method of building a set of weak classifiers to improve the efficiency of these classifiers. After each iteration, the weak classifier will focus on learning on elements that were misclassified in previous iterations. To classify newly arrived data, people use the majority voting rule from the classification results of each weak classification model [35].

D. Evaluating The Model

Confusion Matrix is commonly used in model evaluation. This study employs a calculation of indices of Confusion Matrix as shown in Table 2.

TABLE 2
CONFUSION MATRIX

		Prediction	
		Positive	Negative
Reality	Positive	True Positive (TP)	False Negative (FN)
	Negative	False Positive (FP)	True Negative (TN)

The effectiveness of the opinion classification model is evaluated based on 4 indexes: Accuracy, Precision, Recall, and Harmonized Mean (F1-score). In which:

$$Accuracy = \frac{TN + TP}{TN + TP + FP + FN}$$

$$Precision = \frac{TP}{TP + FP}$$

$$Recall = \frac{TP}{TP + FN}$$

$$F1 - Score = \frac{2}{1/Precision + 1/Recall}$$

E. Collecting Data

This study uses data collected from the Vietnamese stock exchange in the period 2009 - 2020. Data is collected from audited financial statements of listed companies after excluding companies in the field of listed companies, banking, securities, and insurance sectors. After determining the indicators, the data used to perform analysis and forecasting is 4693 observations, presented in Table 3 by year and by field.

The study objectives are to use data mining algorithms including Logistic Regression, Bayesian Network, K-nearest neighbor, Artificial Neural Network, Support Vector Machine, and Decision Tree for predicting bankruptcy and to determine the accuracy of these data mining algorithms. The data are randomly divided into 2 parts to build and test the model: Training data is used for building the research model and testing data is used to test the predictive likelihood of the model. The description of indicator characteristics in the research model is presented in Appendix 1. Out of 4693 observations, 2395 observations are at risk of bankruptcy, accounting for 51.03% and vice versa 48.97% is normal. Thus,

TABLE 3
DEMOGRAPHIC DESCRIPTION

Panel A: Data by year			Panel B: Data by field		
Year	Number	%	Industry	Number	%
2009	213	4.5%	Real estate - construction	1,707	36.4%
2010	306	6.5%	Technology	134	2.9%
2011	398	8.5%	Industry	544	11.6%
2012	404	8.6%	Service	528	11.3%
2013	426	9.1%	Consumer goods	395	8.4%
2014	422	9.0%	Energy	366	7.8%
2015	454	9.7%	Agriculture	402	8.6%
2016	470	10.0%	Materials	473	10.1%
2017	477	10.2%	Medical-pharmacy	144	3.1%
2018	475	10.1%			
2019	413	8.8%			
2020	235	5.0%			
Total	4693	100.0%	Total	4693	100.0%

the data on the number of normal enterprises and the bankruptcy likelihood is quite balanced.

Appendix 1 reveals a testing result of the difference in the mean value of 30 indicators in the research model between the normal enterprise group and the bankruptcy likelihood group. 27/30 indicators that have a difference between the two groups and are statistically significant, only 3 of the indicators of growth have no difference between the two normal groups and the bankruptcy likelihood group including X18-Operating profit growth, X19-Net profit growth, and X20-Equity growth.

IV. RESULTS AND DISCUSSIONS

To achieve the objective of the study on the question of commonly used classification algorithms in Data mining, which algorithm gives the best predictive results, Weka software is applied to research data to conduct experiments. Logistic regression and ANN algorithms give a high probability of bankruptcy prediction (accuracy over 97%).

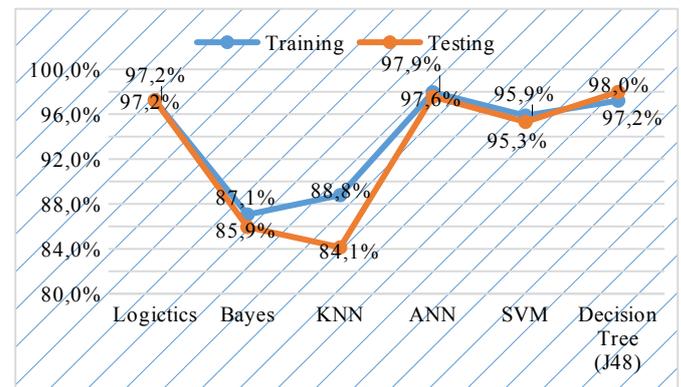


Fig. 4 Accuracy of algorithms in research data

To improve the accuracy of the method of hybridization of models in the classification, Boosting and Bagging methods are employed. The results presented in Figure 5, Figure 6, and Figure 7 show the accuracy. Bankruptcy prediction results of Bagging and Boosting methods have improved over the original basic methods.

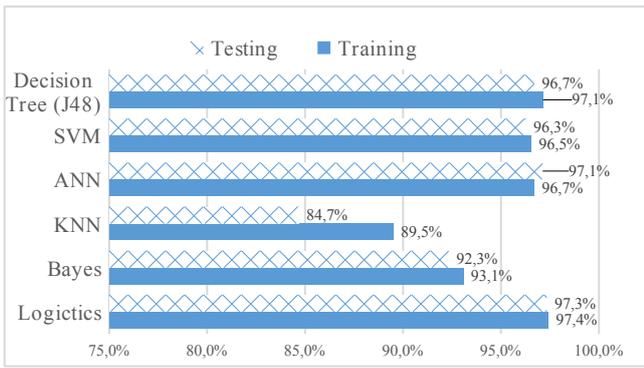


Fig. 5 Accuracy of methods according to Bagging

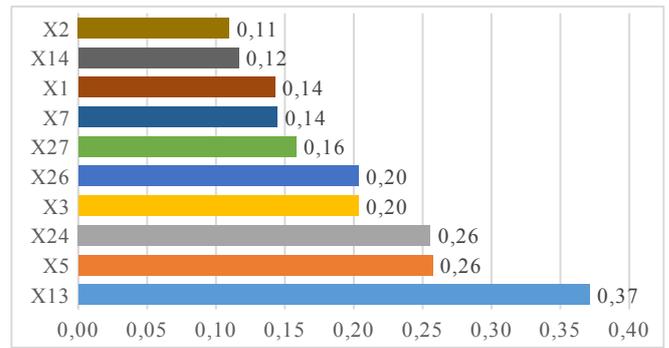


Fig. 8 The most important indicators

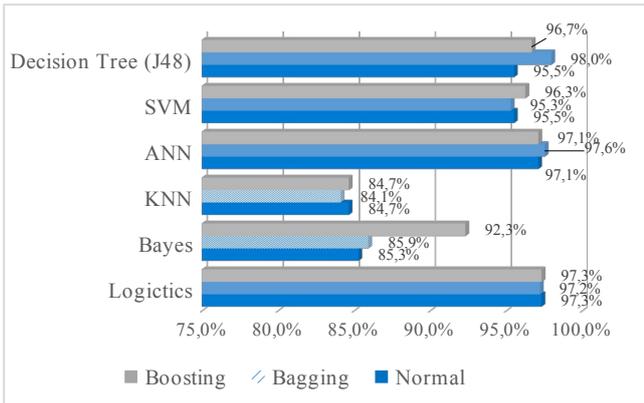


Fig. 6 Accuracy of methods according to Boosting

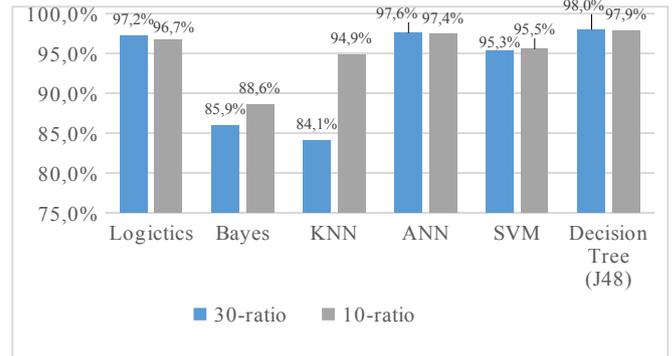


Fig. 9 Accuracy of algorithms with two datasets

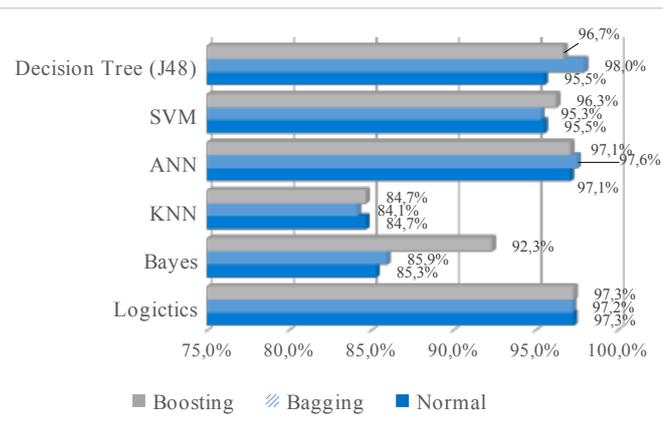


Fig. 7 Comparison of accuracy among methods

With 30 ratios used for forecasting in the model, which ratio is the most important and has the most predictive significance? When using Weka software to identify significant variables in bankruptcy prediction. Figure 8 shows 10 ratios that have the greatest impact on corporate bankruptcy prediction. In which X13 - Total asset turnover is the most important indicator, followed by X5 -Debt to equity ratio, and X24 -Debt ratio.

We select the 10 most significant indicators as a set of important indicators in predicting bankruptcy including X13 - Total assets turnover ratio, X5 - Debt to equity ratio, X24 -Debt ratio, X3 - Receivables turnover ratio, X26 – Receivables conversion period, X27 – Payables conversion period, X7 - Operating cash flows ratio, X1 - Current ratio, X14 - Inventory conversion period), and X2 - Quick ratio. To test again whether the financial ratios are the most important in predicting bankruptcy, we use the dataset with a set of 10-ratio replaces the set of 30-ratio.

The results of this study are consistent, similar, and have higher accuracy than those of Liang, et al. [5], Barboza, et al. [6], Chou, et al. [7], Antunes, et al. [8], Chen, et al. [14].

The results show that the efficiency when using the reduced data set with 10-ratio has the same accuracy as when using the data set of 30-ratio for algorithms with high prediction accuracy rates such as Logistics, ANN, and DT. Even in the Bayesian and KNN algorithms, the accuracy of the prediction is far superior to that of the dataset with full indicators. From these results, this research suggests choosing a set of the most important indicators for predicting bankruptcy that saves resources in forecasting at high accuracy.

The research continues to study using the Decision Tree algorithm (J48) after removing the ratio that has no influence or little importance to perform the analysis. The results show that the Decision Tree algorithms predict bankruptcy with an accuracy of 97.9%, implying that it is appropriate to use the Decision Tree model to predict bankruptcy for Vietnamese enterprises. Appendix 7 depicts the Decision Tree results of the 10 most important indicators which lead to the corporate bankruptcy risk. At level 1, X13-Total asset turnover ratio is the most important ratio to predict bankruptcy risk for businesses that when asset turnover is less than 1.4654 then the business is forecasted to be at risk of bankruptcy. The next most important metric for bankruptcy is X5-Debt to equity ratio, at level 2 with a threshold of 0.511 will lead to bankruptcy.

V. CONCLUSIONS AND RECOMMENDATIONS

This study uses data mining to predict corporate bankruptcy. The sample is companies that have been listed in

Vietnam in the period 2009-2020. This study is to evaluate whether data mining algorithms can be used to predict the bankruptcy of companies in Vietnam accurately or not, which financial indicators are the most effective ratios to predict. To achieve the research objectives, the research has in turn used algorithms including Logistic Regression, Bayesian Network, K-nearest neighbor, Artificial Neural Network (ANN), Support Vector Machine, and Decision Tree. Based on the research results, it can be seen that all 6 methods are accurate in predicting the status, normal, or risk of bankruptcy, of the companies in the sample. In addition, we recommend the use of Decision Tree, ANN that will give the highest prediction accuracy. It can be concluded that these models are suitable for predicting bankruptcy for Vietnamese enterprises in the current period. Moreover, the research has shown 10 financial ratios that are most important in predicting bankruptcy risk. From the above research results, the research has some recommendations for businesses and investors as well as practical suggestions for listed companies to minimize bankruptcy risk.

Total assets turnover ratios, debt to equity ratio, and debt ratio are the three most important indicators in predicting the bankruptcy risk of a business. The results also show that Vietnamese enterprises during the study period are at risk of bankruptcy due to improper implementation of investment decisions stemming from the use of excessive financial leverage and inefficient business activities. The evidence of this research is an important scientific basis for financial managers when planning strategies.

It is necessary to carry out the process to improve the health of the business on the existing foundation, the process of making fundamental changes in the business to increase the ability to operate more efficiently, and create a better "new normal" environment for the business to achieve the strategies and goals. The research postulates some recommendations: Prepare financial statements under the current regulations of the Ministry of Finance; Financial statements must be audited by reputable auditing agencies; In addition to cultivating knowledge about management and law, the listed companies need to regularly improve their knowledge in corporate finance, especially financial ratios to measure business health.

The results show that financial managers need to be careful with regulations on mobilizing funding sources, fully exploiting internal capital sources, especially from retained earnings to reduce the cost of using corporate capital and to limit the use of debt, especially short-term debt. Moreover, the financial managers need to increase the exploitation of highly liquid assets to improve investment efficiency. Furthermore, the financial managers need to regularly re-check the investment regulations so that the business plan can be adjusted in time.

However, the study still has certain limitations. The factors which impact corporate bankruptcy are not only in financial ratios but also come from human behavior. This study has not mentioned the intervening factors such as human behavior, crowd psychology, and speculation affecting the increase or decrease in bankruptcy risk of listed companies in Vietnam.

REFERENCES

- [1] The World Bank. (2021). *The World Bank in Vietnam: Overview* [webpage]. Available: <https://www.worldbank.org/en/country/vietnam/overview#1>
- [2] R. C. Merton, "On the pricing of corporate debt: The risk structure of interest rates," *The Journal of Finance*, vol. 29, no. 2, pp. 449-470, 1974.
- [3] E. I. Altman, "Financial ratios, discriminant analysis and the prediction of corporate bankruptcy," *The Journal of Finance*, vol. 23, no. 4, pp. 589-609, 1968.
- [4] V. T. T. Binh, N.-M. Tran, D. M. Thanh, and H.-H. Pham, "Firm size, business sector and quality of accounting information systems: Evidence from Vietnam," *Accounting*, vol. 6, no. 3, pp. 327-334, 2020.
- [5] D. Liang, C.-C. Lu, C.-F. Tsai, and G.-A. Shih, "Financial ratios and corporate governance indicators in bankruptcy prediction: A comprehensive study," *European Journal of Operational Research* vol. 252, no. 2, pp. 561-572, 2016.
- [6] F. Barboza, H. Kimura, and E. Altman, "Machine learning models and bankruptcy prediction," *Expert Systems with Applications*, vol. 83, pp. 405-417, 2017.
- [7] C.-H. Chou, S.-C. Hsieh, and C.-J. Qiu, "Hybrid genetic algorithm and fuzzy clustering for bankruptcy prediction," *Applied Soft Computing*, vol. 56, pp. 298-316, 2017.
- [8] F. Antunes, B. Ribeiro, and F. Pereira, "Probabilistic modeling and visualization for bankruptcy prediction," *Applied Soft Computing*, vol. 60, pp. 831-843, 2017.
- [9] T. Le, M. Y. Lee, J. R. Park, and S. W. Baik, "Oversampling techniques for bankruptcy prediction: novel features from a transaction dataset," *Symmetry*, vol. 10, no. 4, p. 79, 2018.
- [10] T. Le, H. Le Son, M. T. Vo, M. Y. Lee, and S. W. Baik, "A cluster-based boosting algorithm for bankruptcy prediction in a highly imbalanced dataset," *Symmetry*, vol. 10, no. 7, p. 250, 2018.
- [11] D. Veganzones and E. Séverin, "An investigation of bankruptcy prediction in imbalanced datasets," *Decision Support Systems*, vol. 112, pp. 111-124, 2018.
- [12] F. Mai, S. Tian, C. Lee, and L. Ma, "Deep learning models for bankruptcy prediction using textual disclosures," *European journal of operational research*, vol. 274, no. 2, pp. 743-758, 2019.
- [13] H. Son, C. Hyun, D. Phan, and H. J. Hwang, "Data analytic approach for bankruptcy prediction," *Expert Systems with Applications*, vol. 138, p. 112816, 2019.
- [14] Z. Chen, W. Chen, and Y. Shi, "Ensemble learning with label proportions for bankruptcy prediction," *Expert Systems with Applications*, vol. 146, p. 113155, 2020.
- [15] E. I. Altman, "Predicting financial distress of companies: revisiting the Z-score and ZETA® models," in *Handbook of research methods and applications in empirical finance*: Edward Elgar Publishing, 2013, pp. 428-456.
- [16] Z. H. U. Konglai and L. I. Jingjing, "Studies of discriminant analysis and logistic regression model application in credit risk for China's listed companies," *Management Science and Engineering*, vol. 4, no. 4, pp. 24-32, 2011.
- [17] J. A. Ohlson, "Financial ratios and the probabilistic prediction of bankruptcy," *Journal of accounting research*, vol. 18, no. 1, pp. 109-131, 1980.
- [18] S. Meeampol, P. Lerskullawat, A. Wongsorntham, P. Srinamnuang, V. Rodpetch, and R. Noonoi, "Applying emerging market Z-score model to predict bankruptcy: A case study of listed companies in the stock exchange of Thailand (Set)," in *Management, Knowledge And Learning International Conference*, 2014, pp. 25-27.
- [19] M. N. Kumar and V. S. H. Rao, "A new methodology for estimating internal credit risk and bankruptcy prediction under Basel II Regime," *Computational Economics*, vol. 46, no. 1, pp. 83-102, 2015.
- [20] P. R. Kumar and V. Ravi, "Bankruptcy prediction in banks and firms via statistical and intelligent techniques—A review," *European journal of operational research*, vol. 180, no. 1, pp. 1-28, 2007.
- [21] C. Serrano-Cinca, "Self organizing neural networks for financial diagnosis," *Decision support systems*, vol. 17, no. 3, pp. 227-238, 1996.
- [22] D. Fletcher and E. Goss, "Forecasting with neural networks: an application using bankruptcy data," *Information & Management*, vol. 24, no. 3, pp. 159-167, 1993.
- [23] A. Fan and M. Palaniswami, "Selecting bankruptcy predictors using a support vector machine approach," in *Proceedings of the IEEE-INNS-ENNS International Joint Conference on Neural Networks. IJCNN*

2000. *Neural Computing: New Challenges and Perspectives for the New Millennium*, 2000, vol. 6, pp. 354-359: IEEE.
- [24] A. W. Ghazali, N. A. Shafie, and Z. M. Sanusi, "Earnings management: An analysis of opportunistic behaviour, monitoring mechanism and financial distress," *Procedia Economics and Finance*, vol. 28, pp. 190-201, 2015.
- [25] J. Berkson, "Application of the logistic function to bio-assay," *Journal of the American statistical association*, vol. 39, no. 227, pp. 357-365, 1944.
- [26] E. I. Altman, G. Marco, and F. Varetto, "Corporate distress diagnosis: Comparisons using linear discriminant analysis and neural networks (the Italian experience)," *Journal of Banking & Finance*, vol. 18, no. 3, pp. 505-529, 1994.
- [27] A. M. Flitman, "Towards analysing student failures: neural networks compared with regression analysis and multiple discriminant analysis," *Computers & Operations Research*, vol. 24, no. 4, pp. 367-377, 1997.
- [28] B. P. Carlin and T. A. Louis, *Bayes and empirical Bayes methods for data analysis*. Chapman & Hall/CRC, 2000.
- [29] R. J. Hyndman and G. Athanasopoulos, *Forecasting: Principles and Practice (2nd ed)*. Melbourne, Australia: OTexts, 2018.
- [30] S. Suthaharan, "Support vector machine," in *Machine learning models and algorithms for big data classification*: Springer, 2016, pp. 207-235.
- [31] W. A. Belson, "Matching and prediction on the principle of biological classification," *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, vol. 8, no. 2, pp. 65-75, 1959.
- [32] J. R. Quinlan, "Improved use of continuous attributes in C4. 5," *Journal of artificial intelligence research*, vol. 4, pp. 77-90, 1996.[33] J. R. Quinlan, "Induction of decision trees," *Machine learning*, vol. 1, no. 1, pp. 81-106, 1986.
- [34] L. Breiman, "Bagging predictors," *Machine learning*, vol. 24, no. 2, pp. 123-140, 1996.
- [35] R. Schapire and Y. Freund, "A decision-theoretic generalization of on-line learning and an application to boosting," in *Second European Conference on Computational Learning Theory*, 1995, pp. 23-37.

APPENDIX 2
STATISTIC RESULTS OF BANKRUPTCY PREDICTION

Algorithms	Training						Testing					
	Accuracy	Precision	Recall	F-Measure	ROC Area	PRC Area	Accuracy	Precision	Recall	F-Measure	ROC Area	PRC Area
Logistics	97.42%	0.974	0.974	0.974	0.998	0.998	97.34%	0.973	0.973	0.973	0.997	0.998
Bayes	87.00%	0.87	0.87	0.87	0.93	0.918	85.30%	0.85	0.85	0.85	0.91	0.89
KNN	89.82%	0.898	0.898	0.898	0.958	0.949	84.66%	0.85	0.85	0.85	0.92	0.90
ANN	96.70%	0.967	0.967	0.967	0.996	0.997	97.12%	0.97	0.97	0.97	1.00	1.00
SVM	96.00%	0.96	0.96	0.96	0.96	0.942	95.53%	0.96	0.96	0.96	0.95	0.94
Decision Tree	95.98%	0.96	0.96	0.96	0.963	0.949	95.53%	0.96	0.96	0.96	0.95	0.94

APPENDIX 3
STATISTIC RESULTS OF BANKRUPTCY PREDICTION BY BAGGING METHOD

Algorithms	Training						P R C A r e a	Testing				
	Accuracy	Precision	Recall	F-Measure	ROC Area	Accuracy		Precision	Recall	F-Measure	ROC Area	
Logistics	97.23%	0.973	0.973	0.973	0.998	0.998	97.23%	0.972	0.972	0.972	0.998	0.998
Bayes	87.05%	0.871	0.871	0.871	0.937	0.928	85.94%	0.862	0.859	0.859	0.917	0.902
KNN	88.79%	0.893	0.892	0.892	0.947	0.94	84.13%	0.841	0.841	0.841	0.9	0.884
ANN	97.95%	0.979	0.979	0.979	0.999	0.999	97.55%	0.976	0.976	0.976	0.998	0.998
SVM	95.87%	0.959	0.959	0.959	0.977	0.967	95.31%	0.953	0.953	0.953	0.973	0.962
Decision Tree	97.20%	0.972	0.972	0.972	0.995	0.994	97.98%	0.98	0.98	0.98	0.997	0.997

APPENDIX 4
STATISTIC RESULTS OF BANKRUPTCY PREDICTION BY BOOSTING METHOD

Algorithms	Training						Testing					
	Accuracy	Precision	Recall	F-Measure	ROC Area	PRC Area	Accuracy	Precision	Recall	F-Measure	ROC Area	PRC Area
Logistics	97.42%	0.974	0.974	0.974	0.984	0.979	97.34%	0.973	0.973	0.973	0.978	0.968
Bayes	93.07%	0.931	0.931	0.931	0.983	0.984	92.33%	0.924	0.923	0.923	0.985	0.984
KNN	89.50%	0.895	0.895	0.895	0.927	0.911	84.66%	0.847	0.847	0.847	0.885	0.848
ANN	96.70%	0.967	0.967	0.967	0.979	0.977	97.12%	0.971	0.971	0.971	0.971	0.958
SVM	96.54%	0.965	0.965	0.965	0.995	0.995	96.27%	0.963	0.963	0.963	0.995	0.994
Decision Tree	97.15%	0.971	0.971	0.971	0.996	0.995	96.70%	0.967	0.967	0.967	0.997	0.997

APPENDIX 5
STATISTIC RESULTS OF BANKRUPTCY PREDICTION BY
DECISION TREE

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X13 <= 1.4654
| X5 <= 0.511
| | X5 <= 0.3402
| | | X13 <= 0.3798
| | | | X24 <= 0.2247: Normal (53.0)
| | | | X24 > 0.2247
| | | | | X1 <= 3.1641: Bankruptcy (6.0)
| | | | | X1 > 3.1641: Normal (8.0)
| | | | X13 > 0.3798: Normal (305.0)
| | | X5 > 0.3402
| | | | X13 <= 0.6335
| | | | | X13 <= 0.4234
| | | | | X1 <= 3.594: Bankruptcy (51.0)
| | | | | X1 > 3.594
| | | | | | X5 <= 0.4175: Normal (3.0)
| | | | | | X5 > 0.4175: Bankruptcy (2.0)
| | | | | X13 > 0.4234
| | | | | | X1 <= 2.4853
| | | | | | X5 <= 0.4205
| | | | | | | X1 <= 1.5824: Bankruptcy (4.0)
| | | | | | | X1 > 1.5824: Normal (7.0/1.0)
| | | | | | X5 > 0.4205: Bankruptcy (19.0)
| | | | | X1 > 2.4853
| | | | | | X5 <= 0.4332: Normal (13.0)
| | | | | | X5 > 0.4332
| | | | | | | X2 <= 1.9596: Bankruptcy (2.0)
| | | | | | | X2 > 1.9596: Normal (3.0)
| | | | | X13 > 0.6335
| | | | | | X1 <= 1.7516
| | | | | | X13 <= 0.8173
| | | | | | X5 <= 0.4472: Normal (3.0)
| | | | | | X5 > 0.4472: Bankruptcy (6.0)
| | | | | X13 > 0.8173: Normal (22.0)
| | | | | X1 > 1.7516: Normal (119.0)
| | | | X5 > 0.511
| | | | | X13 <= 0.9186
| | | | | X5 <= 0.6592
| | | | | | X13 <= 0.6262: Bankruptcy (105.0/2.0)
| | | | | | X13 > 0.6262
| | | | | | X1 <= 1.8404: Bankruptcy (18.0)
| | | | | | X1 > 1.8404
| | | | | | X27 <= 13.2254: Normal (8.0)
| | | | | | X27 > 13.2254
| | | | | | | X2 <= 1.409: Normal (5.0)
| | | | | | | X2 > 1.409
| | | | | | | X1 <= 1.9549: Bankruptcy (5.0)
| | | | | | | X1 > 1.9549
| | | | | | | X13 <= 0.7761: Bankruptcy (6.0/1.0)
| | | | | | | X13 > 0.7761: Normal (9.0/1.0)
| | | | | | X5 > 0.6592: Bankruptcy (1072.0)
| | | | | X13 > 0.9186
| | | | | | X5 <= 1.0544
| | | | | | X1 <= 1.5984
| | | | | | X13 <= 1.1831
| | | | | | X5 <= 0.7651
| | | | | | X14 <= -81.6781: Normal (10.0)
| | | | | | X14 > -81.6781: Bankruptcy (5.0)
| | | | | X5 > 0.7651: Bankruptcy (23.0/1.0)
| | | | | X13 > 1.1831
| | | | | X2 <= 0.5561
| | | | | X2 <= 0.4764: Normal (4.0)

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| | | | | X2 > 0.4764: Bankruptcy (4.0/1.0)
| | | | | X2 > 0.5561: Normal (18.0)
| | | | X1 > 1.5984
| | | | | X13 <= 1.0733
| | | | | X5 <= 0.9134
| | | | | | X14 <= -4.27: Normal (26.0/1.0)
| | | | | | X14 > -4.27: Bankruptcy (3.0/1.0)
| | | | | X5 > 0.9134: Bankruptcy (6.0/1.0)
| | | | | X13 > 1.0733: Normal (65.0)
| | | | | X5 > 1.0544
| | | | | X1 <= 1.2168: Bankruptcy (277.0/1.0)
| | | | | X1 > 1.2168
| | | | | X13 <= 1.2471
| | | | | X1 <= 1.807: Bankruptcy (109.0/1.0)
| | | | | X1 > 1.807
| | | | | | X5 <= 1.617: Normal (6.0/1.0)
| | | | | | X5 > 1.617: Bankruptcy (3.0)
| | | | | X13 > 1.2471
| | | | | X1 <= 1.5
| | | | | | X13 <= 1.427
| | | | | | X5 <= 1.484
| | | | | | | X13 <= 1.3288: Bankruptcy (5.0/1.0)
| | | | | | | X13 > 1.3288: Normal (4.0)
| | | | | | X5 > 1.484: Bankruptcy (19.0/1.0)
| | | | | | X13 > 1.427: Normal (6.0)
| | | | | | X1 > 1.5: Normal (14.0)
X13 > 1.4654
| X5 <= 2.275: Normal (770.0/1.0)
| X5 > 2.275
| | X13 <= 1.6915
| | | X1 <= 1.1012: Bankruptcy (13.0)
| | | X1 > 1.1012
| | | | X5 <= 2.8411: Normal (11.0/1.0)
| | | | X5 > 2.8411: Bankruptcy (3.0)
| | X13 > 1.6915: Normal (121.0/2.0)

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Research on the factors affecting the successful implementation of Lean production model in industrial production enterprises in Vietnam

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Abstract—Lean manufacturing is one of the modern management methods to streamline production, reduce waste and increase business efficiency, thereby helping organizations and businesses improve productivity and quality. Most businesses have encountered difficulties when converting to LEAN and have not achieved the expected and sustained results in the long term. The aim of his study is to evaluate the factors of business characteristics affecting the results of Lean model application in industrial production in Vietnam. This study conducts an in-depth study of 10 typical industrial manufacturing enterprises. The research results show a model of six business characteristics that affect the success of Lean in production conditions in industrial enterprises. Based on the results, this study provides some suggestions for the firms to successfully apply lean.

Index Terms—Lean, success, characteristics, industrial production enterprises

sults in the long term. In fact, there are not many enterprises that apply and succeed with the LEAN production method in Vietnam [13; 14; 15]. Only about less than 10% of these enterprises have the ability to successfully approach this production method. [13;20]. From some of the above issues, the author focuses on in-depth research at 10 industrial production enterprises that have applied LEAN to the production system to find out what are the factors affecting the successful application of LEAN in Vietnam. Vietnam [16;18;19;22]. The study focuses on identifying and evaluating the factors affecting the successful application of LEAN and the characteristics of enterprises that affect the results of applying LEAN in enterprises to explain why many businesses in Vietnam have difficulties in successfully applying LEAN.

I. INTRODUCTION

THE LEAN production method is built on the foundation of continuous improvement with the aim of eliminating waste in the production process and helping businesses build a unified thinking and action method for the production process. [5;16]. The concept of LEAN has been studied in many fields, expressed in two well-known and in-depth studies of Womack & Jones, "The Machine that Changed the World" in 1990 and the research work "LEAN Thinking" which is evaluated by experts was simultaneously published in 2003. The basis of LEAN production is the Toyota Production System (TPS) with a new concept of production based on innovation and building consensus among people to create new higher value from and within the business. From the successful experience and strong development of Toyota [1;21;25] up to now, the LEAN philosophy has become a new trend in high-efficiency and zero-waste manufacturing. [6;8;15;18] In fact, there are many businesses in the world that have been participating in the transition to LEAN production for a long time, but most of the results achieved are only modest costs compared with expectations [4;7;10;11].

In Vietnam, the lean production model has been awakened in both research and practice. There are many studies on LEAN that have been published by many researchers. Along with some initial results, there are also many businesses that have not achieved success in the process of applying the LEAN production method to the production system. Most businesses have encountered difficulties when converting to LEAN and have not achieved the expected and sustained re-

II. LITERATURE REVIEW AND RESEARCH MODEL

The term "success factors" is defined as "a limited number of factors that, when satisfied, will ensure the performance and enhance the competitive success of the enterprise." Success factors are identified as the most important factors affecting the success of an organization when implementing a new program or project [18;19;24]. Success factor research will help businesses know and focus on a few areas that may meet these criteria or may even allow businesses to decide if they have the necessary capabilities [1;10].

Clearly defining the criteria to successful application of LEAN in the production system helps the author to accurately analyze the process and evaluate the implementation results of the enterprises. Previous studies have shown that the results of LEAN are expressed through four main criteria: (1) increase production productivity, (2) improve product quality, (3) reduce production costs and (4) ability to deliver on time [9;12;17]. These criteria are considered to be the most important to determine the successful application of LEAN in enterprises [30;31]. An enterprise is considered to have successfully applied LEAN when that enterprise has applied LEAN for at least 3 years and the results must meet all 4 criteria. Moreover, these results have been maintained for at least 1 year [26]. There are two levels of enterprise success in adopting LEAN which depend on when the implementation started or be applied and the results from the adoption process. Accordingly, the levels include: (1) Applying LEAN internally inside the firm and (2) Extending LEAN beyond the firm.

A. Factors for the successful application of Lean model

Based on the literature review, in order to investigate the factors affecting successful implication of Lean, the author focuses on 10 industrial production enterprises with more than 5 years applying Lean. Currently, there is no detailed study on the factors affecting the successful application of the Lean model in industrial production enterprises. Previous research results show that six problems of industrial production enterprises affect the successful application of the Lean model, including: (1) Leadership commitment to companionship, (2) Technology level, (3) Management competences, (4) Quality of employees, (5) The awareness of the workforce about the importance of Lean and (6) Supply chain integration ability. Based on the literature review, we propose the research model as follow:

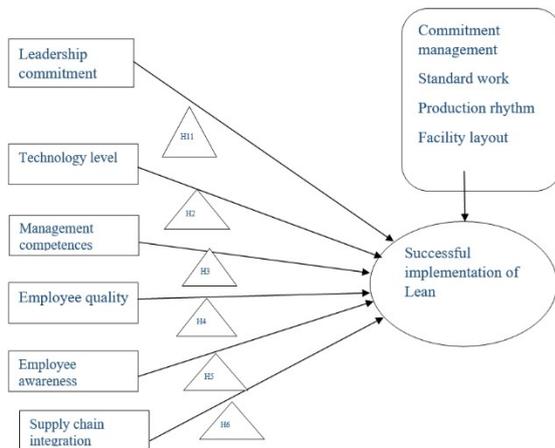


Figure 1. Research model

The following research hypotheses are proposed:

Hypothesis H1: Leadership commitment has a positive impact on Successful implementation of Lean

Hypothesis H2: Technology level has a positive effect on Successful implementation of Lean

Hypothesis H3: Management competence has a positive impact on Successful implementation of Lean

Hypothesis H4: Employee quality has a positive impact on Successful implementation of Lean

Hypothesis H5: Employee awareness has a positive impact on Successful implementation of Lean

Hypothesis H6: Supply chain integration has a positive impact on Successful implementation of Lean

III. RESEARCH METHODS

The study used qualitative research methods combined with quantitative research. Qualitative research aims to: determine the factors affecting the ability to successfully apply the Lean model, determine the research model, adjust the scales of research concepts on the basis of building a draft scale that is summarized Conclusions from previous studies were referenced to form a preliminary interview questionnaire. The survey was conducted through the technique of consulting 5 experts (5 managers knowledgeable about the technical process of quality control). Research, in-depth interviews with 90 workers working at production spans, on production lines in factories arranged with Lean applications,

warehouses, etc. We choose a convenient sampling method to check preliminary questionnaires, adjust the scales to suit the reality of each operation in the production stages, because each production process requires a level of standardization of the stages and very strict operation (cycle time) by rationalizing the production processes. Quantitative research helps to quantify the relationship between factors through the application of statistical analysis tools (SPSS), using 5-level Likert scale to measure the values of observed variables.[3,6, 22, 23, 24, 25;30]

The study sample size was determined on the principle of being larger than the minimum sample size to achieve the necessary reliability of the study. According to, the minimum sample size must be guaranteed according to the formula $n \geq 8m + 50$, the author's research model includes 06 independent variables, so the minimum sample size is $= 8*6 + 50 = 98$ observations; In the study, the author chose a sample size of 150 to ensure reliability for data analysis. Collecting primary data from a structured questionnaire prepared through stratified probability sampling method. Survey subjects were selected from many lines in the workshop at companies producing different product lines. Various products include: fixed line, variable line, continuous production line, assembly and packaging management system, raw material storage, finished product storage, automatic welding workshop. The data analysis was conducted in the following steps: first, we assessed the reliability of the scale by Cronbach's Alpha coefficient, then we conducted exploratory factor analysis (EFA). Finally, to test the hypotheses we did correlation analysis and multiple linear regression [3,6].

IV. RESEARCH RESULTS

A. The reliability of the scale

The results of data analysis showed that the scales were reliable (Cronbach's Alpha > 0.6). Thus, the scale is suitable for exploratory factor analysis (EFA).

TABLE 1. EVALUATION OF SCALE RELIABILITY

The scale	The number of observed variables	Coefficient of correlation of total variables.	Cronbach' Alpha coefficient.	Cronbach' Alpha if variable type
Leadership commitment (LD)	4	0.711 - 0.829	0.917	0.893– 0.911
Technology level (CN)	4	0.623 – 0.693	0.849	0.808 – 0.828
Management competences(NL)	5	0.598 – 0.680	0.809	0.734 – 0.775
Labor quality (LQ)	4	0.677 – 0.800	0.879	0.820 – 0.868
Employee awareness (NT)	5	0.627 – 0.794	0.845	0.755 – 0.825
Supply Chain integration (CC)	4	0.555 – 0.642	0.780	0.699 – 0.742

EFA exploratory factor analysis: After the variables have been evaluated, and the scales of the variables are suitable. The KMO coefficient is between 0.5 and 1 and the model's significance coefficient according to Bartlett's test must be statistically significant at 5%. The variables with Factor loading less than 0.5 in EFA would be omitted from the research model.

Variable	Load factor					
	1	2	3	4	5	6
LD6	0.887					
LD5	0.875					
LD1	0.850					
LD4	0.817					
LD2	0.815					
NL3		0.777				
NL5		0.682				
NL4		0.618				
NL2		0.572				
NL1			0.821			
LQ2			0.819			
LQ4			0.786			
LQ3			0.763			
LQ1			0.752			
NT3				0.894		
NT2				0.860		
NT4				0.850		
NT1				0.814		
CC2					0.896	
CC1					0.831	
CC4					0.786	
CC3					0.784	
CN2						0.835
CN3						0.797
CN1						0.781
CN4						0.773
DISCLAIMER	8,542	19,613	32,34	45,244	57,245	68,461
Eigenvalues	4,537	3,327	3,127	3,026	2,58	2,477

- Factor analysis with scales of independent variables

EFA analysis for independent variables: The results of 06 factors analysis with 26 observed variables showed that: KMO value = 0.824 (0.5 < KMO = 0.824 < 1), so factor analysis is accepted with data research material; Sig coefficient. = 0.000 < 0.005; Cumulative variance of 06 extracted factors = 68.461% > 50%. The variation of 06 factors represents 68.461% of the overall variation. This is a high percentage indicating that the data obtained from the survey has a high degree of convergence of the scale.

EFA analysis for the dependent variable: the results of factor analysis with 04 observed variables showed that: KMO value = 0.752 (0.5 < KMO = 0.752 < 1) satisfied the suitability of factor analysis; Sig coefficient. = 0.000 < 0.005; Cumulative variance extracted = 60.412% > 50%; All factors meet the conditions with Eigenvalue = 2,416 > 1 to form a statistically significant factor [4; 14]. Thus, the factor analysis has given completely reliable results, these factors will be saved directly into the data of SPSS software with specific names as stated in the summary table. These factors will be used in regression analysis to evaluate the influence of each factor on the success of Lean.

After EFA verification and automatic saving of factors in the analysis process, independent factors are given including Leadership commitment to accompany, technology level,

management capacity, quality labor, awareness of the workforce, and the ability to link supply chains are six factors that have a positive impact on the success when applying the Lean model to production and business activities of enterprises.

TABLE 2. RESULTS OF REGRESSION ANALYSIS

Model	R	R ²	Standard deviation	Durbin-Watson
1	0.799a	0.639	0.337	1.783
	Sum of squares	Degree of Freedom	F	Sig
Regression	56,644	6	99,808	0,000b
Balance	32,009	144		
Total	88,563	150		

(Source: the author's survey data processing results.)

Multiple linear regression analysis was performed using the Enter method. The results (Table 3) show that the adjusted value of coefficient R2 is 0.633; this means that the independent variables included in the regression model explain 63.5% (> 50% is good) showing the change of the successful dependent variable of the Lean model. This is a rather high rate, showing that the survey and analysis results are quite suitable for studying the impact of 6 independent factors on the success of Lean.

TABLE 3. RESULTS OF MULTIPLE LINEAR REGRESSION ANALYSIS

Corrected R2 = 51.1%.	Normalization coefficient Beta	t	Sig significance level	Multicollinear Statistics	
				Tolerance	VIF
Constant		0.863	0.389		
LD	0.424	11.686	0.142	0.860	1,026
NL	0.359	9.947	0.000	0.858	1,020
LQ	0.271	7.522	0.000	0.860	1.013
NT	0.270	7.503	0.000	0.735	1.011
CC	0.258	7.126	0.000	0.816	1,02
CN	0.257	3.848	0.000	0.738	1.356

Source: the author's survey data processing results.)

The analysis results (Table 4) show that the independent variables included in the model (: LD, NL, LQ, NT, CC, CN) have sig values ≤ 0.05; the regression coefficients are all greater than zero, so these factors all positively affect the dependent variable TC. However, the firm size variable has the value sig. = 0.142 > 0.05, so there is no impact on the working efficiency at 5% significance level, 95% confidence level; The variance exaggeration coefficient VIF of the independent variables is in the range (1.011 - 1.356) < 2, showing that these independent variables are not closely related, so there is no multicollinearity phenomenon. Based on the size of the normalized regression coefficient Beta and the order of impact level, a standardized multiple linear regression model is built as follows:

$$TC = 0.424LD + 0.359NL + 0.271LQ + NT 0.270 + 0.258 CC + 0.257CN$$

Thus, the leader's commitment to companionship and management capacity and labor qualifications are the factors that have the greatest influence on the successful application of the Lean model in enterprises.

Testing the difference (Table 5) of qualitative variables on worker's work efficiency (Independent - sample T- test; Anova depth) has determined that there is no difference in the leadership factors committed to accompany. With the project team, the manager commits to participate, standard work, production rhythm, site layout. However, there is a difference in leadership and management, in which leadership has a higher difference than management, due to the particularity of limited liability companies and joint stock companies specializing in the production of industrial goods. As for the layout of the premises, the author studies many businesses of different sizes according to the revenue because when doing Lean, special attention need paid to the layout of the premises.

TABLE 4. RESULTS OF TESTING THE DIFFERENCE IN CHARACTERISTICS OF DEPENDENT FACTORS

Stt	Contents	Levene Statistic (Sig.)	Anova (Sig.)
1	Commitment management	0.205	0.006
2	Standard work	0.943	0.962
3	Production rhythm	0.795	0.268
4	Ground layout	0.367	0.846

V. DISCUSSION

The research results also show that the characteristics of the business have a positive influence on the results of applying LEAN. The results of this study also help to explain the determinant of successful implementation of Lean in Vietnamese enterprises.

Firstly, Leadership commitment is especially important for the process of implementing a Lean model. In a company, leaders are very determined, expressed in every word. The direction of the leader's activities makes employees feel the commitment of the leader. Specifically, the daily and weekly reports of the improvement team always have the prompt attention and direction of the company's leaders and management team, which has a positive impact on the success of the project. Kaizen project in business.

Secondly, the technology level of enterprises is 2-3 generations behind compared to other countries in the region [15;20], which leads to LEAN techniques not being able to be deployed. Standards are not fully controlled. Disoco Company applies SMED to the chain that needs to start the motorcycle, but because the entire system of drilling and turning machines is past its useful life, Kaizen ideas and control are difficult in the implementation process [2;8; 17; 32].

Third, the production management and administration capacity of Vietnamese enterprises is still weak, especially SMEs and state-owned enterprises. Poor cognitive and control capacity leads to low commitment. Disoco's production manager said he was always committed to the LEAN project when interviewed but was often absent from meetings and reports. That poor level of commitment to the process led to decisions made after each meeting not being made. As a result, after 6 months of applying the first LEAN project failed [6].

Fourth, the quality of Vietnamese workers is very low with 81% unskilled workers [15;27]. Low quality of labor leads to poor awareness and awareness. Poor awareness makes training or rewarding and motivating activities do not have much effect on change.

Fifth, Vietnamese people tend to personalize, short-term vision, lack of sharing is teamwork, many workers think that they only need to complete the work they are assigned, and improvement is not the goal. their job, they also don't care about the productivity of the whole company. Meanwhile, awareness of the role of LEAN requires teamwork and information sharing. The cultural differences that lead to any change efforts of enterprises with LEAN face great difficulty when implementing improvements [11; 13;16].

And finally, the production network and supply chain system are not stable and complete. The connection and cooperation in production between Vietnamese enterprises is not high at present. Each business often only cares about its own interests and ignores the interests of partners. The instability in the supply chain along with the lack of linkage between partners is a barrier for businesses to implement J.I.T thoroughly. The two factors "supplier participation" and "customer participation" are not guaranteed, leading to 5/6 enterprises participating in the study not being able to apply LEAN successfully. Only TMV has achieved the highest level of success thanks to the support of the system of suppliers and customers. Six business-specific factors positively affect the success of LEAN for businesses.

VI. CONCLUSION

The study presents the essence of applying LEAN production method and factors affecting the success of enterprises when applying it in industrial production. In the context that Vietnamese enterprises have limited resources, low technology level, and low production management capacity, it is difficult to implement synchronously on a large scale throughout the enterprise. On that basis, the article studies the factors of business characteristics that have a great influence on the successful application of the Lean model. Accordingly, businesses that want to apply LEAN successfully and sustainably need to have the companionship of business leaders and choose each step when arranging the premises of Lean application to create habits and form awareness.

REFERENCES

- [1] Ab Wahid, R & Corner, J. (2009), 'Critical success factors and problems in ISO 9000 maintenance', *International Journal of Quality & Reliability Management*, 2(2), 1-13.
- [2] Achanga, P., Shehab, E., Roy, R. & Nelder, G. (2006), 'Critical success factors for lean implementation within SMEs', *Journal of Manufacturing Technology Management*, 17(4), 460-471 .

- [3] Al-Najem, M. (2014), 'Investigating the factors affecting readiness for lean system adoption within Kuwaiti small and medium-sized manufacturing industries', doctoral dissertation, University of Portsmouth.
- [4] Thai An (2015), 'Vietnamese technology is 2-3 generations behind the world', Baodatviet, last accessed June 28, 2016, from <http://baodatviet.vn/khoa-study>
- [5] Aueungkul, A. (2013), 'An investigation of Critical Success Factors and Thai cultural impact', doctoral dissertation, University of Wollongong, Thailand.
- [6] Bakås, O., Govaert, T. & Van Landeghem, H. (2011), 'Challenges and success factors for implementation of lean manufacturing in European SMES', Proceeding of 13th International conference on the Modern Information Technology in the Innovation Processes of the Industrial Enterprise (MITIP 2011), Norway.
- [7] Boynton, A. C. & Zmud, R. W. (1984), 'An assessment of critical success factors', Sloan management review, 25(4), 17-27.
- [8] Coronado, R. B. & Antony, J. (2002), 'Critical success factors for the successful implementation of six sigma projects in organisations', The TQM magazine, 14(2), 92-99.
- [9] Dennis, P. (2015), *Lean Production simplified: A plain-language guide to the world's most powerful production system*, CRC Press.
- [10] Drew, J., McCallum, B. & Roggenhofer, S. (2004), *Journey to lean: making operational change stick*, Palgrave Macmillan.
- [11] Easterby-Smith, M., Thorpe, R. & Jackson, P. R. (2012), *Management research*, Sage.
- [12] Flinchbaugh, J. & Carlino, A. (2006), *Hitchhiker's guide to lean*, Society of Manufacturing Engineers.
- [13] Dang Thi Huong (2016), 'Training managers in small and medium-sized enterprises: Some proposed evaluations', Science Journal of Vietnam National University, Hanoi, Economics and Business, 23(1), 31-39.
- [14] Nguyen Dat Minh, Nguyen Danh Nguyen, Le Anh Tuan (2017) "Factors affecting the application of lean production methods in enterprises in Vietnam" *Journal of Economic and Political Issues world* – No. 12/2017.
- [15] Nguyen Dat Minh, Nguyen Danh Nguyen (2017) "Applying Lean production methods in enterprises in Vietnam, the way to success" *Economic and Development Magazine* No. 1.2017.
- [16] Kilpatrick, J. & Osborne, R. (2006), *The R (E) evolution of Lean*, Business Breakthroughs Inc.
- [17] Kumar, M., Antony, J. & Douglas, A. (2009), 'Does size matter for Six Sigma implementation? Findings from the survey in UK SMEs', The TQM journal, 21(6), 623-635.
- [18] Kundu, G. & Manohar, B. M. (2012), 'Critical success factors for implementing lean practices in IT support services', *International Journal for Quality research*, 6(4), 301-312.
- [19] Duong Thi Lieu & Nguyen Van Ha (2008), 'Integration and Vietnamese business culture', Proceedings of the 3rd International Conference on Vietnamese Studies, Vietnam Academy of Social Sciences and Vietnam National University Hanoi to co-organize, Hanoi, 1-20.
- [20] Nguyen Dang Minh, Nguyen Dang Toan, Nguyen Thi Linh Chi & Tran Thu Hoan (2014), 'Orientation for applying lean management in Vietnamese small and medium enterprises', *VNU Science Journal, Economics and Business*, 30(1), 63-71.
- [21] Ohno, T. (1988), *Toyota production system: beyond large-scale production*, CRC Press.
- [22] Parkhe, A. (1993), 'Messy research, methodological predispositions, and theory development in international joint ventures', *Academy of Management review*, 18(2), 227-268.
- [23] Perry, C. (1998), 'Processes of a case study methodology for postgraduate research in marketing', *European journal of marketing*, 32(9/10), 785-802.
- [24] Rockart, J. F. (1982), 'The changing role of the information systems executive: a critical success factor perspective', *Massachusetts Institute of Technology Boston*.
- [25] Rose, A., Deros, B. M. & Ab Rahman, M. N. (2014), 'Critical success factors for implementing lean manufacturing in Malaysian automotive industry', *Research Journal of Applied Sciences, Engineering and Technology*, 8(10), 1191-1200.
- [26] Tracey, M., & Flinchbaugh, J. (2006), 'HR's role in the lean organizational journey', *World at Work Journal*, 15(4), 49-58.
- [27] Pham Minh Tuan (2015), 'Research and application of lean management in small and medium-sized manufacturing enterprises of Vietnam', PhD thesis, University of Economics, Vietnam National University, Hanoi.
- [28] Vermaak, T. D. (2008), 'Critical success factors for the implementation of lean thinking in South African manufacturing organisations', doctoral dissertation, University of Johannesburg, South Africa.
- [29] Wilson, L. (2010), *How to Implement Lean Manufacturing*, McGraw Hill.
- [30] Womack, J. P., Jones, D. T. & Roos, D. (1990), *Machine that changed the world*, Simon and Schuster.
- [31] Womack, J. P. & Jones, D. T. (2003), *Lean thinking: Banish waste and create wealth in your corporation*, revised and updated, Harper Business.
- [32] Yang, P. & Yuyu, B. (2010), 'The Barriers to SMEs' Implementation of Lean Production and Counter measures-220-225.

The Impact Level of Covid-19 on University Students' Mental Health in Ha Noi, Vietnam

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Abstract—The coronavirus disease 2019 (COVID-19) pandemic has spread all over the world and posed a threat to the medical system of all nations. The global development of COVID-19 pandemic has resulted in direct and indirect effects on the psycho of people around the world. Numerous studies have shown that university students are experiencing particular challenges to poor mental health because of the ongoing pandemic. Recognizing the urgency of this issue, the authors conducted a study in Vietnam based on previous studies. Using a qualitative approach, this study assesses the impact of the COVID-19 pandemic on the mental health of university students in Vietnam. The authors conducted an in-depth interview with 30 students coming from 7 different universities in Hanoi. Due to the recent social distancing policy to minimize the COVID-19 cases, our interview questions were distributed, and the answers were collected during October 2021 by using an online media interview. Based on the results of the study, the authors propose a model to assess the impact of the COVID-19 pandemic on the mental health of university students in Vietnam for future research and make recommendations for governments, university administrators, and health professionals to apply this research to inform mental health practices during and after the pandemic

Index Terms—COVID-19, mental health, pandemic, university students, relationship quality, academic performance, financial stress

I. INTRODUCTION

THE NOVEL coronavirus (COVID-19) was first detected in Wuhan, China, in late 2019 and has now quickly appeared in almost all countries [1]. COVID-19 has caused dramatic changes to the lives of billions of people across the globe and resulted in countless deaths. The ongoing global pandemic has not only exacerbated physical health but has also aggravated mental health outcomes [2].

To cope with the ongoing pandemic, most governments have instigated restrictions and enforced social distancing to minimize the consequences and protect countries from the uncontrolled spreading of coronavirus. The enforced school closures delay in-person classes and learning on online platforms on account of COVID-19, which resulted in an extensive variety of negative psychological effects on university students [3]. Because of the disruption of academic routine, poor mental health is common among university students [4]. Besides, the long-term closing of universities has led to financial losses, lack of private space, fear of infecting other family members, and lost on-campus employment... which may cause negative university students' mental health outcomes [5, 6].

In one study in Vietnam, about one-fourth of university students showed signs of a bad mood, and some people felt in depression [7]. Other study concluded that more than 25 percent of participants underwent mild to severe post-traumatic stress symptoms (PTSS) [8]. In general, a high rate of losing household income along with impairment in some quality of life becomes popular in Vietnam on account of the effects of the ongoing pandemic [9]. This has increased the rate of depression/anxiety. As important as that is, to date there has not been much research on the impact level of the COVID-19 pandemic on the mental health of university students in Vietnam.

This study attempts to extend existing research in the following ways. Firstly, the paper comes up with the direct and indirect influences of the ongoing pandemic on the mental health of university students. Secondly, the authors propose future research models related to these impacts.

II. LITERATURE REVIEW

A. Mental Health

Mental health is a concept that has been taken care of by many psychologists in the world because it reflects the other side of human health. Reference [10] defined: 'Mental health is a healthy state in which each person recognizes the capacity of itself, can respond to normal tension, work effectively and contribute to the community.'

In detail, mental health is the foundation of happiness and productivity in every person's life. Mental health is not only the absence of mental disorders but also includes the ability to think, study, and understand one's feelings and reactions. Mental health is a state of balance, both inside the body and with the external environment. Physical, psychological, social, cultural, mental, and other related factors are all involved in creating this balance. Thus, it can be concluded that there is an inseparable connection between mental and physical health [10].

Research by UNICEF in Vietnam published in 2017 shows that about 30% of the burden of non-communicable diseases is due to mental health disorders. When facing the changes in life with multiple pressures, there is a large number of people, especially university students, who lack the necessary skills to deal with challenges. These vital skills are not naturally acquired, but they must be accumulated from life experiences. In addition, they must be formed from the knowledge base of each individual. A focus on mental

health has the potential to generate more personal, social, and economic benefits than interventions at any time. This shows that timely psychological support and counseling will help us control our moods more proactively [11].

B. The impact level of Covid-19 on university student's mental health

1) Direct influence

Many previous studies have confirmed that the COVID-19 pandemic directly affected mental health. The ongoing pandemic can worsen mental health status [12]. According to the group of authors, the COVID-19 pandemic has impacted mental health and these effects may be long-lasting. Some authors mentioned that the ongoing pandemic has a considerable psychological impact on individuals [13]. People have endured significant psychological pain during periods of a pandemic such as depression and PTSS. The rapid spread of COVID-19 has caused various effects on people's mental health [14]. Measures to prevent, treat and minimize COVID-19 as social distancing and isolation policies can adversely affect mental health, especially in high-risk people. The influence of COVID-19 on university students' mental health had been mentioned in many studies around the world [3]. The ongoing pandemic has created fear and led to a range of psychological consequences [15] typically reactions or behaviors such as anxiety, stress and substance use, anorexia, and insomnia.

COVID-19 continues to profoundly affect university students' mental health and well-being [3]. They are very worried and afraid that they will get a disease and spread coronavirus to their loved ones when they come back home. They tend to think that young people are most likely asymptomatic carriers [16].

In terms of severity, some authors suggested that most individuals had mild-moderate disorders while individuals with severe symptoms represented a minority [13]. In one study measuring the impact of COVID-19 pandemic on mental health of university students in Bangladesh, the authors concluded that about 78.1% of university students studied suffered from mental health effects due to the pandemic in Bangladesh [14]. During the pandemic, about 47% of university students had moderate and severe anxiety.

2) Indirect influence

a) Relationship Quality

The quality of university students' relationships is one of the mediating factors affecting their mental health throughout the pandemic.

A relationship is defined as a long-term bond between two individuals [18]. A persistent pattern of interaction between at least two persons characterizes relationships [19; 20]. As a result, relationship quality includes trust, a sense of security, and fulfillment. It's also linked to a relationship's understanding, validation, and concern [21], as well as an emotional expression [21; 22] and forgiveness [23].

To combat the development of COVID-19, governments have enacted harsh laws like school and company closures, curfews, and mass gathering bans, all of which have had a significant impact on teenage social contacts around the world. This has affected the quality of the interactions

amongst students. COVID-19 had a direct effect on relationship quality, notably for those who had poor relationship quality [24]. Communication via the internet and social networking sites cannot replace meeting in person, even for the closest of friendships [25]. As a result, when the pandemic broke out, many scholars speculated that the stressful living conditions might increase tension in couples, which decreased relationship contentment [26].

COVID-19 can also impair the students' relationship quality since stressful situations can destabilize interactions and damage the quality of their relationships [27]. There are a variety of reasons for this, including the difficulty of group contact, the limited alternatives for sharing activities, and the lack of face-to-face interaction. Typical eye contact patterns and other forms of nonverbal interaction are interrupted with video chats. Furthermore, when the pandemic has spread and social distancing policies have been enforced, some youngsters can't access the Internet, have limited time to surf the web or use inappropriate sites. The relationship quality of these people is severely harmed.

COVID-19 has an impact on the students' relationship quality, as a result, this has an impact on their mental health. Relationship quality can affect mental health through health impacts, limitations in social activities, and communication [28; 29]. Social isolation and bad social interactions have been linked to depression [30; 31] and suicide [32] in studies. The mental health of teenagers has been directly influenced by the quality of the parent-child connection [33]. Discordant relationships may be linked to a higher incidence of mood and anxiety disorders, according to a population-based study in the United States [34]. These findings are in line with those of an Australian population-based survey, which found that better relationship quality was linked to fewer symptoms of sadness and anxiety than low relationship quality [35]. Furthermore, depression is more likely to become severe when the relationship quality is weakened. [36].

As a result, the university students' mental health is inextricably linked to their relationship quality, particularly during the COVID-19 pandemic.

b) Academic performance

COVID-19 has had an indirect impact on the mental health of students at the university through academic performance.

Academic achievement is a fundamental characteristic [37] and one of the most essential educational goals [38]. Academic performance is described as a student's evaluation based on grades or scores, as determined by professors and teachers over some time. Excellent academic achievement motivates students to do better in school and is the most essential incentive for educational institutions [39].

Many university students have been forced to switch to online learning due to the pandemic's impact. This kind of learning is an alternative to face-to-face instruction that reduces contact between students and teachers [40]. However, many students are unable to participate in online classes due to a lack of resources or tools, as well as a lack of digital equipment [41]. As a result, the COVID-19 pandemic had a moderate to severe effect on most of the participants' academic performance [42]. University students benefit from

online education since it keeps them busy and allows them to learn on their own time. The fundamental problem of online education, however, is how to provide students with practical learning. As a result, online learning harms students' learning outcomes.

When a student's academic performance suffers, his or her mental health suffers as well. A study in Sweden found that people are more likely to experience depression in early adulthood when they have a low mean score at 16 years of age [43]. A low mean score was linked to adolescent depression hospitalization in large population research [44]. Low academic performance has an impact on later inner problems in middle age [45]. Although some studies have investigated the effects of academic success on mental health in youth and adulthood in its early stages, the majority of recent research has concentrated on depression. However, it is still true that if a student's academic performance is harmed, his mental health will be harmed as well.

c) *Financial Stress*

A widely accepted concept of financial stress is 'financial stress is defined as the incapacity to meet one's economic responsibilities and is affected by attitudes, beliefs, and other psychological elements' [46].

COVID-19 pandemic, along with the economic closure and social distancing policies in 2020, has resulted in a serious economic crisis and long-term consequences: job loss, unemployment, wage cut, reduction of working hours... Some studies of America [49; 50] showed that the unemployment rate has maintained at a relatively high level since COVID-19 pandemic broke out. American surveys also showed that nearly 90 percent of America's residents indicated that COVID-19 pandemic was bringing them stress and worries due to the loss of income or employment in their family [51].

It is indicated that undergoing financial stress throughout university (such as the inability to meet basic needs) was associated with an increase in symptoms of melancholy [47]. According to a longitudinal study in British, some undergraduate students who reported undergoing financial stress at baseline (according to the IFS) also tended to announce worry, melancholy, and cross-sectionally pressure, and nervousness after two months. Those who reported at baseline that they had thought about dropping out of school for economic reasons had higher depression scores from 6 to 8 months later [48].

In other study about university students, the authors concluded that financial stress was cross-sectionally related to poor mental health in almost all people, and went up symptoms of worry and depression [52]. It is indicated that many university students must delay their research projects and internship plans when universities must switch to online learning. This suspends their conferring of degrees and undermines their advantage and competitiveness in the labor market and occupation, which leads to stress among them [3]. Many university students have had to quit part-time or full-time jobs due to social distancing policies that don't cover the cost of living, which in turn adds to the financial stress and mental health of students.

III. RESEARCH METHODS

The authors used the qualitative method - in-depth interview to check the suitability of the factors in the proposed research model in the Vietnamese context. In-depth interview participants were identified as university students of many different majors at universities in Hanoi. Based on the results of in-depth interviews, the authors have correctly identified the factors that are suitable for Vietnam's conditions and the specific conditions of groups of universities in Hanoi.

The authors conducted an in-depth interview with 30 students coming from 7 different universities in Hanoi (namely: National Economics University, Hanoi University of Architecture, Hanoi University, Foreign Trade University, Hanoi University of Science and Technology, Hanoi Medical University, Hanoi National University of Education). To ensure the objectivity of this study, the authors conducted in-depth interviews with 15 male university students and 15 female university students.

Due to the social distancing policies of the government to minimize the COVID-19 cases, our interview questions were distributed and collected answers during October 2021 by using an online media interview.

The interview questions were designed by the authors with the interview content focusing on the following issues:

- COVID-19 pandemic
- University students' mental health
- Relationship quality
- Academic performance
- Financial stress

To eliminate the rigid division between "data" and "explanation", the authors use NVivo software to link parts of the research project, combining data reflection and statistics.

IV. RESEARCH RESULTS AND PROPOSED RESEARCH MODEL

Our study conducted qualitative research, which collected information from 30 university students in Hanoi through an in-depth interview. As a result, 100% of participants said that COVID-19 had an impact on their mental health. All interviewees agreed that 'under the influence of COVID-19 pandemic, we need to pay more attention to mental health care. Research has shown that COVID-19 and its effects will continue to impact mental health. This is concerning since mental health is critical in the fight against the pandemic.

The result of the interview with 30 university students studying at universities in Ha Noi can be said to be consistent with previous studies. All interviewees agreed that relationship quality affected mental health because good relationship quality helped them not feel lonely. They felt more comfortable when they could release their feelings and vice versa. In our in-depth interview, 11 out of 30 university students thought that COVID-19 had no or little effect on their relationship because they could still communicate via the internet. Some even thought that COVID-19 was an opportunity for them to screen out unnecessary relationships. The rest said that the quality of their relationship was negatively affected by COVID-19 both in terms of friends and family. This caused them to have unresolved negative emotions and prolonged sadness, which led to stress and depression.

The result showed that 9 out of 30 university students had no difficulty in learning online. They were even interested in learning online. The rest found online learning more difficult to absorb knowledge because of the lack of textbooks, supplementary materials, and the unstable quality of the transmission line. Besides, the lack of real-world experiences in online classes and the limited communication between lecturers and university students also made them feel online classes were not as desirable as onsite ones. 23 out of 30 interviewees indicated that their study results were negatively affected by the COVID-19 pandemic. The knowledge acquisition was limited, the forms of study and exam change, so everyone felt nervous during the study and exam period. Many university students had fallen into depression after the exams because the test results were not as good as expected.

The interview results also showed that 50% of attendees had difficulties in paying fees: rent, tuition fees, electricity and water bills, personal expenses... 15 out of 30 university students said that their household incomes have been negatively affected since the COVID-19 pandemic broke out. Because of social distancing and isolation measures, their parents had to work at home or decrease their working hours, which made household incomes reduced significantly. This was the reason why they had to reduce spending and worried about tuition fees. As a result, they felt stressed and anxious. Therefore, the COVID-19 pandemic aggravated financial stress among university students, which resulted in poor mental health outcomes.

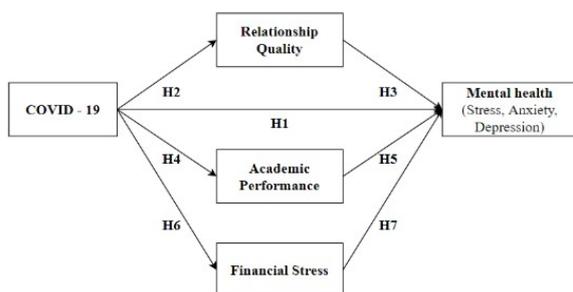


Fig. 1 Research model

For those reasons, the study of the impact of COVID-19 and its accompanying effects on mental health and finding reasonable solutions is very important and critical.

We propose the research model for future study as shown in Fig.1.

From our research model, we propose 7 research hypotheses:

1. Hypothesis 1: COVID-19 negatively affects university students' mental health
2. Hypothesis 2: COVID-19 negatively affects relationship quality
3. Hypothesis 3: Relationship quality proportionally affects university students' mental health
4. Hypothesis 4: COVID-19 negatively affects academic performance
5. Hypothesis 5: Academic performance proportionally affects university students' mental health
6. Hypothesis 6: COVID-19 proportionally affects financial stress

7. Hypothesis 7: Financial stress negatively affects university students' mental health

V. CONCLUSION

The influence of the COVID-19 pandemic on the mental health of university students was explored in this study. We researched the elements impacting the mental health of student groups to analyze the prevalence of psychological difficulties produced by COVID-19 among students and to investigate the association between mental health and the COVID-19 pandemic. The COVID-19 pandemic has had a direct impact on the mental health of university students and indirectly through several factors: relationship quality, academic success, and financial stress.

The authors used a qualitative research method - an in-depth interview with 30 students in different university groups in Hanoi to confirm the direct and indirect relationship between the COVID-19 pandemic and university students' mental health in the current context of Vietnam. Due to time constraints, the research team only surveyed and interviewed a small group of students. Taking the survey only among students in the north as a representative sample of students makes the research work still incomplete.

Inheriting, supplementing, and developing from previous studies, the authors propose a research model of factors affecting university students' mental health during the COVID-19 pandemic with 3 mediating variables: relationship quality, academic performance, and financial stress respectively. The authors recommend that future researchers apply this research model to study by quantitative method to find out effective university students' mental health interventions during and after the COVID-19 pandemic.

REFERENCES

- [1] Barbara Nussbaumer-Streit, Mayr V, Dobrescu AI, Chapman A, Persad E, Klerings I, et al. Quarantine alone or in combination with other public health measures to control COVID19: a rapid review. *Cochrane Infectious Diseases Group, editor. Cochrane Database Syst Rev.* 2020;2020:CD013574
- [2] Ulrike Ravens-Sieberer, Anne Kaman, Michael Erhart, Christiane Otto, Janine Devine, et al. Quality of life and mental health in children and adolescents during the first year of the COVID-19 pandemic: Results of a two-wave nationwide population-based study. 2021.
- [3] Zhai, Y., & Du, X. (2020). Addressing collegiate mental health amid COVID-19 pandemic. *Psychiatry Research*, 288, 113003.
- [4] Agnew, M., Poole, H., Khan, A. Fall break fallout: exploring student perceptions of the impact of an autumn break on stress. *Student Success*. 2019.
- [5] Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., Zheng, J., 2020. The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Res.*
- [6] Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C.S., Ho, R.C., 2020. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. *Int. J. Environ. Res. Public Health* 17, 1729.
- [7] Thien Khai Tran, Hoa Dinh, Hien Nguyen, Dac-Nhuong Le, Dong-Ky Nguyen et al. The Impact of the COVID-19 Pandemic on College Students: An Online Survey. 2021.
- [8] Xuan Thi Thanh Le, Anh Kim Dang, Jayson Toweh, Quang Nhat Nguyen, Huong Thi Le, Toan Thi Thanh Do, Hanh Bich Thi Phan et al. Evaluating the Psychological Impacts Related to COVID-19 of Vietnamese People Under the First Nationwide Partial Lockdown in Vietnam. 2020. 11:284.
- [9] Bach Xuan Tran, Hien Thi Nguyen, Huong Thi Le, Carl A. Latkin et al. Impact of COVID-19 on Economic Well-Being and Quality of Life

- of the Vietnamese During the National Social Distancing. *Front Psychol.* (2020) 11:565153.
- [10] WHO, (2001) *The World Health Report 2001, Mental Health: New Understanding, New Hope.* World Health Organization, Geneva.
- [11] Hong Chau, 2019, Facing the pressures of modern society, Nhan Dan, https://nhandan.vn/chuyen-de-cuoi-tuan/oi-dien-ap-luc-cua-xa-hoi-hien-dai-380058/?fbclid=IwAR33mkRyNXnb0Wp7WYb8emdHlM5iN9XpfyNrQmm_tijlIdalIn6a1CNu2E, accessed on October 1, 2021
- [12] Moreno, C., Wykes, T., Galdarisi, S., Nordentoft, M., Crossley, N., Jones, N., ... & Arango, C. (2020). How mental health care should change as a consequence of the COVID-19 pandemic. *The Lancet Psychiatry.*
- [13] Talevi, D., Soccì, V., Carai, M., Carnaghi, G., Faleri, S., Trebbi, E., ... & Pacitti, F. (2020). Mental health outcomes of the CoViD-19 pandemic. *Rivista di psichiatria*, 55(3), 137-144.
- [14] Kola, L. (2020). Global mental health and COVID-19. *The Lancet Psychiatry*, 7(8), 655-657.
- [15] Liu, S., Yang, L., Zhang, C., Xiang, Y.-T., Liu, Z., Hu, S., et al. (2020). Online mental health services in China during the COVID-19 outbreak. *Lancet Psychiatry* 7, e17–e18.
- [16] Pan, S. L., & Zhang, S. (2020). From fighting COVID-19 pandemic to tackling sustainable development goals: An opportunity for responsible information systems research. *International Journal of Information Management*, 55, 102196.
- [17] Patwary, M. M., Bardhan, M., Disha, A. S., Kabir, M., Hossain, M., Alam, M., ... & Billah, S. M. (2020). The Impact of COVID-19 Pandemic on Mental Health of University Student: A Cross-Sectional Study in Bangladesh. *Riad and Alam, Md. Ashraf and Haque, Md. Zahidul and Billah, Sharif Mutasim, The Impact of COVID-19 Pandemic on Mental Health of University Student: A Cross-Sectional Study in Bangladesh* (June 27, 2020).
- [18] Reis, H.T. (2001). Relationship experiences and emotional wellbeing. In C.D. Ryff & B.H. Singer (Eds.), *Emotion, social relationships and health* (pp. 57–95). New York: Oxford University Press.
- [19] Asendorpf, J.B., & Banse, R. (2000). *Psychology of relationships.* Berlin: Springer.
- [20] Hinde, R. (1993). On the way toward a science of social relationships. In A.E. Auhagen & M. von Salisch (Eds.), *Interpersonal relationships* (pp. 7–36). Göttingen: Hogrefe.
- [21] Clark, M.S., Fitness, J., & Brissette, I. (2001). Understanding people's perceptions of relationships is crucial to understanding their emotional lives. In G. Fletcher & M.S. Clark (Eds.), *Blackwell handbook of social psychology: Interpersonal processes* (pp. 253– 278). London: Blackwell.
- [22] Feeney, J.A. (1999). Adult attachment, emotional control, and marital satisfaction. *Personal Relationships*, 6, 169–185.
- [23] McCullough, M.E. (2000). Forgiveness as human strength: Theory, measurement, and links to well-being. *Journal of Social and Clinical Psychology*, 19, 43–55.
- [24] Pieh C, O'Rourke T, Budimir S, Probst T (2021) Correction: Relationship quality and mental health during COVID-19 lockdown. *PLOS ONE* 16(9): e0257118.
- [25] Foulkes, L., & Blakemore, S.-J. (2021). Individual differences in adolescent mental health during COVID-19: The importance of peer relationship quality. *Neuron.*
- [26] Pietromonaco, P. R., & Overall, N. C. (2021). Applying relationship science to evaluate how the COVID-19 pandemic may impact couples' relationships. *American Psychologist*, 76(3), 438-450
- [27] Neff, L. A., Karney, B. R. (2017). Acknowledging the elephant in the room: How stressful environmental contexts shape relationship dynamics. *Current Opinion in Psychology*, 13, 107–110
- [28] Kawachi I, Berkman LF (2001) Social ties and mental health. *J Urban Health* 78: 458–46.
- [29] Berkman LF, Glass T (2000) Social integration, social networks, social support, and health. In: Berkman LF, Kawachi I, editors. *Social Epidemiology.* New York: Oxford University Press. 137–173.
- [30] Chou KL, Liang K, Sareen J (2011) The association between social isolation and DSM-IV mood, anxiety, and substance use disorders: wave 2 of the national epidemiologic survey on alcohol and related conditions. *J Clin Psychiatry.*
- [31] Schuster TL, Kessler RC, Aseltine RH (1990) Supportive Interactions, Negative Interactions, and Depressed Mood. *American Journal of Community Psychology* 18: 423–438.
- [32] Holma KM, Melartin TK, Haukka J, Holma IA, Sokero TP, et al. (2010) Incidence and predictors of suicide attempts in DSM-IV major depressive disorder: a five-year prospective study. *Am J Psychiatry* 167: 801–808.
- [33] Hazel NA, Oppenheimer CW, Technow JR, Young JF, Hankin BL (2014) Parent relationship quality buffers against the effect of peer stressors on depressive symptoms from middle childhood to adolescence. *Dev Psychol* 50:2115–2123.
- [34] Whisman MA, Sheldon CT, Goering P (2000) Psychiatric disorders and dissatisfaction with social relationships: does type of relationship matter? *J Abnorm Psychol* 109: 803–808.
- [35] Leach LS, Butterworth P, Olesen SC, Mackinnon A. Relationship quality and levels of depression and anxiety in a large population-based survey. *Soc Psychiatry Psychiatr Epidemiol.* 2013; 48:417–25.
- [36] Teo AR, Choi H, Valenstein M. Social relationships and depression: ten-year follow-up from a nationally representative study. *PLoS ONE.* 2013;8:e62396.
- [37] Silva, F. R. da, Guerreiro, R. de C., Andrade, H. de A., Stieler, E., Silva, A., & de Mello, M. T. (2020). Does the compromised sleep and circadian disruption of night and shiftworkers make them highly vulnerable to 2019 coronavirus disease (COVID-19)? *Chronobiology International*, 1–11. doi:10.1080/07420528.2020.1756841
- [38] Narad, A., & Abdullah, B. (2016). Academic performance of senior secondary school students: Influence of parental encouragement and school environment. *Rupkatha Journal on Interdisciplinary Studies in Humanities Special Issue*, 3(2), 12-19.
- [39] Adeyemo, D. A. (2001). Teachers' job satisfaction, job involvement, career and organizational commitments as correlates of student-academic performance. *Nigerian journal of applied psychology*, 6(2), 126-135.
- [40] Pragholapati A. COVID-19 impact on students. *EdArXiv [Preprint].* (2020). p. 1–6.
- [41] UNESCO. Universities Tackle the Impact of COVID-19 on Disadvantaged Students. (2020). Available online at: <https://en.unesco.org/news/universities-tackle-impact-covid-19-disadvantaged-students> (accessed May 24, 2020).
- [42] Mahdy, M. A. A. (2020). The Impact of COVID-19 Pandemic on the Academic Performance of Veterinary Medical Students. *Frontiers in Veterinary Science*, 7.
- [43] Sörberg Wallin A, Koupil I, Gustafsson JE, Zammit S, Allebeck P, Falkstedt D (2019) Academic performance, externalizing disorders and depression: 26,000 adolescents followed into adulthood. *Soc Psychiatry Psychiatr Epidemiol* 54(8):977–986.
- [44] Jonsson U, Goodman A, von Knorring AL, von Knorring L, Koupil I (2012) School performance and hospital admission due to unipolar depression: a three-generational study of social causation and social selection. *Soc Psychiatry Psychiatr Epidemiol* 47(10):1695–1706.
- [45] Deighton J, Humphrey N, Belsky J, Boehnke J, Vostanis P, Patalay P (2018) Longitudinal pathways between mental health difficulties and academic performance during middle childhood and early adolescence. *Br J Dev Psychol* 36(1):110–126.
- [46] Jebediah J. Northern, William H. O'Brien, Paul W. Goetz. *The Development, Evaluation, and Validation of a Financial Stress Scale for Undergraduate Students.* 2010.
- [47] Andrews B, Wilding JM. The relation of depression and anxiety to life-stress and achievement in students. *Br J Psychol* 2004; 95:509–21.
- [48] Thomas Richardson, Peter Elliott, Ron Roberts, Megan Jansen. *A longitudinal study of financial difficulties and mental health in a national sample of British undergraduate students.* 2017.
- [49] Kochhar, R. *Unemployment Rose Higher in Three Months of COVID-19 Than It Did in Two Years of the Great Recession.* 2020.
- [50] M. Felsenthal. *COVID-19 to Plunge Global Economy into Worst Recession Since World War II.* 2020.
- [51] Close Nefe. *Survey: Nearly 9 in 10 Say COVID-19 Crisis is Causing Financial Stress.* 2020.
- [52] Tayla McCloud and David Bann. *Financial stress and mental health among higher education students in the UK up to 2018: rapid review of evidence.* 2019

Investigating the impact of social capital on SC resilience and SC performance

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Abstract—Despite the importance of social capital (SC), its influence on supply chain (SC) resilience and performance is not sufficiently understood. The aim of the research is to analyze the relationship between social capital, supply chain resilience and supply chain performance. This paper is survey-based research which used data of 203 firms from Hanoi. The hypothesis model is examined by structural equation modeling. Empirical examinations indicate that social capital positively impacts supply chain resilience and performance. The outcomes of our study could provide a guideline for practitioners on improving the ability of supply chain to cope with changes and help firms avoid disruptions and improve SC performance.

Index Terms—Social capital, Disruptions, SC resilience, SC, performance.

I. INTRODUCTION

IN CURRENT competitive market and global economy, supply chains have to face with daily disruptions arising from the high demand variability, short life cycle, information system failure and industrial disputes [14]. Those disruptions may adversely affect supply chain (SC) performance [14]. Recognizing these threats, businesses and researchers are increasingly focusing on building SC resilience to remain and improve SC performance [10].

Resilience is commonly described as the ability of a firm to be ready for the unexpected events, react to and get over from SC disruptions by sustaining steadiness of SC operations and control over function and structure [17,16].

Although SC resilience has been employed to describe behavioral responses of institutions, communities and economies, it is adjusted by the degree to which firms in a SC can utilize social capital to increase their capability to bear on unexpected hazards and recovery. In addition, linking social capital to resilience helps researchers to explain why some SCs are more effective than others.

The main purpose of our study is to investigate the way firms exploit social capital in improving SC resilience to maintain and enhance SC performance. Using the sample of 203 participant firms located in Hanoi, Vietnam, the findings indicate that social capital are the sources of SC resilience. It also can improve SC performance. This study has contributed to SC management literature regarding determinants of robust SC resilience and the role of social capital and SC resilience in improving SC performance.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

A. Social capital

Social capital is generally considered as the signal of social resources rooted in interfirm relationships [5]. It is defined as potential resources which are generated from the relationships between firms in a SC [13,20]. According to social capital theory, social capital is considered as the value of SC networks which plays an important role in explaining the nature of connection and cooperation among firms [7,9]. Literature indicates that social capital between firms can be considered as a hedge asset spurring collectivism in the SC to against sudden disruptions and improving SC performance [22,19]. It is also used to manage the conflict between partners. Therefore, social capital is regarded as valuable resources for firms which are resulted from the network of relationships. Stronger social capital between suppliers and buyers help to improve the efficiency of SCs [7].

B. SC Resilience

SC resilience is explained in different ways in literature. However, it is generally defined as the adaptive ability of firms in SC which helps firms reduce the possibility of facing unexpected instabilities, counterattack from spreading out the disruption by utilizing and controlling over organizational structure and functions. It can also provide firms instant and productive responsive plans to exceed the disruptions, and restore and recuperate the SC to a vigorous state of operations [10]. In this study, SC resilience is understood as the ability of a SC to recover from the disruption and to cope with market changes. It is also believed to help firm improve SC performance.

C. SC Performance

SC performance is described as an important construct of administrative performance which relates to saving production cost and shortening product life cycle [4]. SC performance is interpreted as the rewards resulting from collaborative activities in the SC. An effective SC provides SC partners' product and service quality improvement and mutual [1].

In SC management study, social capital is shown to strengthen SC relationships [7]. Social capital is commonly

explained as an external resource which can help firm to gain the competitive advantages [20]. Firms exploit different resources through relational rent and learn from each other. SC resilience is a vital part of risk management strategy and practice. It enables SC partners to get ready to face with changes. To improve resilience, SC needs to decrease internal risk factors [2]. The literature indicates that common value, goals, objectives and culture facilitate communication, mutual understanding and support collaborative efforts to perform SC tasks [11]. However, when goals are incongruent and incentives are not alignment, firms may misunderstand each other and conflict may arise [15,7]. Thus, social capital can create a reliable environment among SC partners and help them eliminate the uncertain feelings about their partners. Social capital can work as the glue that holds firms together to combat disruptions and cope with the changes [8]. As the consequence of the above arguments, the hypothesis is stated as follow:

H1: Social capital has a positive influence on SC resilience.

Previous studies indicate that increased environmental changing could lead to unproductive investments, higher costs, and a possible loss of competitive advantages. During historical disruptions such as financial crisis, a number of SCs face the failure because of tremendous financial losses [3]. A number of firms have to shut down their operations because they don't have the ability to face with changes [6]. Scholars also indicate that resilience plays a vibrant role in maintaining and improving SC performance because SC resilience prevents disruptions and disturbances from arising and reduces negative consequences [14,8]. SC resilience provides chain partners the ability to maintain high visibility and responsivity to changes. Therefore, SC can maintain and ensure a higher performance. Drawing upon on the above arguments, the hypothesis is stated as follow:

H2: SC resilience has a positive influence on SC performance.

Previous studies assert that the lack of social capital may deter resource and information exchanges in SC relationships [21]. SC efficiency and performance depend on the accessibility of social capital. The relational view proposes that the more firms invest in SC relationships and the further the potential is for relational rents [9]. Employing this view, [6] indicated that SC efficiency and resilience can be improved through relational rents because sharing knowledge and information about latent changes that might happen in the future and real changes that are presently occurring is the main factor that helps SC to achieve preparedness and face with the change [22] Accordingly, the hypothesis is stated as follow:

H3: Social capital have positive influence on SC performance.

III. METHODOLOGY

A. Measures

We depend on the literature to originate the existing validated scales for measuring the constructs. We accept a 5-point-Likert-scale to assess the similarity level in the responses. We referenced the measurement from previous studies to measure social capital [25,11,23]. To measure SC

resilience, we apply a five-scale measurement developed by [8]. We used eight items adopted from [18,24] to measure SC performance. We referenced the related studies to develop the questionnaire.

B. Pretesting and sampling

Our study is calculated using the data collected in Hanoi. The process of pretesting and sampling was conducted as follows: First, we validated the content by asking five outstanding academic scholars to refine our pivotal constructs. Second, we pre-tested the revised questionnaire survey with 15 managers to progress the readability of scales and align with the context. The suggestions of pre-test helped us revise the questionnaire again. An extensive survey was conducted through email. The target respondents of the survey set as general manager, operations managers, marketing manager and SC managers of the firms. We sent out 330 questionnaires. After two reminders, 215 responses were given back with the response rate of nearly 65.2%. After checking all the respondents, 12 responses were omitted because of invalid or blank-data. The final sample using to analyze is 203.

IV. RESEARCH RESULTS

Data management and analysis are mainly analyzed with SPSS 20 and AMOS 20. To assess the measurement model, we conduct EFA analysis to screen the variable which has inappropriate commonalities and factor loadings. The result of smaller than 0.5 is accepted. To check the model fit and measurement-scales, we conducted CFA analysis. The results of CFA are presented in table 2.

Reliability is checked by the criterion of Cronbach's α which is larger than 0.7. From the results, two items of SC performance (SCP7 and SCP8) are omitted to enhance the reliability of this construct. The value for other constructs exceeds 0.7. The results (table 2) indicate that this methodology achieves solid reliability.

CV is assessed by three-point criteria: all FL surpass 0.5, CR is greater than 0.7 and AVE surpasses MSV. The results (table 1) point that all observation items meaningfully present latent variable.

We test the discriminant validity of all constructs using AVE calculation. If AVE of construct surpasses maximum MSV and ASV, it is acceptable. These results (table 1) imply that the measurement model is adequate. It means that the study discriminant validity is decent.

Table 1 Convergent and discriminant validity

Indicators	Cronbach α	AVE	CR	MSV	ASV
SC performance	0.903	0.613	0.904	0.006	0.005
Social capital	0.913	0.681	0.914	0.008	0.004
SC resilience	0.790	0.545	0.805	0.023	0.008

A. Hypotheses testing

The model fit was accessed by multiple indices: GFI exceed 0.8, TLI, CFI exceed 0.9, RMSEA should be between

0.05 to 0.07. The results presented in table 2 show that our model fit is satisfactory.

Table 2. Model Fit

Fit index	Value	Indicators
Absolute fit		
CMIN/df	1.323	$\leq 2^a$; $\leq 5^b$
Root mean square		≤ 0.5
GFI	0.867	$\geq 0.9^a$; $\geq 0.8^b$
RMSEA	0.040	$\leq 0.8^a$; $\leq 0.1^b$
Incremental fit		
NFI	0.935	$\geq 0.9^a$; $\geq 0.8^b$
AGFI	0.827	$\geq 0.9^a$; $\geq 0.8^b$
CFI	0.952	$\geq 0.9^a$;

Note: a Acceptability: acceptable; b Acceptability: marginal

Table 3. Hypotheses testing results. (Direct effects)

Path	Coefficient (t-value)
H1. Social capital → SC resilience	0.322***
H2. SC resilience → SC performance	0.245*
H2. Social capital → SC performance	0.343***

Note: ** $p < 0.01$; * $p \leq 0.05$; and Ns = Not significant

In order to test the hypotheses, we employed Structural equation modeling (SEM). The outcomes of hypotheses testing are exposed in table 3. The results indicate that social capital positively influence SC resilience. H1 is supported with a correlation of 0.322 ($P < 0.001$). Our findings also confirm the effect of SC resilience on SC performance. The path between SC resilience and SC performance is statistically significant $\beta = 0.245$ ($P < 0.005$). Thus, H2 is confirmed to be supported. This result indicates that SC resilience significantly influences performance. Similarly, the result indicates that social capital also has positive impact on SC performance (0.343 , $P < 0.001$). Thus, H3 is accepted.

V. CONCLUSION AND IMPLICATIONS

This study investigates the effects of social capital on SC resilience and SC performance. Based on the results, we found that social capital positively influences SC resilience. It is aligned with previous studies on building SC resilience based on social capital [15, 22, 8]. Moreover, the results also demonstrate that SC resilience can enhance SC performance. This study supports the findings of previous studies which indicate that the ability to response and face with disruptions and changes can help firms to maintain and boost SC performance. It can be explained as frequent social interaction, shared goals, value, and culture, trust, friendship and reciprocity between SC partner can reduce internal risks such as conflict and opportunistic behaviors [18,20]. Social capital can also reduce the reluctance of firms to share information

or knowledge which is related to the past and future disruptions [9,12]. These sharing routines can help firms to prepare better for unexpected or unpredicted events [29].

Our study provides a specific implication to business management and the public. Based on the result, managers should have strategies or plans to improve social capital. By improving the level of interaction, network ties, trust, and collaborative culture, firms can expand their ability to cope with the changes and to recover from the disruptions. Since small and medium manufacturers in developing countries tend to be more vulnerable to suffer more severe losses, building SC resilience is very important for them to survive in disruptions. From the empirical results of this paper, managers can see that social capital plays an imperative part in improving the SC elasticity and promoting SC resilience and SC performance. The outcomes of our study recommend that policymakers should utilize social capital to build risk management strategies and operational strategies.

REFERENCES

- [1] Abeysekara, N., Wang, H. & Kurupparachchi, D. 2019. Effect of supply-chain resilience on firm performance and competitive advantage: A study of the Sri Lankan apparel industry. *Business Process Management Journal*, 25, 1673-1695.
- [2] Agrawal, N., Pingle, S. J. I. J. O. L. E. & Globalisation 2020. Mitigate SC vulnerability to build SC resilience using organisational analytical capability: a theoretical framework. 8, 272-284.
- [3] Alghababsheh, M. & Gallear, D. J. J. O. B. E. 2021. Socially sustainable SC management and suppliers' social performance: The role of social capital. 173, 855-875.
- [4] Altay, N., Gunasekaran, A., Dubey, R., Childe, S. J. J. P. P. & Control 2018. Agility and resilience as antecedents of SC performance under moderating effects of organizational culture within the humanitarian setting: a dynamic capability view. 29, 1158-1174.
- [5] Anderson, A. R. & Jack, S. L. 2002. The articulation of social capital in entrepreneurial networks: a glue or a lubricant? *Entrepreneurship & Regional Development*, 14, 193-210.
- [6] Asamoah, D., Agyei-Owusu, B. & Ashun, E. J. B. A. I. J. 2020. Social network relationship, SC resilience and customer-oriented performance of small and medium enterprises in a developing economy.
- [7] Carey, S., Lawson, B. & Krause, D. R. 2011. Social capital configuration, legal bonds and performance in buyer-supplier relationships. *Journal of Operations Management*, 29, 277-288.
- [8] Gölgeci, I. & Kuivalainen, O. J. I. M. M. 2020. Does social capital matter for SC resilience? The role of absorptive capacity and marketing-SC management alignment. 84, 63-74.
- [9] Handoko, I., Bresnen, M. & Nugroho, Y. 2018. Knowledge exchange and social capital in SCs. *International Journal of Operations & Production Management*, 38, 90-108.
- [10] Karl, A. A., Micheluzzi, J., Leite, L. R. & Pereira, C. R. J. P. 2018. SC resilience and key performance indicators: a systematic literature review. 28.
- [11] Krause, D. R., Handfield, R. B. & Tyler, B. B. 2007. The relationships between supplier development, commitment, social capital accumulation and performance improvement. *Journal of Operations Management*, 25, 528-545.
- [12] Mubarik, M. S., Bontis, N., Mubarik, M. & Mahmood, T. J. J. O. I. C. 2021. Intellectual capital and SC resilience.
- [13] Nahapiet, J. & Ghoshal, S. 1998. Social Capital, Intellectual Capital, and the Organizational Advantage. *Academy of Management Review*, 23, 242-266.
- [14] Paul, S. K., Chowdhury, P., Moktadir, M. A. & Lau, K. H. J. J. O. B. R. 2021. SC recovery challenges in the wake of COVID-19 pandemic. 136, 316-329.
- [15] Pettit, T. J., Croxton, K. L. & Fiksel, J. J. J. O. B. L. 2019. The evolution of resilience in SC management: a retrospective on ensuring SC resilience. 40, 56-65.
- [16] Ponomarov, S. Y. & Holcomb, M. C. J. T. I. J. O. L. M. 2009. Understanding the concept of SC resilience.
- [17] Scholten, K. & Schilder, S. 2015. The role of collaboration in SC resilience. *SC Management: An International Journal*, 20, 471-484.

- [18] Singhry, H. B. & Abd Rahman, A. 2019. Enhancing SC performance through collaborative planning, forecasting, and replenishment. *Business Process Management Journal*.
- [19] Thi Mai Anh, N., Hui, L., Khoa Vu, D. & Mehmood, S. 2019. Relational capital and SC collaboration for radical and incremental innovation: An empirical study in China. *Asia Pacific Journal of Marketing and Logistics*, 31, 1076-1094.
- [20] Tsai, W. P. & Ghoshal, S. 1998. Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal*, 41, 464-476.
- [21] Wang, Z., McNally, R. & Lenihan, H. 2018. The role of social capital and culture on social decision-making constraints: A multilevel investigation. *European Management Journal*.
- [22] Wong, C. W., Lirn, T.-C., Yang, C.-C. & Shang, K.-C. J. I. J. O. P. E. 2020. SC and external conditions under which SC resilience pays: An organizational information processing theorization. 226, 107610.
- [23] Yao, L., Yu, Z. & Songyue, Z. 2016. Social capital, portfolio management capability and exploratory innovation: evidence from China. *Journal of Business & Industrial Marketing*, 31, 794-807.
- [24] Ye, F. & Wang, Z. 2013. Effects of information technology alignment and information sharing on supply chain operational performance. *Computers & Industrial Engineering*, 65, 370-377.
- [25] Yim, B. & Leem, B. 2013. The effect of the SC social capital. *Industrial Management & Data Systems*, 113, 324-349.

Investigating the effect of social capital sub-dimensions on supply chain collaboration

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Abstract—The aim of our study is to take a closer look at three dimensions of social capital (SO) and explore the relationship between social capital sub-dimensions and three types of supply chain collaboration. This study provides an in-depth examination of social capital's effect on supply chain collaboration. We developed a comprehensive framework between cognitive, structural and relational capital dimensions and SC collaboration dimensions including information sharing, joint decision making, and benefit/risks sharing. The quantitative method was employed to investigate 249 firms located in Vietnam. The findings of this study provide some important implications for scholars and practitioners to establish and maintain a long-term relationship. The distinguishing between social capital sub-dimensions and collaboration can help managers to design collaborative strategies which will serve for the benefits of the entire supply chain.

Index Terms—Social capital, collaboration, Information sharing, decision making, benefit sharing.

I. INTRODUCTION

THE COVID-19 epidemic reveals the fragility of worldwide supply chains which arise from raw material scarcity, disruption in manufacturing, and transportation. In order to survive and maintain business, firms need to carefully formulate appropriate collaborative strategies [15].

Supply chain (SC) collaboration is a jointly approved process whereby SC members can share responsibility, vision, mission, resources, benefits and risks to obtain SC goals [25].

In SC management literature, social capital (SO) is investigated as a critical component of successful collaboration in the SC [31]. Social capital is defined as latent useful resources which are engrained in the relationships between a firm and its allies [30]. A number of researchers indicate that social capital has a prominent place in facilitating SC collaborative actions for example information and resource sharing, mutually profit sharing, joint planning, and innovation [17, 12]. According to previous studies, SO can be divided into three dimensions which are cognitive, structural and relational capital. However, scholars give close attention to the relational facet as the reflection of social capital rather than the two other dimensions. This approach to SO is no longer suitable in explaining supplier-buyer relationship because those dimensions have different nature and characteristic which may cause the different influence on collaborative activities between suppliers and buyers.

Recently, there are several studies on SC collaboration which investigate the role of social capital as individual sub-

dimensions [34,25], or SC collaboration is treated as a progress of generating and exchanging information between suppliers and buyers. Other types of collaboration such as cooperative in decision making process and mutual sharing risk and profits were overlooked. Therefore, it is necessary to investigate the full effects of SO sub-dimensions on SC collaboration in term of three collaborative types.

Responding to this research gap, in this study, we focus on the effects of three SO sub-dimensions on three mutual information sharing, collaborative decision making, and mutual benefits sharing to take a closer look at the difference in the effects of SO dimensions on collaborative activities. The aim of the research is to answer the research questions: “how three dimensions of SO inter-related?” and “how those dimensions affect SC collaboration in term of information sharing, collaborative joint decision, and mutual benefits sharing?” By developing a comprehensive framework between social capital sub-dimensions and SC collaboration, we distinguish the effects of those three social capital dimensions on SC collaboration in term of information sharing, collaborative decision making, and risks and mutual benefits sharing, and explore the inter-relationship among three social capital dimensions.

II. LITERATURE REVIEW

A. SC collaboration

SC collaboration has been defined as the process of cooperation among firms to build close and long-term partnerships, where they integrate resources to meet customer needs better [12]. Some scholars describe SC collaboration as a mutually shared process where firms stake vision, obligation, risks and integrate resources to attain collective goals [25]. In this study, SC collaboration is considered as a partnership process in which independent firms participate in designing strategies and operating SC toward common goals and beneficial outcomes [5]. In order to get better understanding about SC collaboration, we investigate it through three dimensions: sharing information, joint decision, and risks and benefit sharing.

Sharing information: Previous studies indicate that information sharing can improve SC efficiency [20]. Thus, scholars have emphasized the position of knowledge and information in SC relationship. They indicate that SC partners can share relevant market information, accessibility of resources, the position of operation and innovation in an ap-

appropriate time through relational systems [29,26]. Information sharing about market environment, forecasting, planning, customers, and competitors can help firms to face with market and demand uncertainty [2].

Joint decision is demarcated as the process whereby suppliers and buyers cooperate to decide on SC planning and operation to optimize the profit [16,25].

Risks and benefits sharing is the progression of sharing expenses, hazards, and profits among SC members [20]. Sharing risk and benefits would motivate SC partners to engage in a relationship, and exhibit greater commitment and reciprocity among them [4].

B. Social capital and SC collaboration

Social capital plays a vital role in explaining the nature of cooperation between firms in the SC [3]. [30] describe social capital as valuable resources of firms which are resultant from the network of relationships. Strong social capital between firms can boost collaboration and improve the efficiency of SCs [19]. Social capital involves many facets such as context, network ties, value, and trusting relations. These aspects are represented by three SO sub-dimensions i.e.: structural capital (SSC), relational capital (RSC), and cognitive capital (CSC). Different nature and characteristics of these dimensions can create different effects on SC collaborative [29].

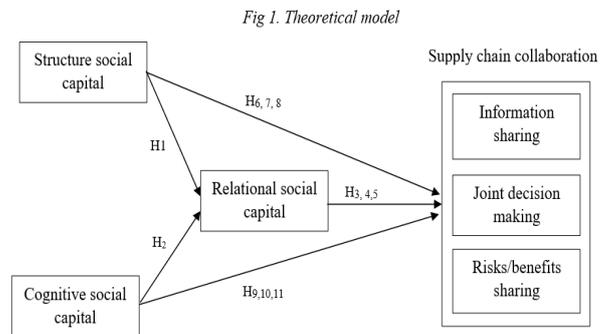
Structural capital mentions the community interactions among parties. It deals with the issue of who you work with and how you work with [30]. Structural capital often contains network configuration and network ties. Network configuration relates to the presence of systems created for one resolution while network ties relate to the strength of linkages and interactions among firms [1].

Rational capital discusses the value that is rooted through relationships [30]. It contains trust, alliance, admiration and reciprocity that are developed during the interactions process [22]. Trust is viewed as a main component of relational capital [27]. Friendship, respect, and reciprocity are built by frequent and repeated interaction and transactions in long-term [29].

Cognitive capital is described as common systems of meaning [27] It is manifested by shared representation, interpretations, and relates to shared common value, culture, goal, and objectives is a prerequisite to focus joint effort from both parties [27].

III. PROPOSED WORK

Literature shows that it is challenging to implement SC collaboration, due to the poor social interactions between the members [7,27]. That is why the authors stress on the social capital as a foundation for the successful supplier-buyer relationship. Other authors emphasize the importance of different social capital dimensions on information sharing [14,7], collaborative planning [16,17], suppliers' benefit [27,4]. In this paper, we combine all those studies and investigate how the three social capital dimensions affect sharing information, joint decision and risks and benefits sharing and propose the theoretical framework as follow:



Inter-relationship among different dimensions of social capital.

Previous studies indicates that social interaction can facilitate mutual trust and strengthen the linkage between firms [6]. Proper interactions between suppliers and buyers can facilitate mutual understanding and create trust and trustworthiness [18]. Also, through repeated interactions, supplier-buyer relationships become more concrete which rise the degree of relational capital between them [30,27]. Thus, the hypothesis is proposed:

H1: Structural capital has a positive association with relational capital in SC relationships.

When suppliers and buyers understand and share the same vision, goals and objectives, trust and friendship can be built [11]. It is because common goals and belief may bring and keep firms together, support the agreement in mutual benefits, and reduce opportunistic [29]. Previous studies also suggest that shared common goals and value can reduce misunderstanding and develop mutual trust among firms [6]. Cognitive social capital can be considered as the antecedent of relational capital between suppliers and buyers [6]. Based on the above arguments we propose the hypothesis:

H2: Cognitive capital has a positive association with relational capital in SC relationships.

Previous studies indicate that relational capital developed by the social interactions among partners can enable the exchange of knowledge, data, and useful resources [30]. Beside, it also can facilitate communicative efficiency which helps to improve knowledge sharing among partners and reduce the delinquent information asymmetry among SC members [28]. SC literature also indicates that relational social capital facilitates functional integration which is favorable for the process of cooperative decision making and problem-solving [6]. Also, relational capital alters decision process from self-centered individuals into municipal shareholders with mutual goals and objectives. When relational capital exists in the relationship, firms are less concerned that they are abused by their partners, which in turn facilitates the willingness to reciprocate investments [28]. Additionally, due to the ambiguity of transaction, a relationship without relational capital may lead to the unwillingness to share benefits and risks [1]. Therefore the belief of a firm in the good intentions and concern of its partners is an antecedent to mutual benefits and risk-taking. Accordingly, the following hypotheses are suggested:

H3: Relational-capital has a positive association with information sharing

H4: Relational-capital has a positive association with joint decision making

H5: Relational-capital has a positive association with risks/benefit sharing

Structural capital has been approached as network structural interactions and network ties. Numerous scholars indicate that social interaction facilitates mutual understanding and resource exchange [36,14]. Frequent interaction among firms can create opportunities for firms to learn from each other and create the positive collaborative exchange environment which can increase the willingness of SC members to joint decision making and create collaborative benefits [32,28]. Through communication, firms understand partners better, therefore, they do not feel disinclined to segment important information [13]. Moreover, Mu et al. (2008) suggests that strong network ties and network configurations can help firms reach consensus on decision making more easily. It also improves the willingness of firms to respond to the problem arising from the relationship [35], facilitates mutual understanding and SC integration, which, in turn, creates the consensus on deciding operational issues. In contrast, lack of structural capital often leads to the anxiety of inadequate distribution of finance and risks, therefore, hinders the collaborative and strategic activities among firms. Accordingly, the following hypotheses are suggested:

H6: Structure capital has a positive relationship with information sharing

H7: Structure capital has a positive association with joint decision making

H8: structure capital has a positive association with risks/benefit sharing

In the SC relationship, communal goals and objectives can force firms to act as one unit to share their information and useful resources. Cognitive social capital which is manifested by shared common goals and value is an applicable factor in amplification the flow of knowledge. It also enables the coordination between suppliers and buyers in exchanging their information and thinking. Moreover, in SC relationships, cognitive social capital can create trust, trustworthiness which reduces conflict and operating disagreement when determining operational issues [21]. It can create co-innovation between suppliers and buyers [27]. When a firm seeks collaboration, cognitive social capital related to common goals and objective can put partners in a more favorable light than others [22]. Therefore, cognitive social capital encourages firms to share profits, cost, and risk. Additionally, Lawson et al. (2008) also argue that when firms share goals and vision, they can work as one firm and integrate to reach the consensus on planning, joint problem-solving, mutual benefits and reduce opportunistic behaviors. Also, shared common goals and objective can reduce opportunism risk in dyadic relationships because it forces firms to behave more accurately [1]. Based on these arguments, we propose the following hypotheses:

H9: Cognitive capital has a positive association with information sharing

H10: Cognitive capital has a positive association with joint decision making

H11: Cognitive capital has a positive association with risks/benefit sharing

IV. METHODOLOGY AND RESULT

A. Measures

Based on literature review, we originate suitable measures for variables in our questionnaire. Three dimension of social

capital are measured by fifteen items collected from previous studies: Structural capital is restrained by five items adopted from Yim and Leem (2013) Nahapiet and Ghoshal (1998) which reflect the interaction among firms in a SC. Cognitive social capital is measured by five items and relational capital is measured by five items. All of the items for these two variables are extracted from [35]. The measurement of three dimensions of SC collaboration are extracted from research of Cao and Zhang (2011).

B. Pretesting and Sampling

Our study based on the data collected in Vietnam using questionnaire survey method. The target participants of our survey were supply chain managers and team leaders of companies. The questionnaire was floated online using mail. We contacted with Vietnam SC association to get the list of the companies. The list is of 395 suppliers in five sectors (real estate, manufacturing, food, beverage, and pharmaceuticals) located in Hanoi, Hai Phong, Quang Ninh and Bac Ninh province. After having contacted with the participants by phone to explain the purpose of the study, we asked for their cooperation to answer the questionnaire. After that, 388 questionnaires (7 representatives refused to take part in the survey) were sent out in the middle of July 2017. After two reminders, 249 participants sent back the questionnaire. The response rate is approximately 64,17%. The final sample size is 249.

C. Measurement Model

SPSS 20 and AMOS 20 were employed to analyze the data. To assess the measurement model, we conduct EFA analysis to screen the variable which has inappropriate commonalities and factor loadings. The result of smaller than 0.5 is accepted. To check the model fit and measurement-scales, we conducted CFA analysis. The results of CFA are presented in table 1.

Reliability is checked by the criterion of Cronbach's α which is larger than 0.7. From the results, two items of SC performance (SCP7 and SCP8) are omitted to enhance the reliability of this construct. The value for other constructs exceeds 0.7. The results (table 1) indicate that this methodology achieves solid reliability.

D. Hypotheses Testing

The model fit was accessed by multiple indices: GFI exceed 0.8, TLI, CFI surpass 0.9, RMSEA should be between 0.05 to 0.07. The results show that our model fit is satisfactory.

The hypotheses testing results are shown in table 2. As said by the results, both structural capital and cognitive capital are positively related to relational capital. The correlations of these relationships are 0.114 ($P < 0.005$) and 0.375 ($P < 0.01$) respectively. Thus, H1 and H2 are accepted. Structural capital and cognitive capital among SC members can lead to relational capital. This result confirms the inter-relationship between three SO sub-dimensions as indicated in previous studies [24,14,7].

The relationships between relational capital and information sharing, and joint decision, and risks/benefit sharing are confirmed with the correlation of 0.561 ($P < 0.001$), 0.876 ($P < 0.001$) and 0.695 ($P < 0.001$) respectively. Thus, H3, H4,

TABLE 1: MEASUREMENT ESTIMATES OF MAJOR CONSTRUCTS

	FL	Cronbach α	AVE	CR	MSV	ASV
Cognitive capital		0.881	0.683	0.895	0.384	0.160
CSC_2	0.855					
CSC_1	0.906					
CSC_3	0.832					
CSC_4	0.698					
Structure capital		0.877	0.589	0.876	0.102	0.065
SSC_2	0.780					
SSC_3	0.870					
SSC_5	0.815					
SSC_4	0.716					
SSC_1	0.634					
Relational capital		0.788	0.434	0.789	0.423	0.234
RSC_3	0.586					
RSC_1	0.750					
RSC_2	0.805					
RSC_5	0.526					
RSC_4	0.582					
Information sharing		0.848	0.510	0.838	0.423	0.200
IS_4	0.740					
IS_2	0.720					
IS_3	0.687					
IS_1	0.636					
IS_5	0.779					
Joint decision making		0.829	0.471	0.816	0.250	0.112
JD_3	0.701					
JD_2	0.723					
JD_4	0.709					
JD_1	0.666					
JD_5	0.630					
Risk/benefits sharing		0.844	0.555	0.858	0.123	0.049
RS_5	0.672					
RS_3	0.604					
RS_2	0.944					
RS_4	0.821					
RS_1	0.626					
Model fit	Chi-square	Chi-square/df	GFI	TLI	CFI	RMS EA
Model	593.54	4	1.696	0.864	0.924	0.934
						0.053

and H5 are accepted. This result indicates that relational capital exists in the relationship between suppliers and buyers, it brings firms together to share information and joint operational planning, decision making and reduce the risks of the relationships as well as facilitate investment and benefits sharing among partners. The results also indicate that structural capital has a positive association with information sharing and joint decision making with the correlations of 0.191 (P<0.001), 0.267 (P<0.005) respectively. Therefore, H6, H7 is supported. This result implies that structural capital related to social network ties and configuration can lead to mutually sharing information and collaborative decision making among partners. However, the result does not confirm the effect of the structural capital on risks/benefit sharing. The correlations are non-significant. Thus, H8 is not supported.

As shown in table 2, the correlation between cognitive social capital and information sharing is also significant (estimations of 0.313, P<0.01). Thus, H9 is supported. Cognitive social capital related to shared common value, culture, objectives, and goals positively affect information sharing between suppliers and buyers. Contrary to our expectation, the relationships between cognitive social capital and joint decision making and cognitive social capital and risks/benefit sharing are not confirmed. Thus, H10 and H11 are rejected. This result indicates that cognitive social capital does not facilitate firms to decide operational issues and other SC problems jointly. It does not lead to the pooling risk and benefit sharing among them.

TABLE 2 : HYPOTHESES DECISIONS

Hypotheses	Estimate	S.E.	C.R	P	Decision
Cognitive capital → Relational capital	.375	.056	6.743	***	supported
Structural capital → Relational capital	.114	.058	1.959	*	supported
Structural capital → Information sharing	.191	.074	2.580	***	supported
Structural capital → Joint decision making	.267	.086	3.090	*	supported
Structural capital → Risks and benefits sharing	.129	.088	1.464	Ns	Rejected
Cognitive capital → Information sharing	.313	.074	4.219	***	supported
Cognitive capital → Joint decision making	-.273	.081	-3.350	Ns	Rejected
Cognitive capital → Risks and benefits sharing	-.291	.082	-3.552	Ns	Rejected
Relational capital → Information sharing	.561	.131	4.268	***	supported
Relational capital → Joint decision making	.876	.174	5.024	***	supported
Relational capital → Risks and benefits sharing	.695	.197	3.521	***	Accepted

Note: * p <= 0.05; ** p <= 0.01; Ns=Non-significant

E. Test of Mediation

In order to check whether relational capital plays a mediating role in the relationships between the other facets of social capital and collaboration, we use SPSS and follow the instruction of Baron and Kenny (1986). The results shown in Table 3 demonstrate that there are partial mediations in the model. The results indicate that structural capital can lead to information sharing and joint decision making through relational capital and cognitive capital can also encourage information sharing through relational capital.

TABLE 3: MEDIATION TEST

Hypothesis	Direct effect	Indirect effect	Result
1) SSC->RSC->IS	.1854*	.2770***	Partial mediation
SSC->RSC->JD	.2135***	.2818***	Partial mediation
SSC->RSC->RS	.0699(ns)	.1261(ns)	No mediation
CSC->RSC->IS	0.3704***	0.4987***	Partial mediation
CSC->RSC->JD	-0.1070 (ns)	0.964 (ns)	No mediation
CSC->RSC->RS	-.1142(ns)	.0527(ns)	No mediation

Note: *= $P < 0.05$; ***= $P < 0.001$, ns= non-significant

V. CONCLUSION AND IMPLICATIONS

This study investigates the impact of SO on SC collaboration in a comprehensive framework. Base on the results, we found that structure and cognitive capital positively affect relational social capital. The frequent interaction, strong link and configuration and the similarity in the perception and interpretation of narratives among individual actor can help to build trust, friendships and mutual understanding among SC members [30]. Moreover, the results also reveal that dissimilar dimensions of social capital have dissimilar effects on collaborative activities such as sharing information, joint decision, and risks and benefit sharing.

A. Academic contributions

Our research provides some contributions to the area of SC management. Firstly, the outcomes provide a nuanced knowledge about the effect of SO on SC collaboration. This study is an insight into how structural, cognitive, and relational social capital affect sharing information, joint decision, and risks and benefits sharing. Second, this is the first study to combine three types of social capital and three sub-dimensions of SC collaboration into one framework. Earlier studies investigating the relationship between SO and SC collaboration often focus on knowledge and information sharing among firms and skip two other types of collaborative activities (joint decision and risks and benefits sharing, which play essential roles in the successful and effective SC collaboration). By focusing on SC collaboration in the implementation process, this study also provides a different approach in studying the role of SO on collaboration in SCs. Lastly, our study also provides empirical sign to support the literature on the inter-relationship between social capital dimensions. Furthermore, while investigating the inter-relationship of social capital dimensions, the results reveal the

mediating effect of relational capital on the relationships between the two other dimensions capital and collaboration. The findings of this study help broaden the understanding about the mechanism for building relational capital and achieving fruitful collaboration through social capital.

B. Managerial contributions

COVID-19 is a record and extraordinary event affecting the global SCs. This is truly a novel challenge for SC managers. Ensuring collaboration in the SC is a demanding concern. By study the relationship between SO and SC collaboration, our study gives some suggestions for the firms. First, by improving the level of interaction, network ties, trust, friendship, belief, and collaborative culture, both parties can collaborate more efficiently and therefore can improve the outcome of collaboration and avoid wasting time on pointless operational adjustments. More importantly, they can collaborate to operate SC management without worrying about opportunistic behaviors and the uncertainty of the relationship. SC collaboration based on the foundation of social capital can also reduce the reluctant of firms to share information and resources and make effort to provide quality goods and services to the customers. Besides, the distinguishing between three dimensions of social capital and collaboration can also help managers to realize the advantages of different collaborative activities and the mechanism to create that benefit. Managers need to understand that their business success is dependent on success of collaboration with SC partners, so that understanding and communicating effectively with partners can help firms to strengthen and endure the collaborative relationship.

Finally, the outcomes of our study recommend that policymakers should take actions to facilitate social capital among SC members. From the social capital standpoint, they can create some policies to improve the quality of SC relationships and create some motivations to inspire collaborative activities.

REFERENCES

- [1] Alghababsheh, M. & Galliar, D. J. J. O. B. E. 2021. Socially sustainable SC management and suppliers' social performance: The role of social capital. 173, 855-875.
- [2] Baah, C., Opoku Agyeman, D., Acquah, I. S. K., Agyabeng-Mensah, Y., Afum, E., Issau, K., Ofori, D. & Faibil, D. 2021. Effect of information sharing in SCs: understanding the roles of SC visibility, agility, collaboration on SC performance. Benchmarking: An International Journal, ahead-of-print.
- [3] Baron, R. M. & Kenny, D. A. 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of personality and social psychology, 51, 1173.
- [4] Blonska, A., Storey, C., Rozemeijer, F., Wetzels, M. & De Ruyter, K. 2013. Decomposing the effect of supplier development on relationship benefits: The role of relational capital. Industrial Marketing Management, 42, 1295-1306.
- [5] Cao, M. & Zhang, Q. 2011. SC collaboration: Impact on collaborative advantage and firm performance. Journal of Operations Management, 29, 163-180.
- [6] Carey, S., Lawson, B. & Krause, D. R. 2011. Social capital configuration, legal bonds and performance in buyer-supplier relationships. Journal of Operations Management, 29, 277-288.
- [7] Chang-Hun, L. & Byoung-Chun, H. 2018. The impact of buyer-supplier relationships' social capital on bi-directional information sharing in the SC. Journal of Business & Industrial Marketing, 33, 325-336.
- [8] Chin, W. W., Marcolin, B. L. & Newsted, P. R. 2003. A Partial Least Squares Latent Variable Modeling Approach for Measuring

- Interaction Effects: Results from a Monte Carlo Simulation Study and an Electronic-Mail Emotion/Adoption Study. *Information Systems Research*, 14, 189-217.
- [9] Colicchia, C., Creazza, A., Noè, C. & Strozzi, F. J. S. C. M. A. I. J. 2019. Information sharing in SCs: a review of risks and opportunities using the systematic literature network analysis (SLNA).
- [10] Corgnet, B., Espín, A. M., Hernán-González, R., Kujal, P. & Rassenti, S. 2016. To trust, or not to trust: Cognitive reflection in trust games. *Journal of Behavioral and Experimental Economics*, 64, 20-27.
- [11] Crescenzi, R., Nathan, M. & Rodríguez-Pose, A. 2016. Do inventors talk to strangers? On proximity and collaborative knowledge creation. *Research Policy*, 45, 177-194.
- [12] Do Canto, N. R., Bossle, M. B., Vieira, L. M. & De Barcellos, M. D. 2021. SC collaboration for sustainability: a qualitative investigation of food SCs in Brazil. *Management of Environmental Quality: An International Journal*, 32, 1210-1232.
- [13] Ha, B. C., Park, Y. K. & Cho, S. 2011. Suppliers' affective trust and trust in competency in buyers: Its effect on collaboration and logistics efficiency. *International Journal of Operations & Production Management*, 31, 56-77.
- [14] Handoko, I., Bresnen, M. & Nugroho, Y. 2018. Knowledge exchange and social capital in SCs. *International Journal of Operations & Production Management*, 38, 90-108.
- [15] Kumar, G. 2021. Collaboration between SC partners: when does it matter? Evidence from collaborative profiles. *Journal of Business & Industrial Marketing*, 36, 1042-1057.
- [16] Kumar, G., Banerjee, R. N., Meena, P. L. & Ganguly, K. K. 2017. Joint planning and problem solving roles in SC collaboration. *IIMB Management Review*, 29, 45-57.
- [17] Lang, T. & Ramirez, R. 2017. Building new social capital with scenario planning. *Technological Forecasting and Social Change*, 124, 51-65.
- [18] Lawson, B., Tyler, B. B. & Cousins, P. D. 2008. Antecedents and consequences of social capital on buyer performance improvement. *Journal of Operations Management*, 26, 446-460.
- [19] Li, Y., Ye, F. & Sheu, C. 2014. Social capital, information sharing and performance: Evidence from China. *International Journal of Operations & Production Management*, 34, 1440-1462.
- [20] Liao, S.-H., Hu, D.-C. & Ding, L.-W. 2017. Assessing the influence of SC collaboration value innovation, SC capability and competitive advantage in Taiwan's networking communication industry. *International Journal of Production Economics*, 191, 143-153.
- [21] Mai Anh, N. T., Hui, L. & Khoa, V. D. 2018. Emerging Economies of Southeast Asia: Achieving and increasing radical innovations through collaborating with buyers and suppliers by fostering trust: the Case of Viet Nam. *Journal of Business-to-Business Marketing*, 25, 357-372.
- [22] Morgan, R. & Hunt, S. 1994. The Commitment-Trust Theory of Relationship Marketing. *Journal of Marketing*.
- [23] Mu, J., Peng, G. & Love, E. 2008. Interfirm networks, social capital, and knowledge flow. *Journal of Knowledge Management*, 12, 86-100.
- [24] Nahapiet, J. & Ghoshal, S. 1998. Social Capital, Intellectual Capital, and the Organizational Advantage. *Academy of Management Review*, 23, 242-266.
- [25] Nguyen, M. A. T., Lei, H., Vu, K. D. & Le, P. B. 2019. The role of cognitive proximity on SC collaboration for radical and incremental innovation: a study of a transition economy. *Journal of Business & Industrial Marketing*, 34, 591-604.
- [26] Raweewan, M., Ferrell Jr, W. G. J. C. & Engineering, I. 2018. Information sharing in SC collaboration. 126, 269-281.
- [27] Sukoco, B. M., Hardi, H. & Qomariyah, A. 2018. Social capital, relational learning, and performance of suppliers. *Asia Pacific Journal of Marketing and Logistics*, 30, 417-437.
- [28] Thi Mai Anh, N. 2019. Relational capital and SC collaboration for radical and incremental innovation. *Asia Pacific Journal of Marketing and Logistics*, 31, 1076-1094.
- [29] Thi Mai Anh, N., Hui, L., Khoa Vu, D. & Mehmood, S. 2019. Relational capital and SC collaboration for radical and incremental innovation: An empirical study in China. *Asia Pacific Journal of Marketing and Logistics*, 31, 1076-1094.
- [30] Tsai, W. P. & Ghoshal, S. 1998. Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal*, 41, 464-476.
- [31] Villena, V. H., Revilla, E. & Choi, T. Y. 2011. The dark side of buyer-supplier relationships: A social capital perspective. *Journal of Operations Management*, 29, 561-576.
- [32] Wang, Y. 2016. Investigating dynamic capabilities of family businesses in China: a social capital perspective. *Journal of Small Business and Enterprise Development*, 23, 1057-1080.
- [33] Wu, L. & Chiu, M.-L. J. I. J. O. I. M. 2018. Examining SC collaboration with determinants and performance impact: Social capital, justice, and technology use perspectives. 39, 5-19.
- [34] Yang, z., Lin, y. J. S. P. & consumption 2020. The effects of SC collaboration on green innovation performance: An interpretive structural modeling analysis. 23, 1-10.
- [35] Yao, L., Yu, Z. & Songyue, Z. 2016. Social capital, portfolio management capability and exploratory innovation: evidence from China. *Journal of Business & Industrial Marketing*, 31, 794-807.
- [36] Yim, B. & Leem, B. 2013. The effect of the SC social capital. *Industrial Management & Data Systems*, 113, 324-349.

Creating Innovation in Hospitality Industry: The Role of Brand Supporting Behavior

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Abstract—Sustainable development cannot be separated from business ethics and innovation. This study proposes to test the antecedent variable for brand supporting behavior, and explore the mediating mechanism of this factor for the influence of corporate social responsibility (CSR) on employee work innovation. With 173 questionnaires collected, the hierarchical regression model is used to test the hypotheses. Discoveries have shown that CSR practices are fundamental to brand supporting behavior, and the important mediating role of brand supporting behavior in the influence of CSR on employee work innovation. Research results have shown the need to implement CSR in the hospitality industry, including issues of environmental protection and community support; on ensuring the interests of customers, as well as employees in the organization. Therefore, it is essential to create a community-oriented organizational climate that promotes employees' efforts in delivering on the brand promise. This is the basis for spreading the image and attractiveness of the organization's brand, and stimulating employee work innovation. Therefore, the research results are a reliable basis in making the right decisions of hotel managers, in order to create advantages as well as improve competitiveness, contributing to the recovery of the economy after the Covid-19 pandemic. The research results are also the theoretical basis for developing research models on innovation in the hospitality industry.

Index Terms—Brand supporting behavior, CSR, Employee Work Innovation, Hospitality Industry.

I. INTRODUCTION

TODAY, the businesses want to create a competitive advantage and develop sustainably, internal businesses must be stable, including ownership of creative and innovative human resources. This is a key resource for businesses to provide products that satisfy consumers' needs. Especially in tourism service, the more customers have choices, the less they feel unsatisfied [1]. That puts pressure on businesses to provide services that satisfy customers' needs. Therefore, the organization needs members who are motivated to work actively, form positive attitudes and behaviors in the process of providing services. That is the foundation for employees to feel more excited when constantly learning skills and overcoming challenges at work.

The customers always care about the service's characteristics (uniqueness and difference). Therefore, employee work innovation in theory and practice is vital. It improves competitiveness, efficiency, quality, productivity and brand of the business [2]. In hospitality, the employees need more flexibility, creativity and skills for improving competitiveness and increasing customer's satisfaction [3]. Therefore, this is an extremely vital problem for human resources management to

build a team who are brave, dynamic, competent and creative to be able to identify, understand, analyze and respond to customer needs as quickly as possible [4]. In addition, customers have the right to demand that businesses act in accordance with prevailing social values, norms and expectations. They will turn away from the company's products with no social responsibility such as: environmental destruction, tax evasion, insecurity, objectionable brand images, discriminatory messages, use of child labor. This is an important factor for the formation and spread of corporate responsibility to employees, responsibility to society, responsibility to the environment, to the community and stakeholders. That is CSR, which is considered as the foundation to help businesses develop sustainably.

There have been studies on the benefits of CSR activities for businesses as well as on the role of service staff in creating a brand image for the organization (for example, [5, 6]). However, in the hospitality industry, whether CSR affects employee attitudes and behaviors has not been considered, nor is there an answer on how to get employees to act positively, and consistent with the brand promise [7]. Furthermore, research on the role of CSR in increasing employee attitudes and behaviors is a relatively new topic in Vietnam.

The expectation of this study can create practical application meanings to promote creativity and innovation of employees, thereby improving the competitiveness of the hospitality industry, and enhancing the organizational brand value. And according to the authors' research, the theoretical model of CSR, brand supporting behavior and job employee work innovation in the Vietnam hospitality industry is very few.

II. RESEARCH FRAMEWORK AND HYPOTHESES

A. Employee work innovation

Innovation has been defined by different authors, but all emphasize "novelty" as the core of innovation. It is a process with many stages. Scott & Bruce (1994) define work innovation as activities such as identifying problems, thereby forming new and useful ideas or solutions. Next is the preparation of resources and implementation plan, and finally the application of ideas in practice. In terms of employees, work innovation is their active behavior in the process of forming creative ideas, developing and realizing new services, products, or methods, in order to get practical benefits [8] - [11]. Thus, through employee work innovation, businesses will accelerate the process of creating new products and services [9]. Especially in the hospitality industry, employee work innova-

tion is the result of interactions between service staff and consumers during service delivery. In this study, the author focuses on considering the employee work innovation as multi-stage process [10].

Thus, it can be said that employee work innovation reflects their ability and problem-solving capacity. Employee work innovation has brought the organization positive consequences such as: increasing competitive advantage [10] - [12], promoting cooperation among members of the organization [13]. And so, employee work innovation not only improves work efficiency but also helps them reduce stress and pressure at work. It is also a motivation to help employees improve their knowledge, professional skills, and develop themselves [13].

B. Brand supporting behavior, and the relationship with employee work innovation

Brands are formed through the organization's service delivery and assurance process. In which, the conveying of the brand, through the brand supporting behavior, is the most important [14]. In the process of conveying the brand identity into the customer's mind, the attitude and behavior of employees is a key determinant. According to Burmann and Zeplin (2005), brand supporting behavior is "an aggregate construct which describes a number of generic employee behaviors that enhance the brand identity" [15, p. 282].

In the process of providing services, service staff are considered as a bridge to provide information to customers. And they are seen by customers as brand transmitters or brand ambassadors. Therefore, besides understanding the brand stands for, service staff need to take action to protect and develop the brand. Including actions that build brands as well as deliver on brand promises. In other words, it's brand supporting behavior [16, 17].

In the hospitality industry, brand supporting behavior is indispensable because it is the basis for customers to evaluate the service quality of accommodation, helping to spread the brand image in the community and increasing brand value [18]. And so, brand supporting behavior has a positive effect on the organizational brand, and is the foundation for improving the work efficiency of employees [19, 20]. Therefore, the first hypothesis is proposed:

H1: Brand supporting behavior directly and positively affects employee work innovation.

C. CSR and the relationship with brand supporting behavior

CSR is a relatively new topic in hotel management research, and is also relatively under-reviewed in this field [21]. In the tourism business, Inoue and Lee (2011) said that CSR is reflected in the following activities: Employee relations, customer relations, community relations, environmental policy, diversity in recruitment, use of human resources, and in cooperation with suppliers [22].

According to ISO 26000:2010, CSR is an organization's responsibility to society and the environment through transparent and ethical behavior [23]. Thereby contributing to sustainable development, including health and social welfare; Pay attention to the expectations and expectations of stakeholders; Comply with applicable laws and in accordance with international standards of conduct; and is maintained

throughout the organization. ISO 26000:2010 also provides guidance on seven key topics: organizational governance; human rights; labor policy; equal; consumer issues; community participation and development, and the environment.

When CSR is seen as representing the values and norms of the enterprise, it will increase the employee psychological confidence about the organization [24], will create supportive attitudes and behaviors of employees, helping to achieve the goals of the enterprise [25, 26]. Research on organizational behavior has also demonstrated that employees not only react to the way the organization treats them, but also to the way the organization treats third parties [27].

In the tourism business, CSR is recognized as a factor creating profitability (short-term and long-term) for tourism businesses [22], so it is difficult to imagine an international company without CSR policies [28]. Moreover, organizational CSR creates a better working and organizational climate for employees. Thereby forming a positive attitude, voluntary spirit as well as their efforts to successfully exceed the expectations of the organization [29]. On that basis, the next hypothesis is proposed:

H2: CSR directly and positively affects brand supporting behavior.

D. Brand supporting behavior play a mediating role

Park's (2020) research also shows that when employees perceive CSR, they will put more effort in their work, will be proud of their work, and will have work engagement, thereby forming innovative behavior [30]. According to the work characteristics theory of Oldham and Hackman (2010), these perceptions are considered as positive psychological states, so it positively affects the employee's work efficiency [31].

When firms implement CSR, it shows their respect for the sustainability of the community, creating a quality relationship of trust between members of the organization, which later translates into innovation. Furthermore, the Social exchange theory has suggested that, when employees perceive the organizations initiated the voluntary social exchange nature actions for their employees, then they respond, including efforts to complete work, and actions for the reputation of the organization [32]. In other words, it is about raising employees' awareness of their role and responsibility for the success of the organization's brand and their efforts to deliver on the brand promise.

And so, brand supporting behavior is the mediator in the relationship between CSR and innovation. From the above theoretical basis, the third hypothesis is proposed:

H3: Brand supporting behavior mediates the relationship between CSR and employee work innovation.

Based on theoretical foundations, a theoretical research model is proposed and presented in Figure 1.

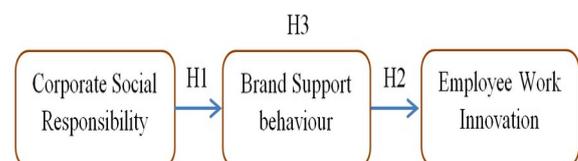


Fig. 1: Theoretical research model

III. RESEARCH METHODOLOGY

The design of the study is considered as the causality category test. The research has two steps, including: preliminary (qualitative) and formal (quantitative) studies. Firstly, the author has looked for relevant documents. After that, according to experts' advice in Khanh Hoa province, we designed the appropriate questionnaires with calibrated scales. Experts are directors or deputy directors of hotels (resorts), and also lecturers of tourism training institutions.

This study uses questionnaires to collect data, test the hypothesis as well as evaluate the theoretical research model. The first is a quantitative preliminary study conducted with 30 questionnaires. The results show a good fit between the content and the concepts. Then came the formal study, with 173 questionnaires. The sample is convenience, collected from January to February, 2021.

In quantitative research, it is appropriate to inherit previously tested scales. Scales brand supporting behavior and employee work innovation are unidirectional scales. Specifically, the brand support behavior scale is inherited from Punjaisri et al. (2009), including four items related to meeting brand standards, supporting brand development, fulfilling brand promises, handling customers' requests [6]. The six items of the employee work innovation scale are inherited from Scott and Bruce (1994), such as, searches out new ideas, generates ideas, promotes and champions ideas, implementation of new ideas, innovation [10]. The CSR scale is a multi-pronged scale with eighteen items showing the organization's responsibility to (i) employees, including training and development, working environment, fairness, and personal interests [33, 34, 35], (ii) customers, including information about products and product quality, and respect for customers [35, 36, 37], (iii) community, including respecting the community's values, improving the quality of life, and charitable activities [33, 34, 35, 37, 38], (iv) environment, including environmental protection, energy saving, and minimizing negative impacts on the environment [35]. The items are rated on a five-point Likert scale. The software SPSS 18.0 was used for supporting.

The analysis was performed in two stages. First, evaluate the scales through Cronbach's alpha values, EFA and CFA. Second, the hierarchical regression method is used.

IV. RESULTS AND DISCUSSIONS

A. Results

1) Describe the research sample

The survey sample partly reflects the current situation of tourism human resources in Khanh Hoa province. Female employees are more than male (101 female, accounting for 58.38%; 78 male/41.62%). Including 9 people as leaders of departments (5.20%), 25 people as managers (14.45%), and 139 employees (80.35%). Most of them are experienced workers working for 3 to 8 years (128 employees/73.99%), even more than 8 years (10.40%). Only a few have less than 2 years of work experience (14.45%).

2) Reliabilities and Correlation coefficients

In this step, twenty-eight questions are used to conduct exploratory factor analysis. Processing has removed seven items (of CSR scale) because the weight difference factor

< .3. Furthermore, removing these items does not change the content of the concepts. As a result, twenty-one questions were reduced into five components with a total variance explained of 70.28% (KMO = .883; Chi-square = 2065.084; df = 2105; sig = .000), load factor values from .60 to .86. The CSR scale has only three components. Reliability and correlation between research concepts (Table 1): Employee work innovation, brand supporting behavior and CSR were shown as well as control variables including employee work experience, star rating of accommodation. The results of the correlation between the concepts support the hypothesis H1 and H2. Specifically, the correlation coefficients indicated a significant relationship between CSR and brand supporting behavior ($r = .540, p < .01$) and the relationship between brand supporting behavior and employee work innovation ($r = .449, p < .01$). Both coefficients were relevant with the hypotheses.

TABLE 1: DESCRIPTIVE STATISTICS AND CORRELATION BETWEEN RESEARCH CONCEPTS

No	Concepts	Mean	S.D	1	2	3	4	5
1	SR	4.73	.45					
2	WE	10.49	.50	.132				
3	CSR	3.87	.72	-.079	-.068	.718		
4	BSB	4.02	.67	.010	.029	.540**	.858	
5	EWI	3.84	.62	.127	.027**	.338**	.449**	.851

**p < .01; reliabilities appear on the diagonal.

WE: employee work experience; SR: star rating of accommodation; BSB: Brand supporting behavior; EW: Employee work innovation.

3) Evaluating the hypothesis

For evaluating the hypothesis in the research model, the author used hierarchical linear modeling suggested by Bryk and Raudenbush [39]. The result of evaluation showed that CSR directly and positively affects brand supporting behavior (Table 2) and contributed significantly into explanation the change of dependent variables ($R^2 = .298, \Delta R^2 = .285$).

TABLE 2: LINEAR REGRESSION FOR BRAND SUPPORTING BEHAVIOR

Concepts	Model 1	Model 2
WE	.028	.060
SR	.006	.045
CSR		.547***
R ²	.001	.298
ΔR^2		.285

Dependent variables: BSB; ***: p < .001.

WE: employee work experience; SR: star rating of accommodation; BSB: Brand supporting behavior; EW: Employee work innovation.

For model 2 (Table 2), the regression results reflected that when the CSR (independent variable) was regressed to brand supporting behavior (intermediate variable) together with the controlled variables (Working time, hotel star), the regression coefficient was considered to be significant for the relationship between these two factors ($\beta = .547; p < .001, R^2 = .298, \Delta R^2 = .285$). So hypothesis H1 was supported.

For hypothesis H2, the analysis results were presented in Model 2 (Table3).

The regression results of Model 2 (Table 3) reflected that when brand supporting behavior (mediating variable) was re-

TABLE 3: LINEAR REGRESSION FOR EMPLOYEE WORK INNOVATION

Concepts	Model 1	Model 2
WT	.193	.181
SR	.102	.099
BSB		.443***
R ²	.053	.249
ΔR ²		.235

Dependent variables: EWI; ***: $p < .001$.

WE: employee work experience; SR: star rating of accommodation; BSB: Brand supporting behavior; EWI: Employee work innovation.

gressed on the employee work innovation (dependent variable), the regression coefficient was seen to be significant ($\beta = .443$; $p < .001$, $R^2 = .249$; $\Delta R^2 = .235$). This result supported the second hypothesis (H2). The third hypothesis (H3) stated that brand supporting behavior plays a mediating role for the relationship between CSR and employee work innovation. Research used the mediation test of Baron and Kenny (1986) has required:

(i) The independent variables (CSR) were considered as premise variables for the intermediate variable (BSB) and predictor variables for the dependent variable (EWI).

(ii) The intermediate variable was the premise variable for the dependent variable.

(iii) The relationship between the independent variable and the dependent variable should decrease when the mediation variable is controlled.

The results of the regression analysis show that CSR was a significantly predicted factor to EWI, $\beta = .373$; $p < .001$ (see Model 2 - Table 4), also effected on BSB (corresponds to the hypothesis H1).

TABLE 4: LINEAR REGRESSION FOR BSB RAND EWI

Concepts	Model 1	Model 2	Model 3
WE	.193	.215**	.194***
SR	.102	.128	.113
CSR		.373***	.186***
BSB			.342***
R ²	.053	.191	.273
ΔR ²		.176	.255

Dependent variables: EWI; ***: $p < .001$; **: $p < .01$.

WE: employee work experience; SR: star rating of accommodation; BSB: Brand supporting behavior; EWI: Employee work innovation.

Next, the results (see Model 3 - Table 4) also showed that BSB positively affects EWI ($\beta = .342$, $p < .001$). Finally, the results showed that the degree of influence of CSR on EWI has been significantly reduced, after the intermediate variable joined the test (with $\beta = .186$; $p < .001$). This proves that employees who perceive their organization's CSR practices, act for the organization's brand, thereby employee work innovation will be increased too. So, hypothesis H3 was supported.

B. Discussion

This study is an attempt to examine the effects of CSR on brand supporting behavior and work innovation in Khanh

Hoang hospitality industry. Research has focused on individual psychological processes ranging from the perception of organizational responsible actions (towards the community, environment, employees, customers) to a positive psychological state, as reflected by employees' efforts in delivering on the organization's brand promise. That leads to employee work innovation. And so, CSR helps employees form positive behavior at work. This result supports the study of Yu and Choi [40].

With the analyzed data, the research results have shown the important role of CSR practices in the Vietnam hospitality industry, especially in the context of the Covid-19 pandemic. Specifically, through CSR activities, employees will gradually form positive attitudes and behaviors at work, promote personal development, and lead to innovative behavior. This finding supports previous studies, which showed the role of brand supporting behavior in positively affecting the brand in the hospitality industry [18].

With the results obtained, this study has helped to discover more about employee work innovation. The development of the hospitality industry goes hand in hand with the conservation of tourism resources. However, the limited availability of resources has also put great pressure on businesses. And employee work innovation helps the organization to make effective use of those resources. Therefore, employee work innovation plays a vital role in the business environment of the hotel industry.

Our study showed that brand supporting behavior seemed an vital mediating factor in increasing employee work innovation. Moreover, the result of analysis about mediating mechanisms has taken aware of the understanding of workers' positive motivation and development in increasing employee work innovation. Besides that, this study provided overview sight and evidence for supporting the point that brand supporting behavior is an vital self-regulation mechanism, which came from individual's mind, and helped them not only get the job done, but also deliver on the organizational brand promise.

Furthermore, this study has practical implications for managers. When employees perceive the actual activities of enterprises about CSR, they will put more effort in their work and act in accordance with the brand promise to customers. Thereby creating motivation for them to innovate at work. If workers have a positive motivation, they will gain more effort and work innovation will be increased. On the other hand, if organizations pay more attention to the employees' mental health, they will get more energy to learn knowledge, skills and employee work innovation will be increased, too. This is a reliable basis to help businesses build and choose appropriate strategies in each stage of development.

V. CONCLUSION

Innovation is an indispensable activity in the development strategy of every organization. Our study was conducted to explore the relationship between CSR, brand supporting behavior and employee work innovation. The results show the positive effects of CSR in developing a positive psychological state of employees, trying to fulfill the organizational

brand promise. From there, it will stimulate discovery, creativity and innovation in their work.

Organizational behavior is a fairly large category, and so each study will have certain contributions. Our findings point to the important mediating role of brand supporting behavior in increasing employee work innovation. This discovery helps managers better understand the conditions affecting innovation, problem solving, stimulating creative ideas and innovative behavior of employees.

Moreover, the research results confirm the role of CSR practice not only as “the right thing to do” but also as “the smart thing to do” [41, p.60]. Thus, practicing CSR is considered a smart solution in the strategy of spreading the image and increasing the brand value of the organization, creating a competitive advantage, contributing to the sustainable development [42, 43]. The efforts of the service staff to meet the diverse customer’s needs create working pressure for them, leading to stress, exhaustion and rest [44]. Therefore, employees need to balance their workplace morale, in order to provide consumers with the best possible service. Participating in volunteer activities is one of the solutions to help them achieve that.

In conclusion, the study contributed to understanding better about the link between CSR, brand supporting behavior and employee work innovation, especially the employee who worked in the hospitality industry. Today, the workforce is not only concerned with job satisfaction, but also the work environment that can get them more positive motivation to learn and promote them better day by day. So on, this study proposed some suggestion:

- The study results explore the important regulatory mechanism of brand supporting behavior in the process of promoting innovation. Therefore, accommodations need to focus on managing human resources, particularly the function of training and developing human resources. From there, it is possible to create an environment that helps employees have a positive psychological state and strive to fulfill the organizational brand promise. Specifically, accommodations need to organize training activities and share experiences to help staff promote their strengths and confidently deal with all difficult situations.

- Besides brand supporting behavior, employee work innovation is also the result of CSR practices. Therefore, hotels and resorts need to focus on volunteering activities for the environment, community, customers and employees. More importantly, creating an organizational culture that shares employee knowledge and learning opportunities. Thereby improving the quality of relationships among members of the organization. It is the foundation to help employees work harder and thrive at work.

However, limitations of study still existed. Firstly, the research samples were collected from participants in the hospitality industry in Khanh Hoa province. Therefore, the findings of this study cannot give an overview for all. Secondly, we used a cross-sectional study method. It limited our ability to test causality or duality of relationships. Thirdly, the specific impact of each component in multi-pronged concepts has not been evaluated. Finally, the variety of concepts, and correlations in the study was still limited. These limitations will be the suggestions for further studies.

REFERENCES

- [1] C. Prahalad and V. Ramaswamy, “Co-creating unique value with customers”, *Strategy and Leadership Strategy and Leadership*, vol. 32, no. 3, pp. 4-9, 2004.
- [2] M. Vilanova, J.M. Lozano and D. Arenas, “Exploring the nature of the relationship between CSR and competitiveness”, *Journal of Business Ethics*, vol. 87, pp. 57-69, 2009.
- [3] K. Ayupp and T. Chung, “Empowerment: Hotel employees’ perspective”, *Journal of Industrial Engineering and Management*, vol. 3, no. 3, pp. 561-575, 2010.
- [4] R. Stock and W. Hoyer, “An attitude behavior model of salespeople’s customer orientation”, *Journal of the Academy of Marketing Science*, vol. 33, no. 4, pp. 536-552, 2005.
- [5] K. Punjaisri, H. Evanschitzky and A. Wilson, “Internal branding: an enabler of employees’ brand-supporting behaviors”, *Journal of Service Management*, vol. 20, no. 2, pp. 209-226, 2009.
- [6] K. Punjaisri, A. Wilson and H. Evanschitzky, “Internal branding to influence employees’ brand promise delivery: a case study in Thailand”, *Journal of Service Management*, vol. 20, no. 5, pp. 561-579, 2009.
- [7] F. M. Morhart, W. Herzog and T. Tomczak, “Brand-specific leadership: turning employees into brand champions”, *Journal of Marketing*, vol. 73, no. 5, pp. 122-142, 2009.
- [8] A. Carmeli and G. Spreitzer, “Trust, connectivity, and thriving: Implications for innovative behaviors at work”, *The Journal of Creative Behavior*, vol. 43, no. 3, pp. 169-191, 2009.
- [9] O. Janssen, “Job demands, perceptions of effort-reward fairness and innovative work behaviour”, *Journal of Occupational and Organizational Psychology*, vol. 73, no. 3, pp. 287-302, 2000.
- [10] S. G. Scott and R.A. Bruce, “Determinants of innovative behaviour: a path model of individual innovation in the workplace”, *Academy of Management Journal*, vol. 37, no. 3, pp. 580-607, 1994.
- [11] F. Yuan and R. Woodman, “Innovative behavior in the workplace: The role of performance and image outcome expectations”, *Academy of Management Journal*, vol. 53, no. 2, pp. 323-342, 2010.
- [12] O. Janssen, E. Van de Vliert and M. West, “The bright and dark sides of individual and group innovation: A special issue introduction”, *Journal of Organizational Behavior*, vol. 25, pp. 129-145, 2004.
- [13] M. West and N. Anderson, “Innovation in top management teams”, *Journal of Applied Psychology*, vol. 81, no. 6, pp. 680-93, 1996.
- [14] B. Machtiger, “Beware pitfalls that kill branding efforts”, *Marketing News*, vol. 38, no. 4, pp. 21-22, 2004.
- [15] C. Burmann and S. Zeplin, “Building brand commitment: A behavioral approach to internal brand management”, *Journal of Brand Management*, vol. 12, no. 4, pp. 279-300, 2005.
- [16] K. Punjaisri, A. Wilson and H. Evanschitzky, “Exploring the influences of internal branding on employees’ brand promise delivery: Implications for strengthening the customer-brand relationships” *Journal of Relationship Marketing*, vol. 7, no. 4, pp. 407-424, 2008.
- [17] C. King, “One size doesn’t fit all: Tourism and hospitality employees’ response to internal brand management”, *International Journal of Contemporary Hospitality Management*, vol. 22, no. 4, pp. 517-534, 2010.
- [18] C. Burmann, S. Zeplin and N. Riley, “Key determinants of internal brand management success: an exploratory empirical analysis”, *Journal of Brand Management*, vol. 16, no. 4, pp. 264-284, 2009.
- [19] T.L. Baker, A. Rapp, T. Meyer and R. Mullins, “The role of brand communications on front line service employee beliefs, behaviors, and performance”, *Journal of Academy of Marketing Science*, vol. 42, pp. 642-657, 2014.
- [20] K. Thomson, L. deChernatony, L. Arganbright and S. Khan, “The buy-in benchmark: How staff understanding and commitment impact brand and business performance”, *Journal of Marketing Management*, vol. 15, pp. 819-835, 1999.
- [21] J.L. Holcomb, R.S. Upchurch and F. Okumus, “Corporate Social Responsibility: What are the top hotel companies reporting? ”, *International Journal of Contemporary Hospitality Management*, vol. 19, no. 6, pp. 461-475, 2007.
- [22] Y. Inoue and S. Lee, “Effects of different dimensions of corporate social responsibility on corporate financial performance in tourism-related industries”, *Tourism Management*, vol. 32, pp. 790-804, 2011.
- [23] ISO 26000:2010, link: <http://www.iso.org>
- [24] M. Santhosh and R. Baral, “A Conceptual Framework for Exploring the Impacts of Corporate Social Responsibility on Employee Attitudes and Behaviour”, *Journal of Human Values*, vol. 21, no. 2, pp. 127-136, 2015.
- [25] C. Bartel, “Social comparisons in boundary-spanning work: effects of community outreach on members’ organizational identity and

- identification”, *Administrative Science Quarterly*, vol. 46, no. 3, pp. 379-413, 2001.
- [26] H. L. Kim, Y. Rhou, M. Uysal and N. Kwon, “An examination of the links between corporate social responsibility (CSR) and its internal consequences”, *International Journal of Hospitality Management*, vol. 61, pp. 26-34, 2017.
- [27] R. Cropanzano, Z.S. Byrne, D.R. Bobocel and D.E. Rupp, “Moral virtues, fairness heuristics, social entities, and other denizens of organizational justice”, *Journal of Vocational Behavior*, vol. 58, pp. 164-209, 2001.
- [28] V. Cherapanukorn and K. Focken, “Corporate Social Responsibility (CSR) and Sustainability in Asian Luxury Hotels: Policies, Practices and Standards”, *Asian Social Science*, vol. 10, no. 8, pp. 198-209, 2014.
- [29] M.T. Azim, “Corporate Social Responsibility and employee behavior: mediating role of organizational commitment”, *Review of Business Management*, vol. 18, no. 60, pp. 207-225, 2016.
- [30] K. O. Park, “How CSV and CSR Affect Organizational Performance: A Productive Behavior Perspective”, *International Journal of Environmental Research and Public Health*, vol. 17, pp.2556, 2020.
- [31] G. Oldham and J. Hackman, “Not what it was and not what it will: The future of job design research”, *Journal of Organizational Behavior*, vol. 31, pp. 463-479, 2010.
- [32] K. T. Blau, “LMX-citizenship behavior relationship: justice as a mediator”, *Leadership & Organization Development Journal*, vol. 27, no. 2, p. 106-117, 2006.
- [33] S. E. Levy and S.Y. Park, “An analysis of CSR activities in the lodging industry”, *Journal of Hospitality and Tourism management*, vol. 18, pp. 147-154, 2011.
- [34] P. Martinez, A. Perez and I.R. Bosque, “CSR influence on hotel brand image and loyalty”, *Academia Revista Latinoamericana de Administration*, vol. 27, no. 2, pp. 267-283, 2014.
- [35] S. Y. Park and S. E. Levy, “Corporate social responsibility: perspectives of hotel frontline employees”, *International Journal of Contemporary Hospitality Management*, vol. 26, no. 3, pp. 332-348, 2014.
- [36] M. Fatma, Z. Rahman and I. Khan, “Multi-item stakeholder based scale to measure CSR in the banking industry”, *International Strategic Management Review*, vol. 2, no. 1, pp. 9-20, 2014.
- [37] D. Turker, “Measuring Corporate Social Responsibility: A Scale Development Study Duygu Turker”, *Journal of Business Ethics*, vol. 85, pp. 411-427, 2009.
- [38] C.A. Benavides-Velasco, C. Quintana-García and M. Marchante-Lara, “Total quality management, corporate social responsibility and performance in the hotel industry”, *International Journal of Hospitality Management*, vol. 41, pp. 77-87, 2014.
- [39] A. S. Bryk and S.W. Raudenbush, “Hierarchical linear models: Applications and data analysis. Methods”, Newbury Park, CA: Sage, 1992.
- [39] H. R. Kim, M. Lee, H. T. Lee and N. M. Kim, “Corporate social responsibility and employee-Company Identification”, *Journal of Business Ethics*, vol. 95, no. 4, pp. 557-569, 2010.
- [40] Y. Yu and Y. Choi, “Corporate social responsibility and firm performance through the mediating effect of organizational trust in Chinese firms”, *Chinese Management Studies*, vol. 8, no. 4, pp. 577-592, 2014.
- [41] N. C. Smith, “Corporate social responsibility: whether or how?”, *California Management Review*, vol. 45, no. 4, pp. 52-76, 2003.
- [42] P. S. Bronn and A.B. Vrioni, “Corporate social responsibility and cause-related marketing: an overview”, *International Journal of Advertising*, vol. 20, pp. 207-222, 2001.
- [43] J. M. S Filho, L.S.O. Wanderley, C.P. Goimez and F. Farache, “Strategic corporate social responsibility management for competitive advantage”, *Brazilian Administration Review*, vol. 7, no. 3, pp. 294-309, 2010.
- [44] D. V. Pavesic and R. A. Brymer, “Job satisfaction: what’s happening to the young manager?”, *Cornell Hotel and Restaurant Administration Quarterly*, vol. 30, no. 4, pp. 90-96, 1990.

The determinants of the business performance of commercial banks: A case study of Vietnam

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Abstract—The paper studies the factors affecting the business performance of commercial banks (2008 – 2018), based on the examination of bank characteristics according to the information on the financial statements of 24 commercial banks and macroeconomic factors. Our findings provide evidence on the significant influence of the factors of diversity on income structure, cost management and capital structure on the business performance of commercial banks. Some implications and future research directions are thereby proposed.

Index Terms—Capital structure, performance, diversity, bank.

I. INTRODUCTION

BUSINESS performance is always a topic that receives the attention of researchers and managers. With different approaches, a vast body of literature has been put together to study the factors affecting business performance, thereby providing policy implications for business activities. However, due to the specificity of the field of operation, commercial banks are more easily affected by the problem of asymmetric information, adverse selection and moral hazard. Besides, the impact of macroeconomic factors is also considered to have more influence on the business activities of commercial banks than non-financial enterprises, given that other factors remain unchanged.

Therefore, although bank activities also aim at adding value for shareholders, including profitability goals similar to non-financial enterprises, the factors impacting the performance can be significantly different from those of non-financial firms. On the basis of these arguments, there are also many studies that have examined the factors affecting the business performance of commercial banks [4], [2], [13], [6]. However, existing research focuses mainly on countries with developed economies rather than countries with transitional economic contexts such as Vietnam. In addition, existing studies have not reached a high consensus on the influencing factors as well as the degree of influence of each factor on the business performance of commercial banks. Based on these considerations, the question arises in the context of Vietnamese enterprises, about how internal factors and macroeconomic factors affect the business performance of banks, as the information needing examination in order to enrich the knowledge on this issue is still quite scarce in Vietnam. The study also provides some implications for banking business management.

II. LITERATURE REVIEW AND HYPOTHESES

Capital structure: Most of the profits that banks obtain are mainly from credit activities through the "borrowing to lend" function of commercial banks, although commercial banks must comply with regulations on legal capital to be able to operate. The equity component of commercial banks, therefore, is generally very large, compared to other non-financial enterprises. However, capital mobilized from deposit is the main source of raw materials for banks to use lending to earn profits. Therefore, when examining the model of factors affecting business performance of banks, the indicator of structure is a factor used consistently in the most existing research [5], [4], [15]. In Vietnam, over 70% of commercial banks' income comes from credit activities, and in some others, this rate is up to 90%. Therefore, we hypothesize that capital structure has a positive effect on the financial performance of commercial banks.

Credit risk: Credit risk is one of the types of risks banks face that directly impact a bank's profitability. Although the study of Rasiah [16] suggested that it did not find empirical evidence on the impact of credit risk on bank performance, most studies support the view that changes in credit risk lead to changes in bank profitability [16]. Credit risk includes default risk and risk from unexpected events. When these adverse events occur (in whole or in part), they all cause partial or complete loss of principal or interest. As a result, the bank's profit will decline due to the increase in provisioning costs for each group of overdue debts and provision for handling when losses actually occur. For this reason, we expect the relationship between credit risk and profitability of commercial banks to be negative.

Liquidity risk: Liquidity risk is considered an intrinsic factor of the bank, where the bank might not be able to fulfill its payment obligation when it is due or be forced to pay high costs to fulfill the obligation in that case. This situation occurs when the bank is in a state of not being able to raise enough cash to support qualified loans as well as meet customers' centralized withdrawal needs at a certain time. The liquidity is measured through the ratio of outstanding credit to total deposits of the bank [3], [13]. The relationship between liquidity risk and profitability remains unclear. While some viewpoints support the opposite view, that the higher the liquid /deposit ratio, the lower the profit, with the argument that to re-establish the liquidity balance, the bank's

costs will be higher, thus reducing profits. Our study also agrees with this view based on the argument that liquidity risk is an internal problem. Commercial banks will not be able to mobilize large deposits if they face liquidity risk, and credit size depends on deposit size. Therefore, we expect this relationship to be negative.

Cost management: Business activities in general and financial institutions in particular, costs are a component that is directly related to profitability. Effective cost management will bring higher profitability and vice versa. Empirical studies consistently support a positive relationship between these two factors [6]. Therefore, we hypothesize a negative relationship between cost ratio and the profitability of commercial banks.

Diversification: Some studies [9], [8] provide evidence of a negative relationship between non-interest income sources in the bank's income structure and profitability. However, it can be seen in theory that revenue from many different sources will bring the ability to improve profits by diversifying the business portfolio, while creating sustainability in the long term. Explaining this problem, it can be seen that although the income of banks comes mainly from credit activities, ceteris paribus, banks that obtain their income from many different sources will have higher revenue, and higher profits, increasing business performance. Non-interest income, in addition to creating sustainability for revenue sources, helps to bring about opportunities to increase income from diversification activities. Tunay and Silpar [17] has provided evidence of the positive influence of diversity on income structure for the profitability of commercial banks. Therefore, in this study, we suggest that income structure diversity has a positive effect on profitability.

Macroeconomic factors: The business performance of financial institutions is directly affected by changes in macroeconomic indicators of the economy, such as inflation or GDP growth. Inherently, in economic conditions that allow economic growth, and inflation to be controlled, entities within the economy will expand the scale of production and business activities as well as promote transactions related to the operation of financial institutions and *vice versa*. Naceur and Kandil [12] shows that inflation increases the uncertainty of economic activities, leading to a decrease in credit scale, thus decreasing the profitability of commercial banks. Additionally, an increase in GDP is an indicator of the ability to increase profitability [1]. Therefore, we propose a negative relationship between inflation and profitability and a positive relationship between GDP growth and profitability of banks.

Aside from the factors mentioned above, the scale of operation of commercial banks is also one controlled by most studies in quantitative models [13], [14], [18] based on the argument that banks with larger size possess less risk (more credible) can make more profits through lending from obtaining more deposits, thus achieve higher profitability and performance, ceteris paribus. On that basis, and based on the argument of scale advantage, our research proposes a positive relationship between bank size and business performance.

III. METHODOLOGY

A. Variables and variable measurement

To examine the hypotheses proposed above, the independent and dependent variables are measured according to the scales detailed in the table below, in which business performance is measured according to 2 indicators, including ROA and ROE. The independent variables are also measured based on relevant business characteristics information for each measurement criterion.

TABLE 1
VARIABLE DESCRIPTION

Variables	Description	Measurement
FP	Financial performance is measured by ROA and ROE	ROA= Profit / Total Assets
		ROE= Profit / Total Equity
CS	Capital Structure of bank i in year t	Total Equity / Total Assets
C_RISK	Credit risk of bank i in year t	Provision for loan losses/ Outstanding Loans
DIVERT	Diversity of income structure of bank	Non-interest income/ Total Assets
LIQRISK	Liquidity risk of bank	Liquid Assets / Total Assets
EXP	Expense management of bank	Operating Expenses / Total Assets
SIZE	Size of bank i in year t	Ln(Total Asset)
INF	Inflation in year t	(CPI _t - CPI _{t-1}) / CPI _{t-1}
GDP	Gross domestic product	(GDP _t -GDP _{t-1})/GDP _{t-1}
Eit	Error term	

B. Research model, sample and data

To test the research hypotheses, the research model for the variables measured according to the scale as presented in Table 1 above is as follows:

$$FP_{i,t} = \beta_0 + \beta_1 CS_{i,t} + \beta_2 CRISK + \beta_3 LIQRISK + \beta_4 EXP + \beta_5 DIVERT + \beta_6 SIZE + \beta_7 INF + \beta_8 GDP + \epsilon_{i,t}$$

The initial final analysis sample of banks with 240 observations.

IV. RESULTS

- Descriptive statistical analysis

On average, ROA and ROE of commercial banks in the sample are about 0.8% and 8.4%, respectively. Some banks have reported losses during this period, which is statistically shown by the smallest values of this variable. The detailed data are presented in Table 1. In addition, these statistical values also show that during the research period, the research sample included observations with loss in credit activities as well as in non-interest income, as shown by the negative value of the variable income structure and credit risk.

TABLE 2: VARIABLE DESCRIPTION

Variables	Mean	Minimum	Maximum	Std. Deviation
ROA	0.007	- 0.055	0.047	0.007
ROE	0.084	- 0.082	0.268	0.081
SIZE	25.102	21.926	27.903	1.149
CS	0.099	0.035	0.332	0.046
CRISK	- 1.50197	- 86.903	- 0.002	7.906
DIVERT	0.025	- 0.006	0.090	0.011
LIQRISK	0.073	0.013	0.368	0.055
EXP	0.0162	0.004	0.052	0.005

- Regression analysis

The Hausman test favors group analysis data under the fixed effects model. The necessary tests of the regression model including multicollinearity and autocorrelation are also performed and corrected based on the robust option. The results of the analysis of factors affecting the financial performance of commercial banks are shown in Table 4 below.

The analysis results show that the factors of capital structure, non-interest income, cost management and inflation have an influence on the financial performance of commercial banks on the data of the research sample for the ROA scale, in which the influence of cost management factors, capital structure and diversity in the bank's income sources impact most significantly. The degree of influence of these factors on the profitability of assets are -1.04; 0.08 and 0.52 respectively at 5% significance level. The effect of the inflation rate on the ROA scale is insignificant and does not support the direction of the research hypothesis. We also do not find supporting evidence on the impact of risk factors including credit risk, liquidity risk and bank size on the business performance of the banks in this study being at 5% significance.

Regarding testing the data on the ROE scale, the results are generally in agreement when compared with the ROA scale, except that this model further confirms the influence of liquidity risk on the business performance of banks with relatively high influence (-0.29) at 5% significance level.

TABLE 3
REGRESSION ANALYSIS RESULTS OF FACTORS AFFECTING ROA

ROA	Coefficient	Std. Err.	t	P> t	[95% Conf. Interval]	
CS	0.081	0.014	5.79	0.000	0.05	0.108
DIVERT	0.527	0.044	11.89	0.000	0.44	0.614
LIQRISK	-0.017	0.0097	-1.72	0.086	-0.03	0.002
EXP	-1.044	0.0781	-13.35	0.000	-1.19	-0.890
CRISK	0.0001	0.0004	1.63	0.104	-0.00	0.000
SIZE	-0.00	0.00	-1.36	0.176	-0.00	0.001
INF	0.0007	0.0003	2.33	0.021	0.00	0.001
GDP	0.0005	0.0005	0.95	0.344	-0.00	0.002
cons	0.038	0.0274	1.39	0.165	-0.03	0.092

V. DISCUSSION AND FUTURE RESEARCH DIRECTIONS

Research results on the factors affecting the business performance of commercial banks confirm the hypotheses on the influence of capital structure, income structure, cost management and inflation, in which the influence of inflation is insignificant. These results have been supported by previous studies; for example, the effect of capital structure on bank performance is confirmed in the study of [5], [13]. In Vietnam, equity size is also an important parameter related to the credit growth of commercial banks, so this result is meaningful for commercial banks for strategic planning in the capital increase roadmap.

The effect of income structure confirmed in this study is consistent with the results of Tunay or Baele [17], This result emphasizes the role of investment strategy and avoids only dependence on income from credit activities. This is a remarkable point for the business activities of commercial

banks in Vietnam at present. Additionally, in order to increase business efficiency, cost management is also a factor that banks need to pay attention to. This problem requires banks to design a more reasonable cost structure when compared with industry averages.

Although our study achieved certain results, we acknowledge that the study has certain limitations. In the period of 2018 - 2020, the economic context has significantly changed due to the impact of the Covid-19 pandemic and the shifting trend of the banking industry. However, these data have not been updated and analysed in the sample. The potential of endogeneity in the panel data model has also not been examined. This is also the direction of future research that needs to be done in order to draw more complete conclusions about the research results of factors affecting the business performance of commercial banks in Vietnam.

REFERENCES

- [1]. Athanasoglou, P., Brissimis, S., & Delis, M. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions & Money*, 18, pp.121-136.
- [2]. Athanasoglou, P., Delis, M. & Staikouras, C. (2006) Determinants of Bank Profitability in the Southern Eastern European Region. Bank of Greece Working Paper. 47.
- [3]. Berríos, MR, (2013). The relationship between bank credit risk and profitability and liquidity. *The International Journal of Business and Finance Vol 7*. Pp 105 – 118.
- [4]. Berger, A.L. (1995) The Relationship between Capital and Earnings in Banking. *Journal of Money, Credit and Banking*, 27(2), pp.432-456.
- [5] Berger, A.L. Patti. EB (2006) Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. *Journal of Banking & Finance*.
- [6]. Dietrich, A. and Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money*, 21(3), pp.307-327.
- [7]. Eichengreen, B. and Gibson, H. (2001) Greek Banking at the Dawn of the New Millennium. CEPR Discussion Paper, No. 2791.
- [8]. Elsas, R., Hackethal, A. and Holzhäuser, M. (2008). The Anatomy of Bank Diversification. *SSRN Electronic Journal*, 34(6), pp.1274-1287.
- [9].Goddard, J., McKillop, D. and Wilson, J. (2008). The Diversification and Financial Performance of US Credit Unions. *Journal of Banking & Finance*, 32(9), pp.1836–1849.
- [10]. Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica* 46: 1251–1271.
- [11].Molyneux, P., Thornton, J. (1992). Determinants of European bank profitability: a note.
- [12].Naceur, S.B. & Kandil, M. (2009) The impact of capital requirements on banks' cost of intermediation and performance: The case of Egypt. *Journal of Business and Economics*. 61(1), pp.70-89.
- [13].Pasiouras, F. and Kosmidou, K. (2007), "Factors influencing the profitability of domestic and foreign banks in the European Union", *Research in International Business and Finance*, 21(2), pp. 222-237.
- [14] Perera, S., Skully, M., & Wickramanayake, J. (2007). Cost efficiency in South Asian banking: the impact of bank size, state ownership and stock exchange
- [15].Pratomo, Ario. W, Ghafar (2006). Islamic bank performance and capital structure. MPRA Paper No. 6012, MPRA Paper No. 6012, posted 29 Nov 2007
- [16] Rasiah, D. (2010). Theoretical Framework of Profitability as Applied to Commercial Banks in Malaysia. *European Journal of Economics, Finance and Administrative Services*.19, pp.74-97.
- [17].Tunay, K.B., Silpar, M.A., 2006. Performance Analysis Based on Profitability in Turkish Banking Sector. *Banks Association of Turkey, Research Papers*, No: 2006-I.
- [18].Zhao, S.Y & Zhao, S.F (2013) States Ownership, Size and Bank profitability: Evidence from Chinese Commercial Banks, 1998-2011.*Information Technology Journal*. 12 (16).

Identify the role of financial leverage in the relationship between entrepreneurship orientation and the performance of SMEs

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Abstract—The paper examines the impact mechanism of entrepreneurship orientation on the business performance of enterprises through the role of financial resources. The analysis results are based on data including 113 observations collected from small and medium enterprises according to the linear structural model. The findings suggest that financial leverage acts as a mediator for the relationship between entrepreneurship orientation and business performance. On that basis, some implications and future research directions are proposed.

Index Terms—Financial leverage, entrepreneurship orientation, mediating

I. INTRODUCTION

ENTREPRENEURSHIP is an important strategy orientation at corporate level. Entrepreneurship practices demonstrate the dynamic capabilities of the organization in searching for new business opportunities and adapting with the current competitive market. Business pursues opportunities through growth and innovation. Innovation activities also help businesses adapt better to the current competitive market, based on the supply of products, new services, or change in the production process and management. Entrepreneurship displays business philosophy through pioneering and taking on risks in seeking opportunities; increasing the advantage over competitors in creating new product segments or expanding the market share of the company's product. Having pioneering skills and the will to take risks are the features of the entrepreneurship concept [7], [18]. Depending on the research, the concept of entrepreneurship can be expanded beyond the three factors above. For example, some researchers [15], [6] proposed the concept of EO with two additional factors including aggressiveness and Competitive energy.

However, the additional aspects are mainly context specific rather than representative. Therefore, assessing the level of entrepreneurship practices of business still depends on consistent actions and the behaviour of the three aforementioned aspects [8].

Entrepreneurship orientation is a key strategic factor, and the business philosophy of the enterprise is based on dynamic capabilities. Therefore, this trend is expected to experience a deep connection with corporate performance. Thus, since the initial research was done by Covin [7], studies related to relationships between entrepreneurship orientation and business efficiency have contributed to quite a volume of documents and data. However, the results of experimental studies haven't managed to come to an agreement on the direction of influence in this relationship. The majority of studies indicate the positive relationship between en-

trepreneurship and performance [27], [23], [25] while some other studies show evidence of a negative relationship or insignificant [21], [8]. These arguments not only originate from different methods of measurement or research context, but are also related to the mechanism forming the relationship between entrepreneurship and business performance. With the same approach, several studies have examined the mediating variables of organized learning techniques [8] or the regulatory role of adaptability [14]. Although these approaches have clarified the transmission mechanism of the influence of entrepreneurship orientation on business performance, it is not possible to help clarify which resources of the enterprise are really necessary to implement the orientation of entrepreneurship and thereby help improve business performance. Based on this argument, and on [8], [24], [25] about how entrepreneurship orientation increases access to finance and the argument regarding the effects of entrepreneurship orientation on business efficiency not being simply a direct connection, our research seeks to examine whether the availability or non availability of financial resources is a factor in explaining the impact of entrepreneurship orientation on business performance. Therefore, our study researches the mediating relationship of the level of debt that the business can access (financial leverage) in the relationship between entrepreneurship orientation and business efficiency of small and medium enterprises based on analysis of survey results of a sample of 113 enterprises.

II. LITERATURE REVIEW AND THEORY FRAMEWORK

Entrepreneurship orientation is known as a multidimensional concept and a strategic direction at the corporate level designed to meet current market requirements through innovative activities (products, services and management process), the will to take risks in investments and enter new markets with uncertainty to be more proactive than competitors in targeting new market opportunities (e.g., [6], [7], [15], [19], [19], [27] [28], [27] to create growth opportunities and outstanding business results.

Innovation is a strategic direction of development associated with the goals of survival and growth of an enterprise. The concept of innovation within the framework of entrepreneurship orientation refers to not only investment or technological change to further improve the quality of products and services, but also to support creative ideas and inventions. Innovation orientation originates from practical market requirements in order to meet the increasingly demanding needs of the current market. Businesses can supply

the competitive markets with unique products and services; or use new technology and processes to create outstanding performance in manufacturing, which will help fast, sustainable growth [23], [3]. This is also supported by many studies examining the relationship between innovation implementation and business performance [7], [29], [2].

Strong competition, together with constant innovation and increasing market demands have shortened the business and product life cycle (Hamel, 2000). This leads to situations where businesses have to face the uncertainty of cash flow and current profit, as well as the future, which may cause a decrease in business performance and risk of bankruptcy. One of the ways normal businesses use to cope with that risk is to diversify business activities. Entrepreneurship orientation approaches this in a way that proactively confronts threats through seeking new opportunities. Proactiveness is expected to help improve business results by gaining the advantage of being first compared to competitors [28], [21].

Although in one of the studies, the relationship between risk-taking ability and business performance seems to be less clear, this aspect of entrepreneurship is still a representative that is expected to help improve business performance. The concept of willingness to take risks in entrepreneurship doesn't mean carelessly deciding without taking the situation into account, but rather a direction for businesses to show off their boldness in decision-making and little hesitation to seize opportunities. Businesses going in the direction of avoiding taking risks can seek profits from projects that are assessed as safe instead of those with less certainty about profitability as well as future cash flows. However, the principle of trade-off between risks and returns is a widely known issue in corporate financial management. Research from studies [17], [18] shows that tried and true strategies can lead to high average returns, as risky strategies lead to fluctuations in earnings. Therefore, it is inevitable that some projects fail while others succeed with more profit in the long run. We expect that if the enterprise applies management on the basis of strategic risk taking orientation thoughtfully, this will lead to higher business performance.

Based on this argument, these hypotheses H1, H2 and H3 are proposed. Specifically:

- Innovation has a positive relationship with business performance
- Proactive pioneering has a positive effect on business performance
- Risk - taking has a positive effect on business performance

Considering the direct influence in the relationship between entrepreneurship orientation and firm performance, although studies support a positive relationship based on empirical evidence, the overall conclusions are not really consistent. Some studies indicate that this relationship is not statistically significant, while there are studies that indicate that exercising entrepreneurship beyond a certain level can have a negative effect on the business performance of the enterprise. These issues raise a debate as to whether this relationship is a direct effect or must be through a transmission mechanism from the effects of entrepreneurship on

business performance. Based on this suggestion, subsequent studies conducted tests on organizational capacity because human capital management is core to the success of small businesses, or the ability to learn and adapt as well as the ability to improvise [14].

This approach shows that the relationship between EO and business performance is better explained if factors concerning the resources to assist strategies are examined. However, this will only be considering the internal resources of the business, while external financial resources are also crucial for business activity and the successful execution of strategies, including innovation and pioneering. In a few studies on capital structure, empirical results have indicated that businesses with better access to official financial resources obtain higher performance [1]. The hypothesis on the mediating role of financial resources is hereby proposed. H4: Financial leverage mediates the relationship between entrepreneurship orientation and performance.

III. METHODOLOGY

A. Variables and variable measure

- Business performance

Business performance is measured through statements related to growth, profit and market share compared to competitors. These indicators are measured on a 5-point Likert scale, in which, the scales include 04 indicators compared to competitors and 01 indicator to evaluate the satisfaction of enterprises with business results. The questions are based on statements such as: from "much less than competitors" to "much more than competitors", these scales are quite commonly used in most of the relevant studies [4], [5].

- Entrepreneurship orientation and financial resources.

Basically, the aspects of entrepreneurship orientation are measured based on the original scale proposed by Miller [19] with 8 measurement indicators. These scales have been used in many studies and have been validated for reliability and relevance [14], [26]. However, in order to be more certain about the relevance of the study in the context of Vietnam, we use the scales in accordance with the approach in the study by Nguyen [21]. Accordingly, each aspect of entrepreneurship is measured by 03 indicators. In other words, the study uses 09 indicators for innovation, proactive pioneering and risk taking.

Similar to the business performance scale, these indicators are measured based on the statements on 5 levels, from "strongly disagree" to "strongly agree". In order for the answers to be reliable, we also set up a reverse question. For example, on the one hand, we designed the statement 'Our company has pursued strategies that enable the discovery of opportunities in the external environment' to measure the risk-taking dimension. On the other hand, we also propose an opposing statement for this indicator, which is: "When it comes to making business decisions under conditions of uncertainty, my business is usually cautious, "wait and see". The questionnaires are considered reliable if the response re-

sults do not show inconsistencies between the opposing questions.

Regarding the assessment of financial accessibility, we use the variable financial leverage representing the ability of enterprises to use debt according to the 5 levels, from "Company has almost no access to debt" to "Businesses can fully access debt on demand" corresponding to debt levels shown on capital structure of firms including: less than 15%; from over 15% to 35%; over 35% - 50%; over 50% - 70% and over 70%.

B. Research model and data

The research model is presented in Figure 1, in which the factors of innovation, proactive pioneering and dare to take risks are the representatives of entrepreneurship orientation at the enterprise level. The financial leverage factor is examined as an intermediate variable in the relationship between entrepreneurship and performance.

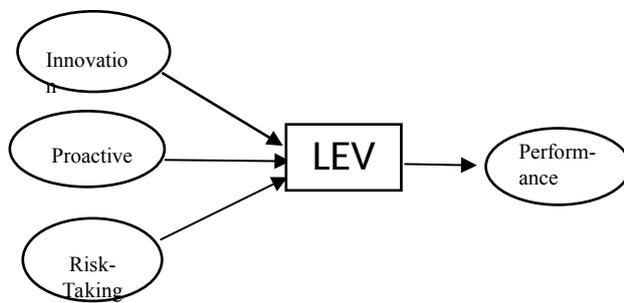


Fig 1: Research Model

The research data used for analysis is collected from survey results through questionnaires sent to 150 SMEs operating in Hanoi. Directors and owners are selected subjects to answer the questionnaires. These are suitable subjects to respond to assessing levels of entrepreneurship orientation at the enterprise level. The returned questionnaires were tested initially. Some responses deemed invalid due to incomplete information are excluded from the sample. The final sample size used for analysis is 113 obvious.

The study uses Structural Equation Modeling (SEM) to analyze the data and examine the research hypotheses. The results are presented in section 4.

IV. RESULTS

A. Exploratory factor analysis and confirmatory factor analysis

Scale reliability: The results of scale reliability evaluation are presented in Table 1. The Cronbach Alpha coefficients of the variables of innovation, proactive initiative and risk-taking are all equal greater 0.7, respectively 0.76; 0.74 and 0.73. According to Hair [13] these scales can be used for analysis.

Corrected Item - Total Correlation coefficient of the observed variables is greater than 0.3. The lowest coefficient is the indicator of the risk-taking variable, reaching 0.44. The observed variables are therefore satisfactory and are used in analysis for the next steps.

- Exploratory factor analysis (EFA)

TABLE 2: SCALE RELIABILITY EVALUATION RESULTS

Variables	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item - Total Correlation	Cronbach's Alpha if Item Deleted
Innovation- Cronbach's Alpha = 0.76				
INV1	8.04	1.97	.58	.69
INV2	8.02	1.66	.69	.56
INV3	7.99	2.12	.51	.76
Proactive pioneering- Cronbach's Alpha = 0.74				
PRO1	6.06	1.59	.74	.44
PRO2	6.18	1.72	.58	.65
PRO3	6.33	2.35	.41	.81
Risk- Taking - Cronbach's Alpha = 0.73				
TRIS1	6.28	1.85	.61	.56
TRIS2	5.89	2.20	.60	.56
TRIS3	6.60	2.71	.44	.75
Performance- Cronbach's Alpha = 0.85				
PF1	13.73	5.70	.65	.83
PF2	12.73	5.31	.68	.82
PF3	12.71	5.23	.73	.81
PF4	13.56	5.21	.77	.79
PF	13.50	5.93	.52	.86

The results of KMO and Bartlett's test show that the data used for factor analysis is appropriate. Specifically, Kaiser – Meyer – Olkin Measure of Sampling Adequacy = .79 and Chi – Square of Bartlett's test = 629.269 with p_value = 0.000.

The study uses the promax rotation and Principal Axis Factoring extraction methods. The results showed that 4 factors were extracted at the Eigenvalue > 1.00 (the lowest value of Eigenvalue = 1,097) with a satisfactory total variance explained (67.7%). In addition, the observed variables all have high loading coefficients (factor weights) on the measured concept. The results of the EFA analysis show that the factors are loaded according to the groups of concepts originally proposed with a loading factor of over 0.5 as presented in the factor rotation matrix (Table 3).

TABLE 3: FACTOR ROTATION MATRIX

Variables	Loading factor			
	1	2	3	4
INV1	.882			
INV2	.806			
INV3	.758			
PRO1		.822		
PRO2		.809		
PRO3		.652		
TRIS1			.840	
TRIS2			.810	
TRIS3			.648	
PF1				.822
PF2				.794
PF3				.789
PF4				.709
PF5				.685

- Confirmatory factor analysis (CFA)

The results of the CFA confirmatory factor analysis of the measurement model show that the model meets the testing requirements at the significance level of 0.05 (5%). 0.05 (5%): χ^2 (68) = 100.82, χ^2/df = 1.28, $p < .05$, RMSEA = .050, GFI = .902, CFI = .965. The values TLI = 0.955 and CFI = 0.967 are greater than 0.9. In addition, the examina-

tion of the correlation coefficients together with the standard errors between different observed variables being different from 1 shows that the concepts all have discriminant value. Thus, the indicators ensure that the measurement model is reliable and suitable for measuring and studying the relationship between structures.

B. The results of the structural model

- The analysis of the structural relationship between entrepreneurship orientation, financial leverage and performance.

The main results of testing the hypothesis on the structural relationship between latent variables based on SEM analysis show that the fit of the model reaches an acceptable level with $\chi^2(84) = 109.663$, $\chi^2/df = 1.306$, $p < .05$, RMSEA = .043, GFI = .936, CFI = .975, và TLI = .968. All t-tests reached the 5% significance level, in which most of the hypotheses are accepted. However, unexpectedly, although the innovation aspect of entrepreneurship orientation shows a consensus on the (+) sign of the influence direction in relation to business performance, this relationship is not statistically significant. The results are reported in detail in Table 4.

TABLE 4: THE RESULTS OF TESTING HYPOTHESES ON THE RELATIONSHIP BETWEEN THE ENTREPRENEURSHIP, FINANCIAL LEVERAGE AND BUSINESS PERFORMANCE OF SMEs

Structural relationship	Standard Coefficient	P-value	Hypothesis
Proactive - Financial leverage	.540	***	Accepted
Risk taking - Financial leverage	.435	***	Accepted
Innovation - Financial leverage	.050	.482	-
Financial leverage- Performance	.784	***	Accepted

- Analysis of direct impact, indirect impact and overall impact

The model achieved a good fit with p value > 0.05 . Values GFI = 0.936 > 0.9 , TLI = 0.966 > 0.9 ; CFI = 0.975 > 0.9 and RMSEA = 0.044 < 0.8 show that research data is in agreement with market data. When comparing the regression coefficients obtained from the partial estimation of the relationship between entrepreneurship and business performance, the results show that these coefficients decrease in the indirect relationships model. The coefficients of innovation, risk-taking and initiative for performance are (-0.17); 0.141 and 0.228 compared with 0.08, 1.54 and 0.56 when implementing a direct relationship without the participation of intermediate variables.

With this result, the mediating role of the level of debt is confirmed by satisfying the conditions for the intermediate variable as proposed by Baron & Kenney (1986), specifically: 1) The entrepreneurship orientation variable explains the variation of the financial leverage variable, in which the levels of different aspects of entrepreneurship orientation have a positive relationship with the financial leverage of the enterprises; (2) The financial leverage variable explains the variation of the business performance variable. The Beta coefficient in this case is non-zero, and (3) The presence of the financial leverage variable reduces the relationship be-

tween the variable entrepreneurship and business performance, which is specified by the level of leverage. This statement is shown by the value of the lower Beta coefficient in the reinforcement test model of the indirect relationship.

V. CONCLUSION AND IMPLICATIONS

The results of the regression analysis show that EO is basically a strategic configuration that has a positive influence on business performance. These findings highlight the role of proactive initiative and risk-taking (but not arbitrariness) for new opportunities with higher business performance. In addition, our study contributes initial evidence on the mediating role of financial leverage, which represents the firm's ability to access finance.

In the context of emerging countries' economies, underdeveloped financial markets, and difficult access to finance by enterprises, especially small and medium-sized ones, the results of this research provides policy implications for encouraging the creation of opportunities to access capital more easily to meet business needs and grow. On the other hand, this also implies that businesses need to consider setting up the optimal capital structure to realize the strategic orientation of entrepreneurship, in order to improve business efficiency.

Although our research has arrived at certain results, this study has not provided evidence of a positive relationship between innovation and business performance, while this relationship has been confirmed in quite a few studies [7], [29], [2], [11]. This is an issue that needs further work. In addition, we also acknowledge some limitations related to the sample size or the tested enterprises are still mainly commercial enterprises instead of manufacturing enterprises. This issue may be one of the reasons why the relationship between innovation and business performance has not been satisfactorily concluded. In addition, the scale of financial resources based solely on the accounting scale may also be a limitation. The following studies may consider how to divide the interval more asymptotically with the Likert scale, for example. These issues are also implications for future research, which is crucial for the SME sector in Vietnam as of today.

REFERENCE

- [1] Abor, J. (2007), "Debt policy and performance of SMEs Evidence from Ghanaian and South African firms", *The Journal of Risk Finance*, Vol. 8 No. 4, pp 364-379.
- [2] Acosta A, Crespo A, Agudo J, 2018. Effect of market orientation, network capability and entrepreneurial Orientation on international performance of small and medium enterprises (SMEs). *International Business Review* 27 (2018) 1128-1140.
- [3] Brown, S.L., Eisenhardt, K.M., 1998. *Competing on the Edge*. Harvard Business School Press, Boston, MA.
- [4] Brush, C.G., Greene, P.G., Hart, M.M., 2001. From initial idea to unique advantage: the entrepreneurial challenge of constructing a resource base. *Acad. Manage. Exec.* 15 (1), 64-78
- [5] Chandler, G.N., Hanks, S.H., 1994. Founder competence, the environment, and venture performance. *Entrepreneurship Theory & Practice*. 18 (3), 77-89.
- [6] Collaghan C, Venter R (2011). An investigation of the entrepreneurial orientation, context and entrepreneurial performance of inner-city Johannesburg street traders, *Southern African Business Review* 15 (1), 2011. 136.

- [7] Covin, J.G., Slevin, D.P., 1991. A conceptual model of entrepreneurship as firm behavior. *Entrepreneurship Theory & Practice*, (Fall), 7–25.
- [8] Covin, J.G., Lumpkin G.H (2011). Entrepreneurial Orientation Theory and Research: Reflections on a Needed Construct. *Entrepreneurship Theory and Practice*, 2011, vol. 35, issue 5, 855-872
- [9] Fombrun, C.J., Wally, S., 1989. Structuring small firms for rapid growth. *Journal Business Venturing* 4, 107–122
- [10] Hamel, G., 2000. *Leading the Revolution*. Harvard University Press, Cambridge, MA.
- [11] GaoY, Geb B, Lang X, Xu X (2018). Impacts of proactive orientation and entrepreneurial strategy on entrepreneurial performance: An empirical research. *Technological Forecasting & Social Change* 135 (2018) 178 -187.
- [12] Hart, S.L., 1992. An integrative framework for strategy-making processes. *Academic Management Rev.* 17 (2), 327–351.
- [13] Hair, J. F. J., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis with readings*. Englewood Cliffs, NJ: Prentice-Hall.
- [14] Hughes P, Hodgkinson, Hughes and Arshad D 2018. Explaining the entrepreneurial orientation–performance relationship in emerging economies: The intermediate roles of absorptive capacity and improvisation. *Asia Pacific Journal Management*. DOI 10.1007/s10490-017-9539-7.
- [15] Knight, G.A., 1997. Cross-cultural reliability and validity of a scale to measure firm entrepreneurial orientation. *Journal Business Venturing* 12, 213–225.
- [16] Lumpkin, G., Dess, G.G., 1996. Clarifying the entrepreneurial orientation construct and linking it to performance. *The Academy of Management Review* Vol. 21, No. 1, pp. 135-172.
- [17] March, J.G., 1991. Exploration and exploitation in organizational learning. *Organization Science*. 2, 71–87 *Academic Management Rev.* 21 (1), 135–172.
- [18] McGrath, R.G., 2001. Exploratory learning, innovative capacity, and managerial oversight. *Academic Management Journal*, 44, 118–131.
- [19] Miller, D., 1983. The correlates of entrepreneurship in three types of firms. *Management Science*. 29, 770–791.
- [20] Namen, J.L., Slevin, D.P., 1993. Entrepreneurship and the concept of fit: a model and empirical tests. *Strategic Management J.* 14, 137–153.
- [21] Nguyen, T.T.Mai, 2009. Enhancing Entrepreneurial Orientation, A stimulus for business development in Vietnam during the Economics Recession. *International Vision*, 13, 85-95.
- [22] Smart, D.T., Conant, J.S., 1994. Entrepreneurial orientation, distinctive marketing competencies and organizational performance. *J. Appl. Business Res.* 10, 28–38
- [23] Schumpeter, J., 1934. *The Theory of Economic Development*. Harvard Univ. Press, Cambridge, MA.
- [24] Sidik, S, Mohamad, M. R., & Nasir, W. M. (2019). Sustaining Small Business Performance: Role of Entrepreneurial Orientation and Financial Access. *International Journal of Academic Research in Business and Social Sciences*, 9(9), 66–80.
- [25] Sidik I.G (2012), “Conceptual Framework of Factors Affecting SME Development: Mediating Factors on the Relationship of Entrepreneur Traits and SME Performance”, *Procedia Economics and Finance*, Vol. 4, pp. 373-383
- [26] Zahra, S., 1991. Predictors and financial outcomes of corporate entrepreneurship: an explorative study. *J. Business Venturing* 6, 259–285.
- [27] Zahra, S.A., 1993b. Environment, corporate entrepreneurship, and financial performance: a taxonomic approach. *J. Business Venturing* 8, 319–340.
- [28] Zahra, S., Covin, J., 1995. Contextual influence on the corporate entrepreneurship–performance relationship: a longitudinal analysis. *J. Bus. Venturing* 10, 43–58.
- [29] Wiklund, J., 1999. The sustainability of the entrepreneurial orientation–performance relationship. *Entrepreneurship Theory & Practice*. 24 (1), 37–48.

Determinants of banking liquidity in Vietnamese commercial banks

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Abstract—This paper measures the liquidity of Vietnamese commercial banks from 2007 to 2017 and tries to detect possible influencing factors. Using a multivariate dynamic panel regression, we examine the effects of two sets of possible determinants: macroeconomic factors, like monetary policy or economic strength, maybe bank characteristic factors, like size or profitability. Analyzing a dataset composed of 20 commercial banks in Viet Nam, we found highly significant impacts of economic indicators and bank-specific factors on banking liquidity. The study points out that increasing the national savings rate and the financial market's liquidity helps improve the liquidity ability of commercial banks in Viet Nam, while the consumer prices index has the opposite effect. Interestingly, both total assets and profitability of commercial banks have a positive impact on LDR.

Index Terms—Liquidity, commercial bank, Viet Nam.

I. INTRODUCTION

LIQUIDITY creation is proved to be one of the most important goals of the banking system (Berger and Bouwman, 2009). More broadly, banks can be seen as pools of liquidity in the economy through accepting deposits, sources of liquidity, and investing in long-term debt or holding less liquid assets [17]. This process allows banks to provide liquid assets to both depositors and borrowers: depositors are offered their deposits, borrowers are given long-term availability of cash through loans. Though, this structure is still the root of banks' potential fragility. Therefore, commercial banks must always store enough liquidity for operation [19].

After the global financial crisis in VietNam in 2008-2009, the economy has faced many difficulties, such as low GDP growth, high consumer price index (CPI), stagnated production, weakening purchasing power, and increasing unemployment... Commercial banks were influenced directly and powerfully, especially in liquidity on the systematic and individual aspects in the 2010-2012 period [24]. This situation indicated that bank liquidity was impacted by many macro and microeconomic factors. That is why our study tries to add deeper insight and more information to the minor existing body of literature. We build and test a panel regression model to determine possible influential factors on commercial banks' liquidity, mainly focusing on separate roles of bank-internal factors such as size or profitability and external factors like monetary supply growth, national savings rate and CPI.

We contribute to the available literature in some ways. First, it provides empirical evidence for the determinants of bank liquidity, which included macroeconomic and microeconomic factors in emerging economies. Second, this paper makes a trial to calculate the liquidity of the financial market,

formed from 4 separate segments, including interbank market, stock market, forex market, and bond market. Based on the obtained index, we estimate its influence on banks' liquidity in Vietnam, similar to [22] and [32] study.

By performing these analyses, following Section 1, the structure of this study includes 5 main Sections. The second section is a literature review about the influential factors on banks' liquidity. This is followed by section 3, which combines the variables description and research methodology. Section 4 analyzes the model results. The recommendations and conclusion are presented in sections 5 and 6, respectively.

II. LITERATURE REVIEW

In recent years, many studies have examined the determinants of bank liquidity, although very few are done in bank-based financial systems. The factors that were categorized affecting banks' liquidity can be grouped as banks' specifications and macroeconomic factors.

A. Banks' Specifications

Banking liquidity has been found to be impacted by many factors like bank borrows, profitability, equity/total asset, operational cost/total asset... Among them, the relationships between banking liquidity and total asset profitability have not been apparent.

Firstly, the results of the earlier research about the impact of size on liquidity are not homogenous. There are two opposing arguments regarding this relationship. The "too-big-to-fail" party states that large banks have considerable advantages in liquidity management, such as priorities in access to capital markets as well as central bank's lending window, more vital ability to screen and monitor borrowers... However, this fact leads to invert choice when the most significant bank has the least liquidity on its balance sheet to maximize profitability. Many studies support this tendency, such as [18], [26], [22]... In Viet Nam, [21] found a negative impact of the total asset on banking liquidity.

On the other hand, the opposite argument shows that bank size has a positive effect on liquidity. Smaller banks that focus on intermediaries and convertible operations have a smaller amount of liquidity. This phenomenon is also confirmed by [4] and [35]... Similarly, [28] had found identical outcomes in Vietnam.

Second, banks' liquidity and profitability are often on the two opposite sides of a rubric, and the effect of profitability on liquidity has been investigated. Ref [30], [26] and [31] found the negativity of this affection when they improved

that holding liquid assets rooted to lower profitability as an opportunity cost for banks. Reverse, the combination of two theories, name as "expected bankruptcy cost" and "liquid assets as a buffer" would explain the positive effect of profitability on liquidity, whereby banks having more liquid assets benefit from advantages in funding markets, lower their financing costs and higher profitability [5]. The close empirical evidence had been exposed in the research of 15 commercial banks in Malaysia from 2003 to 2012 [10]. In Viet Nam, the situation is not different, the applied researchers discovered that bank profitability has a positive impact on liquidity [21]; however, that is the only study we have found.

B. Macroeconomic Factors

At first, national savings rate: In nominal terms, bank liquidity may be increased when the national savings rate increases. Because people have more money to invest when savings grow. As a result, the bank loan demand reduces. Maybe, the exceeded "free" money also is spared in a bank. This leads to the supply of bank deposits increasing. These two tendencies keep bank liquidity in good condition. Though the results of empirical research show different stories, and sometimes they are contrasted. Such as [29] argued that the savings rate increases due to higher-income, which increases as a result of lower unemployment. All of these may come from the rise of bank loans for investment, resulting in more inferior funding liquidity. Through the empirical study in German saving banks from 1997 to 2006, Ref [26] also found a slightly significant and negative coefficient between savings rate and bank liquidity. In Viet Nam, we have not discovered any papers related to this issue.

Second, money supply growth: The increase of money supply from the Central Bank will immediately impact bank liquidity since the added money has to go through the bank system to reach the real economy. There are numbers of single-country papers that showed that tightened monetary policies, interest rates, harm liquidity ([9]; [16]; [32]). Nevertheless, in Viet Nam, this circumstance is not found [28].

Third, consumer price index: On the one hand, the informational friction theory means that a rise in the inflation rate reduces the return on assets subsequent to credit constraints and thus increases the bank's liquidity. This theory is supported by [7] findings and [2]. On the other hand, [27] argued that a high inflation rate increases customers' loans because inflation reduces purchasing power, leading to lower liquidity. The equivalent consequence has also been found in many other kinds of research, such as [32], [22]... In none of the above cases, Munteanua (2012) found that CPI positively impacts bank liquidity before the crisis period and converse relationship when the crisis has gone. In Viet Nam, [28] also discovered that the CPI in the previous year has a positive impact on current year bank liquidity.

Fourth, the liquidity of the financial markets: The empirical studies encompass a vast stream of examinations that measure the multi-level dependencies between liquidity level and financial asset price in the context of asset returns and aggregate market liquidity risk or financial market runs [35]. Ref [34] found a positive connection between market risk and changes in loan-to-core deposits ratio after 1994, against before 1994. Although the intimate relationship be-

tween financial market liquidity and banking liquidity has been proved, especially after the global crisis in 2008-2009, such as [25], [1]... However, the researchers mostly took part in the economy with the market-based financial system, and the results only focus on the effect of the stock market on bank liquidity. Typically, ref [12], [3]... reveal that bank liquidity and stock market turnover (liquidity) were inversely related. In like manner, the study conducted by [11] argues that banking and stock market activities are complements when banking development and stock market liquidity will positively impact each other and economic growth.

In summary, bank liquidity has been investigated in many kinds of research, but factors' impacts are unclear. That is why we develop this paper to determine possible influential factors of commercial bank liquidity. Through a dynamic panel model, the different roles of bank-internal factors such as size or profitability, and external factors like monetary supply, national savings rate, CPI will be transparent.

Based on the literature reviews, the following hypotheses are proposed:

Total asset: The stark variation in size differences between commercial banks in Vietnam helps us to investigate the impact of total assets on liquidity. Based on the "too big to fail" theory, we assume that the larger bank has less liquidity than the smaller one.

Hypothesis 1: Total asset has a positive effect on LDR

ROAA: We use ROAA to show whether a bank's profitability has any influence on liquidity. Profit may help increase the bank's equity and add more funds for business, such as lending, maturity transformation. Thereby, an increase in return might thus trigger an immediate increase in LDR.

Hypothesis 2: ROAA has a positive effect on LDR

National savings rate: The increase in the national savings rate can result in more sources for investment in the economy. As the result, the demand for lending capital from the bank may decrease. At the same time, the demand for bank deposits may grow. All of these may lead to reducing LDR in the condition of increasing the national savings rate.

Hypothesis 3: National savings rate has a negative effect on LDR

Monetary supply growth: A monetary policy contraction has a direct impact on banks and banks' customers (firms) because of not only decreasing the amount of loan supply or surging the price of loans but also making it harder for firms to borrow through additional financial constraints. The tightening in monetary policy will result in decreasing aggregate lending and vice versa. That is why we assume that monetary supply growth leads to a rise in LDR.

Hypothesis 4: Monetary supply growth leads to an increase in LDR

Consumer Price Index: When CPI gets higher, a commercial bank may lend more to offset the added interest expenses. Moreover, under competitive pressure, total deposits may decrease so that LDR may increase.

Hypothesis 5: Higher CPI leads to higher LDR

Financial market liquidity: based on the theory of liquidity management, the liquidity needs of a commercial bank can be met by internal or external resources. In reasonable terms of liquidity in the financial market, banks can quickly

mobilize capital from outsources. Furthermore, the demand for bank credit has also reduced as firms can easily access the capital market and raise money. Therefore, the better liquidity of the financial market can help reduce the LDR in the banking system.

Hypothesis 6: Better liquidity of the financial market helps reduce the LDR

The difference between the groups of banks: This model also investigates the difference in LDR between two groups of banks. In Viet Nam, the state banks or banks dominated by the state owners often have higher LDRs than the others. We assume that when the financial market liquidity changes, the difference may be higher.

Hypothesis 7: The difference between the groups of banks in LDR is higher when the liquidity of the financial market changes.

TABLE III
THE HYPOTHESES

Variable	Sign	Expected impact
<i>Dependent variable</i>		
Bank liquidity	LDR	
<i>Independent variables</i>		
Total asset	LnTA	+
Profitability	ROAA	+
National savings rate	SAV	-
Monetary supply growth	M2	+
Consumer Price Index	CPI	+
Financial market liquidity	MAR	-

Sources: Author

III. DATA AND METHODOLOGY

A. Data

This study uses panel data to examine the determinants of Vietnamese commercial bank liquidity. Because panel data that consists of both time series and cross-sectional elements has outstanding advantages. It helps increase the degrees of freedom, reduce collinearity, improve the efficiency of estimates, and assist in passing the inherent multicollinearity between the independent variables. Moreover, panel data can measure and identify effects that cannot be detected in pure time-series or cross-section data.

At first, this study adopted the ratio approach to measure bank liquidity because academic literature prefers it as a more standardized method [31]. There are several valuable indexes, but we chose the loan to deposit ratio (LDR) to proxy for bank liquidity. The reason is that it can cover the interaction between a risky asset (loan) and the major resource of the bank liquidity (deposit). The raw data is extracted from Vietnamese commercial banks' annual income statements and balance sheets from 2007 to 2017. The original sample contained 35 banks but the data cleaning process eliminated banks that had joined mergers and acquisitions or had missing values in 2007-2017. Finally, we got the strongly-balanced panel data, including 220 items from 20 commercial banks.

Second, financial market liquidity was calculated based on [15]. This method is quite suitable for VietNam because of the near nature of the economic systems in the two countries. Both of them are bank-based financial systems and at the same development level. However, we made some adjusted

points for Vietnamese to build the indicator with the exact meaning as in Czech. In the following paragraph, we describe what we had done with our financial market data in detail.

For each relevant market, time series data were first normalized (using mean and standard deviation) and then averaged on each side of the five dimensions are shown in Table I. They were treated as equal parts of the compiled sub-index for each market segment, which is subsequently smoothed. Finally, the overall market liquidity index is calculated as a simple (unweighted) average of these four (smoothed) sub-indices.

TABLE I
DIMENSIONS OF FINANCIAL MARKET LIQUIDITY INDEX

Dimension	Description	Interbank market	Forex market	Bond market	Stock market
<i>Tightness</i>	Bid-ask spreads	O/N, 1W, 2W, 1M, 2M, 3M spreads	Daily VND exchange rate to USD	1, 2, 3, 5, 7, 10 and 15-year government bond references prices	Highest and lowest price spreads
<i>Depth</i>	Daily turnover	Daily volume	Daily turnover between commercial banks	Daily trading volume on the secondary market	Daily turnover
<i>Resiliency</i>	Return to volume ratio	Daily change in interest rate/daily turnover	Daily USD/VND exchange rate/Daily turnover	Daily change in 7-year interest rate/ daily turnover	Daily change turnover
<i>Liquidity premia</i>	Spreads between alternative assets with different degrees of liquidity			Spreads between 2 and 1 years interest rate	
<i>Volatility</i>	30 days historical volatility	Change in O/N interest rate in 30 days (interest rate on day 30 minus in day 1)		Change in the 7-year interest rate in 30 days.	VNIndex in 30 days
<i>Indicator</i>		Interbank Indicator	Forex Indicator	Bond Indicator	Stock Indicator
		Market Liquidity Indicator			

Sources: Author

All the data must be collected from the most reliable resources in Vietnam. Firstly, the banking data resource is the commercial (and widely used) Bankfocus database compiled by International Bank Credit Analysis Limited (IBCA). The financial market figures were aggregated from Bloomberg, Reuters, Vietnamese Bond Association, Ho Chi Minh Stock Exchange (HOSE). The macro indicators were obtained from ADB's yearly statistical database, including national savings rate, monetary supply growth, CPI.

B. Empirical model

A linear equation is used to perform the regression. Based on [29], [22],..., the model is represented by equation (1).

$$\text{LDR}_{it} = \beta_0 + \beta_1 X_{it} + \varepsilon_{it} \quad (1)$$

β_0 : Constant;

LDR_{it} : Loan to Deposit Ratio of commercial bank i in year t ; $t = 2007$ to 2017 ;

X_{it} : independent variables, covering:

LnTA_{it} : Logarithm of the total asset of commercial bank i in year t ;

ROAA_{it} : Return on average total assets of commercial bank i in year t ;

SAV_t : National savings rate in year t ;

M2_t : Monetary supply growth in year t ;

CPI_t : Consumer Price Index in year t ;

MAR_t : Financial market liquidity in year t ;

D_i : commercial bank group, $D = 1$ if it is a state bank or a bank dominated by the state owner, and $D = 0$ if a bank is private.

β_j : parameters of independent variables to the dependent variable.

ε_{it} : residual of the model.

TABLE II
DIMENSIONS FOR VARIABLES

Sign	Variable	Type	Value	Unit
LDR	Loan to Deposit Ratio	Continuous	From 0 to 1	Point
LnTA	Logarithm of the total asset	Continuous	From 0 to ∞	Point
ROAA	Return on average total assets	Continuous	From 0 to 1	Point
SAV	National savings rate			
M2	Monetary supply growth			
CPI	Consumer Price Index			
MAR	Financial market liquidity			
D	Bank group	Disjointed	0 - 1	Dummy

Sources: Author

IV. EMPIRICAL RESULTS

A. Descriptive Statistics

The summary statistics of all upper variables are indicated in Table IV.

TABLE IV
SUMMARY STATISTICS OF VARIABLES

Variable	Obs	Mean	Std.Dev.	Min	Max
LDR	220	86.741	23.943	23.51	251.77
LnTA	220	11.414	1.314	7.219	13.975
ROAA	220	.998	.946	-5.99	7.94
SAV	220	29.562	1.538	27.25	32.01
M2	220	22.057	9.725	12.07	46.12
CPI	220	8.407	6.107	.6	19.89
MAR	220	.605	.122	.34	.72

Source: Author's calculation in STATA.

Table V presents the correlation matrix of the various variables used in our study. At the first glance, the correlations are all less than 0.8. Along with this, the correlations of the dependent variable with other independent variables are also small, from 0.094 to 0.565.

TABLE V
CORRELATION MATRIX OF KEY VARIABLES

Variables	LDR	MAR	LnTA	ROAA	SAV	M2	CPI
LDR	1.000						
MAR	-0.221	1.000					
LnTA	0.070	0.357	1.000				
ROAA	0.094	-0.242	-0.239	1.000			
SAV	0.046	-0.331	0.031	0.015	1.000		
M2	0.263	-0.412	0.381	0.278	0.505	1.000	
CPI	0.238	-0.565	-0.369	0.263	-0.255	0.255	1.000

Source: Author's calculation in STATA.

The magnification coefficient (VIF) shows that the multicollinearity phenomenon did not occur in the model. The average VIF is 2.154, the component VIFs range from 1.163 to 3.469 (Table VI).

TABLE VI
VIF

	VIF	1/VIF
LnTA	2.07	.483
ROAA	1.163	.86
SAV	1.833	.546
M2	2.884	.347
CPI	2.134	.469
MAR	3.469	.288
DMAR	1.525	.656
Mean VIF	2.154	

Source: Author's calculation in STATA

B. Regression Analysis

To regress the data, Pooled OLS, FEM, REM and GMM methods were applied to get the best result. We also included the first lag of the dependent variable to consider any possible autoregressive effects. Table VII shows that bank-specific and contextual variables have economically and statistically significant impacts on banks' liquidity.

The original model is estimated by the usual panel data regression method, and the hypotheses of the Pooled OLS model are tested. However, the hypothesis is violated.

Therefore, REM and FEM estimation methods continue to be considered for use. Hausman Test results show that FEM is more suitable for estimation. However, the model appears to be an endogenous phenomenon, so the estimated effects are not reliable. GMM regression method continues to be used (similar to the study of [22], [26]).

The study using the Sargan Test obtained the p-value coefficient of $1,000 > 0.05$. Thus, the instrumental variable used satisfies over-identifying. The second-order autocorrelation test obtained a p-value of $0.6929 > 0.05$, so the model's residuals are not quadratic autocorrelation. Therefore, using the GMM model has solved the model's defects. The results found are solid and fully analyzable. The final results are interpreted according to the GMM method.

Firstly, with the bank-specific factors, total assets and ROAA affect liquidity in two opposing ways. As can be seen in the table, the coefficient of LnTA is significant and posi-

TABLE VII
RESULTS OF THE REGRESSIONS

	Pooled OLS	FEM	REM	GMM
LD.LDR	0.145*	0.103*	0.109	-0.0247
	[1.75]	[1.83]	[1.17]	[-0.69]
L.LDR				0.0299
				[0.30]
LnTA	-0.772	1.264	0.666	16.82***
	[-0.48]	[0.41]	[0.19]	[3.79]
ROAA	2.169	4.447***	4.274***	9.774***
	[1.23]	[3.50]	[3.76]	[4.18]
SAV	-1.406	-1.339*	-1.335*	-1.782***
	[-1.28]	[-1.93]	[-2.43]	[-4.64]
M2	0.157	0.127	0.126	0.218
	[0.49]	[0.64]	[0.67]	[1.46]
CPI	0.738**	0.777***	0.764***	1.060***
	[2.48]	[3.94]	[3.34]	[7.80]
MAR	-36.75	-36.16	-34.90*	-109.5***
	[-1.05]	[-1.32]	[-1.81]	[-3.54]
DMAR	26.01***	14.06	20.88	94.13
	[3.62]	[0.38]	[1.40]	[0.61]
cons	147.2***	120.4***	126.1***	-24.10
	[3.25]	[3.30]	[3.34]	[-0.51]
N	180	180	180	160
R-square	0.214		0.332	
Breusch and Pagan test			0.0000	
Hausman test			0.999	
Sargan test				1.0000
Arellano-Bond test				0.9624

T statistics in brackets

* p<0.1, ** p<0.05, *** p<0.01

Source: Author's calculation in STATA

tive, so the first hypothesis is accepted. The "too big to fail" theory comes true in Vietnam. Since the banks increase total assets, they tend to let their customer borrow more money to get a higher LDR. This is in line with many earlier findings, such as [26], [22]... Similarly, ROAA is found to have a positive effect on LDR in all calculation methods. This suggests that a bank that generated high profit likely held a relatively high loan to deposit ratio as higher profitability would result from increasing engagements in lending activity.

Second, with the outside factors, SAV and the liquidity of the financial market have negative impacts on liquidity, against CPI. Specifically, SAV is found to negatively affect LDR, suggesting that Vietnamese banks face a reduction in credit demand and a rising deposit supply when the national savings rate increases. In the same direction, the relationship between LDR and financial market liquidity is negative ($p < 0.01$). In other words, financial market liquidity has a positive effect on bank liquidity. In line with the researcher's expectation, CPI positively links LDR with LDR ($p < 0.01$). This finding is consistent with [22] and [32]. As suggested banks tend to increase its interest revenue (through a more aggregate loan) to offset addicted interest expenses when CPI increases.

Nevertheless, the model did not find any evidence about the relationship of monetary supply growth and the group of banks with bank liquidity. The coefficient of monetary supply growth is not statistically significant, although the signals in all four models are positive. This result was enforced before by [28]. Of note, the model reveals that the correlation between bank groups and liquidity is insignificant.

V. RECOMMENDATIONS

Firstly, to avoid the harmful effect of increasing total assets on bank liquidity, banks need to consider their developing strategy carefully. Therefore, in the case of Vietnam commercial banks (LDR is relatively high, approximately 90%), scaling up should be done with several critical conditions. Some of them are satisfying the LDR ceiling, attracting more customer deposits...

Second, increased profits should go hand in hand with liquidity safety. The solution is to increase non-interest income, such as selling non-credit services/products, developing customer financial management services... At the same time, additional profit should be used reasonably. Accordingly, the capital structure should always be considered to ensure liquidity safety in the short term as well as increase the efficiency of long-term liquidity.

Third, the study proves that the national savings rate has a significant positive effect on bank liquidity. In the Vietnamese economy, improving the national savings rate is essential for faster growth. Experiences in other countries show that increasing private savings can be done through losing fiscal policy (tax), monetary policy (interest rate policy), pension reform programs...

Fourth, empirical evidence implies that stable CPI controls can limit their negative effect on bank liquidity. In Vietnam, the Government and ministries (the Ministry of Industry and Trade, the Ministry of Finance, the Ministry of Health, the Ministry of Education and Training), as well as localities (which authorized the price of health services and education), need to closely coordinate to control the increase in prices of essential goods strictly. In the long term, Vietnam needs to improve the economy's production capacity to less depend on the effects of the costs of imported goods.

The fifth is increasing the liquidity of the financial market to secure the bank's liquidity. Improving the liquidity of Vietnam financial market is one of the major tasks of the Government, measures that can be used include: increasing the number of goods in the stock and bond markets (especially the corporate bond market), increasing the number of investors in the market through enhancing the role of institutional investors, perfecting the legal framework...

VI. CONCLUSION

This study investigates the determinants of bank liquidity in Vietnam between 2007-2017. The results show that total assets, profitability and consumer price index are inversely and significantly correlated with the bank liquidity. In contrast, the national savings rate and financial market liquidity have positive impacts on the liquidity of banks. In Vietnam – a bank-based financial system, it is interestingly noted that the growth in monetary supply growth has no significant effect on bank liquidity.

To conclude, this research is a stepping effort to identify determinants of bank liquidity in developing economies with the bank-based financial market. Further studies can be considered to expand other critical factors of the economy that could affect the liquidity of commercial banks such as unemployment rate, financial crisis, interbank rate...

REFERENCES

- [1] Acharya, V. V. and Viswanathan, S. (2011). 'Leverage, moral hazard, and liquidity', *The Journal of Finance*, No 66 (1), 99–138.
- [2] Al-Khouri, R. (2012), 'Bank Characteristics and Liquidity Transformation: The Case of GCC Banks', *International Journal of Economics and Finance*, No. 12 (4), 11-14.
- [3] Beck, T. *et al.* (2004), 'Bank competition and access to finance: International evidence', *Journal of Money, Credit and Banking*, No. 3 (36), 627-648.
- [4] Berger, A. and Udell, P. (2009), 'Bank liquidity creation', *Review of Financial Studies*, No 9 (22), 3779-3837
- [5] Bordeleau, E. and Graham, C. (2010), 'The Impact of Liquidity on Bank Profitability', *Financial Stability Department*, Bank of Canada, Working Paper.
- [6] Bryant, J. (1980), 'A model of reserves, bank runs and deposit insurance', *Journal of Banking and Finance*, No 4 (1), 335-344.
- [7] Bunda, I. and Desquilbet, B. (2008), 'The bank liquidity smile across exchange rate regimes', *International Economic Journal*, No. 3 (22), 361-386.
- [8] Calomiris, C. and Kahn, C. (1991), "The Role of Demandable Debt in Structuring Optimal Bank Arrangements", *American Economic Review*, No 81 (3), 497-513.
- [9] Chen, J. *et al.* (2014), 'The Determinants of Bank Liquidity Buffer', in the proceedings of the 2014 Southwestern Finance Association(SWFA) conference, Dallas, Texas, March 12-16.
- [10] Choon, L.K. *et al.* (2013), "The determinants influencing liquidity of Malaysia commercial banks, and its implication for relevant bodies: evidence from 15 Malaysian commercial banks", <http://eprints.utar.edu.my>.
- [11] Clayton, M. *et al.* (1999), 'On the Formation and Structure of International Exchanges', Wharton Working Paper 99-22.
- [12] Dey, K. and Flaherty, S. (2005), 'Stock exchange liquidity, bank credit, and economic growth', *Max Fry Conference on Finance and Development*, University of Birmingham, The Business School University House, Birmingham B15 2TT.
- [13] Diamond Douglas, W. (1984), 'Financial Intermediation and Delegated Monitoring', *The Review of Economic Studies*, No 51 (3), 393-414.
- [14] Diamon, D. and Rajan, R. (2001), 'Liquidity risk, liquidity creation, and financial fragility: a theory of banking', *Journal of Political Economy*, No 109 (2), 287-327.
- [15] Gersl, A. and Zlatuše, K. (2009), 'Liquidity Risk and Banks' Bidding Behavior: Evidence from the Global Financial Crisis', *Czech Journal of Economics and Finance*, No 59 (6), 577-592.
- [16] Hackethal, A. *et al.* (2010), 'Determinants of bank liquidity creation', *Working paper*, European School of Management and Technology.
- [17] Holmstrom, B. and Jean, T. (1998), 'Private and Public Supply of Liquidity', *Journal of Political Economy*, No 106 (1), 1-40.
- [18] Kashyap, K. *et al.* (2002), 'Banks as liquidity providers: an explanation for the coexistence of lending and deposit taking', *Journal of Finance*, No 1 (58), 33-73.
- [19] Kiyotaki, N. and John, M. (2012), 'Liquidity, Business Cycles, and Monetary Policy', National Bureau of Economic Research, Inc.
- [20] Lartey, V.C. *et al.* (2013), 'The relationship between liquidity and profitability of listed banks in Ghana', *International Journal of Business and Social Sciences*, No 3, 48-56.
- [21] Nguyen Thi My Linh (2016), 'Determinants of bank liquidity ratio in Vietnamese commercial bank', *Banking review*, No 9, 50-60.
- [22] Moussa, M. (2015), 'The Determinants of Bank Liquidity: Case of Tunisia', *International Journal of Economics and Financial Issues*, No 5 (1), 249-259.
- [23] Munteanua, I. (2012), 'Bank liquidity and its determinants in Romania', *Procedia Economics and Finance*, No 3, 993 – 998.
- [24] Pham Thi Hoang Anh. *et al.* (2015). 'System banking liquidity: Global experiences and some recommendation for Viet Nam'. (Head of thesis: Phạm Thị Hoàng Anh, Code Number: DTNH.18.2014, Place of acceptance: State bank of Việt Nam, Date of acceptance: 24/10/2015).
- [25] Praet, P. and Herzberg, V. (2008), 'Market liquidity and banking liquidity: linkages, vulnerabilities and the role of disclosure', *Financial Stability Review*, No 11, 95-111.
- [26] Rauch, C. *et al.* (2010), 'Determinants of Bank Liquidity Creation', SSRN Electronic Journal.
- [27] Trencă, I. *et al.* (2015), 'Impact of Macroeconomic Variables upon the Banking System Liquidity', *Procedia Economics and Finance*, No 32, 1170-1177.
- [28] Truong Quang Thong (2013), 'Determinants of bank liquidity risk in Viet Nam Banking system', *Journal of Asian Business and Economic Studies*, No 276, 50-62.
- [29] Umar, M. and Gang, S. (2016), 'Interaction among funding liquidity, liquidity creation and stock liquidity of banks Evidence from BRICS countries', *Journal of Financial Regulation and Compliance*, No 24 (4), 430-452.
- [30] Valla, N. *et al.* (2006), 'Bank liquidity and financial stability', *Banque de France financial stability review*, No 9, 40-47.
- [31] Vodova, P. (2011), 'Liquidity of Czech Commercial Banks and its Determinants', *International Journal of mathematical models and methods in applied sciences*, No 5 (6), 1060-1067.
- [32] Vodova, P. (2013), 'Determinants of commercial bank liquidity in Hungary', www.Slu.cz, 180-188.
- [33] Wang, Y. (2002), 'Liquidity management, operating performance, and corporate value: evidence from Japan and Taiwan', *Journal of Multinational Financial Management*, No 12 (2), 159-169.
- [34] Wetmore, J. L. (2004), 'Liquidity Risk and Increasing Loans-to-core Deposits Ratio of Large Commercial Bank Holding Companies', *American Business Review*, No 2 (22), 99-107.
- [35] Wojcik-Mazur, A. and Szajt, M. (2015), 'Determinants of Liquidity Risk in Commercial Banks in the European Union', *Argumenta Oeconomica*, No 35 (2), 26-47.

Completing Accounting to Develop Cooperative Economic in Vietnam in the Digital Economic Era

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Abstract—Collective economy, with the core being cooperatives, is one of the four important economic components in the socialist-oriented market economy in our country. Developing a cooperative model is really important in the latest period, the digital economy, because this is an economic model that attracts farmers, individual economic households, individuals and many organizations, helping to restructure agriculture, build a new countryside, develop the country in a new direction, in accordance with objective laws. However, in order to develop the cooperative model according to its potential and ensure the distribution of benefits among its members and fulfill tax obligations to the state, the accounting work needs to be perfected. So that the management, the use of financial resources of the cooperative is done properly, sufficiently, transparently and objectively in accordance with the law. In fact, the accounting work under the cooperative model in Vietnam still has many weaknesses. The author has summarized, analyzed and given some specific solutions to improve the accounting work at the cooperative in the coming time.

Index Terms—Cooperative accounting, digital economy, collective economy.

I. INTRODUCTION

COOPERATIVE is a collective economic organization, has legal status and has at least 7 members. In Vietnam, cooperatives play an important role in creating jobs and income for households and individuals. In recent years, along with the development of the economy, the number of cooperatives in Vietnam has changed from the old model to the new model, and the number of newly established cooperatives has increased. When transforming into a new model, cooperatives in Vietnam also have many advantages but also face many difficulties, especially in the organizational structure and accounting work of the cooperatives. Many cooperatives have been able to reduce input costs, improve product quality, provide stable income for members, eliminate hunger and reduce poverty, and contribute to social security for localities.

Currently, with the application of the new law on cooperatives in Vietnam, cooperatives must comply with new regulations on organizational structure and operating, requirements on charter capital, accounting structure and conditions of accountants. The cooperative accounting work must comply with the new accounting system applied exclusively to cooperatives. The quality and performance of cooperatives are greatly influenced by the results of the cooperative accounting organization. The application of new regulations as well as the influence of the digital economy also bring cer-

tain challenges for cooperative accounting to help develop the cooperative economy in the digital economy.

In this study, the contributions and current status of the cooperative economy are presented to the Vietnamese economy. The article also presents the influencing factors and current status of accounting work in cooperatives. From that, the article summarizes, analyzes and offers solutions to improve the accounting work of cooperatives in the context of the digital economy.

II. OVERVIEW OF COOPERATIVE

A cooperative is a collective, co-ownership economic organization, having the legal person status, voluntarily established by at least seven members who mutually cooperate in production, business and job creation to meet the common needs of cooperative members, on the basis of self-control, self-responsibility, equality and democracy in the management of the cooperative [1].

Cooperatives have been an effective way for people to exert control over their economic livelihoods as they play an increasingly important role in facilitating job creation, economic growth and social development. To be effective and successful, cooperatives must continuously achieve two inter-related goals: enhance viability and improve ability to service its members; and remain an economically viable, innovative and competitive [2].

The contribution of the cooperative sector to the national GDP, the contribution of this sector is shown through two channels, the direct contribution of the cooperative sector to economic growth and more importantly, an indirect contribution through impact on the member's economy and individual economy. The contribution of this sector to the national GDP averages about 3.9%/year, while the contribution of the whole economic sector, households accounts for over 30%/GDP of the whole country.

Through cooperatives, people associate and take advantage of natural and social conditions, traditional crafts, and local key products, and contribute capital to organize production and provide services that are not performed by a single individual. The cooperative economic sector is also an important nucleus in new rural construction, restructuring agriculture, industry, trade and service. Cooperatives create driving force for sustainable socio-economic development; the quality of the growth is stable, the job creation ability of this

area has increased sharply; improve the quality of life of members and communities, limit negative manifestations, moral degradation.

In addition to economic contributions, the cooperative sector also plays a very important role in politics, security and society in the community. First of all, cooperatives are an important channel in creating jobs, increasing incomes for members and employees, contributing to hunger eradication and poverty alleviation, especially in the fields of agriculture and rural areas. In addition, with the spirit of "cooperation" in the cooperative, the spirit of solidarity and mutual help among members and residential communities is promoted, cooperative members expand community activities, help mutual assistance in production and business activities and improvement of cultural life. Cooperative development will promote and spread the good values of the cooperative to the whole society, such as counting; honesty, fairness, democracy, publicity, transparency, spirit of mutual help, sense of autonomy, responsibility, sense of community care, have great significance in the cause of rich people in the country strong, democratic, just and civilized society.

Developing the cooperative economy contributes to the development of community culture, strengthening political security and social order and safety in the area. Through cooperatives, gradually strengthen democracy in the management of economic organizations in particular and in the local people's life in general. Many cooperatives actively participate together with local authorities in building rural infrastructure, public welfare works, such as traffic, electricity and water systems, schools, kindergartens, medical stations, etc.

The cooperative actively participates in the process of industrialization and modernization, which is an important premise for democratization and civilization improvement in rural areas, especially in remote and isolated areas.

A cooperative is a collective economic organization that plays an important role in socio-economic development. In Vietnam, the Law on Cooperatives (2012) [3] was introduced, creating a great impetus for the development of both the size, quantity and quality of cooperatives. As of December 31, 2020, the whole country has 119,248 Cooperatives (40,354 Cooperatives in the agricultural sector and 78,894 Cooperatives in non-agriculture), an increase of 10,960 Cooperatives (about 10%) compared to December 31, 2016, attracting 1,665,271 members participating members (on average, a Cooperatives has about 14 members). The number of regular employees in Cooperatives is about 1,091,015 people, an increase of 2.38 times compared to 2016 (Summary from reports of 26/63 localities). The average revenue of a Cooperative is 523 million VND/year, up 28% compared to 2016 (Summary from reports of 41/63 localities). The average profit of a Cooperative is 84.51 million VND/year, an increase of 1.57 times compared to 2016 (Summary from reports of 42/63 localities). In recent years, the growth rate of Cooperatives have tended to increase, with an average growth rate of 2.44%/year in the 2016-2020 period. The number of

cooperatives (cooperatives) by the end of 2020, there are 26,112 cooperatives nationwide, an increase of 6,225 cooperatives (about 31.3%) compared to 2016 (of which the number of cooperatives operating in the agricultural sector is 17,462 cooperatives, non-commercial cooperatives). agriculture is 8,650 cooperatives). The total number of members participating in the cooperative is over 6.1 million members, a decrease of 410,295 members (about 6.2%) compared to 2016. By the end of 2020, there were 100 cooperative unions across the country (57 agricultural cooperative unions and 43 non-agricultural cooperative unions), a double increase compared to 2016. The contribution of the cooperative economy has been shown over the years through the improvement of the household economy, creating jobs for many people in society, providing stable income, and contributing to social security local.

However, because cooperatives started off as small, odd and gradually developed, there will be many limitations for cooperatives to operate in a new way, especially for accounting work at cooperatives. In addition, operating according to the organizational mechanism and operating regulations, the cooperative accountant must still comply with the general provisions of the accounting law. The accounting work in the cooperative has a great influence on tracking the scale of operations, the development of the cooperative in cash, managing cash flow and ensuring the distribution of benefits among the members of the cooperative. Therefore, in the coming time, to ensure that the cooperative will develop in accordance with the orientation of the Party and the State, the accounting in Cooperatives needs to be completed in accordance with the provisions of the Law.

III. METHODOLOGY

Applying the method of collecting secondary data on documents related to the influence of the digital economy on the accounting profession and the cooperative economy, the current status of cooperative accounting in Vietnam through data of the General Statistics Office, scientific articles, economic journals, internet, reports, seminars with related topics. Collected data is statistically, aggregated, and analyzed to clarify the operational status of the cooperative economic model and cooperative accounting work in Vietnam in the current industrial revolution 4.0 period, from that provide suitable solutions.

IV. OPERATIONAL STATUS OF COOPERATIVE

A. *Current status of cooperative economic activities in Vietnam*

The promulgation of the Law on Cooperatives in 2012 created a legal corridor to promote the development of the cooperative economic sector in Vietnam. The Steering Committee for economic renewal and development of cooperatives has been built and well organized to perform the tasks as prescribed at all levels. Vietnam is currently a member of the World Trade Organization (WTO) since 2017, participating in 13 free trade agreements, especially CPTPP, EVFTA and IPA. In the globalization trend and the influence of the industrial revolution 4.0, the world tends to use high-

quality products with clear origin, which requires cooperatives to make changes to adapt. Applying e-commerce or digital economy is considered as a solution to help cooperatives improve their competitiveness and expand markets. International integration and revolution 4.0 are both opportunities and challenges for the development of the cooperative economy in Vietnam.

In Vietnam, the number of active cooperatives with annual average production and business results in the period 2016-2019 of the whole country is 13,642 cooperatives, an increase of 5.0% compared to the average period of 2011-2015. Specifically as follows: In the period 2016-2019, there are 5 localities leading the country in the average number of cooperatives, including Hanoi 1,308 cooperatives (down 4.5% compared to the annual average in the period 2011-2015); Ha Tinh 979 cooperatives (up 72.9%); Thanh Hoa 721 cooperatives (down 0.9%); Nghe An 490 cooperatives (down 2.6%); Hai Duong 458 cooperatives (down 11.3%). There are 29/63 localities with an increase in the number of active cooperatives whose average production and business results in the 2016-2019 period are higher than the national growth rate (up 5.0%) compared to the average in the 2011-2015 period. . In which, 15/63 localities had an increase of over 30%, including: Son La with an increase of 295.0%; Binh Phuoc increased by 107.7%; Bac Kan increased by 90.5%; Quang Ninh increased by 81.7%; Kien Giang increased by 79.5%; Lam Dong increased by 75.9%; Ha Tinh increased 72.9%; Lang Son increased by 67.4%; Dong Nai increased by 61.5%; Dak Lak increased by 54.1%; Thai Nguyen increased by 53.6%. There are 8/63 localities with an increase in the number of active cooperatives whose average production and business results in the 2016-2019 period are lower than the national average growth rate in the 2011-2015 period. There were 26/63 localities where the average number of cooperatives in the period 2016-2019 decreased compared with the average in the period 2011-2015, of which 7 localities decreased by more than 15%, including: Bac Ninh down 34.7%; Hoa Binh down 31.9%; Ha Giang decreased by 26.1%; Cao Bang down 24.0%; Binh Thuan down 18.5%; Khanh Hoa decreased by 17.8%; Phu Yen decreased by 15.9% [4].

TABLE I
Number of acting cooperatives having business by province

	Period Average 2013-2015	2016	2017	2018	2019	Development index	
						2019 vs 2018	Period Average 2016-2019 vs 2011-2015
WHOLE COUNTRY	12991	13012	13226	13958	14388	103.1	105
Red River Delta	4928	4511	4466	4507	4511	100.1	93.1
Northern midlands and mountain areas	2184	2061	2160	2376	2540	106.9	104.5
North Central and Central coastal areas	3501	3788	3791	3919	3903	99.6	110
Central Highlands	407	460	535	643	726	112.9	145.3
South East	740	861	906	1038	1057	110.8	130.4

Mekong River Delta	1232	1331	1368	1475	1651	111.9	118.1
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On average, in the 2016-2019 period, the cooperative operating with production and business results nationwide attracted 188,637 employees, down 14.3% compared to the average in the 2011-2015 period. In the period 2016-2019, there are 4 localities that attract an average of over 10,000 employees/year to work in active cooperatives, including: Hanoi 18,695 employees (down 17.7% compared to the average year in the period 2011-2015).); Ho Chi Minh City 14,719 employees (down 30.0%); Thanh Hoa 10,390 employees (down 25.5%); Ha Tinh has 10,006 employees (up 65.2%). On average, in the period 2016-2019, 12/63 localities have an increase in the rate of attracting labor to work in active cooperatives compared to the average in the 2011-2015 period (the national average decreased by 14.3%).), in which 9 localities had an increase of over 20%, including: Son La with an increase of 195.0%; Binh Phuoc increased 87.9%; Kien Giang increased by 81.7%; Bac Kan increased by 66.2%; Ha Tinh increased 65.2%; Lam Dong increased by 62.5%; Bac Lieu increased by 46.6%; Hau Giang increased by 43.8%; Tien Giang increased by 39.4%. There are 35/63 localities with the speed of attracting labor to working cooperatives with the average production and business results in the 2016-2019 period compared with the average in the 2011-2015 period, which is lower than the national average. , in which 7 localities have the rate of attracting labor to work in cooperatives decreased by over 30%, including: Phu Yen down 46.9%; Ha Nam down 43.8%; Hai Phong down 42.9%; Bac Ninh down 40.0%; Lao Cai decreased by 35.6%; Khanh Hoa decreased by 32.5%; Tuyen Quang fell 32.2% [4].

TABLE II
Number of employees in acting cooperatives having business by province

	Period Average 2013-2015	2016	2017	2018	2019	Person, % Development index	
						2019 vs 2018	Period Average 2016-2019 vs 2011-2015
WHOLE COUNTRY	220151	200925	188612	185714	179938	96.9	85.7
Red River Delta	85536	71735	69109	66725	58679	87.9	77.8
Northern midlands and mountain areas	26357	25413	24290	24762	25399	102.6	94.7
North Central and Central coastal areas	48117	46906	43090	42258	41720	98.7	90.4
Central Highlands	8077	7090	6760	7037	6689	95.1	85.3
South East	30755	28063	23498	22160	23432	105.7	78.5
Mekong River Delta	21309	21718	21865	22772	24019	105.5	106

On average, in the period 2016-2019, each year the cooperative sector generated 3,152 billion VND in pre-tax profit, an increase of 0.7% compared to the average profit earned in the 2011-2015 period. In the period 2016-2019, 60/63 localities operated with profit, of which 3 localities had an average annual profit before tax of over 100 billion VND, including: Ho Chi Minh City 1,481 billion VND (down 3.7%) compared with the period 2011-2015), Dong Nai 198 billion (up 190.8%) and Hanoi 185 billion (down 52.4%). There were

3/63 localities in the period 2016-2019 suffered losses, of which: Thai Nguyen lost 123 billion VND (in the period 2011-2015 lost 52 billion VND), Da Nang lost 11 billion VND (in the period 2011-2015 lost 2 billion VND). billion dong), Lao Cai lost 1 billion dong (in the period 2011-2015, the profit was 6 billion dong). Regarding the growth rate of pre-tax profit, 28/63 localities had a decrease in pre-tax profit in the 2016-2019 period compared to the 2011-2015 period; 35/63 localities saw an increase in pre-tax profits, of which 5 localities increased by more than 100%, including: Son La with an increase of 365.2%; Dong Nai increased 190.8%; Bac Ninh increased by 156.4 %; Ba Ria - Vung Tau increased by 135.1%; Nam Dinh increased 104% [4].

TABLE III

Profit before taxes of acting cooperatives having business by province

Bill. dong, %

	Period Average 2011-2015	2018	2019	Development index	
				2019 vs 2018	Period Average 2016-2019 vs 2011-2015
WHOLE COUNTRY	31129	2568	2663	103.7	100.7
Red River Delta	617	450	429	95.3	82
Northern midlands and mountain areas	-54	-126	-117		
North Central and Central coastal areas	363	266	148	55.6	78.8
Central Highlands	96	144	135	93.8	147.7
South East	1680	1581	1529	96.7	106.3
Mekong River Delta	428	253	539	213	103.4

To sum up, the number of cooperatives in Vietnam tends to increase, but the number of participating workers decreases in general. Profits from acting cooperatives have generally increased in the current period. The influence of the industrial revolution 4.0 and the trend of globalization will bring new development directions to the cooperative economy. Therefore, the cooperative economy needs appropriate changes to capture development opportunities.

B. Organizational structure, operational apparatus of the cooperative economic model

Cooperative is a collective economic organization, jointly owned, with legal status, established by at least 7 members voluntarily and cooperates and supports each other in production, business and job creation activities. in order to meet the common needs of members, on the basis of autonomy, self-responsibility, equality and democracy in cooperative management [3].

According to the provisions of the Law on Cooperatives 2012, the organizational structure of cooperatives and unions of cooperatives consists of a general meeting of members, a board of directors, a director (general director) and a supervisory board or controller.

The Members' General Assembly has the highest decision-making power of cooperatives and unions of cooperatives. The

general meeting of members consists of the annual general meeting of members and an extraordinary general meeting of members. The general meeting of members is held in the form of a general meeting or a general meeting of delegates (hereinafter referred to as the general meeting of members). Powers and duties of the general meeting of members are entitled to decide on the following contents: "report on activities, finance, income, salary of members, decide on the expansion and narrowing of the operation scale of the cooperative, deciding key positions in the cooperative...." [3].

The Board of Directors of cooperatives and unions of cooperatives is the governing body for cooperatives and unions of cooperatives established by conference or general meeting of members to elect, relieve from duty or dismiss by secret ballot. . The Board of Directors consists of the chairman and members, the number of members of the Board of Directors is prescribed by the charter but the minimum is 3 people, the maximum is 15 people.

The term of office of the Board of Directors of the cooperatives and unions of cooperatives shall be prescribed by the charter of the cooperatives and unions of cooperatives, but shall be at least 02 years and the maximum is 05 years. The Board of Directors uses the seal of the cooperatives and unions of cooperatives to perform its rights and duties. Decisions and tasks of the Board of Directors "is the advisory body to help the General Assembly of Members implement the planned work, evaluate the performance of the divisions and report to the General Meeting of Members. ..."

The Supervisory Board and supervisors operate independently, inspect and supervise the activities of cooperatives and unions of cooperatives in accordance with the provisions of law and the charter. The Supervisory Board or controller shall be directly elected by the general meeting of members from among the members and representatives of the affiliated cooperatives by secret ballot. The number of members of the Supervisory Board shall be decided by the general meeting of members but must not exceed 07 people. Cooperatives with 30 or more members and unions of cooperatives with 10 or more member cooperatives must elect a supervisory board. For cooperatives with less than 30 members, unions of cooperatives with less than 10 member cooperatives, the establishment of a supervisory board or controller is prescribed by the charter. The head of the Supervisory Board is directly elected by the general meeting of members from among the members of the Control Board, the term of the Supervisory Board or the controller according to the term of the Board of Directors.

C. Operational status of the cooperative accounting apparatus in Vietnam

First, about the organization of the accounting apparatus: The organization of accounting work in a cooperative can be understood as the building and establishment of a reciprocal relationship between accounting objects, accounting methods, the accounting apparatus in accordance with the provisions of the law. Currently, the cooperative's accounting work is carried out in accordance with the provisions of Law on Accounting

88/2015/QH13 dated November 20, 2015 [5] and Circular No. 24/2017/TT-BTC dated March 28, 2017 of the Ministry of Finance [6] on guiding the accounting regime of cooperatives and unions of cooperatives. Particularly for large-scale cooperatives with many transactions that are not regulated in Circular No. 24/2017/TT-BTC, they may choose to apply the accounting system for small and medium-sized enterprises (SMEs) promulgated in accordance with this Circular. No. 133/2016/TT-BTC dated August 26, 2016 of the Ministry of Finance [7]. If the cooperative chooses to apply the accounting method according to this Circular, it must comply with all provisions of this Circular, if there are arising transactions not specified in Circular 24/2017/TT-BTC. The choice to apply the accounting regime must be made consistently in the fiscal year and must be reported to the tax authority managing the cooperative.

In the current actual situation, the organization of the accounting apparatus mostly complies with Circular No. 24/2017/TT-BTC, because the scale of operation of the cooperative is still small and has not yet developed to an enterprise level. According to regulations, the organization of the accounting apparatus is the arrangement and assignment of work for each accountant and the organization of rotation of documents in the accounting department of the cooperative. An accountant does all the work, even concurrently serving as a storekeeper and treasurer, so mistakes and mistakes that are difficult to detect still occur and violate the principle of non-duality.

Second, on the approach and application of the accounting regime. At present, many cooperatives do not fully grasp the basic principles of accounting prescribed in the Law on Accounting and the Accounting System, as well as the guidelines, which leads to many mistakes in accounting work, which is not consistent with the law regulations, affecting the tax payment of enterprises and the distribution of benefits among members of the cooperative.

Third, the application of accounting vouchers, according to regulations, each arising economic transaction must have a specific set of vouchers to ensure the authenticity and accuracy of the operation taking place in accordance with the operating functions of the Cooperative, in accordance with the implementation schedule. However, most cooperatives do not design strict vouchers in reality. There are many shortcomings leading to ineffective management of financial activities, possible tax fraud, status. This will seriously affect the socio-economic development of the country.

Fourth, organize of initial data collection of economic transactions arising in the cooperative. Although cooperatives have compliance with regulations on accounting documents, they have not paid much attention to building a specific scientific document circulation process. This affects the quality of accounting information at the unit. Beside, the distinction and identification of vouchers made to record books for each object is not really clear. Many accountants have used data in one accounting book as a basis for recording in other accounting books. When performing period-end transactions,

most accountants do not prepare vouchers reflecting endogenous economic transactions, but transfer data based on detailed books. This violated basic accounting principles.

Fifth, apply of the accounting system. The task of each accountant is that, after basing on each arising economic transaction, it is necessary to make accounting entries of arising transactions and in accordance with the law, ensuring the monitoring, consistency and binding relationship with other accounts. However, due to the lack of understanding of the nature, use and structure of each accounting account, most accountants at cooperatives use accounting accounts incorrectly for specific situations and record business transactions is not in accordance with the prescribed regime. In detail, in the accounting work of cost aggregation and costing, the cooperative accountant must perform such operations as: Cost aggregation, cost allocation, cost summation, cost calculation, etc. Transactions must be reflected on a specific account according to its nature, but many accountants do not distinguish the use of groups of accounts in the "business account" type such as: "group of accounts for cost calculation" and "group of accounts for distribution according to estimates". This affects the accounting's reflection and recording and the calculation and determination of the necessary criteria to provide information for management and operation of production and business activities.

Sixth, the state of making accounting statements and financial statements at the accounting apparatus of the cooperative, although it is correct in the form for the applicable accounting system but there are still many errors. The balance between the not correct, the account with outstanding balance and credit balance is still not true to reality. There is still an account with no balance but still hanging on the accounting books. In the recognition of accounting information on the financial statements, there are also some errors in the recognition of incorrect items on the accounting reports such as not distinguishing between social insurance and health insurance as debt, liabilities or equity. The presentation of indicators, codes of indicators are not recorded in the correct order. When recognizing payments that do not fully comply with the principles of financial statement presentation.

Seventh, organize the accounting inspection. In fact, because the accounting apparatus in cooperatives usually has one person, the leadership and management of the cooperative are often people who do not have expertise in finance - accounting, leading to the organization of accounting inspection in the cooperative. There are many shortcomings, it is difficult to detect errors in accounting work. Only when there is a tax agency, an audit agency can detect the error, but then it will be more difficult to handle the mistake when it is detected internally from the beginning. In addition, cooperatives often have a small scale of operation, with little economic activity, so many cooperatives believe that they only focus on the responsibility of the Board of Directors for the use of capital, revenues, expenses and profit distribution without focusing on checking the order of recording arising

economic transactions, vouchers, book-keeping and making accounting reports. This has led to gaps in inspection and control are the causes of errors in accounting work at cooperatives.

Eighth, the application of information technology in accounting activities at the cooperative, the establishment of the cooperative was initially small, so in each cooperative, a large amount of concentrated financial resources were always devoted, focusing on the development of production and business without investing in infrastructure and facilities for accounting work at cooperatives. So most of the application of information technology to handling cooperative work is still very limited, monitoring on software Accounting is not yet universal, some units still use excel to do accounting work, leading to confusion of accounting information and limited accounting information storage [8]. A number of cooperative alliances have invested in purchasing accounting software [9] such as accounting software BUCA, Lotus, DTSoft, EBIC.CPA, WACA, VCS-PADDY in the provinces. The cooperatives deployed training for accountants in cooperatives to apply accounting software in practice. However, there are few cooperatives in provinces use this software to handle accounting work. The reason is that it is difficult for accountants to access and apply the software used for accounting work. On the other hand, software providers such as BUCA only provide operating instructions with general principles, so accountants do not know how to use the software to process existing accounting data. Therefore, accountants in the cooperatives mainly perform manual accounting or combine excel at the present.

Final, the qualifications of accountants in cooperatives are still limited. Currently, accountants in some cooperatives still have limited qualifications, thus hindering the absorption and application of new changes in accounting. Most of the accountants in cooperatives have not been professionally trained, only 50% have professional qualifications, of which 20% have intermediate or higher degrees. The professional training for accountants has not been paid enough attention. Many business cooperatives are inefficient or newly established, so there is little funding, low salary payments for accountants, thus not creating motivation for accountants to study and improve their qualifications. Many cooperatives cannot afford to send accountants to train and improve their accounting professional qualifications. This has led to difficult for accountants to apply new policies and procedures and apply digital technology to their accounting work.

D. Factors affecting the accounting work of Cooperatives

First, the influence of the cooperative's perception. For cooperatives, the financial management is in accordance with the accounting regime, ensuring honesty and objectivity, forming financial sources, using financial sources, distributing incomes to members, and fulfilling tax obligations with cooperatives. The state is still new, the mentality is "difficult to adapt" or "unfamiliar", many HXT officials still have to take a long time to adapt. It is very difficult to manage the

finances properly with the accounting regime without affecting the interests of individuals in the cooperative. .

Second, due to the transformation of the management apparatus according to new regulations, the management in general and the organization of accounting work in particular faced many difficulties during the transformation.

Third, the barrier of accounting human resources. In cooperatives, the accounting qualifications of accountants do not meet the actual requirements, plus the double duty of many tasks, so the handling of accounting situations still has many errors.

Fourth, due to the barrier to mobilizing financial resources to develop the cooperative model, in order to supply products that meet the requirements of the market, it is necessary to invest a lot of input costs for production and implementation. Creating a satisfactory product requires a lot of capital. The allocation of capital to invest in the development of the accounting system will not be prioritized, so the accounting work at the cooperative has not been developed with the development of the operation scale.

Fifth, the accounting system and regulations related to the organization of work often change, but the qualifications of the accountants are still limited. So the access to new knowledge and regulations is slow. This affects the operation of the cooperative.

V. SOLUTIONS

In the context of society's rapid development of science and technology, the era of the digital economy, the requirements for the quality of services and products are increasing, the competition in the market is getting fiercer. Competition on integration and trade liberalization of agricultural, forestry and fishery products with other countries is increasing, so the products supplied to the market by the cooperative will have to face stiff competition from other countries. Therefore, in order to survive and develop, it is necessary to have a solid, professional and highly qualified accounting department. In addition to recording and monitoring arising economic transactions, it is necessary to have advice on the development policy of the cooperative to ensure compliance with the provisions of the law, generate large profit after tax, assess the impact of the cooperative's growth of the cooperative through annual financial statements and the influence of other economic factors. In the article, the author offers some specific solutions to focus on accounting, ensuring ensure the highest operational efficiency of the accounting apparatus in the cooperative.

First, perfect the organization of the accounting apparatus. The operational efficiency of accounting work in cooperative depends on the organization of the accounting apparatus [10]. Therefore, when a cooperative is newly established, it is necessary to clearly define the scale of its operations to determine the appropriate accounting regime according to Circular No. 24/2017/TT-BTC or Circular No. 133/2016/TT-BTC [11]. From there, it will determine the number of accounting departments and the number of people working in each department. The number of accounting departments in the

cooperative should be determined appropriately to ensure the working relationship between these departments in common with all other departments in order to assign and coordinate the responsibilities of each department in handling work, meeting requirements and reporting information for management of the cooperative. The cooperative's accounting apparatus is organized according to a centralized accounting model to match its operational characteristics. Accounting jobs need separation of responsibilities to ensure the ability to control accounting work as well as easier to detect errors.

Second, perfecting the accounting voucher system. The perfecting the accounting voucher system for accounting operations is very important. The cooperative needs to set up accounting vouchers according to each arising economic operation, ensuring compliance with regulations, logic, objectivity, science, easy to check, compare errors. In addition, it is necessary to strengthen the inspection, supplement and amend the unreasonable accounting process so that the circulation of documents is carried out in accordance with regulations. The initial collection of documents should be suitable to the scale of operation and management requirements of each type of business of the cooperative. For each cooperative, it is necessary to build an appropriate document system and the document rotation process associated with the responsibilities of each individual and department to strictly control as well as help the circulation of documents to be avoid overlapping between parts. Cooperatives should apply digital technology in issuing, recording and managing accounting vouchers.

Third, perfect the organization of the accounting system. It is very important to identify the correct account to account for arising economic operations, to balance the accounts, to make accounting books, to serve the reporting of financial resources, to inspect and control agencies. State management agencies, so accountants need to accurately determine the account before accounting, so as to best reflect the arising economic operations. For example, the cooperative accounting that aggregates production costs on account 632 is inconsistent with the nature of the current account. According to the provisions of Circular No. 24/2017/TT-BTC [6], to collect costs and calculate costs, accountants must use a group of costing accounts including account "Account 154 - Production and business expenses"; "Account 2422 - Construction in progress". When discharging materials and costs related to production services, the accountant must use account 154 to reflect, at the end of the period, to summarize and calculate the cost. In case, there are expenses related to many periods that need to be monitored and allocated according to the plan, the accountant must monitor and record them on the group of accounts distributed according to the estimate, including "Account 2421- Expenses for payment prior to". These costs are often incurred in cooperatives such as: The cost of major repair of the irrigation system; Cost of tools, tools used many times; The initial seedling cost is related to many crops, the initial cost of tillage. Besides using general accounts, depending on the management requirements of each unit,

accountants can open more detailed accounts to serve the provision of information. The construction of a detailed account system is essential for the financial management of the cooperative and meets the requirements of providing information for internal management of the unit.

Fourth, perfecting the system of books and financial statements in accordance with regulations, opening the books according to the instructions, taking careful notes and printing the archives after each accounting period is a must. The financial statements of the cooperatives should be prepared in accordance with accounting principles, the items should be presented in the correct order, nature and codes. Receivables are not presented in detail on the Balance Sheet. In the Report on the increase and decrease of the cooperative's equity, the social insurance capital for the cooperative's employees is not presented, the nature of the source of social insurance is not business capital.

Fifth, it is necessary to support capacity building for cooperative staff in general and accounting staff in particular, with short-term training courses. Having policies to attract qualified human resources to work in cooperatives. Accountants need to be proactive in researching and updating new accounting programs and regimes. Cooperatives need to create conditions and allocate funds for training and retraining to help accountants access and use accounting software proficiently as required by the digital economy.

Sixth, perform accounting checks at cooperatives regularly to quickly detect errors. The inspection contents need to be fully detailed such as the implementation of the accounting regime on vouchers, bookkeeping, and the preparation of financial statements. Check the mobilization, use of capital, cash, increase or decrease of funds, business results.

Final, it is necessary to arrange annual capital to invest in facilities and apply information in accounting work at the cooperative. Because the application of information technology often changes, it is necessary to have a fixed financial source in order to meet the needs of the job when there is a change. Cooperatives need to promote the application of digital technology in management and administration of production, business and service activities, as well as accounting work through building a system of utilities, monitoring, and increasing internal management efficiency [12] by digital technology such as: human resource management, inventory import and export, cost valuation, selling price, production management, farming areas, batch and code management, supply chain management (packaging, transportation, storage),etc [13]. Allows to monitor, advise and guide the implementation of production processes, operations, remote manipulation, creation and termination of operations on the Japanese system. specialized electronic signature of the system; at the same time, it helps the cooperative to connect with information channels about policies, techniques, markets and units providing materials, transportation, consumption,etc. to increase business performance. Provinces should pilot cooperative models applying digital technology as a point to evaluate, learn from experience, and replicate on a large scale.

Management agencies need to focus on effectively implementing and supporting cooperatives in applying e-commerce and applying new technologies in e-commerce, supporting the digital transformation process. Cooperatives need to invest in accounting software such as HTC-Accounting, Bavutex, DTSoft, EBIC.CPA to ensure the timeliness and accuracy of accounting data, and improve the efficiency of accounting work according to the standards. requirements of the 4.0 revolution.

REFERENCES

- [1] General Statistics Office, 2020. Statistical Yearbook of Vietnam, Statistical Publishing House.
- [2] Dogarawa, Ahmad Bello, (2010). The Role of Cooperative Societies in Economic Development, SSRN, June 8, 2010.
- [3] Law on Cooperatives of Vietnam, No.23/2012/QH13, 2012
- [4] Ministry of Planning and Investment, 2021. 2021 Vietnamese Cooperatives white book, Statistical Publishing House.
- [5] Law on Accounting of Vietnam, No.88/2015/QH13, 2015.
- [6] Ministry of Finance, 2017. Guiding the Accounting Regime of Cooperatives and Unions of Cooperatives, Circular No. 24/2017/TT-BTC, Dated 28/3/2017.
- [7] Ministry of Finance, 2016. Guiding the Accounting Regime for SME, Circular No. 133/2016/TT-BTC, Dated 26/8/2016.
- [8] Le Ngoc, "The current situation of digital transformation in agricultural cooperatives and solutions in the coming time", in press.
- [9] D.T. Han, 2020. Difficulty in organizing accounting work in new type agricultural cooperatives, Journal of Accounting & Auditing.
- [10] YUAN Weiqian, (2015). On Perfection of Governance Structure of Rural Cooperative Economic Organizations in China, *International Business and Management*, Vol. 10, No. 2, 2015, pp. 92-97, April 2015.
- [11] Vietnam Academy of Agricultural Sciences, <https://vaas.vn/vi/tieu-diem-binh-luan/mot-so-giai-phap-hoan-thien-khung-phap-ly-ho-tro-phat-trien-hop-tac-xa-nong>, Paper can be found at the link.
- [12] N.T. Huyen, 2021. Some solutions to develop agricultural cooperatives in Vietnam today", Industry and Trade Journal.
- [13] D.V. Thanh, 2020. Some solutions to develop the collective and cooperative economic sector, Financial Journal.

Corporate social responsibility and employee loyalty: Role of pride and commitment

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Abstract—Recently, corporate social responsibility (CSR) is one of the most important issues that have received the attention of our whole society in all sectors. The current research attempts to examine the influence mechanism of corporate social responsibility on the loyalty of employees who work in the firms. This research also clarifies the mediating effects of employees' pride perception and commitment in the relationship between CSR performance of the firms and employees' loyalty intention. This research collected data through questionnaire survey using a convenient sampling method with the respondents who are employees in small and medium firms in Hanoi city, capital of Vietnam. Finally, 210 valid questionnaires collected that were utilized to test the hypothesis applying PLS-SEM approach with SmartPLS software. The results showed that CSR does not directly affect employees' loyalty behavior, but via the mediating effects of employees' pride perception and commitment with the firms. Moreover, perceived pride of employees has no direct effect on employees' loyalty behaviors with the firms.

Index Terms—Corporate social responsibility, loyalty, perceived pride, commitment, employee, SMEs

I. INTRODUCTION

IN THE context of increasingly fierce competition today, in order to survive and develop, firms must have an appropriate firm strategy. Human resource policy is one of the important policies that firms need to pay attention to because after all, corporate governance is people management. Therefore, internal marketing becomes a very important issue that receives the attention of managers. After recruiting employees to work, they will be trained to match the firm with the job position. This is a time-consuming and costly process, so if the employee leaves the firm, it is a huge loss, especially for senior staff. The purpose of creating and maintaining employee motivation in the firm, increasing satisfaction and long-term working commitment at the firm [1]. Managers are always looking for and have pointed out many factors that determine employee engagement such as leadership style [2], working environment [3], working and learning environment [2], and CSR [4, 5].

CSR is one of the issues attracting the attention of the whole society and of scholars in many fields. Specifically in management, marketing [6], strategic management [7], working efficiency [8], marketing and customer behavior [9]. The research can approach from the perspective of the behavior of employees and customers in the relationship between CSR and their behavior. However, up to now, there are only very few studies focusing on clarifying the mechanism of impact of CSR on the long-term working commit-

ment of employees. In addition, many studies have demonstrated that CSR has a direct or indirect influence on employee behavior of the organization. [10-12]. Furthermore, recent studies suggest that further study of this relationship is needed [4, 5].

This study explores employee engagement with the firm by emphasizing CSR awareness. Forbes magazine, in an article published in 2012 on this issue, indicates that employee engagement. Employees are one of the leading trends in CSR. The article refers to a study by A Hewitt & Associates he visited 230 firms and reached 100,000 employees. The results show that the employees of the firm are more engaged when they actively carry out CSR activities. In addition, a study by the Association for Human Resource Management shows that firms implementing a sustainable development strategy have more loyal employees. Oliveira et al (2014) conducted a study focusing on this relationship, they point to four clusters of documents including "sustainability and ethics". One study shows that CSR awareness studies often focus on external aspects and outcomes, rather than internal factors and its interaction with these factors, for example, human resource management [13]. The authors point out that it is necessary to further study the relationship between CSR and employee engagement with other variables to provide a more comprehensive view of employee behavior with the firm. Moreover, Vietnam is a developing country, sustainable development is an urgent requirement because the hot development in recent years has posed problems about the natural environment. Therefore, people are increasingly interested in environmental issues, quality of life and consider this as the standard that firms need to be responsible for. Firms implementing CSR is a requirement not only of external customers but also of internal employees. Studies also show that when employees are aware of the corporate social responsibility they feel more proud of the firm [14] through which a commitment to firms will appear [15] thereby stimulating employee loyalty to the firm [4].

However, the above studies only stop at the study of individual relationships, there is no research to clarify the mechanism of impact of social responsibility on employee engagement through the mediating variable, pride and identification of employees with the firm. Therefore, this study wishes to clarify this mechanism of impact in the context of the hotel sector in Vietnam. Specifically, this study will answer the following questions:

Question 1: To what extent does the CSR affect employee loyalty?

Question 2: What role does pride play in the relationship between CSR and employee loyalty?

Question 3: What role does employee commitment to the firm play in the relationship between CSR and employee loyalty?

Question 4: What solutions can be proposed to hotels in improving CSR?

II. BACKGROUNDED THEORIES AND RESEARCH MODEL

A. Theory of organizational behavior

Developed in 1999 by Luthans, this theory focuses on personal characteristics that can be developed and improved through improving the working environment and method management. At the same time, this theory offers a new approach to improve employees' positive behavior through the assessment and development of psychological factors of employees, such as internal factors, identification and commitment. Luthans et al. (2004) argue that this research applies to people's psychological capacity in a positive way and the power of resources can be measured, effectively developed and managed for improvement nonstop at work [16].

To date, the concepts of positive psychology that are often mentioned in research and reflect quite comprehensively on the criteria of this theory such as hope, adaptability, optimism, and confidence [16, 17]. This combination of components is called the psychological competence of the employees. This theory has been applied vastly to understand positive behaviors of employees in all sectors of our life [17].

B. Corporate social responsibility (CSR)

In this study, corporate social responsibility can be understood as a form of self-regulation of firms in firm activities. Social responsibility is the responsibility of firms and employers for the whole society, for the products they make, for consumers, for employees, or for natural resources and environment... Archie Carroll, CSR includes economic, legal, ethical and philanthropic responsibility [18]. With the current trend of globalization, in order to be able to occupy more niches of the market as well as increase the brand value for firms, it is imperative that firms perform well through their social responsibility activities for society. There are six types of social activities that firms can do to become a corporate citizen: the first is charity work, the second is volunteering for the community, the third is selling products beneficial to the social community, fourth is promoting and promoting campaigns that benefit the community, fifth is marketing that has social meaning and finally marketing to change social behavior [19]. Any activity that wants to be done well must come from the core of the problem and CSR is not an exception. CSR in a large scale is the face of the country, and in a narrower scope, it is the face of the main firm, so employees are the core of the construction.

The influence of CSR is controlled by employees' perceived actions, so this positive relationship is very strong [20]. The perceived social responsibility of employees will trigger a chain of cognitive, emotional, and attitudinal behaviors. Drawing from the theory of emotional evaluation, it is concluded that perceived CSR is related to emotions (specifically, organizational pride), to work attitudes (specif-

ically, loyalty of employees) [21]. Immediately afterwards, the perception of person-to-organization fit, organization identification, and organizational support were perceived to mediate the positive and important relationship between CSR and affective commitment [22]. In other words, firms that perform well on social responsibility affect employees' attitudes and behaviors at work, improve employee loyalty and love for work as well as the firm [23].

C. CSR and employee loyalty

There are many different conceptions of corporate social responsibility in modern society. From the community's point of view, the social responsibility of firms is the voluntary and self-consciousness of firms to carry out their responsibilities in production and firm in order to gain benefits for their firms, for the society. but must ensure sustainable development for the sake of economic, social and environmental protection. From the point of view of human resource management, the social responsibility of the firm is derived from the relationship between the firm and the employee, which has a positive relationship. In the current market economy conditions, technology and people are the two basic factors that determine the production and firm efficiency of firms [24]. Employee loyalty to the organization is reflected in two aspects: First, behavioral loyalty: each individual wants to receive rewards from the organization or vice versa, fulfilling his/her obligations to that firm. in a way that forces himself with his own actions [25] and second, attitudinal loyalty: is the similarity of employees' uniform behavior towards the organization and employees' active participation in the activities of the firm. Over time, close relationships are evident when employees think about their relationship with the firm and perform activities that clearly reflect the company's strategy. CSR leads to the sustainable development of firms, allowing firms to improve profits and create social values. On the contrary, if the firm implements CSR in a specific way and there is fairness among employees, reflected in the following tools: salary, bonus, supervision [25] or organizational culture as systems of core values, beliefs and behavioral patterns that create a unique identity for a firm.

Employee loyalty represents a work-related mental state characterized by feelings of excitement, accomplishment, enthusiasm, absorption, and dedication [26]. Firm through employee management / internal communication associated with employee loyalty; enhancing supportive communication behaviors that reduce employees' intention to leave the organization [27]. Another study proved that job skill diversity is the main predictor of employee loyalty. In addition, job characteristics and organizational support as well as job satisfaction, organizational commitment, organizational citizenship behavior, and loyalty mediate relationships that build money. subject and consequences [28]. According to another opinion, the loyalty of employees to the organization is even tighter when firms use CSR activities that allow employees to bring their full capacity to work, making them feel satisfied and proud [29]. Based on the links of previous studies, the paper makes a hypothetical proposal:

H1: CSR has the effect of promoting employee loyalty to the firm.

D. CSR and employee perception of pride towards the firms

Employee pride is a series of cognitive, emotional, and attitudinal behaviors about the organization. Specifically, there are two types of organizational pride. First, employees may experience persistent and brief feelings of pride based on the perception of a successful event related to the organization. Second, employees may have a perceived and enduring prideful attitude due to the general perception of the organization. Two types of organizational pride that build relationships and influence each other on customer service commitment, creativity, and revenue intent for the organization itself [31]. According to another study, employee creativity impacts two aspects of their organizational pride (namely, emotion and bravery) [32]. In addition, two aspects of organizational skepticism (emotional skepticism and behavioral skepticism) also had a significant impact on employees' emotional pride in industrial organizations [22]... However, this study focuses on corporate social responsibility (CSR) affecting employees' pride in the organization. Aspects of CSR (external and internal) have a strong influence on employee pride in the organization [33]. Therefore, from previous studies, we can easily see the correlation between CSR and employee pride with the organization. And this study proposes the following hypothesis:

H2: CSR positively affects employees' pride in the firm.

E. CSR and employee commitment.

To date there are many definitions of employee commitment, each research context, and different fields have different points of view. Kahn (1990) defined work commitment as the exploration of organizational members about their job roles [34]. [35] define work commitment as the psychological state in which employees dedicate themselves to their work through health, cognitive and affective performance on tasks. Moreover, when employees commit to work, they will try to perform the work to the best of their ability [35] and know how to handle and solve problems of their work to achieve success, contribute to high efficiency for the organization. Organizational commitment is “the relative strength of close and wholehearted commitment of an individual in a particular organization” [36]. Following that, organizational commitment includes unity, effort, and loyalty. This concept refers to a positive relationship with the organization that keeps them willing to invest their efforts to contribute to the success and development of the organization”. According to [36] “Organizational commitment is defined as a member’s psychological state in the organization, reflecting the degree of personal appeal acquiring or adopting organizational characteristics” Kalleberg et al (1996) argued that “Organizational commitment is defined such as the willingness to devote all their efforts to the organization, the close commitment to the organization and looking to maintain a relationship with the organization”. According to Cohen (2007), “employee commitment is a psychological state that ties individuals to the organization” [37]. This definition has been applied a lot in many studies about employee commitment with the organization. Previous research showed that CSR has a positive effect on employee trust and commitment [38, 39]. Therefore, this research hypothesizes that:

H3: CSR has a positive impact on employee commitment to the organization

F. Pride perception, commitment and employee loyalty

When a member of a corporate organization has a strong sense of pride in the organization they work for, they will

take positive actions and do their best to be worthy of being a member of the firm. Some studies show that when they are proud, their commitment to the firm increases and all actions are taken for the firm [40]. Other studies also show an indirect effect of pride and commitment to the organization. In addition, the commitment to the firm will make employees more loyal to the firm and tend to work for a long time, considering the firm as a second home to build and develop together. From that, the research team hypothesized:

H4: Employee pride perception has a positive impact on employee loyalty.

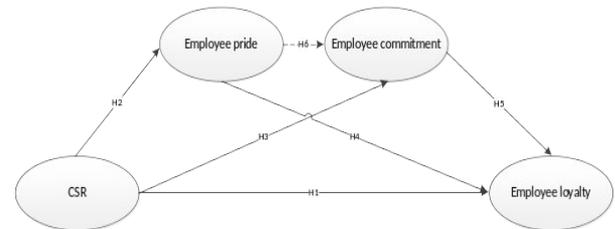
H5: Employee commitment to the organization positively affects employee loyalty.

G. The mediating role of pride and commitment

CSR is communicated to create awareness among employees in the firm and will have a positive effect. Especially when there is a crisis such as the Covid-19 pandemic, many firms donate hundreds of billions of dong for epidemic prevention such as Vingroup, Vinamilk, etc. Employees in these firms will feel proud because of the good actions of firms where they work with the community, contribute to the development of the country, and protect the ecological environment. From there, employees will feel like they have done useful things for society. Usually, when employees feel really members, they will have positive behaviors that speak well for the firm and are ready to serve customers better. These things will stimulate them to be more loyal to the firm and stick with the firm longer. Furthermore, their active and regular participation in environmental activities within the organization strengthens their understanding of the environmental policy and objectives of the firm, which in turn leads to a sense of belonging and responsibility and commitment of employees to environmental issues [41]. Based on these theoretical arguments, the team proposes that:

H6: CSR affects employee loyalty through the serial mediation of pride and commitment to the firm.

From the above hypotheses, the research model is depicted as follows:



III. METHODOLOGY

To test the proposed hypotheses, this study applies the survey method through questionnaires and applies the PLS-SEM model using SmartPLS software.

A. Questionnaire design

To collect data, this study uses a questionnaire with employees working in small and medium firms in Hanoi. The research team selected this respondent because they work at the firm and they have a good understanding of the firm's activities in general as well as the CSR activities. Through which employees will have positive or negative feelings towards the firm where they work. This study applies the scales given by previous studies and adjusts them to suit the research context in Hanoi, Vietnam. All scales are in the form of a 5-point Likert scale with 1 being strongly disagree and 5 being strongly agreeing.

In which, the CSR scale is applied from the research of [42] with 3 observed variables, one of the observed variables is “The firm I’m interested in contributes to social welfare activities”. Employee pride scale of the firm adjusted from the study of [43] with 3 observed variables, one of the observed variables is “I feel proud to be a member of my firm”. The employee commitment scale includes 6 questions that are applied and adjusted from the research of [44]. A typical observed variable of this scale is “I commit to doing my best to be effective”. Finally, the employee loyalty scale consisting of 8 questions is applied and adjusted from the research of [45]. One of the typical observed variables is “If I choose to work again, I still choose this firm”. To increase the reliability of the questionnaire, the research team applied the reverse translation method by linguists and firm administration experts.

B. Data collection

The research team applied a simple convenience sampling method through questionnaire surveys with staff at hotels in Moc Chau national tourist area (Son La). The questionnaire consists of 2 main parts (demographic question part and main question part) with 20 questions. So follow [46] The minimum number of sample sizes to be surveyed is 100. Results after 4 weeks, the research team collected 210 questionnaires. Demographic data includes 108 women, accounting for 51.4%; The age group from 25 to 45 includes 176 people, accounting for 69.6%; income from 5 to 10 million, including 122 people, accounting for 58.4%; There are 111 people with high school or vocational college qualifications, accounting for 52.9% and 99 people with 1 to 5 years of working experience, accounting for 47.1%.

IV. RESEARCH RESULTS

This study applies the PLS-SEM path model to test the proposed hypotheses through SmartPLS software. Compared with other empirical analysis methods, the proposed research model is suitable for this method because it tests the complex relationship between variables. Moreover, the sample size is quite small, so this method is suitable to ensure reliability.

A. Measurement evaluation

To evaluate the scale, the study used Cronbach’s alpha ($C\alpha$), composite reliability (CR) and average variance extracted (AVE). Research results showed that the loading factors range from 0.650 to 0.881 (>0.5); $C\alpha$ values range from 0.71 to 0.86 and CR values from 0.84 to 0.89 are both greater than the minimum level of 0.7 according to Bagozzi’s (1988) [47]. The results show that the reliability of the scales is satisfactory; AVE values ranging from 0.51 to 0.68 all satisfy the 0.5 level according to Fornell’s (1981) [48]. The data demonstrated that the scales meet the requirements in terms of convergent validity (see Table 1).

Table 1. Measurement model

Variables	AVE	CR	$C\alpha$
CSR	0.69	0.87	0.77
Employee pride perception	0.63	0.84	0.71
Employee commitment	0.50	0.89	0.86
Employee loyalty	0.58	0.89	0.85

To test discriminant validity, this study first uses the AVE value of this variable in correlation with other variables (Fornell-Larcker criterion). Then, the analysis results show that the square roots of AVE are larger than the intercorrelation coefficient with other variables, proving that the scales ensure discriminant validity.

B. Structural modelling evaluation

After evaluating the scales by testing reliability, convergent value and discriminant value, the research team applies the PLS-SEM model to evaluate the relationship between the variables in the research model by using SmartPLS software. The analysis results show that the more employees are aware of the CSR, the more pride they feel about the firms ($\beta = 0.40$; $p < 0.001$, t -value = 4.56). Besides, when employees feel proud of the firm, it will promote commitment to the firm ($\beta = 0.531$; $p < 0.001$, t -value = 6.99). From there, employees will feel more attached and loyal to the firm where they work ($\beta = 0.755$; $p < 0.001$, t -value = 7.85). Similarly, CSR has a positive effect on employee commitment to the firm ($\beta = 0.373$; $p < 0.001$, t -value = 6.73). The results of data analysis indicate that CSR has no direct impact on employee loyalty to the firm ($\beta = 0.05$; $p > 0.05$, t -value = 0.71). Similarly, employee pride does not affect employee loyalty with ($\beta = 0.039$; $p > 0.1$, t -value = 5.06). In summary, the analysis results proved that H2, H3, H5 are accepted and H1 and H4 are rejected.

To test the mediating role of both employee pride and commitment to the firm in the relationship between CSR and employee loyalty to the firm, an intermediate model is established [47] and tested through the application PROCESS v3.3 integrated in SPSS by Hayes. The testing results showed that CSR has no direct impact on employee loyalty. But CSR has an indirect impact on employee loyalty through the intermediate variables that are pride perception ($\beta = 0.24$; $p < 0.001$, [-0.0063, .0173]) and through both the employee’s pride with the firm and the employee’s commitment ($\beta = 0.13$; $p < 0.001$, [.08, .20]). The above results demonstrate that the accepted hypothesis H6 is supported.

V. CONCLUSION AND DISCUSSION

In today’s life when life is increasing, employees working in firms not only stand at the basic needs level in Maslow’s hierarchy of needs but have gradually moved to higher levels. They want to work at a firm that ensures safety and they also want the firm to perform well on CSR so that they feel more proud and commitment. For them, firm is not only the firm work but also their second home. This study approaches CSR from the perspective of employees in the firm, thereby examining the impact of CSR on employee pride perception, employee commitment to the firm and employee loyalty.

The study has the following theoretical contributions: Firstly, the study is one of the first to evaluate the relationship between CSR and employee loyalty in the context of the hospitality industry in Vietnam. This study is different from some previous studies when it showed that CSR has no direct effect on loyalty to the firm [5]. This is a very interesting and meaningful new discovery to help us better understand the mechanism of CSR’s influence on employee

loyalty. Second, research showed that CSR promotes employee loyalty through employee commitment to the firm. This means that when the firm practices the CSR well, employees will feel like they are doing good and meaningful work themselves. This is similar to what previous studies have suggested [49] but is considered in the new context of the hospitality industry in Vietnam. Third, research shows that CSR affects employees' pride in the firm, but pride perception is not enough to create employee loyalty in the firm [50]. This is an interesting finding because the logical thinking is that when employees are proud of the firm, they will tend to work for the long-term and be loyal to the firm.

Besides the theoretical contribution, the research also has some practical contributions as follows. Firstly, the research suggests for managers to understand the psychology of employees in the firm so that they can have effective management solutions. Specifically, firms need to perform CSR well and have communication solutions to employees so that they understand and have positive behaviors. In the article, it is shown that when employees perceive CSR of the firm, it will promote their pride in the firm, thereby promoting positive behavior of employees, improving the efficiency of production and firm activities. Secondly, managers understand the great role of good CSR implementation to employees, employees will form a commitment to the firm, considering the main firm as themselves so that they can promote dynamism and creativity and work efficiency. Moreover, when they see the firm as themselves, they will have behaviors to protect and promote the brand image of the firm with people around, in the social network community. Third, managers understand that the impact mechanism of CSR on corporate cohesion is a long and complex process, not directly but indirectly through promoting employee pride in the firm, thereby stimulating employee commitment, ultimately improving employee loyalty to the firm. The loyalty of employees to the firm is of great significance in stabilizing production and firm activities, avoiding creating disturbances in the firm. Because we all know that when employees quit, firms have to hire new people, it will take time and effort to recruit, train and foster so that they can perform the required jobs.

The study has some limitations as follows. Firstly, this study only focuses on employees at Moc Chau NTA, so it may not be representative of all employees in the hospitality industry in Vietnam. Second, the sample size is small (210), so it is reasonable to use the PLS-SEM model. However, the next study can increase the sample size more and apply other research methods. Third, the current study only considers two intermediate variables, which are the pride perception and commitment of employees to the firm, so many other important variables may be missed. Finally, the current study only considers corporate commitment as a first-order construct, future studies can go deeper by dividing commitment into categories such as affective commitment, continuance commitment and normative commitment [51].

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REFERENCES

- [1] M. F. Mikkelsen, C. B. Jacobsen, and L. B. Andersen, "Managing employee motivation: Exploring the connections between managers' enforcement actions, employee perceptions, and employee intrinsic motivation," *International Public Management Journal*, vol. 20, pp. 183-205, 2017.
- [2] N. Govaerts, E. Kyndt, F. Dochy, and H. Baert, "Influence of learning and working climate on the retention of talented employees," *Journal of workplace learning*, 2011.
- [3] S. C. Kundu and K. Lata, "Effects of supportive work environment on employee retention," *International Journal of Organizational Analysis*, 2017.
- [4] L. Lee and L. F. Chen, "Boosting employee retention through CSR: A configurational analysis," *Corporate Social Responsibility and Environmental Management*, vol. 25, pp. 948-960, 2018.
- [5] J. S. Kim, J. Milliman, and A. Lucas, "Effects of CSR on employee retention via identification and quality-of-work-life," *International Journal of Contemporary Hospitality Management*, 2020.
- [6] F. L. Cooke and Q. He, "Corporate social responsibility and HRM in China: a study of textile and apparel firms," *Asia pacific firm review*, vol. 16, pp. 355-376, 2010.
- [7] A. McWilliams, D. S. Siegel, and P. M. Wright, "Corporate social responsibility: Strategic implications," *Journal of management studies*, vol. 43, pp. 1-18, 2006.
- [8] B. Rezzab, A. B. Brik, and K. Mellahi, "A study of management perceptions of the impact of corporate social responsibility on organisational performance in emerging economies: the case of Dubai," *Journal of firm ethics*, vol. 89, pp. 371-390, 2009.
- [9] M. E. F. R. d. Oliveira and P. Rodrigues, "The importance of corporate social responsibility in the brand image: the "Nespresso" case study," 2015.
- [10] W. Davies, "All the happy workers," *The Atlantic*, 2015.
- [11] J. He, H. Zhang, and A. M. Morrison, "The impacts of corporate social responsibility on organization citizenship behavior and task performance in hospitality," *International Journal of Contemporary Hospitality Management*, 2019.
- [12] L. Tourigny, J. Han, V. V. Baba, and P. Pan, "Ethical leadership and corporate social responsibility in China: A multilevel study of their effects on trust and organizational citizenship behavior," *Journal of Firm Ethics*, vol. 158, pp. 427-440, 2019.
- [13] S. D. Hansen, B. B. Dunford, A. D. Boss, R. W. Boss, and I. Angermeyer, "Corporate social responsibility and the benefits of employee trust: A cross-disciplinary perspective," *Journal of firm ethics*, vol. 102, pp. 29-45, 2011.
- [14] T. W. Ng, K. C. Yam, and H. Aguinis, "Employee perceptions of corporate social responsibility: Effects on pride, embeddedness, and turnover," *Personnel Psychology*, vol. 72, pp. 107-137, 2019.
- [15] K. De Roeck, A. El Akremi, and V. Swaen, "Consistency matters! How and when does corporate social responsibility affect employees' organizational identification?," *Journal of Management Studies*, vol. 53, pp. 1141-1168, 2016.
- [16] F. Luthans and C. M. Youssef, "Human, social, and now positive psychological capital management: Investing in people for competitive advantage," 2004.
- [17] F. Luthans and C. M. Youssef-Morgan, "Psychological capital: An evidence-based positive approach," *Annual review of organizational psychology and organizational behavior*, vol. 4, pp. 339-366, 2017.
- [18] A. B. Carroll, "The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders," *Firm Horizons* 34 1991.
- [19] N. K. Lee, Philip "Corporate social responsibility doing the most good for your company and your cause," *Hoboken, NJ: Wiley*, 2013.
- [20] Y. Gao and W. He, "Corporate social responsibility and employee organizational citizenship behavior," *Management Decision*, 2017.
- [21] H. T. Hoang, F. Wang, Q. Van Ngo, and M. Chen, "Brand equity in social media-based brand community," *Marketing Intelligence & Planning*, 2019.
- [22] K. Bouraoui, S. Bensemmane, M. Ohana, and M. Russo, "Corporate social responsibility and employees' affective commitment," *Management Decision*, 2019.
- [23] R. Chaudhary, "Corporate social responsibility and employee engagement: can CSR help in redressing the engagement gap?," *Social Responsibility Journal*, 2017.
- [24] N. N. Thăng, "Gắn quản trị nhân sự với trách nhiệm xã hội của doanh nghiệp," *VNU Journal of Science: Economics and Firm*, vol. 26, 2010.

- [25] R. T. Mowday, R. M. Steers, and L. W. Porter, "The measurement of organizational commitment," *Journal of vocational behavior*, vol. 14, pp. 224-247, 1979.
- [26] L. Eldor and E. Vigoda-Gadot, "The nature of employee engagement: Rethinking the employee-organization relationship," *The International Journal of Human Resource Management*, vol. 28, pp. 526-552, 2017.
- [27] M. Kang and M. Sung, "How symmetrical employee communication leads to employee engagement and positive employee communication behaviors: The mediation of employee-organization relationships," *Journal of Communication Management*, 2017.
- [28] A. M. Saks, "Antecedents and consequences of employee engagement revisited," *Journal of Organizational Effectiveness: People and Performance*, 2019.
- [29] A. Glavas, "Corporate social responsibility and employee engagement: Enabling employees to employ more of their whole selves at work," *Frontiers in psychology*, vol. 7, p. 796, 2016.
- [30] A. Vorina, M. Simonič, and M. Vlasova, "An analysis of the relationship between job satisfaction and employee engagement," *Economic themes*, vol. 55, pp. 243-262, 2017.
- [31] K. Goudarzi, S. Llosa, C. Orsingher, M. H. Gouthier, and M. Rhein, "Organizational pride and its positive effects on employee behavior," *Journal of Service Management*, 2011.
- [32] O. Durrah, K. Allil, M. Gharib, and S. Hannawi, "Organizational pride as an antecedent of employee creativity in the petrochemical industry," *European Journal of Innovation Management*, 2020.
- [33] S. V. Helm, U. Renk, and A. Mishra, "Exploring the impact of employees' self-concept, brand identification and brand pride on brand citizenship behaviors," *European Journal of Marketing*, 2016.
- [34] W. A. Kahn, "Psychological conditions of personal engagement and disengagement at work," *Academy of management journal*, vol. 33, pp. 692-724, 1990.
- [35] W. B. Schaufeli and A. B. Bakker, "Defining and measuring work engagement: Bringing clarity to the concept," *Work engagement: A handbook of essential theory and research*, vol. 12, pp. 10-24, 2010.
- [36] D. Turker, "How corporate social responsibility influences organizational commitment," *Journal of Firm ethics*, vol. 89, pp. 189-204, 2009.
- [37] A. Cohen, "Commitment before and after: An evaluation and reconceptualization of organizational commitment," *Human resource management review*, vol. 17, pp. 336-354, 2007.
- [38] R. Ahmad, S. Ahmad, T. Islam, and A. Kaleem, "The nexus of corporate social responsibility (CSR), affective commitment and organisational citizenship behaviour in academia: A model of trust," *Employee Relations: The International Journal*, 2020.
- [39] M. d. G. M. C. Almeida and A. F. M. Coelho, "The antecedents of corporate reputation and image and their impacts on employee commitment and performance: The moderating role of CSR," *Corporate Reputation Review*, vol. 22, pp. 10-25, 2019.
- [40] S. Lythreathis, A. M. S. Mostafa, and X. Wang, "Participative leadership and organizational identification in SMEs in the MENA Region: Testing the roles of CSR perceptions and pride in membership," *Journal of Firm Ethics*, vol. 156, pp. 635-650, 2019.
- [41] C. J. C. Jabbour and F. C. A. Santos, "Relationships between human resource dimensions and environmental management in companies: proposal of a model," *Journal of Cleaner Production*, vol. 16, pp. 51-58, 2008.
- [42] S.-H. Ko, T.-W. Moon, and W.-M. Hur, "Bridging service employees' perceptions of CSR and organizational citizenship behavior: The moderated mediation effects of personal traits," *Current psychology*, vol. 37, pp. 816-831, 2018.
- [43] D. B. Turban, C.-M. Lau, H.-Y. Ngo, I. H. Chow, and S. X. Si, "Organizational attractiveness of firms in the People's Republic of China: A person-organization fit perspective," *Journal of Applied Psychology*, vol. 86, p. 194, 2001.
- [44] S. Brammer, H. He, and K. Mellahi, "Corporate social responsibility, employee organizational identification, and creative effort: The moderating impact of corporate ability," *Group & Organization Management*, vol. 40, pp. 323-352, 2015.
- [45] E. Kyndt, F. Dochy, M. Michielsens, and B. Moeyaert, "Employee retention: Organisational and personal perspectives," *Vocations and Learning*, vol. 2, pp. 195-215, 2009.
- [46] J. F. Hair, W. C. Black, B. J. Babin, R. E. Anderson, and R. L. Tatham, *Multivariate data analysis* vol. 5: Prentice hall Upper Saddle River, NJ, 1998.
- [47] R. R. Bagozzi and Y. Yi, "On the Evaluation of Structural Equation Models," *Journal of the Academy of Marketing Science* vol. 16, 1988.
- [48] C. Fornell and D. F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," *Journal of marketing research*, pp. 39-50, 1981.
- [49] M. T. Liu, Y. Liu, Z. Mo, Z. Zhao, and Z. Zhu, "How CSR influences customer behavioural loyalty in the Chinese hotel industry," *Asia Pacific Journal of Marketing and Logistics*, 2019.
- [50] N. T. Van, T. T. H. Chi, V. T. M. Chi, and N. Quang, "The relationship between customer-based corporate reputation and customer citizenship behavior: The case in Vietnam," *International Journal of Firm and Management*, vol. 11, pp. 298-308, 2016.
- [51] J. P. Meyer, D. J. Stanley, L. Herscovitch, and L. Topolnytsky, "Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences," *Journal of vocational behavior*, vol. 61, pp. 20-52, 2002.

Impact of Financial Risk on Business Efficiency Listed on The Stock Market in Vietnam

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Abstract—This study aims to evaluate the influence of financial risk on the business efficiency of listed companies in Vietnam's stock market. To carry out the research objective, the authors use the short-run solvency, net working capital, and financial risk criteria proposed by Bathory (1984). At the same time, the authors conducted a quantitative analysis using a two-step GMM model, based on panel data collected from financial statements and financial statements of 430 companies listed on the Ho Chi Minh Stock Exchange and the Hanoi Stock Exchange in the period 2012-2018. The research results show that the business efficiency of enterprises through return on assets and return on equity is positively affected by net working capital and financial risk and is negatively impacted by short-run solvency. This result also has some implications for improving business efficiency and financial risk management of listed companies on the Vietnam stock market.

Index Terms—Financial risk, business efficiency, net working capital, return on assets, return on equity

I. INTRODUCTION

IN ADDITION to capital structure decisions, investment decisions, and cash flow decisions, financial risk management decisions have been considered a great concern of enterprise financial management. According to [3], [14], financial risk is an unexpected or unpredictable change in return. According to [1], [12], financial risk is the probability that a business will fail when it uses debt to meet its financial commitments when the cash balance is insufficient. Financial risk has often influenced by factors beyond the control of the enterprise [13], such as interest rates, exchange rates, or developments in financial markets [27]. [30], [18] hypothesize that the degree of risk has a direct impact on potential returns, financial risk can bring the possibility of pleasant surprises or negative business efficiency. High or low business efficiency is affected by the financial risk that the entrepreneur is facing [22], [7], [8], [25].

Although studies on the impact of financial risks on business efficiency of enterprises have been studied by many scientists around the world and received considerable attention from policymakers. However, for a developing economy like Vietnam, research on this topic is still scarce. This study aims to supplement empirical evidence on business efficiency from the perspective of the financial risk of listed companies in Vietnam's stock market. The results of this study are information to help corporate financial managers come up with solutions to improve their business efficiency. Some previous studies on financial risk often measure financial risk through three components: credit risk, liquidity risk, and operational risk. This article approaches financial risk

from three angles, namely solvency, operating ability, and financial risk in general, based on the proposal of [4]. To solve the endogenous phenomenon in data analysis and processing, especially in linear dynamic table models, we used a two-step GMM (S-GMM) model on Stata 15.0 software.

The continuous parts of this study include: section 2 is theoretical and empirical results; section 3 presents research models and methods; section 4 focuses on the discussion of research results; section 5 is the conclusion and direction for further research.

II. THEORETICAL AND EMPIRICAL RESULTS

A. Financial risks

Financial risk is one of the major concerns of most businesses, so there have been quite a few studies on this topic. Depending on the approach in each study, financial risk can be expressed differently to a certain extent.

For example, some scientists think that financial risk is the possibility of not paying financial debts when they come due [7]. If a firm loses or significantly deteriorates its solvency, the firm may enter a state of financial distress [21]. To measure solvency, [17], [1], [18], [12], [23] have used the short-term solvency ratio (SPR).

$$SPR = \frac{\text{Short-term assets}}{\text{Short-term debt}}$$

On the other hand, Brigham and Houston (2009) states that financial risk is the uncertainty about the return to owners and the financial balance of the firm. In which the financial balance reflects the relationship between the source of funding and the firm's assets. This means that a company is considered financially balanced when its long-term assets must be sponsored by long-term capital and vice versa. Brigham and Houston (2009) also concluded that the financial risk measurement indicator is a financial balance. And the balanced of finance is expressed through net working capital (NWC).

$$NWC = \text{Short term assets} - \text{Short term debt}$$

$$\text{or } NWC = \text{Long term capital} - \text{Long term assets}$$

With a multi-dimensional approach, financial risk reflects possible events associated with the choice and implementation of financial decisions that form the asset structure, capital structure, and liquidity capacity from enterprise resources [4, 24, 19, 25, 9]. And those financial decisions are based on the uncertainty of factors, such as interest rates, exchange rates, developments in financial markets [26]. To measure

financial risk, these scientists used the FR indicator with five components, specifically as follows:

$$FR_{it} = SZL_{it} + SY_{it} + GL_{it} + YF_{it} + YZ_{it}$$

Where:

$$SZL_{it} = \frac{\text{Profit before taxes} + \text{depreciation} + \text{Deferred income tax}}{\text{Short term debt}} \\ SY_{it} = \frac{\text{Short term debt}}{\text{Profit before taxes}} \\ GL_{it} = \frac{\text{Shareholders' interests}}{\text{Short term debt}} \\ YF_{it} = \frac{\text{Short term debt}}{\text{Net Tangible Assets}} \\ YZ_{it} = \frac{\text{Short term debt}}{\text{working capital}} \\ \text{Total assets}$$

According to [4], FR_{it} represents the level of financial risk and financial risk management capacity of the enterprise. If the higher the FR, then the lower the financial risk of the business. It demonstrates the better the financial strength of the business and vice versa.

B. Financial risks

Business efficiency of the firm is the combined use of resources to realize the economic objectives which can be measured through financial performance [28]. According to [5], [6], business efficiency is the efficiency in using resources of the firm, it is expressed through the relationship between revenue and cost of using input resources. In other words, business efficiency is the ability to turn input resources into the best results in business operations.

The above points of view on efficiency basically all affirm that business efficiency is an indicator that reflects the quality of business operations, the level of use of resources to achieve the ultimate goal, which is maximum profit-making.

To evaluate the business efficiency of firm, [6], [3], [29] has used the following criteria:

- Return on total assets (ROA): ROA indicator is an accurate measure when you want to evaluate the business efficiency of the firm. Because ROA is not only the best indicator to measure the efficiency of all assets invested in the period, but also shows the profitability of the owners and creditors of the business. Therefore, ROA is important for both business owners and operators.

- Return on equity (ROE): ROE indicator reflects how much profit after tax had earned by investment owners for each dollar of capital. Besides ROA, ROE has also been considered an important indicator in assessing the business efficiency of the firms. Because maximizing profits is always the most important goal of business owners.

C. Impact of financial risk on business efficiency

The relationship between financial risk and business efficiency has received considerable attention from scientists when studying corporate finance. Many empirical studies have found a statistically significant negative effect of short-term solvency (SPR) on business efficiency (ROA and ROE) ([1], [12], [23]). As businesses increase their ability to pay

their due debts, they must keep high levels of short-term asset items such as cash, receivables, inventory, short-term investments, etc. Meanwhile, these asset items are considered as less profitable items, even the decrease in value or incur costs, thereby reducing business efficiency.

Besides that, some studies have only applied the capital structure theory of Modigliani and Miller (1958) and shown that financial balance has a statistically significant positive effect on financial balance to business efficiency (ROA and ROE). When the business has a high financial balance, that is, when all the long-term assets of the business are financed by long-term capital (including equity and long-term liabilities), the efficiency of business results will increase. Because, when a business achieves financial balance, it will not cost the business to find funding when it is insolvent ([29], [1], [12]).

In addition, the impact of financial risk on business efficiency has been explained through agency theory. [16] said that conflicts of interest are always potential between the parties involved, especially the owner (the principal) and the manager (the representative). A conflict of interest arises when a manager uses cash flow to overinvest or put capital in potentially risky projects. These conflicts will increase the financial risks and agency costs of the business. Such as the costs of monitoring and tracking by the owner, binding costs, or losses. To minimize agency costs we have different solutions, such as financial risk management, use of takeover model, use of appropriate capital structure, etc. In particular, financial risk management can be considered as a means to effectively control and minimize agency costs, thereby increasing business efficiency. Financial risk is explained here to include mainly the risk associated with financial decisions that shape the structure of assets, capital structure, solvency from the resources of the firm. With this view, the FR indicator proposed by Bathory [4] is a good indicator to measure the financial risk of enterprises. Because FR is appropriate in emerging market conditions, where credit rating systems are less developed. In addition, the transparency of market information, the ability to access information, and the information infrastructure are still weak ([8], [25], [9]). Thus, if businesses manage risks well, they will help them achieve the goal of maximizing profits.

III. RESEARCH MODEL AND RESEARCH METHODS

A. Research model

Based on agency theory, capital structure theory, and experimental research results of some scientists such as Arif and Showket [1], Fali [12], Onsongo [23], Wangalwa and Muturi [29]. We build a model to study the influence of financial risk on business efficiency as follow:

Model 1:

$$ROA_{it} = \beta_1 NWC_{it} + \beta_2 SPR_{it} + \beta_3 FR_{it} + \beta_4 Size_{it} + \beta_5 Age_{it} + \beta_6 Growth_{it} + \epsilon_{it} \quad (1)$$

Model 2:

$$ROE_{it} = \beta_1 NWC_{it} + \beta_2 SPR_{it} + \beta_3 FR_{it} + \beta_4 Size_{it} + \beta_5 Age_{it} + \beta_6 Growth_{it} + \epsilon_{it} \quad (2)$$

In which, the scale of variables in the model is presented in Table I below:

TABLE I
THE SCALE OF VARIABLES IN THE MODEL

Var	Describe	Measure	Expectation	
			Model 1	Model 2
ROA	Return on Assets	$\frac{Earning}{Assets}$		
ROE	Return On Equity	$\frac{Earnings}{Equity}$		
<i>Independent variable</i>				
NWC	Net Working Capital	$Logarit(Current Assets - Current Liabilities)$	+	+
SPR	Short-term payment ratio	$\frac{Short - term assets}{Short - term debt}$	-	-
FR		$\frac{SZL_{it} + SY_{it} + GL_{it}}{+ YF_{it} + YZ_{it}}$	+	+
<i>Control variable</i>				
SIZE	Firm size	$Logarit(Assets)$		
AGE	Listing age	$Current year - listing year$		
Growth	Business growth of the firm	$\frac{Revenue_t - Revenue_{t-1}}{Revenue_{t-1}}$		

(Source: Summary of the authors)

The research hypotheses include:

- H1: Short-term solvency (SPR) negatively affects business efficiency.
- H2: Net working capital (NWC) positively affects business efficiency.
- H3: Overall risk level (FR) positively affects business efficiency.

B. Research methods

This study performed regression analysis to determine the factors affecting financial risk according to the S- GMM model, using statistical software STATA 15.0 for panel data. At the same time, necessary tests such as the AR test, Sargan test, and Hansen test are performed to ensure that the model does not have heteroskedasticity, autocorrelation, and endogenous. Besides, the S- GMM method is used in regression analysis to determine the coefficients of unbiased, normal distribution, and model efficiency.

Research data is collected from 769 companies listed on the Stock Exchange in the period 2007-2018, provided by FiinGroup - a leading corporate and financial information provider in Vietnam. However, some firms were excluded from the sample due to missing information in panel data. The final sample size includes 430 listed companies during the 7-year study period (2012-2018), corresponding to 2,288 observations.

IV. RESULTS

A. Descriptive statistics

Descriptive statistics in Table II show that the value of each variable in the model fluctuates quite large. With the independent variable FR, the range is very large, from -0.2569 to 317.6897, the mean value of FR is 10.2265. Followed by the variable NWC, the range from 17.9393 to 31.0240, the mean value is 25.3934. With the dependent variable ROA, the value of the variable ranges from -0.6455 to 0.4792, the mean value is 0.0641. With the dependent

variable ROE, the value of the variable ranges from -3.6740 to 0.9539, the mean value is 0.1059. Among the control variables, the largest gap in values is the year of listing (Age) variable, the mean value being 10.8858 years, ranging from 7 years to 19 years.

TABLE II
DESCRIPTIVE STATISTICS OF THE VARIABLES

Variable	Min	Max	Mean	Std. Dev.
ROA	-0.6455	0.4792	0.0641	0.0712
ROE	-3.6740	0.9539	0.1059	0.1771
FR	-0.2569	317.6897	5.0116	10.2265
NWC	17.9393	31.0240	25.3934	1.6144
SPR	0.0480	61.8349	2.2376	2.9420
Size	23.3303	33.2978	27.1079	1.5258
Age	7	19	10.8858	2.3265
SG	-0.9528	127.4579	0.1773	2.5278

(Source: author's calculation)

B. Regression analysis

To report the study results, Arellano-Bond and Sargan tests were performed. The results of the tests show that the residuals of the GMM model do not exist 2nd order autocorrelation, Prob > chi2 = 0.311 (model 1), and 0.136 (model 2). The instrumental variable used in the GMM model is suitable, satisfying over-identifying and overcoming endogeneity with Prob > chi2 = 0.068 (model 1) and 0.072 (model 2)

The results of 2-step regression with the Hansen coefficient have Prob > chi2 = 0.061 (model 1) and 0.066 (model 2), this result proves that the instrumental variables used in the model all satisfy the tests. Thus, the regression model ensures a stable estimate and a normal distribution. The estimated results are presented in Table III.

TABLE III
IMPACT OF FINANCIAL RISK ON BUSINESS EFFICIENCY

Variable	Model 1 (ROA)		Model 2 (ROE)	
	Coefficient	Std. Deviation	Coefficient	Std. Deviation
ROA _{t-1}	0.0636***	0.0136		
ROE _{t-1}			0.0443***	0.0083
FR	0.0327***	0.0139	0.0722***	0.0275
NWC	0.0636**	0.0161	0.0134***	0.0036
SPR	-0.0148***	0.0020	-0.0230***	0.0044
SIZE	-0.0357	0.0161	-0.0075	0.0046
Growth	0.0017***	0.0004	0.0928***	0.0188
AGE	-0.0005*	0.0004	0.0009	0.0007
Constant	-0.0585***	0.0367	-0.2270***	0.0683
Obs.	2,288		2,288	
N ^o of firms	430		430	
AR(2) test (Prob > chi2)	0.311		0.136	
Sargan test (Prob > chi2)	0.068		0.072	
Hansen test (Prob > chi2)	0.061		0.066	

(Source: author's calculation)

Note: ***, **, * represent 1%, 5%, and 10% significance levels, respectively

The results of the study on the influence of financial risk on the business efficiency of non-financial enterprises listed on the Ho Chi Minh City Stock Exchange and the Hanoi Stock Exchange are as follows:

- Liquidity (through the indicator Short-term solvency - SPR) has a negative impact on ROA and ROE with the coefficient β of -0.0148 (significant level 1%) and -0.0230 (significant level 1%), respectively. This shows that, when an enterprise can pay short-term debts from short-term assets, the higher its business efficiency, the lower its business efficiency, because short-term assets are considered as items of interest less profitable (deposits, short-term investments, ect.) even reduce the value (cash, receivables, ect.) or hidden costs such as storage costs, provision costs, ect. This result also agrees with the research results of Arif and Showket [1], Fali [12], Onsongo [23].

- Financial balance (through Net Working Capital - NWC) has a positive impact on ROA and ROE with the coefficient β of +0.0636 (significant level 5%) and +0.0134 (significant level 1%), respectively. This means that, when the enterprise achieves financial balance, when the long-term assets of the enterprise must be financed by long-term capital and vice versa, the enterprise will not spend any money in seeking funding in case of insolvency. This result is consistent with the capital structure theory as well as the views of Wangalwa and Muturi [29], Arif and Showket [1], Fali [12].

- When considering the factor measuring the level of financial risk through Bathory's FR [4], it can be seen that the direction of the impact of this factor on ROA and ROE are positive with the coefficient β , respectively are +0.0327 (significant level 1%) and +0.0722 (significant level 1%). Meanwhile, according to Bathory [4], the higher the FR, the lower the financial risk of the enterprise, the better the financial risk management capacity. This means that, when an enterprise can limit its FR, its ability to manage financial risks is good, which will help increase its ROA and ROE. This research result is consistent with our explanations in the theoretical basis when applying asymmetric information theory, signal theory, and agency theory.

With the above results, all hypotheses are accepted. A summary of the influence of factors on financial risk are presented in Table 4 as follows:

TABLE IV
SUMMARY OF RESEARCH RESULTS

Independent variables	Research hypothesis		Research results		Conclusion
	ROA	ROE	ROA	ROE	
ROA _{t-1}			+		
ROE _{t-1}				+	
NWC	+	+	+	+	Accepted
SPR	-	-	-	-	Accepted
FR	+	+	+	+	Accepted
SIZE			K	K	
Growth			+	+	
AGE			-	-	

K: There is not enough basis to conclude about the relationship

(Source: Summary of the authors)

V. CONCLUSION AND FUTURE RESEARCH DIRECTIONS

By quantitative research method with panel data collected from financial statements and annual reports of 430 enterprises listed on the Ho Chi Minh City Stock Exchange and Hanoi Stock Exchange from 2012-2018. The study showed that the business efficiency of the firm (through ROA and ROE indicators) is positively affected by the financial balance (represented by Net Working Capital (NWC) and FR); it is negatively affected by solvency through short-term solvency (SPR).

The findings from the study provide empirical evidence to help corporate financial managers have a basis to propose solutions to improve business efficiency. The results of this paper emphasize that, if risk management is not good, it will reduce the business efficiency of enterprises. Therefore, businesses need to come up with an appropriate risk appetite strategy in corporate financial management activities. At the same time, in order to improve business efficiency and create a financial balance, businesses need to be more cautious when deciding debt maturity in setting up a financial structure.

Based on the obtained results, this study has contributed to enrich the existing literature on financial risk and its impact on business efficiency. However, our approach mainly focuses on studying the internal factors of enterprises. Therefore, future research needs to be expanded with the addition of macro factors such as economic growth, inflation rate, or economic crisis into the model.

REFERENCES

- [1] Arif, A. S., A. (2015). Relationship between financial risk and financial performance: An Insight of Indian Insurance Industry. *International Journal of Science and Research*, 4(11), 1424-1433. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3553374
- [2] Auroon, L. (2003). *Asymmetric Information: Theory and Applications*. Seminar of Strategy and International Business, 116, 45-56. Retrieved from <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.198.9252&rep=rep1&type=pdf>
- [3] Awunyo, D. & Badu, J. (2012). Capital Structure and Performance of Listed Banks in Ghana, *Global Journal of Human Social Science*, 12(5), 3-7
- [4] Bansal, A., Kaufmann, R., Mark, R., and Peters. E. (1992). *Financial Risk and Financial Risk Management Technology: Issues and Advantages*. Working Papers Series, New York, New York University, 1(3), 27 - 34. Retrieved from <https://www.managementjournal.info/index.php/IJAME/article/view/173/166>
- [5] Bathory, A. (1984). *Predicting Corporate Collapse: Credit Analysis in the Determination and Forecasting of Insolvent Companies*. London, UK: Financial Times Business Information: London, UK: Financial Times Business Information.
- [6] Berger, A. N., and R. DeYoung. (1997). Problem Loans and Cost Efficiency in Commercial Banks. *Journal of Banking and Finance*, 21, 849-870. [https://doi.org/10.1016/S0378-4266\(97\)00003-4](https://doi.org/10.1016/S0378-4266(97)00003-4)
- [7] Berger, A. N. D. P. (2002). *Capital Structure and Firm Performance: A New Approach to Testing Agency Theory and an Application to the Banking Industry*. *Feds Paper*. doi:10.1016/j.jbankfin.2005.05.015
- [8] Bhunia A., Mukhuti S., 2012. Financial risk measurement of small and medium-sized companies listed in Bombay Stock Exchange. *International Journal of Advances in Management and Economics*, 1(3), 27-34. Retrieved from <https://www.managementjournal.info/index.php/IJAME/article/view/173/166>

- [9] Brigham, E.F. & Houston, J.F. (2009). *Fundamentals of Financial Management* (Eleventh Edition). University of Florida, Thomson South-Western, 415-456.
- [10] Celli, M. (2015). Can Z-Score Model Predict Listed Companies' Failures in Italy? An Empirical Test. *International Journal of Business and Management*, 10(3). doi:10.5539/ijbm.v10n3p57
- [11] Dandago, K. I. B., B.U. (2014). The Use of Multi-discriminant Analysis for the Prediction of Corporate Bankruptcy in Malaysian Textile Industry. *Journal of Business and Economics*, 5(6), 813-822. doi: 10.15341/jbe (2155-7950)/06.05.2014/006
- [12] Dang T.H., P. T. D., Nguyen T.H., Hoang T.H. (2020). Determinants of Share Prices of Lited Companies Operating in the Steel Industry: An Empirical Case from Vietnam. *The Journal of Asian Finance, Economics and Business*, 7(12), 131-138. doi:10.13106/jafeb.2020.vol7.no12.131
- [13] Dasouqi, A. Q, K. A. K. a. (2017). Sales nationality and debt financing impact on firm's performance and risk Evidence from Jordanian companies. *Euro Med Journal of business*, 12(1), 103-126. <https://doi.org/10.1108/EMJB-05-2016-0015>
- [14] Dey, R. K., Hossain, S.Z., and Rezaee, Z. (2018). Financial Risk Disclosure and Financial Attributes among Publicly Traded Manufacturing Companies: Evidence from Bangladesh. *Journal of Risk and Financial Management*, 11(3), 50. <https://doi.org/10.3390/jrfm11030050>
- [15] Fali, I., Nyor, T., Mustapha, L. (2020). Financial Risk and Financial Performance of listed Insurance Companies in Nigeria. *European Journal of Business and Management*, 12(12), 143-153. doi: 10.7176/EJBM/12-12-13
- [16] Harvey, J. (2008). *Financial Risk Management*, 47th ed. London: The Chartered Institute of Management Accountants.
- [17] Holton, G. A. (2004). Defining risk. *Financial Analysts Journal*, 60, 19-25. doi.org/10.2469/faj.v60.n6.2669
- [18] Houston, B. (2009). *Fundamentals of Financial Management* (Eleventh Edition). University of Florida: Thomson South-Western.
- [19] Jensen, M. C., William, H., and Meckling, W.H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3, 305-360. doi: 10.1016/0304-405X(76)90026-X
- [20] Khasawneh, A. K & Dasouqi, A. Q. (2017). Sales nationality and debt financing impact on firm's performance and risk Evidence from Jordanian companies', *EuroMed Journal of business*, 12(1), 103-126.
- [21] Khurshid, M. R. (2013). Determinants of financial distress evidence from KSE 100 index. *Research Journal of the Institute of Business administration Karachi*, 8(1), 7-19. Retrieved from <https://ir.iba.edu.pk/businessreview/vol8/iss1/2/>
- [22] Kinyua, J. K., Gakure, R., Gekara, M. and Orwa, G. (2015). Effect of Risk Management on The Financial Performance Of Companies Quoted In The Nairobi Securities Exchange. *International Journal of Business & Law Research*, 3, 26-42. Retrieved from https://www.academia.edu/33959612/Effect_Of_Risk_Management_On_The_Financial_Performance_Of_Companies_Quoted_In_The_Nairobi_Securities_Exchange
- [23] Kociu, L., Mano, R., & Armand, H. (2015). Financial Risk Assessment of Albanian SMEs with the Help of Financial Ratios. *European Scientific Journal*, 11(4), 309-321. Retrieved from <https://core.ac.uk/download/pdf/328024798.pdf>
- [24] Li, S. (2003). Future trends and challenges of financial risk management in the digital economy. *Managerial Finance*, 29(5/6), 111-125. doi:10.1108/03074350310768797
- [25] Masnoon, M., and Saeed, A. (2014). Capital Structure Determinants of KSE Listed Automobile Companies. *European Scientific Journal*, 10(13), 451-461. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2444698
- [26] Mugozhi, F. (2016). An assessment of the application and the corporate failure predictive value of Altman's Z score model in Zimbabwe. *Journal on Business Review*, 4(4), 66-74. https://doi.org/10.5176/2010-4804_4.4.398
- [27] Modigliani, F. & Miller, M. H. (1958). /The cost of capital, Coporation finance and the theory of investment, *The American Economic Review*, 48(3), 261-297.
- [28] Onsongo S. K., M. S. M. A., Mwangi L.W. (2020). Financial Risk and Financial Performance: Evidence and Insights from Commercial and Services Listed Companies in Nairobi Securities Exchange, Kenya. *International Journal of Financial Studies*, 8(51). <http://dx.doi.org/10.3390/ijfs8030051>
- [29] Saeed, M., Gull, A. & Rasheed, M. (2013). Impact of Capital Structure on Banking Performance (A Case Study of Pakistan). *Interdisciplinary Journal of Contemporary Research in Business*, 4(10), 5-10
- [30] Sharifi, O. (2014). Financial Risk Management for Small and Medium Sized Enterprises. *International Journal of Information, Business and Management*, 6, 82-89. Retrieved from <https://www.proquest.com/openview/cfaa3f3a850e176b17f7901b8bc770f2/1?pq-origsite=gscholar&cbl=2032142>
- [31] Simantinee S., K. T. V. V. (2015). Factors Influencing Financial Risk-A Case Study of NSE NIFTY Companies. *International Journal in Management & Social Science*, 3(8), 132-137. Retrieved from <https://euroasiapub.org/wp-content/uploads/2016/11/6FMApril-2077-1.pdf>
- [32] Spence, M. (2002). Signaling in retrospect and the informational structure of markets. *American Economic Review*, 92, 434-459. Retrieved from <https://www.jstor.org/stable/3083350>
- [33] Steven, L. (2003). Future trends and challenges of financial risk management in the digital economy. *Managerial Finance*, 29(6), 111-125. doi: 10.1108/03074350310768797
- [34] Venkatraman, N, a. V. R. (1986). Measurement of Business Performance in Strategy Research: A Comparison of Approaches. *Academy of Management Review*, 11(4), 801-814. doi: 10.5465/AMR.1986.4283976
- [35] Wangalwa, M. a. M., W. (2018). Effect of Financial Risk on Financial Performance of Large-Scale Supermarkets in Nairobi County, Kenya. *International Journal of Social Science and Technology*, 4, 574-591. Retrieved from <https://www.ijssit.com/main/wp-content/uploads/2018/10/Effect-Of-Financial-Risk-On-Financial-Performance-Of-Large-Scale-Supermarkets-In-Nairobi.pdf>
- [36] Woods, M., and Dowd, K. (2008). *Financial Risk Management for Management Accountants*: Oxford: Elsevier.

The Interactions Between the USD to VND Rate and Stock Index in Vietnam: An Application of VECM Model

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Abstract—This working paper examined the USD to VND exchange rate and VN-Index interactions with VECM model using daily data from November 2012 to June 2021. To be precise, the research compares impacts of the USD to VND exchange rate on VN-Index in two distinct sub-periods, including the first one from November 2012 to December 2015 and the second one from January 2016 to June 2021 because of the introduction of the decision 2730/QĐ-NHNN about the daily average inter-bank exchange rate between VND and foreign currencies in 2016. The results of VECM show that there are stable long-term and short-run relationships between the USD to VND exchange rate and VN-Index. These interactions are stricter in the first sub-period or before the introduction of decision 2730/QĐ-NHNN, leading to some important implications which are significant for portfolio managers' making-decision about the portfolio diversification and risk management.

Index Terms—USD to VND Exchange Rate, VN-Index, Stock exchange, VECM

I. INTRODUCTION

IN PRINCIPLES, the interreaction between exchange rate and stock market is explained through two following theories: (i) From the traditional approach's perspective, exchange rate fluctuations have impacts on have impacts on firms' values by making changes in the competitiveness as well as their firm value which is quoted in foreign currency. In other words, exchange rates should lead stock prices; (ii) By contrast, the portfolio approach indicates that prices of stock index would negatively collerate with the rate of exchange. To be precise, domestic investor's wealth can increase in case of a growth in stock prices, resulting to a higher demand for money and interest rates. Many studies have focused on the relationship between rates of exchange and stock index, but their research results are not significantly homogeneous on different markets.

In Vietnam, the stock market is dominated by retail investors investors with the rate of more than 90% who follows herd behaviour. Vietnamese individual investors dont have a long-term vision and they are willing to accept high risks. The current situation in Vietnam totally supports theories about the behavioral finance and feedback trading model by showing that many Vietnamese investors' psychology may be significantly affected by macroeconomic events like exchange rate. Changes in exchange rate surely affect investors sentiment with raising concerns about Vietnam's foreign exchange reserves and issues about inflation and national debt. So, rate of exchange is a factor that can strongly influence market movements.

In particular, on December 31, 2015, the State Bank of Vietnam (SBV) issued the Decision 2730/QĐ-NHNN announcing the changes in calculating the exchange rate of VND to other currencies, which officially took effect on January 4, 2016. Therefore, since 2016 the central rate of VND to USD has been calculated on the basis of reference to the inter-bank average VND/USD exchange rate. This decision is considered a new progress managing exchange rate which allows Vietnam to depend on any partner, even major partners, thereby avoid adverse shocks from the market, leading to achieve macro-economy objectives about promoting national economy.

However, from our best knowledge, there is not any research which compare the interaction between the exchange rate and change in VN-Index before and after the decision 2730/QĐ-NHNN. Therefore, this research aims to examine the long and short run relationship between the USD to VND exchange rate and stock market in Vietnam. To be precise, it is expected to determine how much changes in exchange rate have impacts on changes in VN-Index during a period from November 2012 to June 2021. The choice of research period primarily originated as a result of the fact that from Vietnamese financial experts' perspectives, November 2012 is marked by the mature of the stock market in Vietnam. Moreover, the Decision 2730/QĐ-NHNN is taken into account as an important event which allows this research compare the interactions between the USD to VND exchange rate and stock market in Vietnam in two different sub-periods, such as the first sub-period from November 2012 to December 2015 and the second sub-period form January 2016 to June 2021.

The study includes 5 sections. After introduction part, in Section 2, the article reviews the literature related to the interactions between rate of exchange and stock market. Section 3 describes data collection and vector error correction model (VECM) used as a method of data analysis. Section 4 describes about data and empirical results. Empirical results and discussions are presented in section 5 while section 6 gives some conclusions.

II. LITERATURE

Several studies about the relationships between stock prices and exchanges rate have been executed on both developed and developing stock markets and provided different results on different markets.

Research in 2016 tries to test the interreaction between these two mentioned variables in Brazil by using linear and nonlinear causality test [1]. As a result, the author don't find evidence about the long-run relationship but support linear Granger causality while the opposite result is found in the relation from rates of exchange to stock index. To be precise, stock index negatively impacts rates of exchange while the later also lead the former.

A test about the relationship between exchange rate of exchange and stock price is executed in Indonesia, Singapore, Thailand, the Philippines and Malaysia from 1993 to 2006 with Engle-Granger test [2]. The results show a cointegration between these two variables. However, this relation cannot be clearly defined.

Similarly, the relationship between currencies, including the euro, the pound, the yuan, and the yen and the U. S. stock from 2000 to 2012 is tested [2]. By using the regression model, the research figures out the negative relationship between the Japanese yen and the U.S. stock market but the positive correlation between the U.S. stock and euro and the pound. Moreover, the relationship between the yuan to USD and stock index is positive but not significant while the Chinese government have taken measures to directly intervene the forex market in an attempt to encourage export activities to countries [3].

Besides regression model, there are different methods used to investigate this relation. Firstly, VECM model is used as a method of data analysis to verify the impact of rate of exchange on stock market in Pakistan [4]. By using daily data of KSE-100 and currency rate between Pak Rupee and the US dollar, the research results indicate that both two variables are independent of each other. In other word, there is no evidence supporting this relationship. Furthermore, multivariate VAR-GARCH is also used to investigate the interactions between stock index and rate of exchange. The data are monthly collected from January 2000 to October 2014 [5]. As a result, there is a stable long-term relationship between stock prices and rates of exchange. Moreover, a significant impact from stock market to rates of exchange is found while the opposite relation is not justified [5]. In addition, non-autogressive distributed lag (ARDL) analysis is also an approach method to investigate the impact of change in rate of exchange on stock index in Vietnam [6]. Monthly data about VN-Index and the VND to USD rate are collected over a period from 2001 to 2018. Authors compare this relationship between the currency appreciation and the currency depreciation. As a result, changes on rate of exchange significantly impact stock index both in long and short terms. In addition, stock prices have a stronger influence on exchange rate during the currency appreciation than during the currency depreciation [6].

Besides studies which directly investigate impacts of exchange rate on stock market, some studies highlight that it is necessary to include other assets such as currencies, commodities, and bonds when considering the integration or interdependence of stock markets [7] and also totally agree that portfolio management should take into account the integration and connections between asset classes since they are really meaningful for both investors and policymakers when they make decisions [8] [9].

Focusing on the association between oil and stock returns in East Asian countries, during the period from 1992 to 2015, the research figures that oil prices have impacts on stock returns in the long run although the two variables experience different fluctuations in distinct periods [10]. In line with this topic, the research in India strongly justifies the interdependence between price of oil and daily stock returns during a period from 1999 to 2021 [11]. Moreover, there is evidence on the co-movement between prices of crude oil and maize, price of soybeans and the rate of exchange, as well as price of sugar and activities of global economy [12]. Similarly, long-term linkages between stock returns and prices of commodities are also justified in Africa [13].

III. METHODOLOGY

A. Data collection



Fig 1. Fluctuation of USD to VND exchange rate and VN-Index from November 2012 to December 2016

Data used in this study are sourced from Investing.com and consist of VN-Index on HOSE and the USD to VND exchange rate over a period from November 2012 to June 2021. Figure 1 shows fluctuations of VN-Index and the USD to VND exchange rate in two different sub-periods. It can clearly be seen that changes in exchange rate were smaller than those in VN-Index during the first sub-period while the second one experienced the opposite situation. Moreover, the USD to VND exchange rate have slightly fluctuated since January 2016, compared to an increase in exchange rate from November 2012 to December 2015. By contrast, there have been significant fluctuations in VN-Index since 2016 while this index remained quite stable before changes in determining the daily average inter-bank exchange rate between Vietnam dong and foreign currencies in Vietnam.

B. Data Analysis

The correlation between the USD to VND exchange rate and VN-Index is determined through 4 main steps, starting with stationarity test and ending with Vector Error Correction Model. At the first stage, Augmented Dickey-Fuller test is used to test stationarity of changes in exchange rate (ΔEX_t) and changes in VN-Index (ΔSM_t). Variables are calculated as following:

$$\Delta EX_t = \frac{\text{Exchange rate}_t - \text{Exchange rate}_{t-1}}{\text{Exchange rate}_{t-1}}$$

$$\Delta SM_t = \frac{Vn - Index_t - Vn - Index_{t-1}}{Vn - Index_{t-1}}$$

Data analysis continues the second stage where optimal lag length is determined by using different criteria such as Akaike information criterion (AIC), Schwarz information criterion (SC), FPE criterion, and Hannan Quinn information criterion (HQ). The next step is Johansen co-integration test. Next, the fourth step of VECM is executed in case of the value of Trace and Max Eigenvalue of bigger than 5% critical value,

At the fourth stage, an estimated VECM is as below:

$$\Delta SM_t = \beta_0 + \sum_{j=1}^n \beta_j SM_{j,t-j} + \sum_{i=1}^n \delta_i \Delta EX_{i,t-i} + \omega \mu_{t-1} + v_t \quad [1]$$

Co-integrate equation (long-run model):

$$\mu_{t-1} = ETC_{t-1} = \Delta SM_{j,t-1} - \beta_0 - \beta_1 \Delta EX_{i,t-1} \quad [2]$$

While:

- ΔSM_t : Changes in VN-Index at time t
- ΔEX_t : Changes in the USD to VND exchange rate at time t
- μ_{t-1} : The lagged value of the error correction term
- v_t : A white noise error term

Both the short-run and long-run dynamics between ΔSM_t and ΔEX_t are explained by the first equation while the second one only focuses on the long-run relationship. and ΔEX_t exists when the coefficient of the co-integrate equation is from -1 to 0. The coefficient of ETC ω means how quickly ΔSM_t go to the balance point after the independent variable and ΔEX_t changes.

The entire process concludes after stability test of VECM model with the inverse roots of the characteristic AR polynomial test as well as CUSUM test.

IV. RESEARCH RESULTS

A. Data Description

The descriptive statistics about changes in the USD to VND exchange rate and VN-Index over a period from November 2012 to Jun 2021 are presented in the table 1. Overall, the USD to VND exchange rate experiences less significant fluctuation than VN-Index. To be precise, ΔSM has the min value of -6.67% and the max value of 4.98% while those of ΔEX_t are -1.135% and 1.38%, leading to the standard deviation of ΔSM_t is 1.09%, compared to 0.11% of. The sub-period 1 and the sub-period 2 experience the same situation.

TABLE 1: DATA DESCRIPTION

	Min	Max	Mean	Standard deviation
Sub-period 1				
ΔSM_t	-5.87%	3.47%	0.13%	1.06%
ΔEX_t	-1.35%	1.38%	0.00%	0.14%
Sub-period 2				
ΔSM_t	-6.67%	4.98%	0.14%	1.11%
ΔEX_t	-0.52%	0.74%	0.00%	0.09%
Total period				
ΔSM_t	-6.67%	4.98%	0.14%	1.09%
ΔEX_t	-1.35%	1.38%	0.00%	0.11%

B. Empirical Results

Appendixes 1 and 2 present VECM results for the sub-period 1 and the sub-period 2, accordingly. It can clearly seen that a regression with intercept c and @trend shows no trend and intercept of series of changes in USD to VND exchange rate and those in VN-Index have during two research sub-periods from November 2012 to June 2021.

Table 2 gives information about optimal lags, and coefficients of ETC between ΔSM_t and ΔEX_t before and after the Decision 2730/QĐ-NHNN. To be precise, different criteria like AIC and FPE show that optimal lags between ΔSM_t and ΔEX_t in the first sub-period is 7, compared to 2 in the second sub-period.

Regarding to co-integration, the Trace and Max-Eigenvalue tests indicate a cointegration at the 5% between ΔSM_t and ΔEX_t if the probability is smaller than 0.05. So, it can be obviously seen that there is co-integration between ΔSM_t and ΔEX_t during two research sub-periods from November 2012 to June 2021.

TABLE 2: OPTIMAL LAGS AND COEFFICIENTS OF ETC BETWEEN ΔSM_t AND ΔEX_t IN TWO DIFFERENT SUB-PERIODS

	Optimal lags	Coefficient of ETC
Sub-period 1	7	-0.543357
Sub-period 2	2	-0.141311

Moreover, the coefficients of ETC between ΔSM_t and ΔEX_t are -0.543357 and -0.141311 for the sub-period 1 and the sub-period 2, accordingly. These values are bigger than -1 and smaller than 0, confirming a total long-run relationship between ΔSM_t and ΔEX_t over a period from November 2012 to June 2021.

Notwithstanding the above, Wald test obviously shows evidence about the short-run relationship between ΔSM_t and ΔEX_t in both two sub-periods since p-values of F-statistic and Chi-square are less than 0.05. In addition, the test of the autocorrelation of residuals indicates that all indices have p-values less than 5% significant level.

V. DISCUSSION

Firstly, this research confirm both long-run and short-run relationships between the USD to VND exchange rate and VN-Index, supporting both two main theories, such as the traditional approach and the portfolio approach. This means that the USD to VND exchange rate can lead VN-Index while changes in VN-Index also has negative impacts on changes on the USD to VND exchange rate. Furthermore, the results of this study are entirely consistent with the findings of [1], [3], [5], [6] but totally different with what [4] found out in their working paper.

Secondly, there are significant differences in relationships between the USD to VND exchange rate and VN-Index in the sub-period 1 and the sub-period 2, which can be translated through optimal lags and coefficients of ETC. To be precise, that optimal lags between ΔSM_t and ΔEX_t in the first sub-period is 7, compared to 2 in the second sub-period. In other words, a change in the USD to VND exchange rate has impacts on VN-Index during 7 next days in the sub-period 1, compared to only 2 next days in the sub-period 2. In addition, the coefficients of ETC between

ΔSM_t and ΔEX_t are -0.543357 and -0.141311 for the sub-period 1 and the sub-period 2, accordingly. This means that a change in the USD to VND can lead a more significant fluctuation in VN-Index in the first sub-period than in the second sub-period.

In fact, the central rate mechanism ensures that the exchange rate is flexibly adjusted in line with what is happening in the market and is also regulated by the State Bank when the market witnesses complicated movements. The continuous fluctuations of the exchange rate reflecting the supply-demand relationship in the market will make it difficult for speculators to forecast rates of exchange, thereby reducing the act of holding foreign currencies as before. Moreover, the new exchange rate mechanism which is able to give clearer information can help participants to be fully active in their production investment activities. To be precise, they must be familiar with changes in exchange rate instead of a fairly stable exchange rate, leading to the fact that they have to improve their risk management. Furthermore, the central exchange rate mechanism's flexibility and objective reflection of the supply-demand relationship is significantly considered a positive factor in attracting foreign investment into Vietnam. Therefore, it is argued that the central exchange rate mechanism is very flexible, making stable the foreign exchange market in Vietnam.

VI. CONCLUSION

The result of VECM shows the high coefficient of the cointegrating equation and high coefficient of ETC between changes in the USD to VND exchange rate and VN-Index over a period from November 2012 to June 2021. In particular, this correlation have been lower since the Decision 2730/QĐ-NHNN about new calculation methods of determining the exchange rate between VND and foreign currencies. So, this research provides empirical evidences on relationship between rate of exchange and stock index in Vietnam. Investors can refer these results to choose an efficient investment strategy, making-decisions about portfolio diversification and risk management. However, it can be seen that this research only give evidence about the

interaction between the USD to VND exchange rate and VN-Index but not explained detailed ways where the exchange rate impacts changes in stock index. There is a need for further follow-up studies which focus much more on financial behaviors of retail investors in Vietnam towards changes in exchange rates in order to be able to provide deep analysis and highly specific recommendations.

REFERENCES

- [1] Tabak, B.M. (2006). The Dynamic Relationship between Stock Prices and Exchange Rates: evidence for Brazil. *Working paper series*, 1-37.
- [2] Harjito, D. A. (2009). Testing the relationship between exchange rate and stock price in the ASEAN countries. *Economic journal of emerging markets*, 3, 181-195.
- [3] Bello Z. (2013). The association between exchange rates and stock returns. *Investment Management and Financial Innovations*, 3, 40-45.
- [4] Suriani, S., Kumar, M.D., Jamil, F., Muneer, S. (2015). Impact of Exchange Rate on Stock Market. *International Journal of Economics and Financial Issues*, 5, 385-388.
- [5] Manasseh, C. O., Chukwu, N. O., Abada, F.C., Ogbuabor, J. E., Lawal, A. I., Alio, F.C. (2019). Interactions between stock prices and exchange rates: An application of multivariate VAR-GARCH model. *Cogent Economics & Finance*. 7:1, 1681573. <https://doi.org/10.1080/23322039.2019.1681573>
- [6] Dang, V.C., Le, T.L., Nguyen, Q.K., Tran, D. Q. (2020). Linkage Between Exchange Rate and Stock Prices: Evidence from Vietnam. *Journal of Asian Finance. Economics and Business*, 12, 95-107.
- [7] Bekaert, G., & C. Harvey. (1997). Emerging equity market volatility. *Journal of Financial Economics*, 43(1), 29-77. [https://doi.org/10.1016/S0304-405X\(96\)00889-6](https://doi.org/10.1016/S0304-405X(96)00889-6).
- [8] Gilbert, C. (2009). Commodity speculation and commodity investments. *Journal of Commodity Markets and Risk Management*, 1-189.
- [9] Yang, L., Garcia, P. (2014). Portfolio investment: are commodities useful?. *Proceedings of the NCCC-134 Conference on Applied Commodity Price Analysis, Forecasting, and Market Risk Management*, (p. 138). St. Louis, M.O.
- [10] Xiao, C, Tian, C., Yuanb, N., Hamoric, Sh. (2017). Interdependence between oil and East Asian stock markets: Evidence from wavelet coherence analysis. *Journal of International Financial Markets, Institutions and Money*, 48, 206-223. <https://doi.org/10.1016/j.intfin.2017.02.001>.
- [11] Das, S. (2020). The Time-Frequency Relationship between Oil Price, Stock Returns and Exchange Rate. *Journal of Business Cycle Research*. <https://doi.org/10.1007/s41549-021-00057-3>
- [12] Fernandez-Diaz, J., & Morley, B. (2019). Interdependence among agricultural commodity markets, macroeconomic factors, crude oil and commodity index. *J Research in International Business and Finance* 47, 174-194.
- [13] Boako, G., Alagidede, I., Sjo, B., & Uddin, G. (2020). Commodities price cycles and their interdependence with equity markets. *Energy Economics*, 91. <https://doi.org/10.1016/j.eneco.2020.104884>.

Using Google translate in teaching and learning activities for English – medium – instruction (EMI) subjects

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Abstract - *In the age of globalization, translation has tended increasingly necessary in bilingual classrooms. The advancement of technology has provided useful tools for making translation easier and more convenient. The automatic tool “Google translate” is increasingly popular and used in many teaching-learning activities recently. The study provides a comprehensive and new insight into the strengths and weaknesses of Google translate. Through the comparison of machine translation and human translation on the aspects of task response, coherence, lexical resource, grammar and accuracy, it shows that there are some limitations in machine translation, which affects the quality of the translations. However, machine translation still plays an important role in supporting users, in terms of time and economic efficiency. Google Translation is a productive tool to assist individuals in learning and teaching in the field of specialized English-medium-instruction subjects.*

Keywords: *Machine translation, Google Translate, Teaching and learning activities, Management Accounting module.*

I. INTRODUCTION

In the era of globalization and multilingual communication along with the Fourth Industrial Revolution, translation activities play an important role in all aspects of life. It can be said that translation activities have existed since the beginning of human civilization, expressed at many different levels. Translation is seen as a powerful tool with the mission of breaking down the wall of language differences, bridging the gap between countries through sharing cultural values. Advances in technology, especially in the field of information and communication, make the interaction between one country and other countries increasingly enhanced, so according to [13]: “Global communication cannot exist without translation”. The explosion of international exchanges as well as the increasing demand for translation in many fields requires translators who can translate in a short time a large number of documents in various fields. The advancement of science has given birth to a solution to support humans, then machine translation is formed as an independent scientific trend. Machine translation is a part of the automatic translation system, although there are still some limitations, machine translation is currently considered the key of international social issues in the international information era [5].

Google Translate (GT) is one of the most popular machine translation tools in the world. Google translate is one of the

applications developed by Google, a website that allows users to access information from all over the world at any time and from anywhere. Currently, Google translate can translate into more than 100 languages used in the world. In the era of globalization, students are required to read and understand many texts and documents that still use the original language from an international language, such as English. From there, students came up with the idea of translating these texts in instantaneous ways in a relatively short time. One of the effective tools is using Google translate.

In the trend of international integration, Hanoi University of Industry (HaUI) has been implementing a project to teach a number of specialized modules in English to improve English skills as a means to exchange and learn from the world. However, there are still some difficulties in teaching-learning activities due to language barriers. To support the teaching-learning process of lecturers and students, the research focuses on (i) assessing the strengths and weaknesses of the Google translate tool; (ii) determine the practical application of Google translate in teaching-learning activities in specialized subjects in English; thereby (iii) exploring the current situation of using GT as a supporting tool among HaUI students.

In this study, the examples are taken from the module of Management Accounting (ACCA) and its translation is processed by Google translation. The course belongs to the Department of Accounting Information Systems, Faculty of Accounting and Auditing and is taught in English, using the curriculum provided by ACCA.

II. THEORETICAL PERSPECTIVES ON TRANSLATION

A. *The term of translation*

Translation is a process of replacing meanings in one language into another by means of interpretations [13]. The translation process must consider the vocabulary, grammar and contextual situations in the source language, and then translate that text into the target language with the same meaning by considering the naturalness of the target language. Therefore, the equivalence of the source and target languages needs to be met to avoid misunderstanding by the receiver. According to [2], translation is a process or a product including literal translation, technical translation, subtitle or machine translation. The translation should have equivalence in meaning and context between the source and target languages. The result of the translation process must be readable so that the reader can easily understand the content of

the translation. On the contrary, when the translated text is unreadable, it will be difficult and confusing for the reader.

B. Machine translation

Machine translation is a strand of natural language processing within the sub-discipline of artificial intelligence. Machine translation is a combination of language and computer science. Translations are “*automatically translated from one language into one or more other languages, without human intervention in the translation process*”. At a basic level, machine translation performs an independent substitution of words in the source language into the target language, but it usually does not produce a good translation. Currently, machine translation is rapidly evolving to solve this problem by capturing statistics and neutral techniques, so that it can handle typographical differences, idiom translations, and unusual differences. Machine translation is a very valuable area of research, leading to the development of approaches in building high-quality translation software. Currently, custom domain names or professions are often available in translation software. This feature will narrow the range of allowed substitutions, resulting in improving the quality of translation results. Human intervention is also an alternative way to improve the quality of translation products. Some translation systems can improve the accuracy of the translation next time after the user can suggest corrections for the mistakes it has made.

III. STRENGTHS AND WEAKNESSES OF GT

A. Introduction to Google Translate

Machine translation developed by Google is called “Google Translate”. It was first developed in 2007, using a system called SYSTRAN. Then, in 2010, Google moved to a new platform of machine translation according to the principle of “Statistical Machine Translation”. Translation quality is increased over time as more and more texts are loaded with increasingly diverse structures and contexts. Since 2016, GT has used Neural Machine Translation (NMT) technology for most language pairs, which gives more accurate results than other methods. Recently, GT has supported more than 100 languages at different levels. Google translate can translate not only a word, but also a phrase, part of text, or a Web page. To translate a text, Google Translate searches different sets of documents to find the most appropriate translation pattern among human-translated texts.

B. Strengths of GT

Google translate has various advantages. First, it's free. It also offers multiple languages for input and output. The app also enables speech recognition, translates entire web pages, and uploads entire text files for quick translation.

[8] emphasized the advantages of Google translate in teaching English. Google translate allows users to access websites for free. Users just need to open the website in their browser or load the app in their widget to use the app. Photo recognition becomes a feature in the Google translate app on learners' smartphones to save time, especially when learners

are trying to understand some English text. Students simply take a picture of the word or text, then let the tool do the job. In addition, this application also allows text input through the virtual keyboard, handwriting recognition or voice recognition.

C. Weaknesses of GT

Although Google translate offers many benefits, its role in teaching and learning activities as a mainstream aid is still controversial because of a number of limitations. One of the most mentioned limitations is that the translation from this application is not accurate for a sentence or a long text [8, 10]. GT will provide a word-by-word translation in cases of translating a long sentence or paragraph. Google translate also can't process language as idioms or figurative. Therefore, the length of the text determines the quality of the translation, the shorter the text, the higher the quality. [12] tested google translate with six different types of documents, including: articles, minutes, notes, letters, quizzes and Powerpoint slides, only slides were for best results, because the slides do not contain full sentences but only phrases.

In addition, [3] also pointed out that google translate does not have a grammar function, so it cannot process grammatically correct sentences. Another limitation of this tool is that there is no context. This can cause misunderstandings in word choice. Word choice is the way of how learners choose words to express their ideas in their writing. Choosing the right words while writing ideas is one of the best ways to get the message across to the reader [11]. Word choice has a lot to do with vocabulary. Since vocabulary is defined as the words needed to convey students' ideas and meanings, vocabulary plays an important role in language. A well-organized article is one in which the reader can easily follow the writer's ideas, ideas need to be clearly organized, coherent and suitable word choice. Accordingly, google translate or machine translation cannot replace human.

IV. METHODOLOGY

To answer research question, the paper is conducted based two methods as followed. First, data from the most popular machine translation tool, Google translate, will be collected to become a comparative document. The authors compared the translations between GT's and humans. In this method, Management Accounting materials provided by ACCA will be collected as examples for reference. The basic criteria for assessing the quality of a translation are responsiveness, coherence, vocabulary, grammar and accuracy.

Additionally, the paper aimed to investigate current situations of using GT among students who are currently studying Management Accounting delivered in English in Hanoi University of Industry. Thus, the paper distributed a survey questionnaire created by Google Forms to collect data on students' attitudes and feelings towards using GT for learning purposes. The five-point rating scale questionnaire was adapted from a questionnaire developed by [14]. Students were asked to complete the questionnaire in a given time to

provide their purposes of using GT, attitudes on benefits, drawbacks as well as problems when using GT.

V. FINDINGS AND DISCUSSION

A. The quality of Translations

Task response and Coherence

With Google Translate, the response to translating a word, sentence, or entire web page is available with the click of a mouse or the touch of a finger.

Google translate relies on various available forms to translate from source language to target language. In some cases, language coherence may be lost. Individual words are processed at an increasing level by Google translate. Therefore, to increase the quality of the translation, the user should provide input in the form of basic templates to create context for the translated text.

The example below (Figure 1) is an illustration of a context-specific translation. If just translating the word "fixed" alone, it is not enough context for an accurate and appropriate translation, but when adding the word "cost" or the whole sentence, it is much clearer.

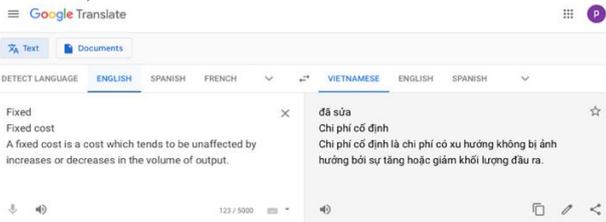


Fig. 1 Example of "Fixed cost"

Similarly, with the term "variable cost", if only one word "variable", google translate will result in a variable, but when placed in a specific context, adding the word "cost" or the whole sentence, the translation has already changed for more accurate results.

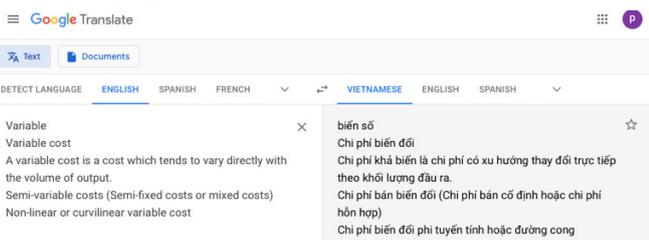


Fig. 2 Example of "Variable cost"

However, google translate is still limited, as mentioned above, the translations still result in translating from single words then combining them. If it needs more precise, the translation could have additional results such as: "fixed cost" or "variable cost". As another example, the terms "Non-linear variable cost" and "curvilinear variable cost" both mean the same translation as "non-linear variable cost" or "non-linear variable cost"

Vocabulary and Grammar

Regardless of the source language or the target language, for machine translation, the distinction between synonyms to use to suit a particular context is a challenge.

For example, the word "variance" can be translated as "variance" or "variance", but in management accounting, "cost variance" is understood as the difference in costs.

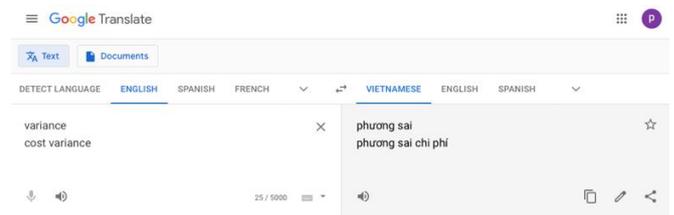


Fig. 3 Example of "cost variance"

In those cases, critical thinking in translation is needed when the vocabulary has multiple meanings or the existence of some special meanings in individual words. Therefore, students must apply critical thinking when searching and selecting equivalent words to choose the appropriate one.

An example of a plural word is the word "set". According to the Oxford dictionary, the word "set" has the largest number of meanings, in such cases, users need to think critically to choose words that match the context.

Accuracy

As mentioned previously, the semantic translation method focuses on accuracy, while the communicative translation method focuses on fluency. Hence, Google Translate can be useful on a word-by-word level, but actual accuracy is often lost in cases of grammar and accuracy. Two factors that can be used to assess the accuracy of a translation are the titles and terms in the translation.

Titles play an important role in translation because they are the first object that comes to learners. Most titles are translated literally and are closest to the source language.

The table below evaluates the titles and accuracy of translations from google translate.

TABLE I

Evaluation of the title and the accuracy of the translation from google translate

Title	Translation from GT	Evaluation
Cost behaviour patterns	'Các mẫu hành vi chi phí'	The meaning is not clear Dịch là "các cách ứng xử của chi phí"
Fixed costs	'Giá cố định'	Incorrect Dịch đúng "chi phí cố định"
Step costs	'Chi phí bước'	Incorrect Dịch đúng "chi phí cấp bậc"
Variable costs	'Chi phí biến đổi'	Acceptable
Non-linear or curvilinear variable costs	'Chi phí biến đổi phi tuyến tính hoặc đường cong'	Acceptable
Semi-variable	'Chi phí bán biến đổi'	Acceptable

costs/Semi-fixed costs/Mixed costs	‘Chi phí bán cố định / Chi phí hỗn hợp’	
Other cost behaviour patterns	‘Các mẫu hành vi chi phí khác’	The meaning is not clear Dịch đúng “các cách ứng xử chi phí khác”
Cost behaviour and cost per unit	‘Hành vi chi phí và giá mỗi đơn vị’	Incorrect Dịch đúng “ cách ứng xử của chi phí và chi phí đơn vị”
Assumption about cost behaviour	‘Giả định về hành vi chi phí’	The meaning is not clear
Determining the fixed and variable elements of semi-variable costs	‘Xác định các yếu tố cố định và biến đổi của chi phí bán biến đổi’	Acceptable
Analysing costs	‘Phân tích chi phí’	Acceptable
High-low method	‘Phương pháp cao thấp’	Acceptable
Linear equations	‘Các phương trình tuyến tính’	Acceptable
Example: Deriving a linear equation	‘Ví dụ: Lập phương trình tuyến tính’	Acceptable
Linear equation and graphs	‘Phương trình tuyến tính và đồ thị’	Acceptable
The intercept and the slope	‘Điểm giao nhau và độ dốc’	Incorrect Dịch đúng “hệ số chặn và độ dốc”

From the comparison table, it can be seen that in the majority of titles, Google translate gives acceptable results with short and stereotyped titles. However, with long and specialized titles, a translator's intervention is required to ensure accuracy. The cause of the wrong translation may be that automatic translation software tends to translate single words and misinterpret specialized terms. For example, the title “Fixed cost” is translated by google as “fixed price”, while the correct translation should be “fixed cost”. Or the title “the intercept and the slope” is translated by google as “intersection and slope”, but in the field of economics this title should be translated correctly as “intercept and slope”.

A term has the characteristic that it represents only a single concept without causing any confusion. In order to evaluate the quality of a term translation, it must ensure three characteristics of the term, which are accuracy, systematic and national and international (Bowker & Ciro, 2019).

Table 2 is a complete list of management accounting terms in chapter 3 Cost behavior of Management Accounting textbook (BPP, 2019).

TABLE II

Terms	Google Translate	Human translate
Cost behaviour	Hành vi chi phí	Hành vi của chi phí
Fixed cost	Chi phí cố định	Chi phí cố định
Step cost	Chi phí bước	Chi phí cấp bậc
Variable cost	Chi phí biến đổi	Chi phí biến đổi

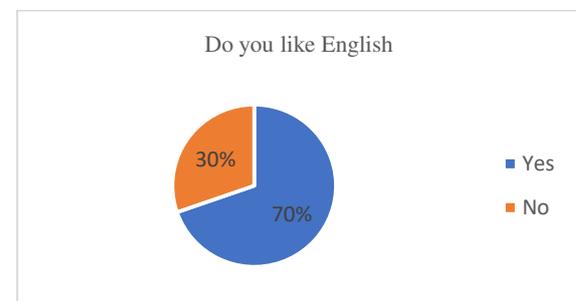
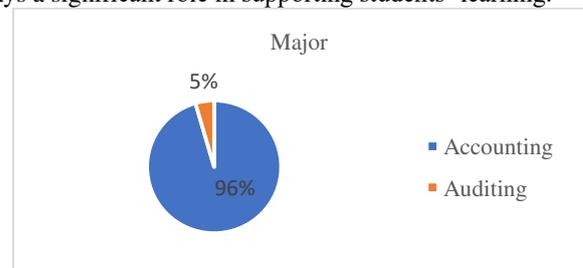
Mixed cost	Chi phí hỗn hợp	Chi phí hỗn hợp
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Vietnamese versions are translated by google translate, of the five terms, 4/5 are translated close to the human translation. Errors that google translate can come from many causes. Firstly, the successful translation terms are mostly short and simple, the Vietnamese equivalents are usually a single word. While terms are longer or more complex, having multiple equivalents often makes Google translate confusing to display. Secondly, there is currently no standard system for terms in management accounting, which is also the most important factor affecting the quality of automatic translation software. Vietnamese is not a common language in the world, so it is inevitable that automatic translation tools have difficulty converting terms between the two languages. This can be seen in the translation of the word “step cost”. Google translate could not process the whole phrase, instead it split the word into two single words “step” and “cost”, processed it separately and then put it together in Vietnamese into the word “step cost”. Thus, this translation method is not always effective in Vietnamese terms.

B. Students' frequency in using GT

In order to understand students' use GT and their attitudes, feelings and behaviors towards GT, the study selected a sample of 155 undergraduate students through shared link of Google forms survey questionnaires. The study was carried out at Faculty of Auditing and Accounting, Hanoi University of Industry. These students are learning module of Management Accounting in 2021 academic year.

The results showed that 100 percent students used GT (see Figure 4). Most of these GT users frequently used GT at least twice a week, whereas some students almost used GT every day or “uncountable”. These findings indicated that GT plays a significant role in supporting students' learning.



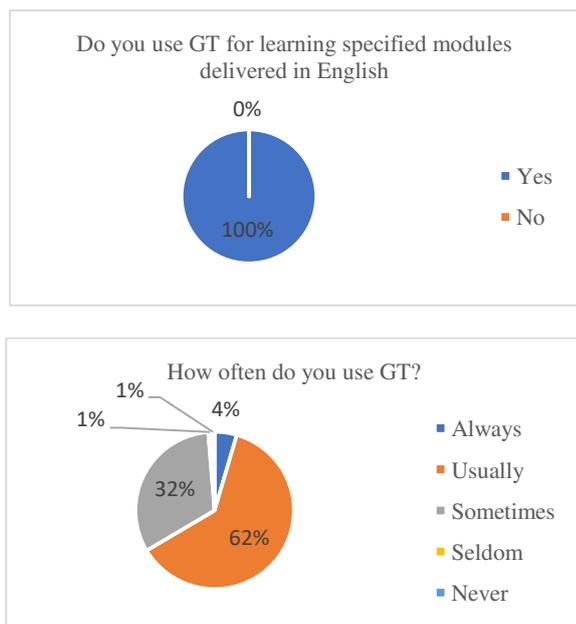


Fig 4. Students' frequency in using GT

When using Google translation to translate assignments or exercises of Management Accounting module, students usually "read sentences and text before using GT" ($X = 3.32$, $S.D = 0.82$), "used GT only for meanings of unknown vocabulary words and translated the rest by myself" ($X = 3.63$, $S.D = 0.79$). They used GT to "translate one sentence at a time" ($X = 3.13$, $S.D = 0.83$), a paragraph ($X = 3.32$, $S.D = 0.92$), parts of an essay/article consisting of two paragraphs or more ($X = 3.26$, $S.D = 1.0$), a whole essay/article ($X = 3.15$, $S.D = 1.09$). These results indicated that these were the behaviors of reading sentences and texts before using GT. Students translate one sentence at a time, then look for and replace more suitable words and finally edit the GT output. Almost students knew how to use GT in an effective and appropriate way. They are aware of GT limitations and tried to avoid those errors. They also know how to check and correct the errors. When they were not sure about word meanings translated by GT, they tried to find another suitable word by clicking on those words to see other possible alternatives and chose the most appropriate ones ($X = 3.74$, $S.D = 0.92$); and they asked for other students' help ($X = 3.18$, $S.D = 0.94$).

C. Students' attitudes towards using GT for learning purposes

Students were high in favor of GT because GT gives more advantages than disadvantages ($X = 3.52$, $S.D = 0.71$); free and easy to access ($X = 4.15$, $S.D = 0.79$); quick to translate texts ($X = 3.99$, $S.D = 0.74$); better quality of texts translated by GT ($X = 3.46$, $S.D = 0.82$). From the students' point of view, they agreed that the quality of translated messages by GT was much better than theirs. Thus, students stated that GT could help both students with low and high English ability.

However, some students thought that GT negatively affects their learning habits in different ways. GT made them lazy to think and to use my effort in understanding English (X

$= 3.26$, $S.D = 0.96$). They gave the opinion that students with low English competency depend more on GT in learning English rather than those with high level ($X = 3.26$, $S.D = 0.96$). These findings consistent with Maulidiyah (2018), found that students' attempt in reading and writing were reduced, and problems of vocabulary retention appeared when they used GT.

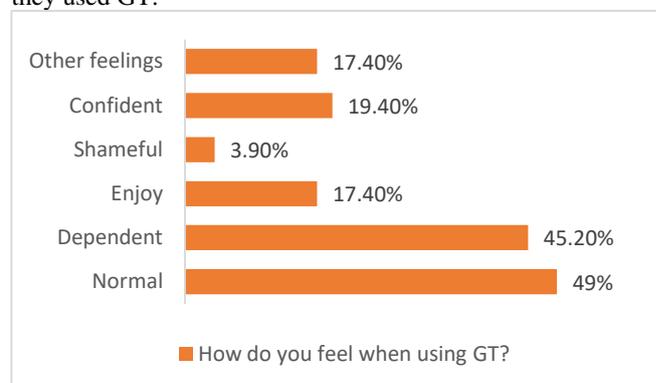


Fig 5. Students' feeling about using GT

When being asked how to feel when using GT, nearly a half of students felt normal (49%) or dependent (45.2%). This is in line with the result indicating that students might feel reliant on GT and that GT demotivated their attempt to learn English by themselves. Most of the time they did not try to attempt to read a text in the target language, but had it translated immediately by GT.

Furthermore, in terms of problems of using GT, this study showed that GT could be problematic in some ways. First, it sometimes provides inaccuracy and inappropriateness of word meanings. Second, word order of GT output might be wrong when there are different grammar structure between source and target languages. Dealing with these problems, students suggested that they confirmed word meanings by rechecking them with a dictionary or another translating apps, or even asked for teachers and friends' help. However, students still suggested that GT is more favorable and beneficial.

VI. IMPLICATIONS AND FUTURE DIRECTION

In conclusions, automatic translation tools, particularly Google translate, have some significant advantages. First, it provides a translation in a very short time, much faster than manual translation. Therefore, it helps to save time significantly, especially when dealing with large volumes of documents. Second, automatic translation software can translate almost any language, even if the source text has a combination of different languages, automatic translation can still handle it. Otherwise, two translators may be required, which can be costly.

On the contrary, automatic translation still has weaknesses that affect translation quality. First, automatic translation lacks consistency in translation versions, which comes from rigid systematic rules in pre-written translation software. Second, automatic translations have low reliability due to the lack of proofreading, so widespread use in highly

specialized fields is not feasible. The final limitation is insecurity. Information may be lost or leaked or exploited by the provider itself. In addition, this software does not have an archiving feature, so the translations also need to be controlled and managed by the user.

Translation is an inevitable first step and an integral part of the bilingual classroom. Therefore, the aim of the study is to provide some ideas for effective use of Google translate in specialized classes delivered in English. Proper application of instant machine translation tools will improve teaching and learning in English. Research shows that users use Google translate in three aspects: vocabulary, spelling and grammar. Among them, vocabulary becomes the most useful aspect of Google translate, with the word level being the most common, followed by the phrase level, and finally the sentence level. Grammar is the least useful aspect because accuracy is often reduced in some complex cases.

Through evaluating the quality of the translation of Chapter 3 of the Management Accounting textbook translated by Google, compared with the human-translated translation, the study shows that using automatic translation software is relatively effective in case of need for assistance. It is time-saving. Automatic translation tools are increasingly improved thanks to outstanding features of artificial intelligence. User contributions also make using Google translate more and more convenient and necessary in the future. Therefore, within the specialized classroom, the Google Translate automatic translation tool still promotes efficiency and speed, helping students to understand the basic content in the document. Most simple words and phrases are translated relatively accurately and do not require much editing. However, a careful translation process, discussion under the guidance and support of the lecturer is necessary to ensure the quality of the translation.

In some cases, with documents with a high level of specialization, the use of automatic translation software may not be appropriate. For specialized terms, accuracy and consistency in translation when using Google translate is a disadvantage, which greatly affects the quality of the translation. In addition, errors in word deviation and word abuse often occur, making users confused or misinterpret the meaning of the text. Therefore, in most cases, automatic translation is still not a substitute for translators and still requires human intervention and correction.

Results also showed that 100 percent of the students have used Google translate in learning, especially for vocabulary learning and translating. The majority of students agreed that the quality of texts translated by GT is better than by their translation. Besides, they had highly positive attitudes towards google translate, for example, free access, quick and helpful for translating. However, some problems are also reported. GT is unable to translate all the words correctly and sometimes gives inappropriate meanings, requiring students to recheck word meanings from dictionaries or ask for teachers and friends' help. Some students feel too reliant on GT, which reduces their attempt to learn English by themselves. Most students hold beliefs that GT could produce some mistakes in

vocabulary choices; hence they might reduce these mistakes by performing these four behaviors, including reading the whole sentences and texts and trying to understand the context before using GT, translating one sentence or a range of words, looking for and replacing more suitable words by checking other sources, and editing the GT output as many as possible. They proposed solutions to improve the situation, such as usage of dictionaries or Grammarly apps.

Research shows that using Google translate tool in teaching-learning specialized subjects in English is feasible and useful as a support tool for lecturers and students. However, this study also has the limitation that it applied google translate in translating text from English to Vietnamese at an initial basic level. The use of GT in a range of classroom activities such as group activities, discussion, writing from English to Vietnamese or vice versa, translating from Vietnamese to English needs to be further studied through other methods such as interview or experimental research to verify. The author proposes to carry out further research to examine the effectiveness of using Google translate in practical classroom activities through in-depth interview methods, questionnaire survey and experimental research in the future.

REFERENCES

- [1] Bowker L., Ciro J. B., 2019. Machine translation and global research: Towards improved machine translation literacy in the scholarly community: Emerald Group Publishing.
- [2] Hatim B., Munday J., 2004. Translation: An advanced resource book. Psychology Press.
- [3] Jin L., Deifell E., 2013. Foreign language learners' use and perception of online dictionaries: A survey study. *Journal of Online Learning and Teaching*, 9(4), 515.
- [4] Kelly N., Zetzsche J. O., 2012. *Found in translation: How language shapes our lives and transforms the world*. TarcherPerigee.
- [5] Kroulek A., 2017. A translation showdown: Man vs machine translation. *K-International Language Blog*.
- [6] Lan P. P., 2019. Evaluating the differences between human translation and machine translation- An implication for teaching and learning translation course for construction materials in the national economics university (NEU) . *Educational Sciences*, 64(12), 50-63. Retrieved from <http://stdb.hnue.edu.vn>. doi: 10.18173/2354-1067.2019-00131
- [7] Larson M. L., 1984. *Meaning-based translation: A guide to cross-language equivalence* (Vol. 366). University press of America Lanham, MD.
- [8] Medvedev G., 2016. Google translate in teaching English. *Journal of Teaching English for Specific and Academic Purposes*, 4(1), 181-193.
- [9] Newmark P., 1988. *A textbook of translation* (Vol. 66). Prentice hall New York.
- [10] Souhila D., 2015. *Developing EFL writing skill through the use of the process approach*. University of Biskra.
- [11] Starkey L. B., 2004. *How to write great essays*. LearningExpress.
- [12] Van Rensburg A., Snyman C., Lotz S., 2012. Applying Google Translate in a higher education environment: Translation products assessed. *Southern African linguistics and applied language studies*, 30(4), 511-524.
- [13] Zafitri L., Harida E. S., 2017. The effectiveness of using google translate on students' translation at mathematic faculty of Universitas Negeri Padang. *Proceedings of ISELT FBS Universitas Negeri Padang*, 5, 80-85.
- [14] Sukkwan, A. 2014. *Students' Attitudes and Behaviors towards the Use of Google Translate: A Thesis*. Prince of Songkla University, Thailand (retrieved on November 2, 2017).

A study on factors affecting buying of cosmetic products with reference to males in Ghaziabad

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Abstract—The focus of this research is to identify the determinants that affect men purchasing behaviour when it comes to cosmetics. The research took place in Ghaziabad, Uttar Pradesh. The data was collected from 105 respondents using a survey method. The economy of the country is reliant on the possibility of personal care, which is also seen as an important aspect of the economy. The cosmetics business is one of the country's burgeoning industries. The Indian buyer's purchasing power and disposable income have increased dramatically; it has also developed a speciality for pushing associations in this field in the last decade, resulting in remarkable progress.

Index Terms—Male customers, Buying behaviour, Cosmetic products, Personal care.

I. INTRODUCTION

THE ACCOMPLISHMENT of any business associations is reliant on understanding the conduct of buyers. Advertising individuals are constantly investigating the purchasing conduct and buying choices of consumers to foresee the future patterns and also investigate regarding how, when, what and why individuals purchase. As indicated by Global Cosmetic Industry report the brands providing proper instruction about how the products can be used with clear information about ingredients put in the products have made consumers use and spend more on these cosmetic products. Consumer behaviour can be comprehended as: "The study of decisions which a customer takes in order to satisfy its needs and wants".

A. Indian Cosmetic Industry

In the current context, it is being observed that the Indian cosmetics goods sector is blossoming into a full-fledged industry with impressive product and marketing development. Indian clients are shifting away from 'simply utilitarian' cosmetics and toward more developed 'and focused' restorative items. In 2011, Indian buyers spent just over US\$3 on makeup on an annual basis. In terms of cosmetics use, India has increased from 27% in 2005 to 31% in 2014, and this trend is likely to continue in the next few years. Due to the entry of numerous multinationals into the Indian beauty care market starting in 2011, India has become a vibrant and extremely challenging market for cosmetics products. Foreign corporations are focused more on creative items, re-launching brands, and brand extensions across a range of price ranges. These businesses also offer a wide range of distribution channels to help them gain a foothold in the market. These businesses are implementing effective cost-cutting strategies in their advertisements, allowing them to pass on the enhanced value to their clients by rethinking their overall

price approach. The increased awareness and beauty consciousness youth with financial independence has increased the demand of cosmetics products. In rural India due to less awareness and financial inability the growth of cosmetics markets is negligible. The increased competition and increased prices also contribute towards it.

II. LITERATURE REVIEW

The Indian beauty and fashion industry has been growing immensely due to development of new scientific techniques, new and innovative products and media hype. Due to increased awareness and increased disposable income along with changing demographic variables and lifestyle of the people the cosmetic industry is flourishing worldwide. According to Euromonitor International, (2006) [1] due to increased awareness and increased disposable income along with changing demographic variables and lifestyle of the people the cosmetic industry is flourishing worldwide.

Interestingly, I noticed that Indian buyers are focusing more on international products embarking on sophistication and increased social status although the scenario is different worldwide. People across different countries are switching to herbal and ayurvedic products [2].

It was observed that income levels of consumers and different brand dimensions like social, culture etc influence the buying behaviour of consumers. But there was no evidence regarding personal and psychological factors of consumers affecting their buying behaviour. [3]

It was found that consumer buying behaviour towards FMCG products, is affected by price, place, promotion and product quality the 4 P's of marketing. [4]

It was found out that the majority of the men believed that using men's cosmetics products improved their appearance and also helped them succeed in their career. [5]

It was identified that consumer buying decisions are influenced mainly by the five factors, which are quality product; product price; brand name; product packaging and advertising. [6]

It was identified that male consumers like to buy the cosmetics products independently. The males' focuses mainly on quality while buying the products. It was also found in the study that male customers prefer buying all their cosmetics products from one single shop of their convenience and choice. [7]

The customer purchasing practices steps in the decision process model.

There are mainly five phases of customer buying behaviour

1. Issues/Need Recognition
2. Information search
3. Assessment of substitutes
4. Buying choice
5. Post buying behaviour

III. PROPOSED WORK

A. Need for Research

This research was done with an intention to provide the cosmetics industry an insight about how the male customers decide to purchase the cosmetics products from a diversified range. And also helps in understanding the ranges of products of different brands which they prefer to buy.

B. Objectives of the study

- 1) To study the demographic profile of male buying cosmetics products.
- 2) To identify factors affecting males for buying cosmetics products.
- 3) To examine the reasons for buying cosmetic products.
- 4) To find out the types of cosmetics products bought by male consumers.

C. Scope of the Study

The study examines the buying behaviour of cosmetic products by male belonging to different segments in Ghaziabad City. The significant factors chosen for the investigation are as per the following:

Demographic Profile of Male Consumers

Age, Occupation and Monthly Income.

Major Factors identified for detailed study includes Buying behaviour, Reasons of purchase, Nature and types of products, Factors in purchase decision, Frequency of purchase, Spending Pattern, Collection of product information Influence of celebrity endorsement and Time duration.

Research Design - Descriptive Research Sampling Method-Non-Probability Convenience Sampling Sampling Area -Ghaziabad Sampling Size- 105

D. Methods of Data Collection

Primary Data- Data was collected through questionnaires by mailing the respondents.

Secondary Data- Data was collected from various sources like research articles, books, internet and magazines etc.

E. Method of Data Analysis

For data analysis Ms excel 2010 has been used.

TABLE 1: AGE

15-20 Years	9	8.6%
20-25 Years	64	61.9%
25-30 Years	11	11.4%
30-35 Years	11	11.4%
35-40 Years	10	6.7%
Total	105	100%

IV. RESULT & DISCUSSIONS

Tabulation and Data Analysis. The Male Customers Demographic Details are mentioned in the tables below.

TABLE 2: OCCUPATION

Self Employed	9	8.6%
Private Employees	32	30.5%
Student	60	57.1%
Business	4	3.8%
Total	105	100%

TABLE 3: MONTHLY INCOME

None	56	53.3%
Less than 10,000	4	3.8%
10,000-30,0000	21	20%
30,000-50,000	7	6.7%
Above 50,000	17	16.2%
Total	105	100%

TABLE 4: FACTORS AFFECTING MALE BUYING COSMETIC PRODUCTS BUYING BEHAVIOUR

Rarely	20	19%
Very Rarely	28	26.7%
Occasionally	34	32.4%
Frequently	15	14.3%
Always	8	7.6%
Total	105	100%

TABLE 5: REASONS OF PURCHASE

Self Esteem	9	8.6%
Attractiveness	5	4.7%
Personal Care	86	81.9%
Celebrity Endorsements	5	4.7%
Total	105	100%

TABLE 6: NATURE OF PRODUCTS

Chemical	16	15.2%
Herbal	47	44.7%
Semi-herbal	17	16.2%
Ayurveda	25	23.9%
Total	105	100%

TABLE 7: TYPES OF PRODUCTS

Skin Care	52	49.5
Hair Care	27	25.7
Body care	26	24.8%
Total	105	100

TABLE 8: FACTORS IN PURCHASE DECISION

Quality	11	10.5%
Price	7	6.6%
Brand	50	47.6%
Advertisements	2	1.9%
Features	35	33.4%
Total	105	100

TABLE 9: FREQUENCY OF PURCHASE

Weekly	9	8.6%
Monthly	60	57.1%
Fortnightly	12	11.4%
Half Yearly	15	14.3%
Yearly	9	8.6%
Total	105	100

TABLE 10: SPENDING PATTERN

Below 500	67	63.8%
500-1000	23	21.9%
1000-1500	10	9.6%
1500-2000	5	4.7%
Total	105	100%

TABLE 11: COLLECTION OF PRODUCT INFORMATION

Very rarely	11	10.5%
Rarely	30	28.6%
Occasionally	20	21%
Frequently	14	13.3%
Always	28	26.7%
Total	105	100%

TABLE 12: INFLUENCE OF CELEBRITY ENDORSEMENT

Very rarely	45	42.9%
Rarely	30	29.5%
Occasionally	15	15.2%
Frequently	8	4.8%
Always	7	7.6%
Total	105	100%

TABLE 13: TIME DURATION

Less than 6 months	17	16.2%
1-5 Years	39	37.1%
5-10 Years	24	22.9%
10-20 Years	13	12.4%
Above 20 Years	12	11.4%
Total	105	100%

V. FINDINGS

The majority of the respondents purchasing cosmetic products belonged to the age group of 20-25 years. The respondents were not having any monthly income due to the fact that the majority of the respondents were students.

Majority of the respondents bought cosmetic products for their personal care focusing more on skin related products. The respondents invested more on herbal products and considered brand as the most influencing factor for buying the products. The majority of the respondents spent less than Rs 500 in buying cosmetics products due the fact that the maximum respondents were students. More of the buyers collected prior information before buying any cosmetic products and did not consider celebrity endorsements for purchase. The majority of respondents were using cosmetics products between 1-5 years maybe due to the fact that the majority of the respondents were in the age group of 20-25 years and have reached adolescence stage.

VI. CONCLUSION & FUTURE WORK

Due to changing demographics and lifestyle scenarios men are becoming more conscious about their looks and appearance. In this research, it was found that men use more skin care products.

The younger generation is especially more inclined towards buying cosmetic products when compared to older generations. Monetary factor also plays an important role in buying behaviour of cosmetics products, people who earn more money can access these kinds of products more than those who are deficient in them. Many factors contribute towards men buying skin care products but the two most noteworthy ones are improvement in skin and personal cleanliness. The main reasons behind men buying cosmetics products indicate that men are concentrating more on their appearance off late.

REFERENCES

- [1] <https://www.euromonitor.com/article/global-cosmetics-and-toiletries-sales-reach-five-year-high-in-2006> Global cosmetics and toiletries sales reach five year high in 2006 - Euromonitor.com
- [2] C. Briney, "State of the industry," Global Cosmetic Industry, vol. 172, p. 26, 2004.
- [3] J. S. L. & T. Z. Stávková, "Factors influencing consumer behaviour," Zemedelska Ekonomika-Praha, vol. 54, no. 6, p. 276, 2008.
- [4] A. K. T. & P. V. Vibhuti, "A case study on consumer buying behavior towards selected FMCG products," International journal of scientific research and management, vol. 2, no. 8, pp. 1168-1182, 2014.
- [5] A. Y. Khan, E. Karim and O. Abbas, "Identifying the Factors affecting the customer's Buying Behavior," Identifying the Factors affecting the customer's Buying Behavior, pp. 147-156, 2016.
- [6] S. S. Anjana, "A study on factors influencing cosmetic buying behavior of consumers.," International Journal of Pure and Applied Mathematics, vol. 118, no. 9, pp. 453-459, 2018.
- [7] A. H. Kumar and John, S. F., & Senith, S., "A study on factors influencing consumer buying behavior in cosmetic products.," International Journal of Scientific and Research Publications, vol. 4, no. 9, pp. 1-6, 2014.

Leadership and Human Resource Development Role in the time of Crisis Management

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Abstract—The pandemic has created a gap between the people and the resources. In this situation, a leader is the only mediating force who can fill the gap between the employees and the organizational objectives. The objective of this paper is to examine the role of a leader and study the changing role of human resource development of an organization during a crisis. The study has been done through the study of three parameters concerning crisis management Leadership, Organizational Development, and Crisis Management. The methodology adopted for this paper through review of the literature. This paper is conceptual type paper. The research questions directing this work are 1. What are the leadership attributes required during and post-times of crisis? 2. And what roles do human resource development practitioners imagine supporting their organizations during and post-times of crisis? The paper showcases the certain qualities of a leader which are required to handle the crisis effectively.

Index Terms—Leadership, Human Resource Development, Crisis Management, Covid-19.

I. INTRODUCTION

RECENTLY the whole world faced the COVID-19 pandemic which has changed the very fiber of the modern workplace. It hit an enormous reset button on everything. Everything we were aware of in the workplace has changed forever. More than anything, we have all learned the importance of leadership during such uncertain times. It was leadership attributes that kept many companies coping during the pandemic, and it will be leadership that will help companies recover and thrive in a post-COVID-19 world. Certain qualities of leaders will help employees, associates, businesses, and even industries, come together around them and spark revitalization. The role of leader is not only required during the phase of Covid-19 but also has a positive impact after the post-Covid-19. The amount and speed of breakdown in different activities that have followed are unlike anything experienced in our lifetime [1]. In this paper, from the Human Resource Development perspective, how competent and efficient leaders can bring change at each stage of crises and help to lessen the effect of negative force, fear, and unambiguity not only in organizations but on individuals as well.

Crises can be defined as a situation that brings imbalance in our routine activity to a large extent and requires a quick and appropriate response to minimize the consequences. The researchers and practitioners have a different outlook to define it as a specific, unexpected, and non-routine event or series of events that create imbalance. There seems to be a

direct relationship between leaders' viewpoints and crisis management. One's viewpoint related to any crisis is based upon how they perceive the situation and organize the information, and this becomes reality, and then the actions will be directed by this perception [14] explained the importance of perception to the crisis in the following definition: Crises are the joint products of unusual events and shared perceptions that something is seriously wrong. As one of the characteristics of perception is that any

Different individuals perceive & act differently towards the crisis based on their different values, norms, beliefs, and the capacity to handle the crisis.

According to [8] certain elements play a vital role in a crisis system. These elements include the external as well as the internal factors such as technology, organizational structure, human factors, organizational culture, and to some extent top management strategy & mindset. Each of these elements can be a causal or consequential factor; a crisis event can pose a threat to the organization's core values modifying the existing culture into something different. The only element which can minimize & control the effect and control the situation effectively is the effective leadership trait of the human being. Leader with his qualities of motivating and coordination can easily help others to cope up with unpredictable situations. Effective leadership especially plays the utmost role in handling critical situations. To make a prediction related to the outcome a leader requires understanding the culture of the organization and considering it seriously. However, not all leaders are equally capable dealing with crises.

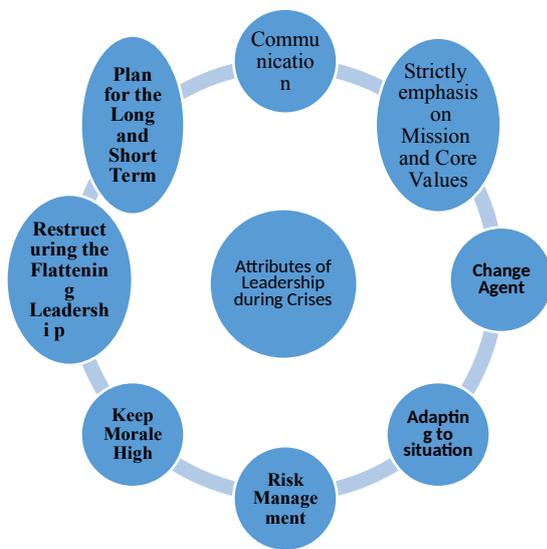
Crises are unpredictable for the reason that they always occur without prior intimation or information. It requires prompt decision-making as it results in quick breaking. There are chances that a single crisis can generate many others elsewhere. It depends upon the organization's strategy to deal with.

II. SPECIFIC QUALITIES OF LEADERS REQUIRED DURING CRISIS

The corona virus disease-19 (COVID-19) pandemic has globally created an exceptional humanitarian crisis. This unpredictable, uncertain & difficult time requires prompt decisions from a limited reliable source of information. To handle the situation effectively, the leaders have to learn how to manage with all these unknown elements, and need to develop new learning which helps to develop various creative and innovative problem-solving strategies to keep their en-

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terprise operational and stakeholder's safe. In this paper, certain characteristics and practices have been mentioned that effective leaders must represent during a time of crisis and discussed them in the context of the existing COVID-19 pandemic.



Source: Author's own work

A. Communication

Communication is a medium of expressing our thoughts, ideas, feelings, experiences among others. But the pandemic Covid-19 has brought a great impact on this communication process. Before the pandemic the situations were very different, like the employees meeting physically, making discussions, brainstorming and being able to understand the other's thought process in their working environment. But due to the restriction which pandemic has brought such as Work from Home, maintain social distancing, Lock down break the channel of communication among the employees, as well as with their leaders & superiors. Lack of physical communication has given rise to ambiguity and in truthfulness which are the producers of anxiety among the people and workforce. It is perquisite for a leader to communicate clearly and make his organization or region aware about the reality and motivate by presenting a clear perspective of what is happening and how to deal with it. The essential of Communication is that it needs to be clear and reliable.

B. Strictly emphasis on Mission and Core Values

An unpredictable crisis is worked as both a challenge and as an opportunity too. It also provides a prospect time to any organization to review their core values. Instability and pandemic situations creates the environment which allows any organization to put their organizations' mission and core values for testing and it also provides an opportunity for effective leaders to reemphasize these values. Reviewing and restructuring of these values and of mission helps to stimulate and create a positive environment for others. It is also a sign of efficient leaders to identify and appreciate the effort of those who took initiative, showed voluntary participation and came across to give their best at the time of pandemic.

A successful leadership team encourages "outside the box" thinking to affect tragic events.

C. Restructuring the Flattening Leadership Structure

The need of the leaders in the organisation gets rapidly changed and unpredictable during crises. During a pandemic situation the senior leaders in the organizational hierarchies have a normal tendency to emphasize control, and take away the responsibility of leadership from their direct employee's suggestions, their ideas, and their needs which creates a sense of togetherness. The first step towards understanding and gaining knowledge is Humility, and the world needs humble leaders more than ever. This attitude assists the leader to create a bond with others and reflects that they genuinely care about their welfare. It is also seen that in the situation of crisis, it is easy to blame others. Criticize and focus on problem areas. The leaders who are focused in their approach try to choose the path by mutual discussion so that a solution can be found. He very well understands the crisis situation not to count the mistakes but to show the attitude of respect, trust, support, empathy towards their employees. Therefore, leaders need to get in touch with their humble side and continue to be great leaders.

D. Plan for the Long and Short Term

A good leader possesses the skills to understand the long term and short term goals of the organisation. They are efficient to apply scarce resources to meet the real time needs by maintaining attention on Long-term visionary goals. They are clear about the requirements of the situation and do not hesitate to make unique choices like, providing options to work from home, maintaining social distance, use of e-portals for hiring, conducting virtual meetings instead of physical one.

The organizations required different attributes of leader's post-COVID-19, because the change that has been brought on seems to be permanent, and only leaders with the above-mentioned qualities will be able make an accurate difference.

E. Change Agent

Unpredictable pandemic has brought a lot of changes not only in the lives of individuals but also in the workplace. Employees are now working virtually and following the practice of work from home and also with the new teams that were never familiar with each other earlier. This new change has brought the need for a change agent in management style. There is a lot of a change in attitude and mindset of the employees in the organization. Employees are handling new and different tasks and more responsibilities individually. It's all about co-operation and working together. And as a leader, one is expected to manage employees and prepare employees to adapt to these new changes. They have to act to lead the way in the change. They are liable to create a sense of teamwork in the new hybrid teams, so they can also adapt to the new changes and continue to improve.

F. Adapting to Situation

Quick adaptation to prevailing situations is immediately required by the strong leaders. The COVID-19 pandemic

has exposed a number of the flaws in the system. It was exceptional. Nothing like this had ever been seen before or dealt with. But good leaders will quickly observe and adapt to the situation. Successful leaders will plan rules and regulations to protect not only people's health, but also related to their jobs and finances. Industry leaders will look at ways to create safe & healthy working conditions and protect the jobs of the employees to provide them job security. WFH, Virtual & digital implementation is one example of the quick adaptation to the situation.

G. *Keep Morale High*

The burden of dealing with the crisis is more than the crisis itself and it brings people down. And here comes the role of leader to pick them up. Leader play a crucial role from taking decisions and making changes that encourage employees, to even directly communicating with each employee and assuring them of improvement in the situation. So a true leader will do whatever it takes to keep the morale high of his stakeholder. Certainly, this doesn't mean they have to hide the truth, it means they have put forward the optimistic attitude and help employee's to understand and act accordingly.

H. *Risk Management*

Leaders will be expected to be ready for better risk management as the financial and health risks have increased ten-fold post Covid- 19. The COVID-19 pandemic uncovered the obvious gaps in current business and economic systems and all were caught unrehearsed. Leaders need to put in a lot of observation with time and effort into preparedness to lessen risk factors. One great action of readiness is WFH. The lockdown due to Covid-19 risk threatened business operations, but the WFH model ensured continued operations without employees losing jobs and moving to their workplace. It also supported businesses by saving money during the tough time. Similarly, leaders should be keen observers to quickly spot risk factors and come up with possibilities that protect the business, the employees, and customers.

III. AFTER THE EFFECT OF CRISIS ON EMPLOYEES

There is a lot of unpredictable situations which have no control in the pandemic situation for the organizations. Due to which the organizations have to work under a lot of ambiguity and stress that leads to the significant challenge for corporate functional leaders. The central challenges during crisis management have been addressed as unrealistic and unclear information, new situations, uncertainty and shifting of goals, and ill- structured situations' as per the [6]. The value of human resources can't be measurable like capital or financial markets, yet the scholars of Human Resource states that Human Resource is one of the most important assets of an organization that will contribute highly in the growth of the organization [17]. [9] Stated that during uncertain times, retaining high skills and getting high productivity is a game of thoughtful planning. One must retain the highly skilled employees as retaining them also helps to retain their knowledge and skills [15]. Due to the unstable situation a number of organizations try to reduce the expense for the organization by minimizing the number of employees in the and also

expects the greater amount of flexibility from the remaining employees from remaining employees [9].

IV. NEED OF EMPLOYEES AS AN INDIVIDUALS AT THE TIME OF CRISES

The successful leaders will help the organization and its employees to understand the complexity of the situation, align it with the organizational strategy, find out new ways to handle the situation, will focus on how to deal with complexity, and make the employees acceptable for the new way of working. Beside this efficient leaders will also support emotionally and psychologically to boost up the morale of the employees. The main task of the leaders in the situation of crises would be to review the situation, define the strategy required to recover the business, and to create a model for crisis management. In the coming sections, we will discuss HRD actions & their importance of guiding support, psychological empowerment, recognition of work, positive reinforcement and, meaningful message from the leaders during these exceptional times of crisis, the COVID-19 pandemic.

A. *Support and Assistance from HRD*

The worth of the human resource of any organization is not measurable in capital. It is the function of HRD to emphasize the importance of the well-being of all human capital of any organization. They have to give extra effort to manage their physical, emotional, & psychological well-being. As they are the most valuable assets of the organisation, it is the responsibility of HRD to understand the current mental condition of the employees and make strategies that will foster their performance and help them to cope up with the unseen danger during the crises. Leader has to create a link with his employees. He has to create an environment where the employees can freely share their concern with the leader and the leader effectively listens and understands their problems. Providing suitable suggestions and empowering the psychological and emotional condition of his employees at the time of crises is also a major responsibility of the leader. Leader has to keep himself updated about the current situation and also keep informed about his employees' situation creates job insecurity which will impact the emotional condition of the employees and that reflects in their day- to-day functioning. The leader can provide the exposure which can engage the employees which help to boost their motivation. The leader should create a flexible environment so that the employees can easily accept the new working environment. It totally depends upon the out of the box thinking, presence of mind to handle the novel situation and also to make the proper strategy for coping up with the changing situation [13].

B. *Appreciation & Positive Motivation of work*

As crises create the environment of instability, appreciation, and acknowledgement of employee's efforts for their functions work as a positive reinforcement for them in the existing crisis Covid-19. [2] After his interaction with various industrialists concluded various needed skills for effective leadership. First, efficient leaders need to have a capability to deal positively with the stress, insecurity, anxiety the employees are carrying with them due to the uncertain

crisis. Foresightness is the quality that helps the leaders to closely observe the situation and predict the challenges which might be overcome for the business in future.

C. Technology enabler

Technology plays a very important role in handling the pandemic existing situation of Covid-19. Leadership includes power for the expansion of integrating technology in the organization as per [10] and the updated technology helps the members to facilitate their activities [16]. As [12] mentions, leaders have to develop the skills of making the balance with adaptability and learning the new system, that will lead to high efficiency. One of the important trait of leadership is Adaptability which is arisen because of the uncertainty and the ambiguity due to the technological advancement and the economic growth [12]. It's because of the flexible feature of technology that can help in reducing the stress and insecurity of employees as well as of leaders during Covid-19. It is the role of HRD to train and update their leaders with the use of new technology so that they can handle the crises effectively and promptly. Technology has helped almost every area of operations by allowing the people to work from home, virtual meetings, e-learning. As a result HRD practices a new way of learning which includes the different mode like e-learning, distance learning, self-learning, and online learning which have turned out to be in practice by all globally [4]. As per the demand of the pandemic HRD professionals should train their leaders so that the leaders can support their employee to find out to their requirement and needs by the use of technology and try to meet those in an cost effective manner which will lead to the growth of organisation.

D. Emotional stability and employee well-being

The impact of crises can be seen in the emotional disturbance in any individual to some extent. It is again the role of the leader to understand the emotional and personal problems of all employees and guide them to handle them properly. The support is not only required during the crises but it is also post crises. [5] In their research they have presented their views on how the organisation must promote the practice to provide a space for employees so that they can express their grievance openly. HRD should assist to develop the leaders with emotional intelligence and emotional quotients. Both of these are the important traits of leadership [7]. [16] states the importance of emotional-social intelligence model in providing assistance in the development of leadership and also aiming on the development of leader's overall personality, their intrapersonal & interpersonal skills, interpersonal skills, their adaptability to the situation as well as skills to handle stress. HRD should develop a plan and training programmes for the leaders to develop interpersonal skills, emotional quotient, stress management techniques, and change management. The leaders have to fill the gap which has come across due to the absence of physical presence of employees at the workplace. They have to develop a plan with the HRD department to reach out to the employees virtually on a regular basis. This kind of virtual meeting with leaders helps the employees to develop the sense of security, and also provide psychological and emotional sup-

port to meet better performance results. Work from home is also a big challenge for the employees and that requires the proper communication and clear directions from the leader.

V. IMPLICATION

As we discussed numerous qualities of the leaders which are required to be used effectively during the time of Pandemic, among those Clear communication comes first in the list. Another is organizational resilience. Resilience is the process of developing capability which allows the organisation to move to a new and better position after the crises. It is only possible through the efforts of the effective leader who can lead the organisation with innovative ideas and favorable strategies to absorb adverse situations effectively due to pandemic. All crises don't require the same style of leadership; resilience also acknowledges that there is no one best approach to be used in every pandemic. Distributing leadership has the power to create highly motivated teams which leads to an improved decision making process, and simultaneously increases the stakeholders' assurance to the organization and its survival [3].

VI. CONCLUSION & FINDINGS & LIMITATIONS

The study reveals the Importance of leadership during and post Covid 19 with the role of human resource development. The current study tries to show the more effective role of HRD in developing their leaders which further impact on the employees of the organisation in the situation of pandemic. In this regard we suggest HRD practitioners and research scholars need to critically observe the HRD involvements that can be functional during the pandemic time which brings a lot of instability and indecisiveness.

REFERENCES:

- [1] Gopinath, G. (2020). The great lockdown: Worst economic downturn since the great depression. IMF blog, 14, 2020.
- [2] McGuinness, J. 2020. "4 COVID-19 Leadership Lessons." Chief Executive, May 12
- [3] Kohlls, A. 2020. "How One Company Is Taking Care of Employees during COVID-19." Forbes, April 6
- [4] Li, J., R. Ghosh, and S. Nachmias. 2020. "In a Time of COVID-19 Pandemic, Stay Healthy, Connected, Productive, and Learning: Words from the Editorial Team of HRDI." Human Resource Development
- [5] Rocco, T. S., and B. Shuck. 2019. "Death and Dying: Grief, Compassion and Workplace Responses." New Horizons in Adult Education & Human Resource Development 32 (1): 1-4
- [6] Głodziński, E., & Marciniak, S. (2016). Organisational innovations in crisis management of project-based enterprises. Economics and Business, 28(1), 26-32.
- [7] Farina, F., and F. M. Nafukho. 2016. "Emotional Intelligence Research within Human Resource Development Scholarship." European Journal of Training and Development 40 (2): 90-110.
- [8] Naudé, M. 2012. "Global Economic crisis: Employee Responses and Practical Implications for Organizations." Organization Development Journal 30 (4): 9-24.
- [9] Kopp, D. M., I. Nikolovska, K. P. Desiderio, J. T. Guterman. 2011. "Relax, I Remember the Recession in the Early 1980s": Organizational Storytelling as a Crisis Management Tool." Human Resource Development Quarterly 22(3):373-385
- [10] Lewis, D. 2010. "The Principal as Technology Integration Leader. Graduate School of Computer Science and Information Sciences." PhD diss., Nova Southern University.
- [11] Colville, I. D., and A. J. Murphy. 2006. "Leadership as the Enabler of Strategizing and Organizing." Long Range Planning 39 (6): 663-677

- [12] Schreiber, C., and K. Carley. 2006. "Leadership Style as an Enabler of Organizational Complex Functioning." *Emergence: Complexity and Organization* 8 (4): 61–76
- [13] Eraut, M. 2006. "Schon Shock: A Case for Refraining Reflection-in-action." *Teachers and Teaching Theory and Practice* 1 (1): 9–22.
- [14] Ramlall, S. 2004. "A Review of Employee Motivation Theories and Their Implications for Employee Retention within Organizations." *Journal of American Academy of Business* 5 (1/2): 52–63
- [15] Adkins, C. L., Werbel, J. D., J. L. Farh. 2001. A Field Study of Job Insecurity During a Financial Erisis." *Group & Organization Management* 26: 463—483
- [16] Stokowski, W. J. 1992. "The Duality of Technology: Rethinking the Concept of Technology in Organizations." *Organization Science* 3 (3): 398–427.
- [17] Jacobs, R. L. 1990. "Human Resource Development as an Interdisciplinary Body of Knowledge." *Human Resource Development Quarterly* 1 (1): 65–71.
- [18] Agarwal, S., Garg, P., & Rastogi, R. (2011). Impact of quality of work life on employee trust. *International Journal of Management Research*, 54.
- [19] Mewafarosh, R., & Agarwal, S. Influence of demographics variables on students subjective well-being. *Journal of Public Affairs*, e2749. (Scopus, ABDC Listed) (1479-1854).
- [20] Shivani Agarwal and Rekha Mewafarosh (2021). "Linkage of Social Media Engagement with FOMO and Subjective Well Being", *Journal of Content, Community & Communication*, Vol. 13, pp 46-57.
- [21] Agarwal, S. (2020). Trust as a missing link between quality of work life and subjective well-being. *Ingenieria Solidaria*, 16(1), pp (1-21).

The Good, The Bad, The Ugly & The Futile: The Memory & Their Impact On Human Beings

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Abstract—The smriti or the memory is the vital part of our mental body. In fact, it is essential for every unit (in human & animal order) in existence. Here the authors are specific to the human order. Memory, specifically to the mental body has been categorized in many ways in the literature. Here the authors are classifying the memory in a novel way based on the analysis done of the existing classification. Further the strength & limitations of memory are also discussed. Memory can also be seen as the boundary or the limitation. The same concept has been described over here. Memory causes vrittis (others being vikalpa or verbal delusions, viparyaya or false knowledge, nidra or sleep, swapn or dreams) which create opacity for the mind stuff or chitt visibility and hence hurdle in the path of self actualisation. Vrittis in the literature has been described as the form the mind takes upon encountering above-mentioned ripples. This can be further viewed as an anti-force restricting the human order to propagate towards cosmic (higher level) identity. Location of the memory storage and the time period before rehearsal also determines the nature of the memory. Based on this the authors have proposed to categorize the memory as volatile & non-volatile.

Index Terms—Manas, mental body, chitt, vritti, memory, smriti, volatile, eustress, distress, cosmic identity.

I. INTRODUCTION

If you are not changing your mind (thinking/manas) nothing will change.

If you change your mind (thinking/manas) everything will change.

Anonymous

ACCORDING to the Yogic philosophy the mental body (manas) has been divided into four parts. Intellect (buddhi), identity (ahankara), memory (smriti) & mind stuff (pure intelligence or chitt). The intellect when associated with the memory becomes intelligence and intelligence without memory is the mind stuff or pure intelligence or chitt. Ancient Indian philosophy has largely described the importance of manas equally to the physical body. Charak & Sushruta has described the seating of mind in the heart whereas there are references indicating the seating of mind in

the whole physical body. If we refer to the electromagnetic field present all around our body we find different aura as prana or physical aura, psychological aura, psychical aura & projected aura. Thus the second layer or the psychological aura may be said to represent the mental power and activities [7]. There are references indicating up to seven layers. They are physical, sacral, emotional, astral, spiritual, intuitional and absolute layers. Most of these layers are in some or other way linked to the mental powers and activities. Every cell in the human body (of course applicable to the animal order as well) is a type of micro mental body hence carries one or other kind of memory. Let us first explore the literature and clarify the concepts related to this.

II. LITERATURE REVIEW

Manas has been defined as Uhayatmaka Indriya which means both sensory organs and action organs. We can call it as antahkarana. Manas is described as the mind in Ayurveda. There are many references indicating the seat of manas or mind in the heart or hridaya. There is evidence indicating the seat of manas as the whole body [20]. Literature defines manas as a link between atma (soul) and sharir (body). Manas is primarily inactive and gets activated when combined with atma (soul). Memory is one of the elements of manas [1, 16].

Every human being has got only one indivisible mana. It is neither a force or energy nor any matter. It is an attribute or part of the self. It is no way linked to the soul and not immortal [11, 23]. The word manas has been derived from the Sanskrit root word which means 'to know'. Yajurveda describes manas as an inner flame of knowledge which regulates all senses. Thus there is literary evidence which indicates the duality of manas. They call manas a sense as well as a motor. So when manas is associated with the senses the one of the outcome is memory [4].

As per the Yoga philosophy citta or the mind or pure intelligence when encountered by any type of vritti is the manas [8]. Let us have an analogy with the computational

system which will make the things clearer. The computer or a laptop is like a self or 'I'. Operating system software is like mind or manas and an integral part of the self. Without manas(OS) self(device) is useless as well as cannot exist without the hardware(body). The electricity is like consciousness required to run the hardware(body). Consciousness and manas are two separate things like an interface between manas and self. Thus when electricity(consciousness) is linked to the hardware(body) operating system software is loaded and makes the device(self) operatable. The functions of manas(OS) like learning, emotions, memory ceases with shutdown of the device (self) [23].

The vaisheshika philosophy says that the interaction of atma(soul), indriya(organ) and manas(mind) results in realisation of happiness, unhappiness, dreams, memory (smriti) etc [2, 10, 13]. Manas joins atma, senses to evolve the emotions like attachment, aversion, fear, anger which are the major cause of vrittis and hence the smriti or memory [3].

Mind stuff or citta is said to be the combination of manas, buddhi, ahankara and senses. Mind and consciousness are two separate things. They need not to be confused with each other. Mind is simply the instrument of perception and experience. As the vrittis are being generated, may be due to vikalpa, viparyaya, smriti, dreams or susupti (dreamless sleep) self enjoys or suffer accordingly [12].

The Upanishads have also described manas in their own ways. Amartanandopanisad says Mind is the major cause of both bondage & liberation. The mind is a subtle matter with an outcome in the form of the memory as a source of feelings and emotions. Kenopnisad says that mind and intellect can move together spreading over all sensory organs (in a way the entire body). Kathopnishad says the senses are like the horses of a chariot (body) in which the charioteer is the buddhi. To control the horse's mind is the motor organ regulated by the soul. In Prasnopanisad the mind is said to be active when it desires, thinks & expects. Having dreams in the sleep indicates memory in a form is causing a disturbance wave. Mandukyopanisad tells us the four stages of consciousness namely wakeful or jagrat, swapn or dream, susupti or deep sleep & turiya or super consciousness. Panchkosas doctrine says manas is the organ of perception, memory & understanding which give rise to mind. (The concept of mind in major upnishads, no author, no date)

Jain philosophy opines that the constituent atoms making manas are active and there are four possible forms a manas can take up. These are true or pure, deceptive, combination of true and deceptive & combination of untrue and deceptive. Mati or senses and sruta or the source of knowledge are termed as indirect or paroksha sources of cognition whereas clairvoyance, telepathy and omniscience are the direct or pratyaksh sources. In Sankhya philosophy cognition through senses is a process that involves buddhi, ahankara, manas and indriyas or senses. Whatever be the source of the cognition one of the outcomes is smriti or memory [21].

Patanjali has identified basic mental functions as pramana or valid knowledge, viparyaya or illusion, vikalpa or imagination, nidra or sleep & smriti or memory [5].

Sharirendriyasatvaatmasanyog dhari jivitam

This means that manas (mind), atma (soul) and sharir (body) together lead to a healthy life of an individual [9,17,18].

The functions of manas has been described as manovya-par by Charakacharya which is as under

Atindriyam punarmana satvasangyakam chet ityahureke, tadarthamasampattadayattachestam chestapratyabhumiindriyaanaam

This means that the knowledge acquired or not acquired depends on manas which is certainly an interface between senses and soul. Buddhi or the intellect has three sets dhi, dhriti and smriti. Smriti recollects the status of the information newly perceived [9,17,18]. If we explore the relevant ancient literature, manas is supposed to be situated in the heart, head or mastulung. Few scholars agree that manas is located in the entire body [9,17,18].

The literature talks of four layers of human aura namely physical aura, psychological aura, psychical aura and the projected aura. The physical aura surrounding the body immediately can be sensed easily. Next to follow is the psychological aura which represents a person's mind. Psychical aura is next to follow which in turn is enveloped by the projected aura. This simple configuration of auras represents the spread of mind (manas) all over the body in form of psychological / psychical / projected auras [6, 7].

Western philosophical tradition creates an ontological distinction of physical or physiological or biological body and the mental body. The mental body comprises soul, intellect, mind, emotions etc. Nearly all the western thinkers have supported the idea of mind-body dualism. In the western philosophy the concept of mind is something different. They talk of the wandering spirits or shamanism which is capable of walking into and outside the body. Later Homer identified these spirits as souls which were supposed to be located in the head. He gave the concept of two types of soul body soul and impersonal immortal soul capable of ethereal travel. Later Plato came up with the concept of a single soul for a person, however it consisted of three parts namely thymos, logos and pathos. Logos which means logical reasoning is attributed as the mind which is supposedly immortal. Aristotle, a disciple of Plato, has described three types of soul, rational (thinking & analysing), sensitive (passions & desires) and nutritive (appetite & drives). According to him, the mind was simply an attribute of the self. Few things are to be made clear regarding the concept of manas [11. 23].

Dictionaries define aura as "Any subtle, invisible emanation or exhalation." [22] Prana aura represents the energy or force which makes the soul manifest and in turn the mind manifests the thought activity [22]. Every human being is surrounded by some electromagnetic radiation or energies.

This is now detectable. This energy surrounding the person or released by the person is called aura. Kirlian photography is a contact print process and has no camera or lens supporting the existence of aura spread all over the body [6].

Memory as perceived can be categorized in three as working memory, short term memory and long term memory. Working & short term memory lie in the prefrontal cortex of our brain where as long term memory is located in the portion called hippocampus. All memories are supposed to be in array form. Working memory (through gyanendriya) after many rehearsals get into prefrontal cortex as short lived memory. Similarly, short lived memory (in the prefrontal cortex) after many rehearsals get into the hippocampus as long lived memory [15].

A volatile memory is a memory which tends to be erased after a time gap if not rehearsed properly. It can be treated like RAM in the case of a computer. Whatever information is stored there vanishes if not committed or saved or the system shuts down abruptly. Long term memory can be termed as non-volatile memory just like ROM in case of a computer [14].

III. PROPOSED WORK

Here in this paper the author recognises the importance of memory & the significant impact on human beings. Authors are widely analysing the impact accepting it as one of the causes of happiness / suffering. Another cause is the imagination.

IV. THE CONCEPT

The above discussion makes few things clear to us:

1. Consciousness is an energy or force that drives our soul (atma) and mind(manas).
2. The interaction of soul(atma), mind(manas) and organs (both sensory and action) results in feelings, emotions and memory. Here we are going to focus on memory.
3. Majority of things in our life do not result in short or long term memory. They may be termed as volatile memory. The probable reason being its non-rehearsal.
4. Short term and long term memory happens probably due to limited or even unlimited number of rehearsals and the impact they have on the subject.

Now we propose a memory classification as good memories, bad memories, ugly memories and futile memories.

Good memories are the happenings we cherish and may love if the event occurs again. For example, getting a prestigious award, some sort of reunion with old acquaintances etc.

Bad memories, on the other hand, creates a feeling of sadness, agony in us and we wish to erase them as soon as possible and pray for its non-occurrence. They cause a feeling

of distress in us. For example, losing someone near and dear to you, any ghastly emergency like an ambush attack or terrorist activity etc.

Ugly memories are the memories that teach us something. Like getting a reward after properly completing a task. Initially we wish for its non-recurrence but later we realise the things and get better prepared. This can be a potential source of stress.

Futile memories mean useless for us. Occupying the space unnecessarily and we wish to erase them as they can be causing vrittis thought waves disturbances.

V. ANALYSIS: MEMORY MODEL

The memory can have a positive as well as negative impact on us, hence we develop a model exhibiting the same.

TABLE 1: POSITIVE AND NEGATIVE IMPACT ON MEMORY

	Positive Impact	Negative Impact
Good	Yes	----
Bad	----	Yes
Ugly	May be	May be
Futile	Low Chances	Low Chances

The matrix above deals with possible impact on human beings of various types of memory.

Good memories are always cherished and have a positive impact on us. Conversely bad memories have a negative impact on us and we try to get rid of them. Ugly memories are associated with us in a mixed way. They normally teach us a lesson & we may or may not welcome the recurrence. Futile memories are like scrap /garbage kept in our house to be thrown out. They may not find any use for us.

VI. CONCLUSION & FUTURE SCOPE OF WORK

The memory is the outcome of the interactive process between the components of the physical, mental and spiritual body of a human being. A good touch/word/action and a bad touch/word/action propagates a message through the sensory / motor organs and lies in our prefrontal cortex or hippocampus as a good or bad memory. Similarly, we can have ugly memories which are disliked by most of us as we are not realising it anyway. Lastly we have futile memory which is like junk mail occupying space in our mailbox. We are indifferent to it.

The memory is a potential source of creating thought waves in us which in turn disturb our mental health and perhaps holistic health. Future endeavours can be devising a tool / technique (physical/mental/spiritual) to get rid of such memories at least. If we are able to do so, that will be a great

foot for the entire mankind and we can ensure a smooth movement towards cosmic identity [19].

REFERENCES

- [1] Acharya Y.T. (2006) Charak Samhita with Ayurveda [Online] Available at: <https://www.bibliomed.org/fulltextpdf.php?mno=170946> (Accessed : 10 August 2021)
- [2] Amin,Hetal & Sharma, Rohit (2014). Concepts of Manas (mind): An Insight from Vaisesika Darshana and Ayurveda, British Journal of Medical and Health Research,1(1), pp. 1-12.
- [3] Amin,Hetal & Sharma, Rohit (2016). Concept of Manas in Mimāṃsā Darśana, Yog-Mimansa,48(1), pp. 4-8.
- [4] Amin, H, Sharma, R, Vyas, H A, & Vyas, M K (2015). Concept of Manas in Samkhya Darshana, Indian Journal of History of Science, 50 (1), pp. 125-130, DOI: 10.16943/ijhs/2015/v50i1/48115.
- [5] Amin, H, Sharma, R, Vyas, H A, & Vyas, M K (2014). Importance of Manas Tattva: A searchlight in Yoga Darshana, 35(3): 221–226 PMID: PMC4649565.
- [6] Chhabra, G, Naraynan, A, & Samantha, S (2013). Human Aura: A New Vedic Approach in IT, International Conference on Mechanical and Industrial Engineering, 26th May-2013, New Delhi, ISBN: 978-93-82208-95-2
- [7] Charles T. Tart (1972). Concerning The Scientific Study of the Human Aura, Journal of the Society for Psychical Research, 1972, 46, No. 751, 1-21. Copyright 1972 Charles T. Tart.
- [8] Das, B C (2018). The Concept of Citta in Yoga Philosophy, Philosophy and the Life-world, Vol.20, pp. 46-54, ISSN: 0975-8461.
- [9] Flood, Gavin (2021). The Concept of Mind in Hindu Tantrism, The Journal of Hindu Studies, pp.1–32, doi:10.1093/jhs/hiaa020.
- [10] Harold T, Smith M, Nolan R. Living issues in Philosophy, 9th edition, Belmont: Wadsworth Pub. Co.
- [11] IGNOU: School of Social Sciences (2015). Fundamentals of Mental Health: Concept of mind, Indira Gandhi National Open University, pp. 14-26, ISBN-978-81-266-6715-4.
- [12] Krishnappa, D T, Sridhar, M K, & Nagendra, H R (2020). Concept of mind in Indian philosophy, Western philosophy, and psychology, Yog-Mimansa, 52(1), pp. 25-28.
- [13] Maharshi Kanada (1924). Vaisesika Darshana, V.D. 5/2/14,16, Swami Darshanand Saraswati, Shankaradatta Sharma, Moradabad, 1924:76.
- [14] Micron Technology. What is the Difference Between RAM and ROM? Available at : www.micron.com (Accessed : 17 August 2021).
- [15] Miller, Allannah, (2021). Three types of memory important to learning: working, short-term, and long-term memory, Available at : thriveworks.com (Accessed : 13 August 2021).
- [16] Pathak, Madhu, Sharma, Anita & Kumawat, D K (2017). Role of Ancient Indian Sciences in Mental Health, World Journal of Pharmaceutical Research, 6, No. 7, pp. 534-543, ISSN 2277-7105, SJIF 7.523.
- [17] Taylor, S (1890). A Case of "Intellectual Aura " OR " Dreamy State, The Lancet, pp. 276-277,
- [18] Sharma P.V., Sushrut Samhita (2005). Sushrut Samhita with Nibandha Samgraha, Commentary of Dalhana, Eighth edition, Varanasi (india), Chaukhambha Orientalia, 2005; 375.
- [19] Sharma, R & Raj, S (2021). Cosmic Identity, Turkish online journal of qualitative inquiry, 12(9), pp. 178-185.
- [20] Shivgotra, Rachin & Gupta, Rahul Kumar (2019). Literary review of Manas in Ayurveda, Journal of Ayurveda and Medical Sciences, 2019, 4(2), pp 118-120, ISSN 2456-3110.
- [21] Soni, Jayandra (2020). The Concept of Manas in Jaina Philosophy, Journal of Indian Philosophy 48: pp. 315–328.
- [22] Swami Panchadasi, (no date) The Human Aura Astral Colours and Thought Forms, Yog publication society.
- [23] Thirunavukarasu, T (2011). A utilitarian concept of manas and mental health, Indian Journal of Psychiatry,53(2), pp. 99-110, doi: 10.4103/0019-5545.82532.

Comparing the effectiveness of Convolutional Neural Network and Long Short-Term Memory Network for Disaster Based Social Media Messages—Using Thunderstorm and Cyclone as Case Studies

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Abstract—We present a framework to ameliorate the classification of disaster-related social media messages. In the present work, we have incorporated the Convolutional Neural Network, and Long Short-Term Memory Network. To demonstrate the applicability and effectiveness of the proposed approach, it is applied to the thunderstorm and cyclone Fani dataset. The results indicate that CNN is better than the LSTM model with an accuracy score of 0.9999 (99.99%) and loss score of 0.0410. The output from the research study is helpful for disaster managers to make effective decisions on time.

Index Terms—Convolutional Neural Networks, Disaster Management, Long Short-Term Memory, Social Media.

I. INTRODUCTION

Social Media (SM) is one of the prominent tools that has been ranked the fourth most popular source of accessing emergency information [1]. During disastrous events, a lot of textual content is rapidly posted on microblogs, however only a few messages are useful and informative, the rest all are either sentimental or opinions [2]. Hence, considering the colossal and varying amount of data being broadcasted and shared through SM during the disaster, an effective text mining solution needs to be developed to distinguish the messages as *disaster-relevant* and *irrelevant*.

Convolution Neural Network (CNN) and Long Short-Term Memory Network (LSTM) network are the Deep Learning (DL) models in which the level of abstraction increases gradually by non-linear transformations of input data. Therefore, we address the challenge of assessing the relevancy of disaster-related SM messages by examining the capability of DL models of Twitter data in different disastrous events. Overall, the major contributions of this research are as follows:

- 1) We propose two datasets, i.e., a cyclone, and a thunderstorm dataset with manual label of relevance.
- 2) We present a novel framework for the classification of disaster data.
- 3) We compare two different neural networks in terms of performance and tune the models.
- 4) We computationally evaluate our model on different disaster-related datasets (thunderstorm and cyclone).

II. LITERATURE REVIEW

In the past few years, researchers have advocated the use of DL neural network model architectures over sundry domains. Zhao et al. [3] has utilized CNN to automatically extract and analyze the cyber threat intelligence from SM data. Madisetty and Desarkar [4] employ CNN based architecture to detect spam on Twitter. Salminen et al. [5] experiments with neural networks to develop an online hate classifier. Andrea et al. [6] presents an intelligent system regarding vaccine-related tweets utilizing CNN and LSTM models integrated with word embeddings. Wu et al. [7] identifies emotional labels from the psychological SM texts employing CNN-LSTM model. Ombabi et al. [8] experiments with CNN and LSTM models to analyse the sentiment from Arabic tweets. Subramani et al. [9] experiments with CNN and LSTM to identify domestic violence crisis from Facebook posts. They have been used in the medical domain. Monshi et al. [10] surveyed CNN and LSTM in generating radiological reports.

In this paper, we propose a DL based framework to address the aforementioned challenge. The proposed model will use DL techniques to classify disaster-related tweets based on the relevancy of the messages.

III. METHODOLOGY

The architectural diagram of the proposed framework is shown in Fig.1.

A. Data Acquisition

We used Twitter Search Application Programming Interface¹ to gather the tweets. We used the query #thunderstorm, #CycloneFani to fetch the tweets. Only English language tweets were collected. With the coded web-crawler in Python language, 1,48,287 thunderstorm tweets fetched from May 03, 2018, to May 10, 2018. The number of gathered cyclonic tweets are 1,72,907 dated April 27, 2019, to May 06, 2019.

B. Development of Gold Standard

We engaged three human annotators for the development of Gold Standard. The annotators were proficient in English

¹ <https://developer.twitter.com/en/docs/tweets/search/api-reference/get-search-tweets.html>

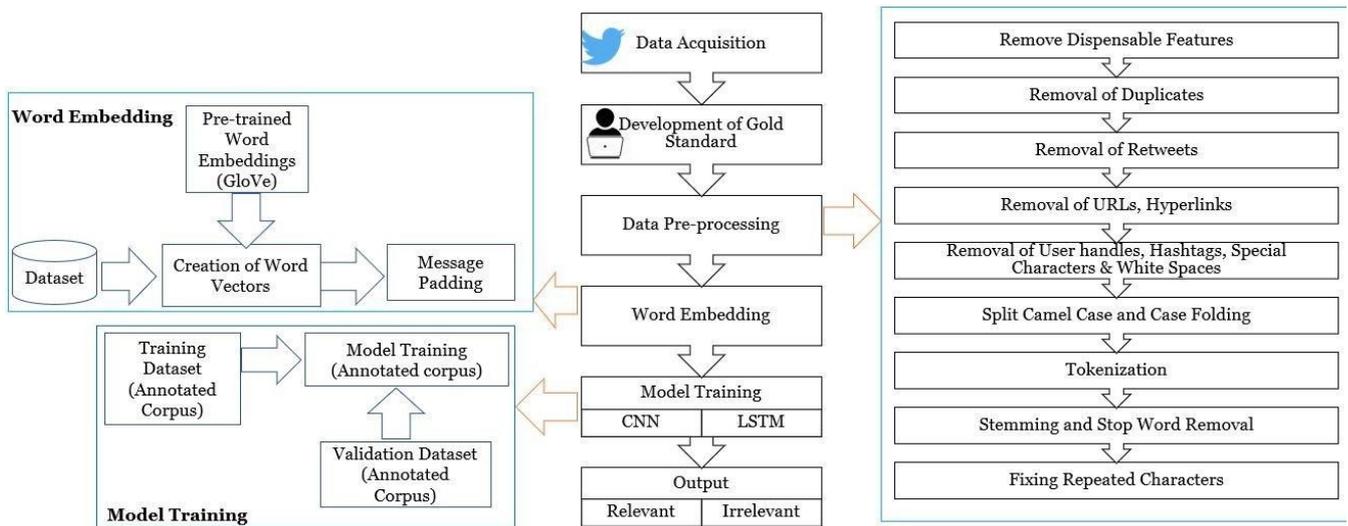


Fig. 1 Methodology of the Proposed Framework.

language and everyday users of Twitter, but none of them is an author of this paper. Given the fetched dataset to annotators, they were asked to label the tweets as relevant and irrelevant. Initially, all the three annotators divided each dataset into three equal sections and annotated the tweets individually. They annotated the tweets by inspecting carefully the terms relevant to thunderstorm and cyclone Fani. Therefore, *relevant* and *irrelevant* tweets are categorized as following:

- *Relevant tweets:* Tweets those contain information about the situation, need, non-need and availability of a vital resource like food, water, shelter, medical aid etc.
- *Irrelevant tweets:* Tweets which do not contain any information about the disaster.

C. Data Preprocessing

One of the main challenges of using SM data for Disaster Management (DM) is the unstructured and raw data. To transform the raw data into information, tweets undergo a series of pre-processing steps. The steps range from removal of irrelevant features to normalization and transforming the data into vectors. In our approach, the pandas dataframe has been used to execute the following steps of pre-processing: removal of dispensable features, removal of duplicates, removal of retweets, URLs, hyperlinks, user handles, hashtags, special characters, and white spaces, split camel case and case folding, tokenization, stemming and stop word removal, fixing repeated characters.

D. Model Details

In this study, we employ two DL models namely CNN, and LSTM. For the purpose of building the models, each dataset is partitioned into two subsets- training and validation dataset in the ratio of 80:20, respectively. During the training phase, the training dataset is fed into the model to generate output from input efficiently. The purpose of the validation dataset is to provide an unswayed evaluation of the model to fit on training data whilst tuning the hyperparameters.

IV. RESULTS

In order to experiment with different neural network models, we ran several training simulations with random combinations of hyperparameters, i.e., random grid search, to evaluate the best converging model towards the best accuracy score. Table I demonstrates the results from the validation phase. Specifically, it lists out the accuracy and loss score obtained during each simulation. With the optimized standards in mind, we chose the hyperparameters that yielded the best accuracy and lesser loss score. The simulations are run for 50 epochs. The best scores are highlighted in bold. Considering

Cyclone Fani dataset, LSTM performs better than CNN with higher accuracy score and lesser loss score. Further, considering thunderstorm dataset, CNN model outperforms LSTM model. Considering both the model's performance, the optimized CNN model yields highest accuracy and lowest loss score on thunderstorms between the two datasets (Table II, row 1).

V. CONCLUSION

Reliable and accurate framework for disaster in SM usage is of great significance but has gained scant attention as compared to other fields. However, in recent years, significant advancements have been made for developing efficient frameworks. In the paper, we described CNN and LSTM models and applied the classifier to manually annotated datasets, which are classified into relevant and irrelevant messages. We adopted well-known state-of-the-art CNN and LSTM models for the disaster domain. For both the models, we demonstrated the results with thunderstorm as well as cyclone datasets. We investigated the effect of the model architecture and hyperparameters' tuning on the model's performance to determine the best architecture. Our results demonstrate that CNN model is better than LSTM model in terms of accuracy and loss. Thus, CNN model outperforms LSTM model in assessing the relevancy of disaster-based messages with an accuracy score of 0.9999 (99.99%) and 0.0410 loss score. Hence, the research adds to the growing body of disaster research by proposing a DL based frame-

TABLE I Accuracy and Loss score on each of the datasets.

Dataset	Model	Epoch	Training Accuracy	Training Loss	Validation Accuracy	Validation Loss	
Cyclone	CNN	5	0.9825	0.2102	0.9827	0.2010	
	CNN	10	0.9827	0.1911	0.9828	0.1909	
	CNN	25	0.9825	0.1010	0.9827	0.1008	
	CNN	50	0.9825	0.1009	0.9827	0.1008	
	LSTM	5	0.9827	1.3936	0.9828	1.3524	
	LSTM	10	0.9769	1.1610	0.9813	1.1760	
	LSTM	25	0.9790	0.3294	0.9858	0.3110	
	LSTM	50	0.9904	0.1007	0.9993	0.1006	
	Thunderstorm	CNN	5	0.9945	0.0898	0.9956	0.0691
		CNN	10	0.9955	0.0535	0.9956	0.0432
CNN		25	0.9962	0.0432	0.9978	0.0424	
CNN		50	0.9988	0.0414	0.9999	0.0410	
LSTM		5	0.8992	41.4000	0.9241	11.7506	
LSTM		10	0.9315	20.4506	0.9310	17.8893	
LSTM		25	0.9969	2.4062	0.8979	2.3794	
LSTM		50	0.8854	1.2971	0.9386	1.4972	

TABLE II Results with the optimal hyperparameter combinations for CNN and LSTM models. The bold numbers correspond to highest accuracy score and lowest loss score.

Model	Dataset	Training Accuracy	Training Loss	Validation Accuracy	Validation Loss
CNN	Thunderstorm	0.9988	0.0414	0.9999	0.0410
LSTM	Cyclone	0.9904	0.1007	0.9993	0.1006

work that efficiently assesses the disaster-based messages as *disaster-relevant* or *irrelevant*.

VI. LIMITATIONS AND FUTURE SCOPE

The results exhibit the potential of the proposed approach. There are a number of limitations and research directions to be considered for future work. First, the work is limited to static data. We envision the real-time relevancy prediction of the SM messages. Second, it is limited to natural disasters. We ideate a multi-hazard design for efficient decision-making.

REFERENCES

- [1] J. Kim and M. Hastak, "Social network analysis: Characteristics of online social networks after a disaster," *Int. J. of Info. Mgt.*, vol. 38, no. 1, pp. 86–96, 2018. [Online]. Available: <https://doi.org/10.1016/j.ijinfomgt.2017.08.003>
- [2] M. Basu, A. Shandilya, P. Khosla, K. Ghosh, and S. Ghosh, "Extracting Resource Needs and Availabilities From Microblogs for Aiding Post- Disaster Relief Operations," *IEEE Trans. on Comp. Soc. Sys.*, vol. 6, no. 3, pp. 1–15, 2019.
- [3] J. Zhao, Q. Yan, J. Li, M. Shao, Z. He, and B. Li, "TIMiner: Automatically extracting and analyzing categorized cyber threat intelligence from social data," *Comp. & Sec.*, vol. 95, 2020.
- [4] S. Madisetty and M. S. Desarkar, "A Neural Network-Based Ensemble Approach for Spam Detection in Twitter," *IEEE Trans. on Comp. Soc. Sys.*, vol. 5, no. 4, pp. 973–984, 2018.
- [5] J. Salminen, M. Hopf, S. A. Chowdhury, S. Jung, H. Almerakhi, and B. J. Jansen, "Developing an online hate classifier for multiple social media platforms," *Hum.-cent. Comp. and Info. Sci.*, vol. 6, pp. 1–34, 2020. [Online]. Available: <https://doi.org/10.1186/s13673-019-0205-6>
- [6] E. D. Andrea, P. Ducange, A. Bechini, A. Renda, and F. Marcelloni, "Monitoring the public opinion about the vaccination topic from tweets analysis," *Exp. Sys. With App.*, vol. 116, pp. 209–226, 2019. [Online]. Available: <https://doi.org/10.1016/j.eswa.2018.09.009>
- [7] Z. Wu, D. Pi, J. Chen, M. Xie, and J. Cao, "Rumor detection based on propagation graph neural network with attention mechanism," *Exp. Sys. with App.*, vol. 158, pp. 1–16, 2020.
- [8] A. H. Ombabi, W. Ouarda, and A. M. Alimi, "Deep learning CNN – LSTM framework for Arabic sentiment analysis using textual information shared in social networks," *Soc. Net. Anal. and Min.*, pp. 1–13, 2020. [Online]. Available: <https://doi.org/10.1007/s13278-020-00668-1>
- [9] S. Subramani, H. U. A. Wang, H. U. Y. Q. Vu, G. Li, and S. Member, "Domestic Violence Crisis Identification From Facebook Posts Based on Deep Learning," *IEEE Acc.*, vol. 6, pp. 54 075–54 085, 2018.
- [10] M. M. A. Monshi, J. Poon, and V. Chung, "Deep learning in generating radiology reports: A survey," *Art.Int. In Med.*, vol. 106, no. April 2019, p. 101878, 2020. [Online]. Available: <https://doi.org/10.1016/j.artmed.2020.101878>

Operating cash flow in commercial firms listed on the Ho Chi Minh Stock Exchange

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Abstract—The study is conducted to scrutinize four operating cash flow indices of commercial firms listed on the Ho Chi Minh Stock Exchange (HSX). The research employs a set of aggregated data from 14 commercial firms. At the same time, the study also receives comments from experts experienced in the same field. We used both qualitative and quantitative methods. We have performed some descriptive analysis, compared to evaluate and measure four operating cash flow indices of commercial firms, including: (i) Operating cash flow/net sales; (ii) Operating cash flow/total assets, (iii) Operating cash flow/owner's equity, and (iv) Operating cash flow/net operating profit. The results illustrate that there is a big difference in operating cash flow indices of commercial firms listed in the context of Vietnam. Foreign ownership accounts for a relatively low proportion of these firms. Based on the results, some suggestions are proposed for commercial firms in order to improve the four operating cash flow indices.

Index Terms—operating cash flow, net sales, assets, owner's equity.

I. INTRODUCTION

IN FIRMS' business activities, there is a variety of information to evaluate and analyse, such as: human resources, firm's competitiveness, indexes of profitability, growth, solvency, cash flow capacity, etc. which include operating cash flow and operating cash flow indices.

For a firm, cash flow is a bloodline that affects business activities of the firm tremendously. Therefore, assessing the cash flow capacity and operating cash flow indices are always of interest to business owners and investors. Cash flow indexes are employed to measure the profitability from business activities and display the efficiency of cash flow, thereby helping business managers devise and perfect more profitable decisions for the sake of the firm in the future.

"Investors' reactions are regarded to be passive in the changes of the stock market because they, to some extent, do not have enough data and information in making sound economic decisions. So, having relevant financial information - including information of cash flow - is too important and necessary to help individual investors be more confident and comfortable when making investment decisions.

There are some studies on the world and domestic about cash flows, such as, "[1] used 475 firm-year observations during the period 2006-2010 to evaluate the relative and incremental information content of earnings and operating cash flows of traded companies. The findings illustrated that earnings are more employed than operating cash flows in explaining stock returns. According to [7], cash flow has both

positive and negative impacts on the stock returns and the health of companies; the abundant amount of cash enables firms to immediately have good investment opportunities when the cost of external finance is too high or be more proactive when facing financial shocks." [8] chose the Association of Southeast Asian Nations (ASEAN) to investigate different roles of cash flows in evaluating the return on investment. They suggested that enterprises should manage cash flow in a prudent manner when consider the firm value from the shareholder's perspective. Cash returns become an important performance indicator for the company, while higher cash component over reported earnings is preferred. However, these studies have not much investigated operating cash flow indices of firms.

Commercial firms have an important role in regulating goods supply and demand that is providing both manufacturers and consumers information about one another. As a result, goods are better distributed and manufacturers can make sure their production is effective and meeting customer's needs. With activities such as commercial promotions or trade promotions, etc. commercial firms help manufacturers to promote products, engage customers and bring the products to customers' awareness. Thenceforth, details of the products can be directly provided to customers through sales staff, catalogues, etc. Commercial firms in general, and commercial firms listed on the HSX in particular have used a variety of management tools, including cash-flow related methods in order to ensure the accomplishments of objectives and strategies, etc. However, the operating cash flow indices of commercial firms have not been fully utilized. In addition, not many researchers are interested in the topic of operating cash flow indices.

This research analyses, evaluates and measures the operating cash flow indices in commercial firms, including (i) Operating cash flow/net sales (OCFNS); (ii) Operating cash flow/total assets (OCFTA), (iii) Operating cash flow/owner's equity (OCFOE), (iv) Operating cash flow/net operating profit (OCFNOP).

II. LITERATURE REVIEW

A. Operating cash flow

There are some studies on operating cash flow, such as [5] studied in the United States, [6] studied in Australia. In the context of Vietnam, [1] looked into forecasting operating cash flow of enterprises listed on the HSX. The role of cash

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flow to an enterprise is as important as a blood flow in the human body [2].

Operating cash flow (OCF) is the money inflow and outflow related to the income and expenses of the business, which occurs regularly in the production and business activities. Operating cash flow reflects cash inflows and outflows related to firm activities within a period, including cash flows related to securities held for business purposes [10].

Operating cash flow inflows, include (i) Sales revenue, service provisions and other revenues. Other revenues here include royalties, fees, commissions and other sources of revenue such as sales of business securities; (ii) Other revenues from business activities include: proceeds due to tax refund, advance recovery, recovery of funds, compensation revenues and other revenues not covered by investment and financial activities cash flow [10].

Operating cash flow outflows, include (i), Payments to suppliers of goods and services, including purchases of trading securities; (ii) Wages; (iii) Loan interest payments; (iv), Corporate income tax; (v) Other expenses for business activities such as insurance premiums, advances, funds, potential compensation due to the firm's breach of economic contracts and other expenses not included in the investment cash flow and financial cash flow [10].

The role of operating cash-flow

Operating cash-flow is the most important in a cash flow statement because it shows the ability of the business to generate cash from within the business activities to repay debt, pay dividend and increase investment.

In addition, the information derived from operating cash-flow is an important foundation for the planning of cash flows for future periods.

Interviewed experts said that OCF is one of the better indicators of a firm's profitability than earnings because a firm may report positive earnings figures on its financial statements while it still is unable to repay the loan. Cash flow is what helps firms pay their bills and due debts. By making use of OCF, investors can examine firms' income conditions. If a firm reports earnings data at a record high but has a negative inflow, it means that the business is having problems with cash flow, and the firm is polishing its image.

Determination of operating cash flow

Based on the direct method, net Operating Cash Flow is calculated by subtracting operating expenses from revenues; those revenues and expenditures are reported on the basis of the capital account in cash and counterpart accounts [10].

Under the indirect approach, the operating cash inflows and outflows are first measured by adjusting the profit before income tax (IT) of the business by excluding non-cash items, inventories change within the period, receivables and payables from operating activities, and amounts which are a result of investing cash flows.

B. Operating Cash Flow/Net Sales

This ratio implies the difference between the net operating cash flow and the revenue of the firm. This ratio can be used to measure a firm's capacity to generate income from revenue.

When the company's revenue increase is not accompanied by the growth in operating cash flow, there is a risk.

C. Operating Cash Flow/total assets

The ratio of operating cash flow to total assets is a financial indicator reflecting the relationship between a firm's OCF and its total resources.

This ratio is used to evaluate the conversion efficiency from assets that generate cash flows for businesses.

Operating cash flow to total assets implies the difference between operating cash flow and total assets. The assets of a firm are made up of borrowed capital and equity. Investors should also pay attention to the interest rates that firms are responsible to pay on debt. Besides, this ratio increases the credibility of a firm's financial power. To fully utilise, investors may evaluate volatility trends in the most recent 3 - 5 years and make comparisons with other firms in the industry.

D. Operating Cash Flow/Owner's equity

This ratio indicates the amount of operating cash inflow for every unit of equity.

This index will answer the question: For every unit of equity spent, how much money will be generated from operating activities.

The higher the ratio is, the more effectively the firm is using the capital from shareholders, which indicates the firm can balance between shareholders' capitals and borrowed capitals to efficiently exploit its competitive edge during capital mobilization and expansion stage. Therefore, investors will be attracted to stocks of firms with this ratio high.

E. Operating Cash Flow/Operating profit

This ratio is one of several indicators that help managers measure the capacity to generate money from business activities in relation to profits. This ratio shows how much firms receive for each unit of profit earned. Consequently, this ratio can help business managers build and perfect the direction along with appropriate strategies and investment decisions for the coming time of the firm.

III. RESEARCH METHODOLOGY

A. Context and sample

Currently in Vietnam, there are 14 commercial firms listed on the HSX (Table 1). Commercial firms listed on the HSX were listed at different times, have different numbers of outstanding shares, and different current equity.

TABLE 1
LISTED COMMERCIAL FIRMS ON THE HSX

No	Stock code	Name's firm	No. of shares ^o outstanding	transaction date	Owner's equity (million VND)	Foreign Ownership (%)
1	BTT	Ben Thanh Trading and Service Co.	5,312,920	2007	363,957	4.67
2	CCI	CuChi commercial and industrial developing investment Co.	17,541,105	2010	275,406	2.43
3	CMV	Ca Mau Trading Joint Stock Co.	18,155,868	2010	197,802	0.23
4	DGW	Digiworld Co.	44,200,278	2015	1,158,586	24.98
5	GIL	BinhThanh import export production and trade Co.	36,000,000	2002	1,289,988	5.32
6	HDC	Ba Ria - Vung Tau House Development Co.	83,143,874	2007	1,142,139	2.51
7	MWG	Mobile World	475,271,464	2014	15,481,690	49.01

No	Stock code	Name's firm	No. of shares outstanding	transaction date	Owner's equity (million VND)	Foreign Ownership (%)
		Investment Co.				
8	PET	Petrovietnam General Services Co.	83,570,524	2007	1,663,166	5.65
9	PIT	Petrolimex International Trading Co.	14,210,225	2008	120,624	0.8
10	PNJ	Phu Nhuan Jewelry Co.	227,366,563	2009	5,241,862	48.34
11	SMA	Sai Gon Machinery Spare Parts Co.	20,352,836	2010	166,550	0.04
12	SMC	SMC Trading Investment Joint Stock Co.,	60,922,941	2006	1,584,291	22.17
13	SVC	Saigon General Service Co.	33,300,466	2009	1,743,131	1.92
14	TNA	Thien Nam Trading Import Export Co.	39,385,930	2005	565,710	3.77

Source: Authors' compilations

Along with the economic development of the country, joint stock commercial firms listed on the HSX have recently shown strong development, and significantly contributed to the development of the country.

Most of the commercial firms listed on the HSX have wide business areas scattered throughout the country and even abroad. For the sake of business, these firms usually have to open branches and set up stores in different regions and localities. Firms may choose to operate in various types such as commercial, service, real estate, etc.

Commercial firms listed on HSX may choose to operate in various types of businesses; goods produced can be sold in wholesales, retails, agency, services, etc.

This study employs a balance sheet whose data is categorized according to objects and time. Secondary data were collected from audited financial reports of 14 commercial firms listed in HSX as of the end of the accounting year 2020 from the [12]. The study involved 14 firms over five years, with a total of 56 observation variables. All 56 observations are included in the analysis through synthesis and data cleaning.

B. Research Approach

This study employs qualitative methods with secondary data collection and expert interviews. Experts consulted include two experienced lecturers in the field of finance from the National Economics University and two chief accountants of commercial firms. The interview revolves around the assessment of four OCF ratios as mentioned within the scope of this study. Experts will make analysis of the status of commercial firms' OCF ratios and provide their professional opinions on the suitability anticipated from those operating cash flow ratios and the relevance between operating cash flow ratios and firm's production, business activities and other aspects. The study also employs quantitative methods by calculating and comparing OCF with the help of descriptive statistics and correlation analysis by Excel and Stata 13.

IV. RESULTS & DISCUSSION

A. Ratio of operating cash flow/net sales

Table 2 and 3 reveal that there are three firms whose proportion of operating cash flow/net sales is higher than 10%. Two firms that have a high ratio of operating cash flow to net

TABLE 2
THE RATIO OF OPERATING CASH FLOW TO NET SALES OF LISTED FIRMS

Unit: %

Code	2017	2018	2019	2020	Average
BTT	20.64	29.07	13.14	7.08	17.48
CCI	12.15	6.09	3.26	5.59	6.77
CMV	3.62	0.08	-0.94	1.09	0.96
DGW	0.45	-2.49	12.25	7.26	4.37
GIL	-6.08	-2.12	3.38	6.59	0.44
HDC	32.90	-27.76	9.92	33.05	12.03
MWG	4.02	2.61	-1.26	9.94	3.83
PET	0.04	1.78	3.12	-0.30	1.16
PIT	3.93	9.14	7.42	-6.95	3.39
PNJ	1.00	-2.07	-3.89	8.55	0.90
SMA	8.26	16.86	24.82	44.53	23.62
SMC	4.97	-0.26	2.75	2.83	2.57
SVC	4.28	-1.03	-0.23	5.77	2.20
TNA	-1.40	-2.94	0.36	-4.73	-2.18

Source: Authors' compilations

sales are firms with stock codes of SMA and BTT; otherwise, the firm with stock symbol of TNA possess the smallest operating cash flow.

TABLE 3
THE RATIO OF OPERATING CASH FLOW TO NET SALES OF FIRMS

Unit: %

Description	2017	2018	2019	2020	Average 2017-2020
Operating cash flow/net sales	6.34	1.93	5.29	8.59	5.54

Source: Authors' compilations

During the period from 2017 to 2020, the ratio of operating cash flow to average net sales of commercial firms is 5.54%, meaning that operating cash flow constitutes a low proportion in net sales.

The financial experts supposed that changes in terms of sales as well as debt policy can be reflected in these ratios. It is also acclaimed that the higher the ratio is the better. However, the ratio reported within a firm should be different from the industry's average. That is why, investors need to know the kind of this ratio for detecting significant deviations from the firm's average cash flow/revenue, as well as compare this ratio of other firms within the industry. In addition, investors also need to observe fluctuation of revenues in correlation

TABLE 4
THE RATIO OF OPERATING CASH FLOW TO ASSETS OF FIRMS

Unit: %

Code	2017	2018	2019	2020	Average
BTT	16.09	20.96	7.83	2.39	11.82
CCI	5.94	3.53	1.81	2.34	3.41
CMV	23.19	0.55	-6.09	7.58	6.31
DGW	-14.58	-5.65	11.92	26.93	4.66
GIL	0.66	-3.04	16.38	9.26	5.82
HDC	8.98	-12.12	3.32	8.32	2.13
MWG	11.67	8.04	-3.08	23.45	10.02
PET	0.07	3.55	6.28	-0.64	2.32
PIT	13.65	35.38	22.78	-11.50	15.08
PNJ	2.40	-4.69	-7.68	17.65	1.92
SMA	6.49	13.59	6.53	7.53	8.54
SMC	12.43	-0.85	9.12	6.62	6.83
SVC	16.29	-3.50	-0.88	21.78	8.42
TNA	-4.30	-6.60	0.95	-11.63	-5.40

Source: Authors' compilations

TABLE 5
THE RATIO OF OPERATING CASH FLOW TO TOTAL ASSETS OF LISTED FIRMS

Ratio	2017	2018	2019	2020	Average 2017-2020
Operating cash flow/total assets	7.07	3.51	4.94	7.86	5.85

Source: Authors' compilations

with cash-flow and assess their relative increase with one another.

B. Operating cash flow/total assets

Table 4 and 5 demonstrate that commercial firms' operating cash flow proportion in total assets has a noticeable difference. While the firm with the stock code of PIT has the highest operating cash flow proportion in total assets (i.e. 15.08%), this proportion of firm with the stock code of TNA is -5.40%. For each firm, the ratio of operating cash flow to total assets also changes sharply during the period from 2017 to 2020.

The ratio of operating cash flow to average total assets of commercial firms listed tends to increase from 2018 to 2020.

C. Operating cash flow/owner's equity

Table 6 and 7 illustrate that during the period 2017 - 2020, three listed firms listed with stock codes of PNJ, PET, CCI have the low ratios. However, some firms have a fairly high ratio such as firms with stock symbols of PIT and MWG.

TABLE 6
THE RATIO OF OPERATING CASH FLOW TO OWNER'S EQUITY OF LISTED FIRMS

Code	2017	2018	2019	2020	Average
BTT	23.73	30.79	11.46	3.25	17.31
CCI	15.15	8.97	4.60	5.89	8.65
CMV	89.29	2.18	-24.54	23.20	22.53
DGW	-33.70	-16.39	31.00	71.33	13.06
GIL	1.75	-7.90	37.18	19.45	12.62
HDC	18.84	-24.73	7.06	24.28	6.36
MWG	45.08	25.17	-10.59	69.71	32.34
PET	0.25	12.17	19.03	-2.44	7.25
PIT	56.59	123.28	56.94	-31.75	51.27
PNJ	3.61	-8.07	-14.44	28.56	2.42
SMA	17.66	32.41	14.35	19.70	21.03
SMC	51.95	-3.32	34.74	28.07	27.86
SVC	46.13	-9.93	-2.55	53.24	21.72
TNA	-14.06	-26.72	2.97	-43.78	-20.40

Source: Authors' compilations

TABLE 7
THE RATIO OF OPERATING CASH FLOW TO OWNER'S EQUITY OF LISTED FIRMS

Ratio	2017	2018	2019	2020	Average 2017-2020
Operating cash flow/owner's equity	23.02	9.85	11.94	19.19	16.00

Source: Authors' compilations

The ratio of operating cash flow to average owner's equity over the years of commercial firms listed on HSX is 16.00%, which is considered average.

TABLE 8
THE RATIO OF OPERATING CASH FLOW TO NET
OPERATING PROFIT OF LISTED FIRMS

Stock code	2017	2018	2019	2020	Average
BTT	152.64	166.31	64.09	80.36	115.85
CCI	117.25	63.21	33.67	42.69	64.21
CMV	-1,346.39	210.98	2,698.46	1,069.15	-567.71
DGW	-248.66	-91.46	136.57	248.94	11.35
GIL	5.60	-27.40	158.74	63.38	50.08
HDC	139.43	-165.46	45.86	95.75	28.90
MWG	95.29	59.91	-25.54	199.40	82.27
PET	2.07	113.87	311.45	-20.39	101.75
PIT	-169.27	-442.90	-496.89	-1,857.30	-741.59
PNJ	12.15	-25.10	-43.89	110.95	13.53
SMA	70.10	271.08	181.98	274.50	199.42
SMC	187.82	-21.11	328.89	120.56	154.04
SVC	-6,290.13	-58.79	-31.14	717.59	-1,415.62
TNA	-46.09	-240.02	10.20	-470.08	-186.50

Source: Authors' compilations

TABLE 9
THE RATIO OF OPERATING CASH FLOW TO NET
OPERATING PROFIT OF LISTED FIRMS

Ratio	2017	2018	2019	2020	Average 2017-2020
Operating cash flow/net operating profit	-522.73	-13.35	51.85	-30.28	-128.63

Source: Authors' compilations

D. Operating cash flow/net operating profit

Table 8 and Table 9 present that commercial firms' ratio of operating cash flow to net operating profit is uneven. This ratio of firms with the stock code of SMA is extremely high, 199.42%. Meanwhile, the ratio of firm with stock code of DGW is low, only 11.35%. However, the mean ratio of listed commercial firms in 2017 - 2020 is -128.63%.

The financial specialists stated that the higher this index value is the better since as it shows that the firm is developing. In addition, firm managers should compare this ratio with the industry's average in order to assess their firms' positions in comparison with other businesses in the industry. Financial experts also believe that tracking this ratio chronologically will assist investors to easily detect the firm's deficiencies.

E. Descriptive statistics

Data in Table 10 reveal that each operating cash flow indexes are calculated by 56 observations. Basic numbers of mean, max, min, standard deviation (SD), variance, skewness coefficient of variation, the sum of variables, range, coefficient of variation, coefficient of variation of each observed variable (CV) have been tabulated; and these indices accurately reflect the current states of operating cash flow indices of listed commercial firms.

Owner's equity (OE): The dummy variable is 1 if the firm has 1,000,000 million VND or more of owner's equity; is 0 for other cases.

TABLE 10
GENERAL AND DETAILED DESCRIPTIVE STATISTICS

General descriptive statistics					
Variables	Obs	Mean	Std. Dev.	Min	Max
OCFNS	56	.0553821	.1118202	-2.776	.4453
OCFTA	56	.0584643	.1060281	-1.458	.3538
OCFOE	56	.1600179	.3137895	-4.378	1.2328
OCFNOP	56	-.6173429	10.01823	-62.9013	26.9846
Detailed descriptive statistics					
stats	OCFNS	OCFTA	OCFOE	OCFNOP	
N	56	56	56	56	
sum	3.1014	3.274	8.961	-34.5712	
range	.7229	.4996	1.6706	89.8859	
variance	.0125038	.0112419	.0984638	100.3649	
cv	2.019065	1.813553	1.960965	-16.22798	
skewness	1.04816	.4052229	.8439452	-4.131307	
kurtosis	6.263296	2.960111	4.355129	29.00523	
p50	.0332	.0611	.1326	.6156	

Source: Authors' compilations

Comparison of operating cash flow indices of listed firms with owner's equity over 1,000,000 million VND and the remaining firms

Table 11 shows that there were 24 firms (6 firms in the 2017-2020 period) with 1,000,000 million VND or more rate of owner's equity.

OCFNS: firms with owner's equity of 1,000,000 million VND or more have a smaller OCFNS than the rest. The difference on OCFNS between firms with 1,000,000 million VND or more owner's equity and the rest is not statistically significant (p-value is 0.42, higher than 0.05; difference value 0.0244

OCFTA: firms with owner's equity of 1,000,000 million VND or more have a larger OCFTA than the rest. The difference on OCFTA between firms with 1,000,000 million VND or more owner's equity and the rest is not statistically significant (p-value is 0.52 > 0.05; difference value 0.0186

OCFOE: firms with owner's equity of 1,000,000 million VND or more have a larger OCFOE than the rest. The difference on OCFOE between firms with 1,000,000 million VND or more owner's equity and the rest is not statistically significant (p-value is 0.37 > 0.05).

OCFNOP: firms with owner's equity of 1,000,000 million VND or more have a smaller OCFNOP than the rest. The difference on OCFNOP between firms with 1,000,000 million VND or more owner's equity and the rest is not statistically significant (p-value is 0.53, higher than 0.05; difference value 1.6920 [4].

V. CONCLUSION

This study has evaluated four OCF ratios of commercial firms listed on HSX with mixed research methods. With the contemporary status of those firms, it was depicted that firms with more stable and high OCF ratios received a great deal of interest from investors and their firms were operating decently.

Firms with poor operating cash flow ratios need to take strategies to improve the OCF ratios such as increase revenue (expand market, diversify sales policies, etc.), reduce costs (control costs, allocate costs appropriately, avoid excessive costs). In addition, businesses also need to modify terms of sales or diversify debt policies for each customer group or individual in order to improve these ratios.

According to [9], cash flow, overconfidence and investment have a close relationship. They affirmed that CEOs with overconfidence, large free cash flow and unaffected firms tend to invest more. In contrast, the cash flow is to some extent limited or not big enough to invest, CEOs tend to invest less instead of raising capital by issuing shares or CEOs show that the issuance of shares will be information that makes the market underestimation [9]. Cash flow from operations, along with earnings, is an important asset of the firm value. The use of cash flow indicators has always been underlined by the accounting community [3].

REFERENCES

- [1] Anh, N. H. (2013). Forecast operating cash flow of enterprises listed on the Ho Chi Minh City Stock Exchange. *Journal of Economic and Development*, 10/2013, 20-27. [Vietnamese]
- [2] Anh, N. H., and Hieu, N. T. (2015). Using historical accounting profit and cash flow information to forecast operating cash flow of non-financial firms listed on the Ho Chi Minh Stock Exchange. *Journal of Economy of Asia - Pacific*, 458, 78-80. [Vietnamese]
- [3] Asgari, L., Salehi, M., and Mohammadi, A. (2014). Incremental Information Content of Cash Flow and Earnings in the Iranian Capital Market. *Journal of Industrial Distribution and Business*, 5-1, 5-9.
- [4] Bryman, A., and Cramer, D. (2001). Quantitative data analysis with SPSS release 10 for Windows: A guide for social scientists (1st Ed.). <https://doi.org/10.4324/9780203471548>
- [5] Greenberg, R., Johnson, G., & Ramesh, K. (1986). Earnings versus Cash Flow as a Predictor of Future Cash Flow Measures. *Journal of Accounting, Auditing & Finance*, 1(4), 266-277.
- [6] Habib, A. (2010). Prediction of operating cash flows: further evidence from Australia. *Australian Accounting Review*, 20(2), 134.
- [7] Hau, L. L., and Vy, Q. N. T. (2017). The influences of free cash flows on firm performance: Evidence from listed firms on the Ho Chi Minh stock Exchange. *The journal of Banking Technology*, 137, 72-84. [Vietnamese]
- [8] Lau, W. T., and Mahat, F. B. (2019). Robustness of Cash Flow Value: Investment in ASEAN. *Journal of Asian Finance, Economics and Business*, 6(2), 247-255.
- [9] Malmendier, U., and Tate, G. (2005). CEO overconfidence and corporate investment. *The Journal of Finance*, 60(6), 2661-2700.
- [10] Ministry of Finance (2014), Circular No. 200/2014/TT-BTC on guiding the accounting system of firms, Finance Publishing House.
- [11] Pouraghajan, A., Emamgholipour, M., Niazi, F., and Samakosh, A. (2012). Information content of earnings and operating cash flows: evidence from the Tehran Stock Exchange. *International Journal of Economics and Finance*, 4, 41-51.
- [12] Website: cophieu68.vn/finance.vietstock.vn

TABLE 11
COMPARISON OF OPERATING CASH FLOW INDICES AMONG FIRMS WITH OWNER'S EQUITY OF OVER
1,000,000 MILLION VND OR MORE AND THE REMAINING FIRMS

. ttest OCFNS, by(OE)						
Tow-sample t test with equal variances						
Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Intervall]	
0	32	.0658438	.0237544	.1343751	.0173963	.1142912
1	24	.0414333	.0147305	.0721645	.0109609	.0719057
Combined	56	.0553821	.0149426	.1118202	.0254365	.0853278
Diff		.0244104	.0302916		-.0363206	.0851414
diff = mean (0) – min (1)			t =		0.8058	
Ho: deff = 0			Degrees of freedom =		54	
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr (T < t) = 0.7881		Pr (T > t = 0.4239		Pr (T > t) = 0.2119		
. ttest OCFTA, by(OE)						
Tow-sample t test with equal variances						
Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Intervall]	
0	32	.0504812	.0204402	.1156271	.0087932	.0921693
1	24	.0691083	.0189913	.0930382	.0298217	.1083949
Combined	56	.0584643	.0141686	.1060281	.0300698	.0868588
Diff		-.0186271	.0287833		-.0763342	.03908
diff = mean (0) – min (1)			t =		-0.6471	
Ho: deff = 0			Degrees of freedom =		54	
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr (T < t) = 0.2601		Pr (T > t = 0.5203		Pr (T > t) = 0.7399		
. ttest OCFOE, by(OE)						
Tow-sample t test with equal variances						
Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Intervall]	
0	32	.1273781	.0620292	.3508903	.0008687	.2538876
1	24	.2035375	.0524598	.2569995	.0950161	.3120589
Combined	56	.1600179	.0419319	.3137895	.0759845	.2440512
Diff		-.0761594	.0848834		-.2463404	.0940217
diff = mean (0) – min (1)			t =		-0.8972	
Ho: deff = 0			Degrees of freedom =		54	
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr (T < t) = 0.1868		Pr (T > t = 0.3736		Pr (T > t) = 0.8132		
. ttest OCFNOP, by(OE)						
Tow-sample t test with equal variances						
Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Intervall]	
0	32	.1078406	1.226026	6.935451	-2.392656	2.608337
1	24	-1.584254	2.688438	13.1706	-7.145712	3.977204
Combined	46	-.6173429	1.338742	10.01823	-3.300242	2.065557
Diff		1.692095	2.720437		-3.762053	7.146243
diff = mean (0) – min (1)			t =		0.6220	
Ho: deff = 0			Degrees of freedom =		54	
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr (T < t) = 0.7317		Pr (T > t = 0.5366		Pr (T > t) = 0.2683		

Source: Authors' compilations

Occupational safety and health in garment enterprises in Vietnam—the corporate social responsibility to employees

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Abstract—By making statistics and analyzing the data provided by the Department of Occupational Safety and Health, ILO&IFC, and other sources, the author shows the fact that implementing occupational safety and health in enterprises is a part of implementing corporate social responsibilities to employees, occupational safety and health in enterprises is an issue, which has the most violations in labor matters. They are mainly concentrated in 4 groups: worker protection, OSH management system, emergency response, chemicals and hazardous material, with very high non-compliance rates, 93%, 82%, 74%, 68% respectively. Through real analysis, the author gives some suggestions to improve the implementation of occupational safety and health.

Index Terms—occupational safety and health, corporate social responsibility, garment enterprises.

I. INTRODUCTION

OCCUPATIONAL safety and health (OSH) in an enterprise is the workers' right to safety, which is also an important part of the corporate social responsibility to employees, except the other part of the corporate social responsibility to employees, including Freedom of assembly and collective labor agreement; Discipline and working time; Remuneration and management system. Corporate social responsibility to employees has received much attention from researchers because of its increasingly important role for each business. Implementing corporate social responsibility to employees is the protection of workers' rights, first of all respecting and ensuring the basic rights of employees, including the right to safety. However, in Vietnam, many garment enterprises have not let employees work in an environment with many unsafe and harmful hazards by neglecting the OSH. Textile and garment industries are considered as one of the highest OSH risks, ranking 9th out of 11 industries occupations with high OSH risks. That is the reason for many accidents in the garment industry. According to statistics of the Department of Occupational Safety, for 5 consecutive years (2016-2020), the textile and garment industry is classified as an industry with deadly occupational accidents, accounting for 5 -7% of the whole country. Implementing OSH is not only fulfilling corporate social responsibilities to employees it is also a requirement of international integration to raise the level of OSH compliance in the enterprise to international standards, to have long-term business cooperation with inter-

national partners. However, Vietnamese garment enterprises still have many violations of OSH regulations, so, the author hopes to give a description of the compliance with the law on occupational safety and hygiene in garment enterprises, thereby analyzing, discussing and proposing some suggestions for improving compliance with the law on OSH, ensuring the basic rights of employees working. This Study includes 5 main parts: introduction, literature review, proposed work, result and discussion, conclusion and suggestions.

II. LITERATURE REVIEW

Corporate social responsibility and corporate social responsibility to employees by implementing OSH in the enterprise are valuable for researching, therefore there are lots of studies about this topic.

Bowen in research named "*Social Responsibility of Businessman*" has defined CSR as the obligation of business people to pursue policies, make decisions or perform a series of socially desirable activities in terms of goals and values. After that, there was a strong development in the concept of social responsibility [1]. Elkington suggested that there are three sustainable factors in the operation of an enterprise showing the 3Ps such as people, the earth (planet), and profit for the enterprise's sustainable development [2]. On the topic of corporate social responsibility to employees, [3-5] pointed out that, "The company needs to commit to ensuring the health and safety of employees" is a part of implementing corporate social responsibility to employees. The same is shown in the studies [6-9]. The role of implementing OSH - CRS to employees to create conditions for the sustainable development of the enterprise as indicated in many studies such as ILO [10-15]. In reality, there are many enterprises that refuse to implement OSH measures, violate OSH and OSH legislation and ignore sustainable benefits from OSH because they have to pay an amount of money to maintain safe working conditions.

Through other research, the author found that an in-depth study of the occupational safety and health situation in garment enterprises in Vietnam is necessary.

Methodology

In this study, the author used the documentary research method. The secondary data is collected information statis-

tics on occupational safety and hygiene in garment enterprises in Vietnam such as the data of accidents, occupational diseases, number of legislation violations on occupational safety and health from the studies, report of ILO, IFC, Department of Occupational Safety, Department of Vietnam Textile Union... to analyze and give assessments about the implementation of occupational safety and health in garment enterprises in Vietnam for 05 years and find out the causes, consider the factors affecting, thereby proposing some suggestions to improve the implementation of occupational safety and health in garment enterprises in Vietnam.

III. PROPOSED WORK

Many researchers defined corporate social responsibility. According to experts of the Business Council for Sustainable Development (2002), "*Social responsibility is the commitment of enterprises to business ethics and contributes to sustainable development, improving the quality of life for employees and their families, local communities and society at large*"; In 2003, experts from the World Bank said that: "*Social responsibility of enterprises is the commitment of enterprises to contribute to sustainable economic development, through activities to improve the quality of life of employees and their family members, for the community and for the whole society in a way that is beneficial to businesses as well as the general development of society*". Thus, most researchers agree that part of corporate social responsibility to employees is to take care of the lives of employees.

According to Dinh Thi Huong, "*implementing social responsibility for employees includes all activities to realize the commitments of enterprises to employees, thereby improving the quality of life for employees as well as ensuring the development of employees. sustainable development of enterprises*" [5], which includes constantly improving working conditions, ensuring occupational safety and hygiene for employees in the enterprise.

The term "occupational safety and health", that refers to a multidisciplinary field concerned with the safety, health and welfare of workers in the workplace [16]. "Safety" and "health" are two closely related categories because they can arise at the same time in the same space, It means the worker could be unsafe and have diseases in the workplace in working process. However, we clearly differentiate "safety" and "health" through the way in which hazardous factors and harmful factors in working conditions affect people; Occupational safety refers to measures to help reduce the "dangerous" factor that causes "occupational accidents", emphasizing "incidents" that occur "unexpectedly", while occupational hygiene means to say to measures to help prevent and avoid "harmful" factors, which affect workers "slowly" over time and cause "occupational diseases". According to the ILO, OSH is defined as "the sci-

ence of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment". Occupational safety and health are the activity of many different subjects, each with different roles, their occupational safety and health activities are also different. With the science of occupational safety and health, they research scientifically to come up with measures, protective means or rules to prevent occupational accidents and occupational diseases. Therefore, occupational safety and health in an enterprise is understood as *all the measures that enterprises take to prevent occupational accidents and occupational diseases from dangerous and harmful working conditions, to ensure safety and health for workers*.

In the period of industrialization, modernization and international economic integration, Vietnam has ratified ILO conventions on occupational safety and health, including: Convention 148 on the protection of workers against occupational diseases. occupational risks due to air pollution, noise and vibration in the workplace (1977); Convention 155 on occupational safety and health and working environment, Recommendation 164 on Occupational safety, health and working environment (1981); Convention 170 on safety in the use of chemicals at work, Recommendation No. 177 on safety in the use of chemicals at work (1990); Convention 183 on Maternity Protection (2000)... and Vietnam is also completing the national legislation on OSH by promulgating legislation to manage OSH in enterprises, including Law on Occupational Safety and Health (2015); Law on Fire Prevention and Fighting (2001); Decree 39/2016/ND-CP guiding the Law on Occupational Safety and Health, Decree 88/2020/ND-CP guiding the Law on Occupational Safety and Hygiene on occupational accident and disease insurance mandatory ... Through the study of ILO conventions, ILO recommendations, national laws and a number of documents on occupational safety and health in enterprises such as: fundamental principle of OSH [17]; Principles of Occupational Safety Management [18] and textbook on occupational safety and health [19], the author recognise that occupational safety and health in enterprises include 7 basic contents, which are:

(i) Building an OSH management system

The occupational safety and health management system in an enterprise is defined as a network of involved factors. These factors include person and their responsibilities, relationships between the position in the system, activities, processes, line of action, and resources. Thus, building an OSH management system means setting up a management apparatus, regulating the operation of parts in the management apparatus, stipulating the responsibilities and powers of positions, developing a process to manage OSH, and defining the relationship between departments. On the other

hand, the enterprise must also make a general assessment of the occupational safety and health situation to have an overview to build a system of regulations, safety rules, plans for the implementation of occupational safety and health...and at the same time, to record cases of occupational accidents and diseases to learn from experience.

In order for the OSH management system to work effectively, the regulations on the rights, obligations, resources of each element in the apparatus could be clearly defined; an operation process should be built to manage the OSH system; a large number of employees clearly understand their roles, positions, duties.

(ii) Chemical and hazardous materials safety

Chemical safety is very important, because if chemical safety is not ensured, its consequences will not only affect the health and lives of workers but also greatly affect the environment. Chemical and hazardous materials management includes: the employer stores the chemicals and hazardous materials used at the workplace properly; appropriately labeled chemicals and hazardous materials; the employer has used records for hazardous materials; employers perform activities to evaluate, supervise, prohibit, and moderate workers' exposure to hazardous substances; workers work with hazardous materials are trained effectively; employees are provided adequate washing facilities and cleaning materials in case of exposure to hazardous chemicals.

(iii) Worker Protection

Employees must be provided personal protective equipment (PPE) free of charge to protect them from workplace hazards such as chemicals, noise, air pollution, sharp objects, eye injuries or burns. Employees must be provided personal protective equipment (PPE) free of charge to protect them from workplace hazards (chemicals, noise, air pollution), vulnerable body areas (eyes, head, hands), sharp objects, burns. Employees also must be trained to use the PPE, and employers must remind and monitor workers of their duties to use it at the workplace. PPE are gloves, glasses, helmets, protecting clothes, masks...they protect a part of body safety.

The equipment in the workplace such as machines, shelves for finished products, semi-finished products, tools, wires, etc. must be arranged logically with ergonomic principles. If workers trust that they face a coming and serious danger, they could deny working without punishment for doing so.

In Vietnam, the government enacts the OSH law and Vietnam standard to force employers to provide PPE for workers.

(iv) Ensure a safe working environment;

The workers must ensure that the workplace environment is monitored and controlled at appropriate levels of the ambient factors in the workplace such as temperature, ventilation, humidity, noise, and lighting, as regulated by the national OSH law and other related regulations. If one of the

ambient factors in the workplace surpassed the allowable limit, it will cause harm to workers' health. Depending on their intensity, they cause immediate injuries (cause occupational accidents) or cause health problems through long-term exposure (cause occupational diseases). Ensuring a safe working environment is the responsibility of the employers and is guaranteed to implement by national legislation.

(v) Occupational disease management and medical services.

Occupational disease management means that the employers monitor the health of each employee through their healthy report. Employers need to have periodic health checks for the workers to ensure that they are healthy enough to meet current job demands and detect occupational diseases early.

In addition, the employees could be injured in the workplace, so the employers must ensure to address safety and health risks to employees. That is the reason why the workplace have needed onsite medical facilities and staff; the employer makes sure that there are complete of readily reachable first aid supplies suit for the number of workers, also, the employees are trained for first-aid to respond to emergencies.

(vi) Emergency preparedness

Emergency preparedness is an employer's preparation for emergencies, such as problems related to fire, problems related to electrical incidents causing fire and explosion, etc. For Emergency preparedness, the employers are required to be fully equipped with fire alarms, emergency extinguishing equipment, warning signs, emergency exits (require to the width of the emergency exit, the number of exits).

In order to face an emergency, the employer is required to train employees in basic knowledge including how to recognize the fire alarm, how to use extinguishing equipment, use the emergency exit, ect, and the employer must conduct periodic drills for emergencies.

(vii) Welfare facilities in OSH

The welfare in OSH for employees includes: the workplace has adequate accessible toilets for employees; the workplace has sufficient hand washing soap and hand sink; the worker is supplied enough free safe drinking water. These are basic human needs, especially the need for drinking water, the need for a clean toilet.

IV. RESULT AND DISCUSSION

Vietnam is currently in the top 5 countries in terms of global garment exports, of which the majority of goods are exported to the United States (46.1%), Europe (13.7%), Japan. 12.5%) and Korea (9.9%) [11]. In 2019, Vietnam has more than 6,000 enterprises operating in the garment sector with nearly 2.7 million people, it's about 4,200 garment enterprises, most of them are the garment export (CTM – cut – make – trim) [11]. The employees in garment enterprises are mainly unskilled workers, with low qualifications. The num-

ber of primary workers and ones with less than 3 months of vocational training is 81.2% [20]

Since becoming a member of free trade agreements, Vietnam has been improving its national labor laws to bridge the gap between international labor standards and national labor laws. The government makes a plan to extend the worker's rights like improving the working condition regulation to gain the tax offer and trade opportunity from the new general FTAs such as CPTPP, EVFTA.

Although, for 2016-2020, the accident number in the garment sector at a high level. It reached a peak In 2018 with 103 accidents and 111 deaths. In 2020, this number was decreased by 50%. However, within 5 years, the textile and garment industry has always been classified as one of the industries with a high number of occupational accidents. It shows that the risks to get accidents in the garment sector still at an alarming rate. In addition, the statistical reports on occupational accidents provided by the Department of Occupational Safety are just incomplete figures. The annual report on occupational accidents states that the reporting rate of enterprises to the Department of Labor - Invalids and Social Affairs is still low. In 2019, it's about 5.9% of enterprises reported, in 2020, the one is about 5.47%. It shows that the actual number could be much larger than the reported number.

The database on occupational diseases is also very lacking and incomplete. In the garment industry, early detection of occupational diseases has not been fully and seriously implemented. According to Mr. Nguyen Hong Chien, Head of Propaganda Department of Vietnam Textile Union, in 2019, there was 116,370 out of 130,427 workers received periodic health checks. According to reports from 118 Textile and Garment unions, no cases of occupational diseases have been detected. However, the number of members at trade unions is extremely lower than the total number of employees in the Textile and Garment industry (2.7 million employees in the Textile and Garment industry). According to the Ministry of Health, the current periodical health checking only stops at classifying health and detecting some common diseases. In fact, survey data on 1,000 garment workers aged 25-35 at 3 enterprises in Binh Duong, Ho Chi Minh City and Dong Nai of the Institute of Public Health Hygiene of Ho Chi Minh City showed that there was 93% of workers suffer from fatigue after work; 47% of workers suffer from general fatigue; 16.7% of workers suffer from strong headache; 15.1% of workers showed signs of burnout; 80% of muscle and joint pain in the waist, neck and shoulder area. These statistics show that many textile and garment business owners (especially those without a trade union, small businesses) are neglecting the rights of employees, especially in improving working conditions, taking care of employees' health, in order to prevent occupational accidents and control occupational diseases for employees.

The occurrence of occupational accidents and neglect of workers' health are the result of incompliance OSH regula-

tion of garment enterprises. According to statistics from the Vietnam better work program, the rate of garment enterprises violating regulations on occupational safety and health is the highest among all labor violations.

TABLE 1: VIOLATIONS OF REGULATION ON OSH BY GARMENT ENTERPRISES PARTICIPATING IN BETTER WORK

Violations	2017 (n=257)	2019 (n=331)
Building an OSH management system	66%	82%
Chemicals and hazardous materials	73%	68%
Worker protection	89%	93%
Working environment	21%	15%
Occupational disease management and medical services	51%	51%
Emergency preparedness	80%	74%
Welfare facilities	58%	43%

(Source: compiled from the report of the Better work program in Vietnam)

Building an OSH management system in the enterprise

The issue of building an occupational safety and health system is specified in the OSH law (2015) and Decree 39/2016 ND-CP. However, there is a significant increase in violations from 73% in 2017 to 82% in 2019. The cause is believed to be due to a change in the regulations on standards of the person in charge of occupational safety and health position. In fact, these factories have not enough employees of the OSH department (compared to the size of the factory) or the employees are not qualified to undertake this work as prescribed. As required by the new OSH Law, the OSH officers have to meet certain criteria on educational background and experience.

Similarly, Vietnamese law also requires factories to establish an OSH collaborator's network, which more than a quarter of factories still fail to do adequately.

The OSH National law raises standards for OSH positions and medical staff is expected to help the OSH system in enterprises work effectively.

Chemical and hazardous materials management

Chemical safety in enterprises is specified in the OSH law and the chemicals law. In recent years, the chemical safety has improved, specifically, there was reduce of violation rate from 73% in 2017 to 68% in 2019. However, the violation rate is still high. The main violations in chemical safety include: not labeling chemicals (44% of enterprises violate); the number of violations on storage was 33%, 34% of enterprises did not train employees in the use and storage of chemicals, 25% of enterprises did not fully record the number of chemicals used.

Labor protection

The provision of labor protection equipment in garment enterprises is quite specific and detailed in *Circular*

04/2014/TT-BLDTBXH. However, in the matter of labor protection, there are many garment factories in the Better Work program that do not pay enough attention to separate occupational safety and hygiene requirements for different types of work. There are stricter requirements on several positions, such as people working at height, people working with cutters, presses, irons, dryers, etc. All of these jobs require workers get certifications for using machines. Similarly, the worker is inadequate PPE provision or low-quality PPE is popular. In addition, workers often do not comply with regulations on the use of protective equipment. They don't regularly use PPEs such as gloves, goggles, and carbon masks, and they pull out or deviate the protective shield of the sewing machine to see easier. It is the lack of responsibility of employers and employees in the work of occupational safety and health that leads to a very high rate of non-compliance, there are respectively 47%, 35%, and 39 % of factories observed non-compliance in issues including jobs with strict OSH requirements, use of PPEs, and safe operation of machinery, [11]. Non-compliance with electrical safety has also taken place for a long time. There is 37% of observed factories are poorly in installing and maintaining electrical wires, switches, and plugs.

Ensure a safe working environment

This is the issue with the fewest recorded violations in occupational safety and health issues in garment enterprises participating in the better work program. The rate violations in 2017 and 2019 are respectively 21% and 15%. The main environmental violations in garment enterprises are related to noise and dust.

Ensure emergency response

In several years, the locking of the exit doors no longer occurs, but another phenomenon occurs in more than half of the surveyed factories, which is the situation where the exit is blocked by goods, materials, even machines. Along with that issue, poor quality fire fighting equipment and alarm systems and lack of coordination in the network of occupational safety and health workers are also the problems of more than half of the surveyed factories.

The highest rates of incompliance in emergency preparedness include storage of flammable materials (12%); properly installing and maintaining electrical cords, switches, plugs and electrical appliances (21%); indication of emergency exits (41%); emergency exits are locked, blocked or inaccessible during business hours (51%).

Fire fighting equipment and fire alarm systems are not of good quality, accounting for 44% of surveyed factories. Although the awareness of fire safety has increased, the problem of ensuring a suitable fire protection system is still not well implemented, many factories do not have enough fire alarm systems, besides, they also do not periodically check and maintain this fire detection and alarm system.

V. CONCLUSION AND SUGGESTIONS

Statistics on occupational accidents and occupational diseases of garment enterprises in Vietnam show that serious occupational accidents in garment enterprises are still very large, in the past 5 years, garment enterprises are still the one of the types of enterprises with the highest rate of death from occupational accidents and is classified in the group of industries with high risk of occupational accidents. There are no specific statistics on occupational diseases in garment enterprises in Vietnam, however, the early detection of occupational diseases has not been taken seriously. In addition, garment enterprises that violate regulations on OSH also account for a large proportion of all contents of OSH.

Garment is a potential industry, making a great contribution to the national GDP (from 10-15% of GDP), and also creating many jobs for the economy. But from the study of statistics on occupational accidents, diseases and the number of violations of regulations on OSH in garment enterprises in Vietnam, shows that the implementation of OSH in garment enterprises still has many problems that need to be improved to implementing responsibilities, ensuring the occupational safety and health rights of employees, towards sustainable development, the author would like to give some suggestions as follows:

For garment businesses

- Be aware of the role of OSH

Implementing OSH has been costly in the short-term, but employers gain in the long-term, that include: protecting and enhancing brand image and brand value; helping the employee maximize their productivity; helping employees adhere to the business; building a more competent, healthier workforce for enterprises; reducing business costs and disruption because of cutting down accidents; enabling businesses to meet customers' OSH expectations, and encouraging them to stay longer in active life.

Risks at work should be reduced to a minimum, because they may damage the health of employees, losses the cost and reputation for companies, and damage to economies. Therefore, employers need to plan to identify, assess the dangers and risks in the workplace and implement preventive measures for employees. It is necessary to build into a system of risk control and prevention and regularly evaluate and improve this system.

Every enterprise can enjoy worthy of attention benefits by investing in OSH. Simple improvements in OSH can increase competitiveness, profitability and increase the motivation of employees. The performance of an OSH management system provides an effective framework to prevent or minimize accidents and ill health, help enterprises developing in sustainability.

- Promotes training on OSH for employees

The training OSH is really important because the purpose of training is to raise employees' awareness of the role of oc-

occupational safety and health in the health and life of employees, provide them with safe working knowledge, lead to safe and health-oriented behavior. Training is seen as a vital part of prevention measures which has eliminated risks and prevented them from the causing source.

- Strengthen communication on OSH for employees

The data in part 4 is shown that the awareness of employees about risk is low, they are ready to take off the protective equipment to get convenience instead of their safety. The reason is the lack of knowledge about safety. To improve this issue, employers need to promote communication of the information about OSH to employees to raise awareness of safety for workers.

For state management agencies

- Strengthen the inspection, examination and handling of violations in OSH at garment enterprises.

The implementation of occupational safety and health in enterprises needs to be closely and regularly monitored and checked by government management agencies to ensure that enterprises comply with the law on OSH.

The OSH inspectors will note the issues that are not regulated by the law, the problems that are still inadequate to propose to the superiors in amending the laws. In addition, the occupational safety and health inspectors also advise employers and employees on measures to overcome shortcomings in the implementation of OSH at enterprises so that OSH practices in enterprises are effective. The reality showed that the OSH improving suggestion is important to help the enterprise in building the OSH system.

- Strengthen communication and education on OSH legislation for employees and employers.

The employees in garment enterprises are mainly low qualifications so they almost lack law knowledge. They do not aware of their duties and rights in OSH. The government needs to select suit method in communication for low qualification workers. With the worker, seminar or book is not suit. They will be impressed with a short phrase, an image, or a short story. The government could research to find out an effective way to give information to them.

- Increase the level of OSH's penalty to deter OSH violations.

Currently, the level of administrative penalties for violations of the law on occupational safety is still very low. In fact, the administrative fine level of enterprises is not enough of a deterrent, so violations of the law on occupational safety and hygiene still take place at a high rate.

The Government should research to increase the appropriate fines and expenditures and consider using forms such as suspension of operations or deprivation of business license.

- Increasing the supervisory role of OSH implementation in garment enterprises by unions.

Trade unions are organizations that represent and protect the interests of workers. According to the provisions of national law, trade unions have the duty to supervise the im-

plementation of occupational safety and health of enterprises. However, in Vietnam, trade unions are mostly part-timers, receiving salaries from employers. This makes unions vulnerable and dependent on employers.

The State needs to strengthen the protection of the supervision rights of trade unions and workers in order to effectively use this monitoring channel.

For workers

- Actively improve their understanding of their rights and responsibilities in OSH: In relation to employers, workers are often seen as weaker, however, this does not mean that workers can not protect their basic rights. The law has specific provisions to protect workers to a certain extent, importantly, the workers themselves. They need to be more proactive in recognizing their rights and taking action to protect them. In order to do that, they first need to actively increase their understanding of labor laws and promote the activities of workers' unions.

REFERENCES

- [1] Bowen, R. H, "Social responsibility of the businessman", Harper & Row, New York., 1953
- [2] Elkington, "Cannibals with Forks: The Triple Bottom Lines of 21st century Business". Capstone Publishing Limited, Oxford, 1999
- [3] Lorraine Sweeney, "A Study of Current Practice of Corporate Social Responsibility (CSR) and an Examination of the Relationship Between CSR and Financial Performance Using Structural Equation Modelling (SEM)", 2009
- [4] United nations, "The corporate responsibility to respect human rights". An Interpretive Guide - New York and Geneva, 2012
- [5] Đinh Thị Hương, "Trách nhiệm xã hội đối với người lao động của các doanh nghiệp may Việt Nam", Đại học Thương mại, 2019
- [6] Beresford D. and Freeman S, "Companies Increase Social Responsibility Disclosure Management Accounting", Journal of Business Ethics, 51-5, 1979
- [7] Clarkson M, "A stakeholder framework for analyzing and valuating corporate social performance". The Academy of management review 20(1), 92-117, 1995.
- [8] Robertson D. and Nicholson N, "Expressions of Corporate Social Responsibility in UK Firms", Journal of Business Ethics 15(10), 1095-106, 1996
- [9] Ashridge, "Catalogue of CSR Activities: A Broad Overview Ashridge Centre for Business and Society", Hertfordshire, 2005
- [10] ILO, "Cải thiện An toàn và Sức khỏe cho Lao động trẻ", ILO, 2018
- [11] ILO và IFC, báo cáo tuân thủ lần thứ 10, ILO, 2019
- [12] ILO và IFC, báo cáo tuân thủ lần thứ 9, ILO, 2017
- [13] Phạm Trọng Nghĩa, Pháp luật về lao động trong quá trình toàn cầu hóa, 2009
- [14] Nguyễn Thị Minh Nhân, Quản trị thực hành trách nhiệm xã hội, NXB Đại học Quốc gia Hà Nội, 2019
- [15] Viện khoa học lao động và xã hội, "Tác động của các hiệp định thương mại tự do thế hệ mới đến vấn đề lao động, việc làm ở Việt Nam", Viện khoa học lao động và xã hội, 2019.
- [16] Fanning, Fred E, *Basic Safety Administration: A Handbook for the New Safety Specialist*, Chicago: American Society of Safety Engineers, 2003
- [17] Benjamin O. Alli (2008), fundamental principle of OSH, ILO
- [18] Ron Dotson at el., Principles of Occupational Safety Management, Cognella Academic, 2017
- [19] Đặng Đình Đào, Giáo trình An toàn và vệ sinh lao động, NXB Đại học kinh tế quốc dân, 2015
- [20] Lê Thị Thu Hiền (2017), "đặc điểm lao động và một số giải pháp nâng cao chất lượng lao động ngành dệt may", Hue University

The Impacts of Corporate Governance on Information Quality on Financial Statements

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Abstract—The core aim of this paper is studying corporate governance and information quality on financial statements, then summarize the results of last papers about the factors on the impacts of corporate governance on information quality on financial statements. Based on the content of these previous papers about this topic, this paper has identified the impact trend of each factor such as the characteristics of the board of directors (BOD), the audit committee (AC) on the quality of information on the financial statements. In addition, this paper also proposes further research involved in each factor. The content of this research expands the literature of the relevant research, and it is a useful reference for regulators and researchers.

Index Terms—corporate governance; the information quality on financial statements; financial statements.

I. INTRODUCTION

IN INTERNATIONAL integration of the economies, the competition in the market requires entities to ensure “healthy enough” to be able to maintain and develop the production of business. Moreover, the businesses must not only understand the entities by themselves but also obtain reasonable strategies and understand clearly legal policies and regulations if the enterprises are to develop stability. To do this, the entities must collect and present the information having good quality, high value. Information is one of the important factors to make success, increase value-added and enhance the competition ability of businesses in the market [1].

Financial statements are the outcome of the accounting department, presenting the financial information of the entity, and are considered as one of the most important sources for internal and external users such as administrators, investors, creditors... can analyze the financial capacity of the enterprise, thereby making decisions. Accounting information is a core sector in business management system, which managers always use in forceable decisions and targets to effectively apply at work [2]. The quality of accounting information (QOAI) provided in the financial statements (FS) is a tool for CEO to control the economic - financial activities of enterprises. As a result, the entities obtain the challenges and opportunities from which to outline the strategies, management plan, business operation and these are the basis for making economic decisions. Furthermore, the accounting information also helps others such as authorities, investors, suppliers, creditors to have business plans, policy adjustments and obtain performance evaluations to achieve their purpose [3].

Research results of ACFE - Association of Fraud Investigators in the period 2016-2017 in 125 countries, there were 2,690 fraud cases that caused a loss of US\$7.1 billion, of which fraudulent financial statements despite accounts for only 10%, less than property embezzlement, but causes a high average loss of \$800,000 per fraud. There were various errors in presenting accounting information which has caused negative impacts on the world economy, for example, because of fraud, embezzlement and excessive interference in the accounting work of managers with an amount of more than 600 million USD in the financial scandal of Tyco International group which operates in the field of pipeline construction in America [4]. Another instance, the intentional act of concealing the losses in Toshiba Corporation in Japan in the period from 2008 to 2014 by using tricks to overstate profits and overstate revenue up to \$1.2 billion. dollars... causing significant impacts on financial markets in the world [5].

There were numerous impacts on the reward of relevant in many ways if the managers used discretionary accounting methods and different techniques to prepare financial statements that positively describe business activities and financial position performance [6] or gain information on financial statements as they desired [7] to protect the reward of an individual or organisation [8]. There was a variety of papers about the influence on characteristics of corporate governance (CG) on the QOAI presented, aspects studied such as: independence of BOD, BOD size, ownership characteristics, chief executive officer (CEO) earnings, characteristics of the audit committee. The main research direction of these studies is to examine the influence of factors related to the BOD, the Board of Supervisors or the AC on the quality of financial statement information. This paper studied repeatedly some independent variables such as: the independence of BOD, the AC, the CEO's duality, CEO's gender. In addition, each research paper contributes to the diversity of this topic of research by adding or changing the independent variable.

Based on summarizing and arranging papers followed by publication time, the paper will show the trends in the influence of elements on the quality of information on FS and propose further research related to this topic. For business owners, the paper provides evidence on the impact of CG on the quality of the information in the financial statements, then the business owners will take measures to control the activities of the BOD to limit the risk. Based on the over-

view results, enterprises can issue regulations related to corporate governance to prevent information quality behavior on financial statements. Researchers can explore the research gap outlined in the paper to study future research on related topics.

The paper structure includes 4 main parts: Introduction, background theories, Methodology, Results and conclusion.

II. BACKGROUND THEORIES

A. Overview of corporate governance (CG)

The origins of CG arise from the single of ownership from management in companies which is publiced on the stock market. This separation has measured the conflict between capital and operating capacity, between investors and managers, and this also created the risk of conflicts of reward, making the operating efficiency of the enterprise not reach the highest performance. CG is a system consisting of people, processes and activities that can help they have a management their assets [9]. Similar to this, there are studies that consider corporate governance as an important tool to control management activities in enterprises [10]. From the perspective of investors, research by Maines (2006) suggests that corporate governance is the commitment to pay a fair return on invested capital and ensure the efficient operation of business operations from investment capital [11]. From the above quotations, it can be seen that there are many different definitions of corporate governance, there is no concept of CG that can be used in every insitutions and countries. However, most of the concepts put the enterprise at the centre position, so it can be summarized: CG is a system of relationships between stakeholders with interests. Sometimes conflicting interests related to the direction and control of the enterprise's activities to appropriately divide the rights and responsibilities.

The Board of Directors (BOD)

The BOD is a governance mechanism, consisting of members selected by shareholders, playing a central role in the supervisory system. With the assignment of the management department of the enterprise, the Board of Directors represents the shareholders to inspect and monitor the activities of the BOD, and plays a significant taskments in controlling the major issues [12].

In Vietnam, according to the Enterprise Law 2020 No. 59/2020, the BOD is the management division of the company and has all authority on behalf of the company to decide and exercise the rights and obligations of the company, except rights and obligations under the authority of the General Meeting of Shareholders. Companies, depending on the characteristics of the business, will conduct the election of members of the BOD through the General Meeting of Shareholders, ensuring the provisions of the law on the structure of the BOD.

Board of Supervisors (BOS)

The BOS is a governance mechanism, consisting of surveyors elected by the General Meeting of Shareholders. Research by Bezemer et al (2012) suggests that the Board of Supervisors is the solution to the legal representative person. The supervision of the Supervisory Board minimizes the

problem of asymmetry of information between shareholders and managers, preventing misleading acts for the personal purposes of executives [13]. In terms of management structure, not all joint- stock companies must have a Supervisory Board. This depends on the regulations of each country. In Vietnam, according to the Enterprise Law 2020 No. 59/2020, joint-stock companies have the right to choose the management organization and operate according to one of two corporate governance models with or without a Supervisory Board but must have AC under the BOD. The organizational framework, functions and duties of the AC are specified in the company's charter or the operation regulations of the AC issued by the BOD. Unlike the Supervisory Board, which supervises both the BOD and the BOD, the AC is a specialized department under the BOD, focusing mainly on the task of supervising the activities of the enterprise.

B. The qualitative information of financial statements

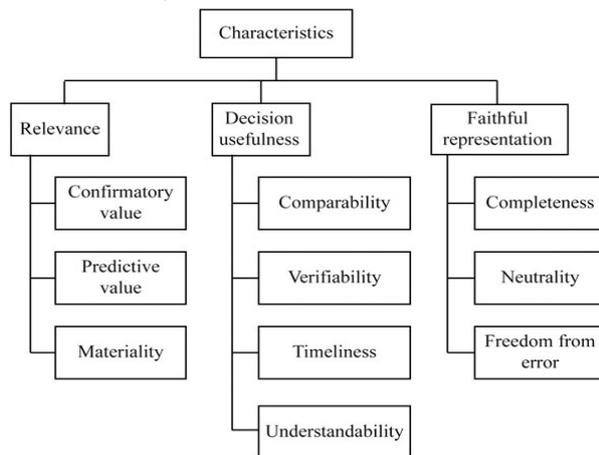
Financial statements are the outcome of financial accounting, the product of the accounting information system, reflecting in a strict structure the financial position and financial performance of the enterprise to meet the requirements of most people who used financial information in making economic decisions, it also shows the management results of the BOD with respect to the resources entrusted to these people (IASB, 2018). In order to adapt to changes in the international business environment following the trend of integration, financial statement information is understood in a wider and more multiway sense [8]. On the other hand, the information provided by financial statements must be useful to users in any sense [14]. Overall, that the quality of information on FS is an emotional evaluation factor between the issuer of financial statements (mainly represented by organizations, enterprises, and companies) and those interested in enterprises (investors, policymakers, shareholders...) but can still be quantified to match the aspect of the information. While the smaller the difference between the required accounting information and the expected information in the FS, the higher the quality of information on the FS [15].

Various research, viewpoints of accounting professional organizations in different countries have agreed to describe the useful value of information on FS provided through the specific description of characters and requirements. The quality of information on FS are regulated by professional accounting organizations (IFRS Framework, FASB, AASB).

The International Accounting Standards Board (IASB) when issuing the International Accounting Standards (IAS/IFRS) agreed that the common objective of FS is to "provide useful financial information to investors, lenders, other existing and potential creditors in decision-making". Therefore, in "Report on Accounting Concepts No. 8"- in chapter 3 (2010) when describing the qualitative characteristics of accounting information, it was supposed that "Accounting information is considered useful when it must be useful to what it implies and represents". As a result, when issuing the International Accounting Standards (IAS/IFRS), the common objective of financial statements is to "provide useful

financial information to existing and potential stakeholders in decision-making”. These aspects are shown in diagram 1:

DIAGRAM 1: THE QUALITATIVE CHARACTERISTICS OF FINANCIAL INFORMATION



Source: According to IAS 01, 2010

III. METHODOLOGY

In this article, the authors have used qualitative research methods to synthesize research results on the influence of factors of corporate governance on the quality of information on FS from last papers on the world. Thereby, suggesting further research directions related to each factor. To find documents for the paper, we accessed many international databases such as: Emerald, ScienceDirect, Proquest, Google Scholar. The main keywords used to search are “corporate governance”, “Fraud or Errors”, “financial reporting quality”, “discretionary accruals”. Criteria for selecting articles are based on the prestige of the journals in which the article is published.

To ensure that the previous research papers found which obtained high quality and relevant to the topic of financial reporting information quality, the papers are published in the journals listed with the keyword “Accounting”. Initially, collect articles with a high number of citations, based on the reference list to continue to find related articles. After that, we continue to find out in magazines with one of the following keywords: "Finance", "Economics", "Business". Because the article is interested in the research involved in the impact on CG factors on the quality of financial statements information, from the articles found, we select the most relevant ones to the mentioned topic. and prioritize articles with the highest number of citations and the most recent publication time.

At first, we found 117 papers, after the selection steps described above, we kept 42 papers to use in this paper. Out of 42 previous papers, there was a paper published in 2002, and one was published in 2009, these are two research articles with a high number of citations and published in prestigious journals, which play a leading role in the research related to the topic of this paper. The rest of the articles were published between 2012 and 2020.

IV. RESULTS AND CONCLUSION

Corporate governance must ensure the disclosure of appropriate and truthful financial and non-financial informa-

tion to shareholders. According to Maines (2016), in order to provide quality financial statement information, it is necessary to have an effective control mechanism for the preparation, presentation and disclosure of FS [11]. The control function in corporate governance aims to monitor, supervise and check the process of preparing, presenting and disclosing information on financial statements [1]. Most of the previous studies when looking at the bond between CG and financial statement information quality were aimed at the BOD and the AC. The BOD and the AC as shareholder representatives supervise the Board of Management [6] and they are expected to monitor the quality of FS in order to increase the integrity of the FS. information on the FS. Cohen et al (2010) argue that CG factors such as: The BOD, the AC,.. plays a noticeable sectorin ensuring the quality of FS information.

A. The impact of BOD on the quality of financial information on FS

Niu et al. (2006) argue that the characteristics of FS information strongly bank on the characteristics of CG [17]. In other words, the BOD is responsible for overseeing the company's financial reporting process [5].

Size of BOD

The size of BOD illustrates how many members of the BOD. With this character, the studies give different views, focusing on 3 directions: (a) BOD size has a positive relationship with the quality of financial statements [4]. (b) BOD size is negatively related to the quality of financial statements, for example: Panzer (2005) concludes that in companies with a smaller number of members of BOD, financial statements fraud rarely occurs. The third view (c) believes that the size of the BOD is not related to the quality of financial statements information [10].

Duality

The chairman of the BOD has control over the operations of the entity and has influence over the rank of management oversight and the FR process of the entity. One of the requirements of CG is to strengthen the supervisory function by limiting the concentration of power. The dual titles of General Director (CEO) and Chairman of the BOD often tend to concentrate power in one person. According to Alzoubi (2012), when managers have both incentives and opportunities, they will perform profit management behavior, which leads to low quality of financial report information. [20]. Anderson et al (2003) found that the separation of the roles of chief executive officer (CEO) and chairman of the BOD seems to have a positive impact on the (QOAI). [21]. Except for Cheng, Courtenay (2006), in their research did not find any correlation between duality and voluntary publication, most other studies concluded that the duality of two titles leads to deterioration of financial statement information quality [9]. Nadia Smaili, Réal Labelle (2009) believe that holding two positions will lead to fraudulent financial statements. [24].

Independent member of the Board of Directors (BOD)

Independent members of the BOD are members who are not responsible for running the company and are not dependent on the company, they are only involved in providing solutions and supervision for the CEO [5]. Forker (1992) ar-

gues that the presence of non-executive members on the board of directors improves the quality of financial information [12, 23]. These studies suggest that independent members of the BOD tend to protect the interests of shareholders more than others (Felo, 2003). According to Huang Zhizhong, Zhang Juan (2011) reviewed 880 republished reports of 465 listed companies on the Shanghai and Shenzhen Stock Exchanges of China, they argued that the proportion of independent members on the BOD with higher the level of governance, the less re-disclosure of financial statements [19]. And this feature also contributes to reducing financial reporting fraud (David B. Farber, 2004; Nadia Smaili, Réal Labelle, 2009) [4,7]. In contrast, different from the above studies, according to Srinivasan's (2004) study, there is a conclusion when providing evidence that independent members of the Board of Directors are involved in detected frauds related to financial information disclosed by the company.

Member of the Board of Directors with expertise in financial accounting

The BOD's financial accounting expertise is another element of board characteristics that may influence presenting financial statements. Directors with accounting expertise are skilled professionals, with experience working in the financial accounting field [20]. Professional members will help the Board of Directors in the orientation and strategy of monitoring the internal control system and risk management, controlling manipulation and ensuring the truthfulness of financial statement information. Empirical studies show that financial expertise is a decisive factor for the quality of financial statements [4, 15].

Despite there are still a few opposing views, most show that the presence of members with financial accounting expertise on the BOD, especially independent members of the BOD will contribute to enhancing the quality of financial statements information. Typically, there are studies by Agrawal & Chadha (2004) that the presence of independent BOD with financial accounting expertise helps the BOD to better monitor the financial statement preparation process, thereby reducing the risk of financial fraud behavior of financial statements [6]. Meanwhile, Ismail et al. (2010) researched 400 listed companies in Malaysia, there was no evidence of any association between professional membership and the truthfulness of financial statement information [9].

Frequency of meetings of the BOD

The frequency of meetings of the BOD shows the number of meetings of the BOD in a given time unit, usually a year. The higher the meeting frequency, the more time the members of the BOD must discuss the issues of planning and monitoring the BOD. According to Xie et al. (2001), the BOD having many meetings has a positive relationship in reducing fraudulent behavior and increasing the quality of the information in FS.

Board of Directors' gender

Research by Barker and Mueller (2002) concluded that CEO gender has an impact on corporate governance policies. Accordingly, a series of studies check the influence of gender diversity on earnings management behavior. on the quality of information on the financial statements made. [13]. Most studies have found a negative relationship be-

tween the presence of women on the BOD and the quality of information on FS, such as the study of Al Azeez et al (2019) claiming diverse Gender in the BOD will limit the behavior of profit management, thereby increasing the quality of the information in the FS [20]. Research by Lakhal et al (2015) gives different results that if there are more women in the BOD, the higher the quality of information on the FS and there should be at least three women on the BOD, this result is similar to Research by Arun et al (2015). However, the novelty of Arun et al. (2015) is to find a positive relationship between the number of female directors and the quality of information on financial statements in companies with high debt [15]. The negative relationship between the presence of women on the BOD and the quality of information on FS is again confirmed in the study of Gull et al (2018), Zalata, Tauringana, and Tingbani (2018) [22].

In conclusion, a general view of the studies examining the relationship between the characteristics of the board of directors and the quality of financial statements information has conflicting research results, so research in the future may continue to check this relationship to add to the reference.

Besides, in studies on the influence of governance characteristics on the quality of information on financial statements, researchers often exclude financial services and insurance companies in the survey sample. The researchers explain that the performance characteristics of these companies are different from the rest, which leads to the difference in financial information. This creates an opportunity for future research, this relationship can be explored in studies where the survey sample is companies dealing in financial services and insurance [16]. And with the trend of the market economy using later period data can provide more relevant results.

B. The impact of the characteristics of supervisory board on the quality of information in the FS

The Supervisory Board includes controllers elected by the General Meeting of Shareholders. Research by Bezemer et al (2007) suggests that the Supervisory Board is the solution to the agency problem. The Supervisory Board in the enterprise is obliged to supervise and evaluate the exercise of rights and obligations of the members of the BOD, the Director or the General Director of the company; monitoring and evaluating the effectiveness and compliance with internal audit regulations, risk management and prevention regulations, reporting regulations and other internal governance regulations of the company; supervise the legitimacy, systematicity and honesty in accounting work, accounting books, in the contents of financial statements. Accordingly, the Supervisory Board is expected to operate effectively, thereby improving the quality of financial statements [13]. Deriving from previous studies and collected data, the thesis studies the impact of the Supervisory Board's characteristics on the quality of the information in the FS in terms of size, seniority, expertise in finance and accounting and gender of the Supervisory Board member.

The size of the Board of Supervisors

The size of the Supervisory Board represents the number of members in the Supervisory Board. According to Firth et

al. (2007), the size of the Supervisory Board is an important factor in improving the quality of financial statements because large-scale Supervisory Boards can have an advantage based on a broader knowledge base and therefore perform better. a more effective supervisory role. In addition, the increase in the number of members allows the members to divide the supervisory workload more appropriately, each member will have specific time and tasks to perform their responsibilities, so the financial statements With better quality, the information on the report becomes more relevant for users to make effective decisions [14]. This result is also agreed by Hendra (2016) [7]. However, some studies did not find evidence of the influence of Supervisory Board size on the quality of the information in financial statements such as Xie et al (2003) [4].

Board of Supervisors’ experience

The seniority of the Supervisory Board represents the working time of the Supervisory Board members at the enterprise. Chen et al. (2006) argue that the attachment of the members of the Supervisory Board shows the experience and understanding of that member with the enterprise [10]. Sticking with the enterprise allows these members to gain working experience and at the same time understand the specifics of the business, especially the unit's internal control system, thereby improving supervision efficiency. , increasing the quality of information on financial statements. However, Anisykurlillah et al (2020) did not find evidence of the relationship between the seniority of the Supervisory Board and the quality of the information in the financial statements [15].

Member of the Board of Supervisors with expertise in financial accounting

Research by Anisykurlillah et al (2020) has shown a positive correlation between the financial expertise of the Supervisory Board and the quality of the information in the financial statements [15]. The reason is that the knowledge of accounting and finance allows the members of the Supervisory Board to easily and independently access the accounting issues of the enterprise easily. They are qualified to evaluate the accounting methods, estimates and assumptions made on the company's financial statements in order to promptly detect and correct early years and residual errors on the financial statements. These members also have the ability to understand the issues of the independent auditor and assist the auditor in the event of a conflict with the Board of Directors to ensure the quality of the audit and the post-audit report. Ran et al (2015) also pointed out that when the Supervisory Board has expertise in the accounting field, they are able to detect profit management and financial fraud in a timely manner, thereby improving the quality of information. information on financial statements [23]. However, the study of Hendra (2016) did not find evidence of this relationship [18].

The Board of Supervisors’gender

When researching the quality of information on financial statements, many studies have demonstrated the positive impact of the presence of female members in the Supervisory Board on increasing the transparency of financial statements. Studies show that women are close supervisors in management, they value independence and are more likely

to act in the interests of shareholders [19]. This is because they have more risk aversion and are more sensitive to ethical standards than men [11], so they have a higher level of vigilance to ensure confidentiality, and are suitable for supervisory roles. close [9, 23]. In addition, women are also more likely to adhere to rules and regulations in making financial decisions than men [24]. From this, the authors believe that female members of the Supervisory Board will examine control activities more seriously and thoroughly than their male counterparts, so companies with a high percentage of female members on the Supervisory Board will promote the supervision function well, thereby improving the quality of the information in financial statements [23].

According to the research, the members of the Supervisory Board to ensure the good performance of the role of increasing the quality of the information in the financial statements need to meet the requirements such as having expertise in finance, accounting and being a woman. However, regulations on control boards in enterprises in different countries are different; Therefore, future research when studying the influence of the supervisory board on the quality of information on financial statements can be selected in emerging and developing economies and should pay attention to the specific regulations of each. nation. How is the identification of the role of the supervisory board before and after the application of corporate governance rules? Whether the quality of financial statements can be improved is still a topic that needs to be focused on research.

TABLE 1. SOME STUDIES ON THE INFLUENCE OF CORPORATE GOVERNANCE ON THE QUALITY OF THE INFORMATION IN FINANCIAL STATEMENTS

Authors	Country	Results
Studies on the influence of board characteristics on the quality of information on financial statements		
Vafeas (2000)	America	Board size has a adverse impact on the quality of information on FS
Xie et al (2003)	America	The size of the BOD, the percentage of independent members who are organizations and the independent members of the BOD with financial expertise have a decisive impact on the quality of information in the financial statements.
Dimitropoulos và Asteriou (2010)	Greek	The percentage of independent members has a decisive impact on the quality of information on FS.
Fathi (2013)	France	Board size, being audited by reputable auditing firms have a decisive impact on the quality of information in financial statements.
Holtz và Sarlo Neto (2014)	Brazil	The number of members of the BOD and the duality of the chairman of the Board of Directors have an adverse impact on the quality of information in the FS. The percentage of independent members has a decisive impact on the quality of information on FS.
Kukah và cộng sự (2016)	Ghana	The independence of the BOD, the non-duality between the two titles of Chairman of the BOD and CEO has a positive impact on the quality of information in the FS.

Authors	Country	Results
Roden et al (2016)	America	The seniority of the Board of Directors, the duality between the two titles of Chairman of the Board of Directors and CEO, the proportion of members of the Board of Directors who are male have a negative impact on the (QOAI).
Studies on the influence of Supervisory Board characteristics on the quality of information on financial statements		
Firth et al (2007)	China	The size of the Supervisory Board has a decisive impact on the quality of information in the FS.
Ran et al (2014)	China	Members of the Supervisory Board have accounting expertise and the Supervisory Board has a high percentage of women, which has a decisive impact on the quality of information in the FS.
Panzer và Müller (2015)	Germany	The members of the Supervisory Board and the deputy head of the Supervisory Board are women with an decisive impact on the quality of information on FS .

Source: Synthetic group of authors

V. CONCLUSION

The paper summarizes the previous research results on corporate governance to the quality of information on financial statements, in which, the factors of corporate governance are considered: the size of the board of directors, gender in the BOD, CEO duality, audit committee characteristics... This topic can be explored for future research by expanding the object of analysis, paying attention to specific businesses such as financial companies, insurance and should choose the research context as countries with developing economies. In addition, the in-depth research on the elements of corporate governance also creates opportunities for further research, for example when studying the influence of CEO duality on the quality of information on FS combined with the CEO tenure.

One of the limitations of the paper is that the number of research articles is not much, so it is possible to omit other elements of the corporate governance mechanism. Secondly, although mentioned, not deeply analyzed the control variables in the research model of the authors. Thirdly, the paper only stops at an overview, identifies the impact trend, but has not tested the specific model. Despite the mentioned limitations, the results of the article have increased the content of the literature review on the topic of information quality on FS, so researchers may be interested in research proposals. In another aspect, this will be a remarkable reference when authorities issue regulations on corporate governance mechanisms, aiming to limit the quality of information on FS, ensuring the quality of the FS.

REFERENCES

- [1] Liu & Lu, *Corporate governance and earnings management in the Chinese listed companies: A tunneling perspective*, Journal of Corporate Finance, Vol.13, 2007, pp.881-906
- [2] Huang, K. T., Lee, Y. W., Wang, R. Y. *Quality information and Knowledge*, New Jersey: Prentice Hall, 2007, pp.281-311
- [3] Gacheru, F.A.I.T.H. *Effect of Financial Accounting Information Quality on Decision Making: a Survey of Public Benefit Organizations in Nairobi County*, 2017, pp.811-825
- [4] Xia, B. and Zhao, C., January. *Empirical Research of the Relationship between Characteristics of Supervisory Board and Earnings Quality*. In 2009 Second International Workshop on Knowledge Discovery and Data Mining, 2009, pp. 409-412.
- [5] Roden, D.M., Cox, S.R. and Kim, J.Y. *The fraud triangle as a predictor of corporate fraud*. Academy of Accounting and Financial Studies Journal, 2016, 20(1), p.80.
- [6] Hendra, G.I. *Analysis of the Effect of Sharia Supervisory Board (SSB) Function on Earning Quality of Islamic Banks*. Tazkia Islamic Finance and Business Review, 2016, 10(2).
- [7] Well, Joseph T., *Corporate fraud handbook: Prevention and Detection*, Wiley, Hoboken, ISBN 9781118757260, 2013.
- [8] Azar, N., Zakaria, Z. and Sulaiman, N.A. *The Quality of Accounting Information: Relevance or Value- Relevance?* Asian Journal of Accounting Perspectives, 2019, 12(1), pp.1-21.
- [9] Mulyani, S. and Arum, E.D.P. *The influence of manager competency and internal control effectiveness toward accounting information quality*. International Journal of Applied Business and Economic Research, 2016, 14(1), pp.181-190.
- [10] Chen, H., Chen, J. Z., Lobo, G. J., & Wang, Y. *Effects of audit quality on earnings management and cost of equity capital: Evidence from China*. Contemporary Accounting Research, 2011, 28(3), 892-925.
- [11] Maines, L.A. and Wahlen, J.M. *The nature of accounting information reliability: Inferences from archival and experimental research*. Accounting Horizons, 2006, 20(4), pp.399-425.
- [12] García-Meca, E. and Sánchez-Ballesta, J.P. *Corporate governance and earnings management: A meta-analysis*. Corporate governance: an international review, 2009, 17(5), pp.594-610.
- [13] Bezemer, P. J., Peij, S. C., Maassen, G. F. and van Halder, H. *The changing role of the supervisory board chairman: the case of the Netherlands (1997– 2007)*. Journal of Management & Governance, 2012, 16(1), pp.37-55.
- [14] Healy, P. M. and Wahlen, J. M. *A review of the earnings management literature and its implications for standard setting*. Accounting horizons, 1999, 13(4), pp.365-383.
- [15] Kahn, Beverly K., and Diane M. Strong. *Product and Service Performance Model for Information Quality: An Update*. IQ, 1998, 102-115.
- [16] Cohen, D., and P. Zarowin. *Accrual-based and real earnings management activities around seasoned equity offerings*. Journal of Accounting & Economics 50 (1): 2–19 companies: A tunneling perspective, Journal of Corporate Finance, 2016, Vol.13, pp.881-906
- [17] Niu, F. F., *Corporate governance and the quality of accounting earnings: a Canadian perspective*. International Journal of Managerial Finance, 2006, 2(4), 302- 327.
- [18] Panzer, L. and Müller, S. *Earnings quality and gender diversity on German supervisory boards: an empirical analysis*. Problems and perspectives in management, 2015, (13, Iss. 4), pp.9-18.
- [19] Panzer, L. and Müller, S. *Earnings quality and gender diversity on German supervisory boards: an empirical analysis*. Problems and perspectives in management, 2015, (13, Iss. 4), pp.9-18.
- [20] Alchian, A.A. and Demsetz, H. *Production, information costs, and economic organization*. The American economic review, 1972, 62(5), pp.777-795.
- [21] Afify, H.A.E. *Determinants of audit report lag*. Journal of Applied Accounting Research, 2009, Vol. 10 No. 1, pp. 56-86.
- [22] Vafeas, N. *Board structure and the informativeness of earnings*. Journal of Accounting and Public policy, 2000, 19(2), pp.139-160.
- [23] Ran, G., Fang, Q., Luo, S. and Chan, K.C. *Supervisory board characteristics and accounting information quality: Evidence from China*. International Review of Economics & Finance, 2015, 37, pp.18-32.
- [24] Bernardi, R.A. and Arnold Sr, D.F. *An examination of moral development within public accounting by gender, staff level, and firm*. Contemporary Accounting Research, 1997, 14(4), pp.653-668.

Framework of Using Techniques in Human Resource Management in Vietnamese Companies

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Abstract—The COVID-19 pandemic requires many companies changing the way of their operations because of the lock down of movement and limitation of facing contact, etc. This also is an opportunity for companies to utilize technology and use digital space to keep their works and companies' activities. Companies can encourage their labors via policies of promotions. However, how to evaluate employee performance fairly, unbiasedly, and transparently? The existence of AI (Artificial Intelligence), especially machine learning, might be a solution for this due to the fact that it can automatically evaluate individual workers' performance. Therefore, the performance evaluation process ensures that the system works without interference from people outside of the system. In the paper, a framework of KPIs building systems to evaluate individual workers is represented as a solution for applying the advantage of AI (machine learning techniques) in Vietnamese companies. It can help them to improve the labor productivity and increase the workers' quality in the labor market in general.

Index Terms—Human Resource Management; Machine Learning; Artificial Intelligence (AI); Techniques; individual KPIs.

I. INTRODUCTION

HUMAN resource management activities also have been changed with the significant development of the Fourth Industrial Revolution. At the beginning, human resources work mainly related to supervision, salary calculation, bonus, welfare and labor safety. The human resource management process became easier with the help of computers, internet, etc. The more development of technology, the more convenient the management of human resources can be. Therefore, human resource activities have time to focus on recruiting and attracting talent employees from alternative resources as well as improve the optimization of management in work allocating.

The challenges for many companies in COVID-19 pandemic are the lockdown of movement, limitation of facing contact, etc. All these might provide opportunities for companies to utilize technology and use digital space to keep their works and companies' activities. The existence of AI (Artificial Intelligence), in particular to machine learning such as chat bot, might let many people to concern about the fear of being replaced [8]. However, the existing of AI here

means helping people in their works as well as improving their work performances. For example, by using machine learning techniques, human resource recruiters can be able to select the right employees from many talent profiles in the massive selective job platforms.

The term artificial intelligence¹ (AI) started in the 1950s, which tried to build a machine to mimic people's thinking. By that time, the development of AI is wide with the abilities of deep learning, problem solving, recognizing etc. Machine learning is a main field of AI in which people can teach the machine (computer) doing. According to [6,7], machine learning can be applied widely in alternative areas because it can create outcomes from diverse domains. Machine learning going with AI technologies also offers many significant opportunities and challenges to organizations. For example, it might change an organizational structure such as the capacity to constrain, complement, or substitute for humans at work [13]. These changes might shift the management from the exclusive domain of humans to a new method of management and it requires the development of a combination between machine working (with AI) and human beings in new ways to establish a new method of work, or new forms of work in the company [1, 2, 11].

In Vietnam, not many Vietnamese companies have used this advantage of AI particular machine learning techniques because of the expensive system installation. However, nowadays, the cost of SaaS (software as a Service) can help the company cut down the cost of system deployment. Therefore, Vietnamese companies have a chance to apply the advantage of innovation of Technology such as machine learning in their business, in particular to human resource management. The research objective here is applying the advantage of machine learning techniques in human work's performance evaluation sector by using the framework of work's performance evaluation system with machine learning techniques such as clustering. This is because the machine techniques can ensure the performance evaluation system to perform independently without the involvement of people outside the system. This leads the system becoming a transparent, fairness, and trusted evaluation one.

II. LITERATURE REVIEW

A. The challenges to human resource management in Vietnamese companies

In general, the use of human resources with machine learning can be seen as the transformation of human resource services with the help of using AI to support the decisions in employees' works.

Vietnam ranked the 48th over 100 for the structure of production as well as the 53th over 100 with factors leading to production according to WEF [3], in 2018.

On the side of human resources, Vietnam also only stops at 70th position, in which the indicators of highly skilled labor and university quality are also low (ranking 81st and 75th respectively). In the ASEAN region, in terms of innovation technology and human resources rankings, Vietnam ranks behind Malaysia (with ratings of 23 and 21 respectively), Thailand (41 and 53), and the Philippines (59 and 66). Although information technology in Vietnam has significant growth nowadays, the requirements of training high quality human resources who are adaptable to the innovation are necessary.

The inevitable trend of the 4.0 technology revolution will impact the supply and demand of labor as well as the shift in labor resource structure. In the process of transforming labor structure, improving the quality of human resources is urgent [4], [18]. According to [14], [15] the opportunities and challenges that Vietnam faces in the Fourth Industrial Revolution are: Vietnam has a dynamic economy and a young population, so it is easy to access new technologies of the Fourth Industrial Revolution; The large market size and relationships with many countries around the world are good conditions for the production and exchange of goods. However, Vietnam has not yet met the high-quality labor force. Besides that, the phenomenon of brain drain is happening. This is because of the policy of attracting talent from International companies and the free labor movement in the ASEAN region. This phenomenon makes the labor force in Vietnam increasingly in shortage.

Here is a context in the Vietnamese labor market. In Fig. 1, the total of employed workers is 53.61 millions in alternative employment status. This takes up half the proportion of the Vietnamese population (over 98 millions).

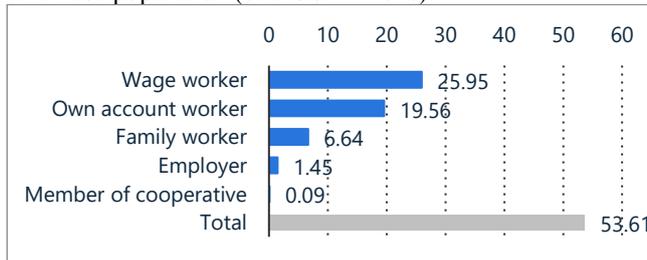


Fig. 1: The number of workers with employment status in Vietnam in 2020, (in millions)

(Source(s): General Statistics Office of Vietnam; Statista, 2021)

In Fig. 2, the rate of workers in rural areas is more than double that of urban. This is appropriate to the Vietnam population characteristics of an agricultural country. However, there is not much of a difference between rural labor and urban labor.

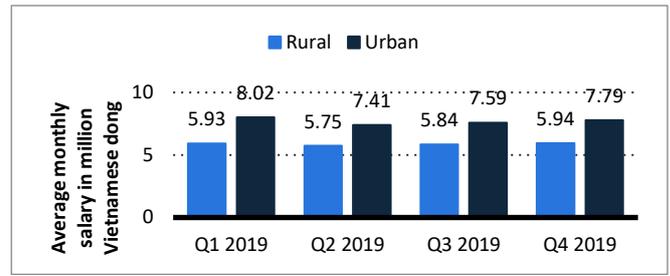


Fig. 2: Monthly salary for workers and employees in Vietnam by area (on average) in 2019

(Source(s): General Statistics Office of Vietnam; Statista, 2021)

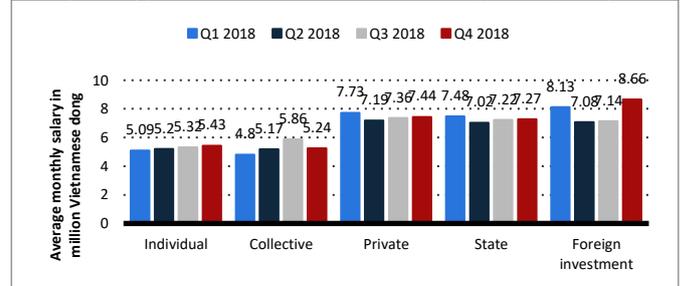


Fig. 3: Monthly salary for workers and employees by economic sector and unit in Vietnam (on average) in 2019.

(Source(s): General Statistics Office of Vietnam; Statista, 2021)

According to Fig. 3, the highest rate of monthly salary belongs to foreign investment companies. There is not much different salary payment between private and state sectors.

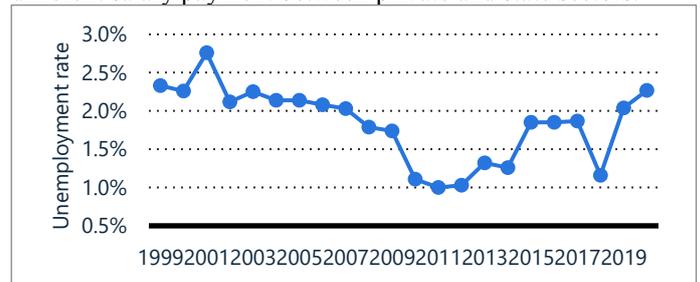


Fig. 4: Unemployment rate in Vietnam from 1999 to 2020.

(Source(s): General Statistics Office of Vietnam; Statista, 2021)

The unemployment rate in Vietnam is fluctuant. The unemployment rate is up from 2018 to now. This might be the unexpected impact of COVID-19 pandemic.

Almost all Vietnamese enterprises in Vietnam are small and medium-sized (SMEs). Their companies contribute to society by creating jobs for workers. For example, they create more than 500,000 employees every year, and hire about 50% social workers. They contribute to the nation over 40% of GDP every year [20]. However, there are very few small and medium enterprises that have long-term human resource planning. According to statistics [20], almost all the recruitment from investigated enterprises is based on the replacement of workers. In these recruitment, there is about 15% of replacements with the changes of many factors such as science, technology, new requirements of products and services, capital scale, etc.

In Vietnam, in many companies, the number of demanding planned labor shortages is calculated by each department in the companies. This is based on the current workload and normally done without the participation of the human resources department. In these companies the functions of the human resource management department are receiving labor

demanding from other departments and conducting recruitment. Therefore, to make a prediction of the forecast of human resources for further years is not interested or paid attention in Vietnamese companies in particular small or medium companies.

Job analysis

The brief detail of job analysis or description is only done in medium enterprises with a size of 50 employees or more. There is no common job description form. But the general template for drafting job descriptions can be as: Job title; Name of the department in charge of the job; Supervisor's name; Brief description of the job; Standards for getting the job done; etc. There is no existing job analysis. It is only conducted when there is a vacancy in the enterprise. There are a few companies, who have used a process to build job analysis, whereas many others do this by individual staff in the human resources department.

Recruitment

Vietnamese enterprises usually use two resources for recruitment. Firstly, the employees are recruited from internal recruitment sources. When the recruitment is carried out, the administration department will send an announcement to other departments or to the board of the enterprise system. Each department will consider the individual who is able to take on the job. Then, the company's departments will inform the administration department about the candidate.

Secondly, the employee can be recruited from outside. Currently, the recruitment through job agencies is still very limited. In fact, there are not many professional agencies who can assure the quality of the human resources for enterprises. The job agencies now operate their activities as the job exchange market. The sources from training institutions and the mass media are part of ensuring that businesses hire the right people for the right jobs. This form is usually used with enterprises having 50 employees or more. The common method of recruitment is announcements which are made via the Internet and newspapers. According to statistics [20], there are about 25% of enterprises recruiting through these mass media. This rate reflects the low rate of using technology in recruiting compared to other countries such as Asian countries.

Depending on the level of awareness and management, the effectiveness of the recruitment process is normally not evaluated. So, there is not a professional process of recruitment in Vietnamese companies.

Performance evaluation

Many Vietnamese companies use the scoring method to evaluate staff's performance. However, this evaluation is based on individual manager or manager board rather than basing on job descriptions. The assessment to workers' managers is not performed by employees in Vietnamese companies. This might reduce the opposite points of evaluation works. As a result, this might cause the disadvantages of innovation in companies' managers.

Training skills

There are not many enterprises having the strategy plan of training for their workers. They seem to focus on training the senior managers and experts. The lower workers such as technicians and workers have to train or improve their skills

by themselves. Besides that, many Vietnamese currently have not got a complete salary payment regulation for their employees

To sum up, the efficiency of management in human resources in Vietnamese companies is quite low. This needs to improve to update and meet the rapidly developing economy. To deal with this, the human resource management needs to be focused on as well as interested in Vietnamese companies in order to make an effective use of the labor resources in the enterprise.

B. Machine Learning in Human Resource management

Compared to other fields in economical society, human resources seems to be slower applying with machine learning or artificial intelligence (AI) than the other. However, if it can be used, the results are significant. For example, the use of machine learning techniques can predict employee contributions via KPI (Key Performance Indicator) or using machine learning in the recruitment process in the companies.

The improvements of machine learning such as in natural language processing contribute impressive applications. For example, intelligent chat bots which can handle some HR functions. Some companies use machine learning as intelligent assistants to support users in scheduling, project development planning or general communications instead of traditional methods [12], [9], [10].

Some human resource functions can be used with the help of machine learning are [17]:

- Create a schedule to make the interviews, group meetings in the system. Sometimes, the function might be a host of HR tasks in general.
- Produce a report on analytics related to HR data
- Rationalize workflows
- Enhance recruitment process
- Minimize the staff movement
- Train individually plan
- Monitor the cooperation and assessment
- Improve rewards and recognition programs

According to [5], the applicant of using machine learning in human resource is tracking and assessment. It has been recorded as the top list in machine learning applications, in particular it can work well with companies having high volumes of applicants. The machine learning techniques can help human resource staffs to hire new candidates by tracking their journey from starting job applying application to the interview process. The machine learning tools also can help to arrange the process of getting streamlined feedback to applicants. There are some free and open-source applications for users can be seen as [16]:

- Fresh-team: this software is used with a small number of employees as well as alternative companies.
- Open-CATS: It is usually used with technical firms. It is used as software for customization and systems integration.
- Job-Score: It uses for regulated industries which can check the background within ATS software
- Home-base: This software is usually used for restaurants and retailers. It focuses on finding hourly workers.

AI in particular with machine learning can boost individual skill management and development via workers' self-training application. For example Workday ([19] – an enterprise cloud applications for finance and human resources) can be seen as a recommendation of building personalized training. The company's needs, market trends, and employee specifics are the main factors of building the application.

II. PROPOSED WORK

The goal of human resource analytics is improving the human resource units in alternative departments in the company in order to achieve outcomes overall. The use of machine learning techniques might help to category the employees to improve their works as well as their promotions. KPI (Key Performance Indicator) is a term of job performance evaluation index. The machine learning techniques can be seen as a tool used with data, ratios, quantitative indicators for measurement of work for employees. Therefore, the KPI reflects the performance of organizations or functions or individuals.

In general, the use of KPIs for human resource management activities contributes to businesses and employees' sides. The supporting issues can be seen as:

- For the company: Monitor employee performance intuitively, transparently, accurately as well as propose appropriate salary, reward and discipline regimes. It can improve the efficiency of the acceptance work process. It ensures goals and visions can be completed as company expectations.
- For employees: Understand the level of completion of the work compared to the set goals. It is a tool to motivate working to achieve the goal. It can detect defects if the task is behind schedule for timely improvement.

The framework of using machine learning in HRM can be seen in Fig. 5. The steps as follows:

Step 1: KPI builder:

In this step, the company defines the persons, who have responsibilities for building employees' KPI. There are two methods to perform as:

- The functional departments directly build the KPIs system for positions of individuals in that department. For this, the human resource management team plays a supporting role as well as providing guidance to ensure KPIs comply with the company's rules/policies. The advantages of this method is that KPIs will be highly feasible and clearly show the functions and tasks of the department. However, if the department sets its own goals, there will often be a situation of lack of objectivity or sometimes the setting goals are too low. So, if a company uses this method, it is necessary to have the assessment and evaluation of the human resources team and senior management team.
- The human resources department or senior management team provides a set of KPIs for other departments in the company. Unlike the above method, it will ensure the objectivity and science of the method. However, the given KPIs may not be

realistic or not properly represent the functions and duties of the department. To overcome this, the KPIs system, after being built, needs to be appraised and evaluated by functional departments in the company.

Framework of using machine learning techniques in KPI assessment can be seen as the Fig. 5:

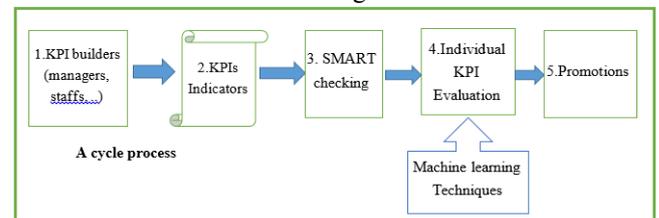


Fig. 5: Framework of using ML in HRM.

Step 2: KPI Indicators:

In this step the Indicators will be created basing on the following factors:

- Business vision: here the general tasks and objectives are shown clearly in order to achieve the business goals.
- At each general task, the details of sub-tasks or sub-objectives are divided. These are KPI indexes.
- From each KPI index, the descriptions of individual tasks are written for each position in the functional department. These tasks are also the requirements for individuals in the evaluation stage.

Step 3: SMART checking:

After building KPIs indicators which are agreed with the functional department, the SMART criteria should be used to evaluate the tasks. The meaning of SMART can be seen as follows:

- S – Specific: Specific goal
- M – Measurable: Measurable goal
- A – Attainable: The goal is achievable
- R – Relevant: Realistic Goals
- T – Time bound: A goal with a specific deadline

SMART in here means that the task can be reached to a detailed objective. In general, it can be used to measure the company's goals. The goal in KPIs indicator is achievable, realistic, and having a specific deadline. The KPIs should be built to satisfy the SMART criteria because they adversely affect the evaluation as well as the human resource management system. In case, the business goal in KPIs is not to clarify clearly the criteria (in specific indicator), it will be difficult for employees to do their jobs in order to achieve the desired work efficiency. Additionally, the indicators of KPIs should be measurable because the performance consequence has to be meaningful. Thirdly, the KPIs are not achievable or unrealistic, that means the employees cannot achieve their KPIs despite their best efforts. In other words, the KPIs have a very high goal so that the employees can not reach. As a result, employees might feel to be not happy to work and this affects psychologically and causes fatigue. Lastly, the KPIs should have specific deadlines (in Time-bound). This helps employees know the time to complete their work. Conversely, the system will be difficult to control what the employee's doing.

Step 4: Individual KPI Evaluation:

Once the companies have their own KPIs for each department and job position, it's time to apply the KPIs system into management of both human resources and productivity. As KPIs have been defined based on measurable criteria, there is certainly a specific evaluation method for each KPI item.

Also at this step, the automatic machine learning techniques such as clustering algorithms are used to categorize workers into alternative groups. Some techniques are used here such as K-means cluster or Association rules which divide individual KPIs into exactly, unbiased groups based on their achievements (individual KPIs).

Clustering techniques usually are used to partition data into groups, or clusters. The group data objects in the same clusters will have many characteristics more than other groups in other clusters. There are many methods to define the number of clusters. Here, a number of clusters can be taken from users before going to the learning process. This depends on companies' decision of dividing how many groups of KPI's evaluate their workers. In general, evaluation of individual KPI can be divided into 3 main groups as follows:

- Group 1: takes less time, less impact
- Group 2: takes little time to implement and a little affects the overall goal; OR/AND takes a long time to implement, has little impact on the overall goal.
- Group 3: takes a long time to implement, greatly affects the overall goal.

The main steps in machine learning techniques as follows:

- **4.1. Step 1:** Choose the number of clusters K (normally K=3 for example)
- **4.2. Step 2:** Select K random points from the data as centroids

For example, we randomly select the centroid for each cluster (K=3).

- **4.3. Step 3:** Assign points to the closest cluster centroid by calculating the Euclidean distance. This means whenever we initialize the centroids, the points in attribute spaces will be arranged into different areas where each point is assigned to the closest cluster centroid. In Fig. 7, the sample points will be assigned to 3 clusters according to closest distance from them to the centroid. We have temporary three clusters according to three colors and shapes.

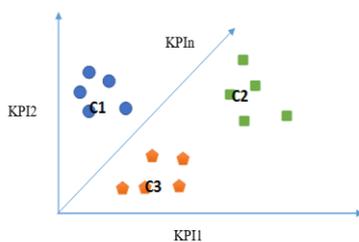


Fig. 6: Choose 3 centroids in KPI dimensional space.

- **4.4. Step 4:** Re-compute the centroids of newly formed clusters. This step is to compute the centroids

of newly formed clusters. For example, new centroids are found (see in Fig. 7).

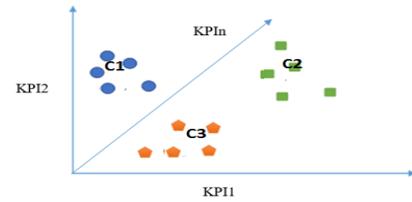


Fig. 7: Re-calculated centroids in KPI dimensional space

- **4.5. Step 5: Repeat steps 3 and 4.**

At the end of the learning process, the clusters are collected (see in Fig. 8).

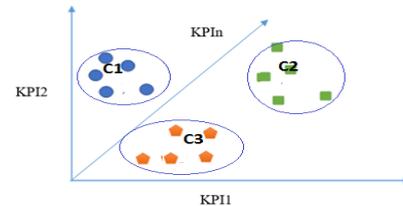


Fig. 8: Three clusters (groups) of KPIs in the system

The outputs of using machine learning techniques are the detail groups which contain individual KPIs values. Based on companies' policies e.g. the importance effects to the business goal, the weights might be applied at each group. For example, group 1 contributes 20% of weights; group 2: 30% and group 3 as 50%.

Step 5: Promotions:

Based on the individual achievements in step 4, the companies will build alternative salary and bonus levels. In general, there is a meeting to evaluate the work results between the manager board, human resource teams, and employees.

The KPIs usually are adjusted occasionally in companies for achieving the optimization ones. In general, the KPIs system can be applied to a company's policies of promotions for a year at least.

III. DISCUSSIONS

Artificial Intelligence, nowadays, has been applied in many fields of human resources. The human resource management system using AI in particular machine learning techniques which can help the companies to find the right candidates, manage the assessments, give offers, and manage employee careers and exits. Before machine learning was used, human resources used to manage data in a manual and semi-automated manner. It causes difficulty in managing human resources. However, with the development of social networks as well as the eruption of information, all of the above needs to be done in a short period of time. Therefore, a human resource with the help of technology such as machine learning should be used. This can help the companies' manager board to quickly monitor, manage, and deliver their human resource efficiently because the data would quickly become irrelevant and out of date.

Vietnam has not got the needed skill labor to meet the high-quality labor force although Vietnam has a young-age population. Not many Vietnamese companies concentrate on developing long term human resource planning. If the

individual workers' performance is evaluated regularly, there will be a further labor picture for companies in the labor force. It can help companies to have an overview of the needed workforce in the future. From there they can be proactive in restructuring labor, arranging and organizing personnel as well as having a plan to recruit personnel.

In the 4.0th technology revolution era, the companies' leaders prefer to manage their employees via data-driven performance management. It can help them to concentrate on the current work information as well as the reviewing of employees' performances. Before making decisions about individual workers' promotions there is a need for employees to collaborate with companies' leaders. To evaluate workers fairly and unbiasedly without interference by human effects, AI in particular machine learning techniques should be applied. The benefits of using machine learning in human resource performance management system can be seen as follows:

- **Centre Information:** Using this system to ensure that all the information has been stored in one single domain (normally in company's servers). The information or employee data can help companies and related parties can evaluate employee performance or/and share with the others at any time.
- **Extract information at the real-time analysis:** The information system can help the companies extract employees' KPI information in real-time via its analysis tools. Therefore, the system might help to improve overall employees' performance.
- **Eliminate any form of psychological bias:** As using machine learning techniques, the evaluation individual KPI performance is performed automatically. This means that no one can interfere with the system. The clustering of individual workers' performance results will be done without the intervention of any individual outside the system. The machine learning techniques ensure that the similar performance results will belong to the same group of promotions.

IV. CONCLUSIONS AND FUTURE WORK

There is no denying the great influence of AI, especially machine learning, in the human resource management field. Many companies have not yet applied modern human resource management methods, partly due to a lack of implementers, and partly due to prioritizing investment in the production and business system, which has consumed a lot of time and efforts of enterprises. Moreover, it also depends on the level of managers, who might be better at technical company's operations than personal management. In order to keep up with the trend of applying modern techniques of the Industry 4.0 era, companies should invest appropriately in human resource management, in which the factor of assessing human quality through KPIs is a core. That will promote the adaptability of human resources, increase competitiveness within the company itself, and create human strength throughout the company.

In this paper, the framework for the HRM information system has been proposed. It can be seen as the general steps for using machine learning techniques in HRM. For future

work, this framework needs to be used and evaluated with the KPI real data from a company in order to show the advantage of using machine learning such as clustering techniques. To improve the disadvantage of clustering techniques on difficult explanations of results, another technique such as association rules also should be performed.

REFERENCES

- [1] Benbya, H., & McKelvey B. 2006. Using coevolutionary and complexity theories to improve IS alignment: A multilevel approach. *Journal of Information Technology*, 21(4), 284298
- [2] Benbya, H., Nan, N., Tanriverdi, H., & Youngjin, Y. 2020. Complexity and information systems research in the emerging digital world. *MIS Quarterly*, 44(1), 1-17.
- [3] Bích Ngọc. 2019. Việt Nam: Mức độ sẵn sàng tham gia Cách mạng công nghiệp 4.0. *Tạp chí Con số và sự kiện, Tổng cục Thống kê, Bộ Kế hoạch và Đầu tư – ISSN 2734 -9144*. Available at website: <http://consosukien.vn/viet-nam-muc-do-san-sang-tham-gia-cach-mang-cong-nghiep-4-0.htm>
- [4] Chu Thị Bích Ngọc. 2018. Nâng cao chất lượng nguồn nhân lực Việt Nam trong cuộc CMCN 4.0, *Tạp chí Tài chính*, Available at website <http://tapchitaichinh.vn/nghien-cuu--trao-doi/trao-doi-binh-luan/nang-cao-chat-luong-nguon-nhan-luc-viet-nam-trong-cuoc-cach-mang-cong-nghiep-4-0-147363.html>
- [5] Daniel, F. 2019. Machine Learning in Human Resources – Applications and Trends. Available at website: <https://emerj.com/ai-sector-overviews/machine-learning-in-human-resources/>
- [6] Daugherty, P., & Wilson, H. J. 2018. *Human + machine: Reimagining work in the age of AI*. Harvard Business Review Press.
- [7] Davenport, T. 2018. *The AI advantage: How to put the artificial intelligence revolution to work*. MIT Press.
- [8] Deloitte. 2020. *Thriving in the era of pervasive AI: Deloitte's state of AI in the enterprise (3rd ed.)* <https://www2.deloitte.com/us/en/insights/focus/cognitive-technologies/state-of-ai-andintelligent-automation-in-business-survey.html>
- [9] Gregor, S., Lin, A. Gedeon, T., Riaz, A. and Zhu, D. 2014. Neuroscience and a nomological network for the understanding and assessment of emotions in information systems research. *Journal of Management Information Systems*, 30(4),13-47.
- [10] Gregory, R. W., Henfridsson, O., Kaganer, E., & Kyriakou, H. 2020. The role of artificial intelligence and data network effects for creating user value. *Academy of Management Review*, 30(4), 13-47.
- [11] Hppy, 2016. *the white paper and see how you can create an integrated, engaging employee experience using people analytics*. Available at website: <https://gethppy.com>
- [12] Julia, M. 2020. *How Machine Learning is Changing HR Industry*. Available at website: <https://codetibur.com/machine-learning-changing-hr-industry/>
- [13] Murray, A. Rhymer, J., & Simon, D. (in press). *Humans and technology: Forms of conjoined agency in organizations*. *Academy of Management Review*.
- [14] Nguyễn Thị Bích Loan. 2018. Báo cáo tổng kết hội thảo “CMCN 4.0: Cơ hội và thách thức đối với phát triển kinh tế Việt Nam”. Đại học Thương mại.
- [15] Nguyễn Trọng Hoài. 2018. Quốc tế hóa giáo dục Việt Nam: đào tạo nguồn nhân lực trong bối cảnh CMCN 4.0, *Conference proceeding of “Nhu cầu nhân lực chất lượng cao cho phát triển trong bối cảnh CMCN 4.0”*, page 236 – 252.
- [16] Olga, Y. 2020. *How to Create an Applicant Tracking System and Improve Your Recruitment Process*. Available at website: <https://codetibur.com/how-to-build-an-applicant-tracking-system/>
- [17] Sarah, W. 2021. *The Impact Of Machine Learning In HR*. Available at website: <https://gethppy.com/hrtrends/the-impact-of-machine-learning-in-hr>
- [18] Trần Mai Đông et al. 2018. Tác động của cuộc CMCN 4.0 đến đời sống xã hội và dịch chuyển cơ cấu nguồn lao động, *Conference proceeding of “Nhu cầu nhân lực chất lượng cao cho phát triển trong bối cảnh CMCN 4.0”*. Page: 181 – 189.
- [19] workday Inc. 2021. Available at website: <https://www.workday.com>
- [20] <https://www.statista.com/>

Preserving human resource of Vietnamese enterprise in covid-19 pandemic

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Abstract—The impact of the Covid-19 pandemic is still a heavy consequence and forces businesses to respond promptly to ensure their production process. Labor supply disruption is occurring in some localities. Enterprises need to have a plan to bring workers, who have been severely impacted by the pandemic both physically and mentally, back to production activities safely. The study focuses on the perceptions of business leaders about responding to the impacts of Covid-19 on the enterprise's human resource management and efforts to preserve the enterprise's human resources. The research is based on information and data from a survey and direct interviews from senior managers of 50 manufacturing enterprises in different fields in some industrial zones in northern Vietnam.

Index Terms—Covid-19 pandemic, protecting HR, industrial zone, Human resource management, safet factors.

I. INTRODUCTION

THE COVID-19 pandemic is being considered as one of the catastrophes of humans. It claimed the lives of millions of people around the world, and also delayed the world's economic development for decades. Vietnam has been affected by the pandemic since January 2020. After two years, the severe effects of this pandemic are clearly felt in every aspect of the economy. The prolonged periods of social distancing in many provinces and cities in the past time to prevent and control the Covid-19 epidemic have greatly affected the labor market.

During a pandemic, due to the implementation of social distancing measures, goods circulation will be disrupted, production and business will be delayed. Many enterprises are forced to choose the "3 on-site" or "1 route, 2 destinations" production option to be able to continue their production and business activities. However, in order to implement the above options, enterprises face many difficulties such as higher production costs, affected human resources, and disruption of input materials. This is especially important for exporters, who can hardly complete the production and deliver the goods on time, so they have to renew or cancel the contract signed with their partner. Many businesses went bankrupt or dissolved due to exhaustion and could no longer endure the epidemic for a long time. In addition, many other businesses also had to temporarily suspend business, do business in moderation, produce inefficiently, or make losses in the context of the epidemic. From the beginning of 2021 until now, nearly 13 million people of working age in the country have been affected in terms of employment and income. In particular, from the end of June to the beginning of August, localities recorded that nearly 10% of units and

businesses had to suspend production and business, equivalent to nearly 4 million workers who had to temporarily stop working. Along with businesses, one of the subjects heavily affected by this pandemic is the employees of the enterprise in particular and the human resources of the country in general [2, 4, 15].

II. IMPACT OF COVID-19 PANDEMIC AND SOME BASIC CONCEPTS OF "PRESERVING HUMAN RESOURCES"

According to Venkatesh [1, page 1] "the individual's knowledge, experiences, capabilities, skills, creativity and innovativeness. These elements are connected to each other and collectively contribute to success in work".

In a narrow sense, human resource is the labor capacity of society, a resource for socio-economic development, including the working-age population, capable of participating in labor, Social production, i.e. all specific individuals participating in the labor process, is the sum total of their physical, mental and spiritual factors mobilized in the labor process.

Human resources are expressed in two ways: (1) In terms of quantity, it is the total number of people in the organization and the working time that organisation can be mobilized from them; (2) In terms of quality, it is the health, knowledge, skills and attitude of workers in the organization.

With the above understanding, conservation of human resources is understood as the stabilization of the number of employees as well as the quality of human resources to serve the production and business activities of enterprises during and after the pandemic.

According to labor experts, the epidemic and prolonged social distancing have forced workers to find other jobs to do, or leave industrial zones to return to their hometowns, causing businesses to experience labor shortages after the pandemic. when the Covid-19 epidemic became serious. It is expected that the number of workers returning home to return to work is only about 60-70%, which will create a big paradox in terms of labor supply and demand. Finding ways to ensure that there is no shortage of labor resources for production and business activities is considered a difficult problem for businesses today.

III. RESEARCH METHODOLOGY

Our research is based on the survey of 50 managers of manufacturing enterprises in the industrial zones. We conducted the survey from May to July 2021 in some northern

industrial zones like VSIP (Bac Ninh province), Dong Van (Ha Nam province), Song Khe – Noi Hoang (Bac Giang province), and Quang Minh (Hanoi). The detailed information is presented in table 1.

Table 1: Information of research sample

Order	Criteria	Classification	Number	%
1	Sex	Male	42	84%
		Female	08	16%
2	Age	Under 30	6	12%
		30-45	29	58%
		More 45	15	30%
3	Formation	Bachelor	35	70%
		Master	13	26%
		PhD	2	4%
4	Experience	Under 3 years	6	12%
		3-10 years	25	50%
		More 10 years	19	38%
5	Type of enterprises	Electrical equipment	14	28%
		Garment	12	24%
		Wood and papers	8	16%
		Plastic products	6	12%
		Others	10	20%
6	Industrial zones	Quang Minh (Hanoi)	18	36%
		VSIP (Bac Ninh)	12	24%
		Song Khe – Noi Hoang (Bac Giang)	12	24%
		Dong Van (Ha Nam)	8	16%

Research focuses on the problem of Human Resource Management of manufacturing enterprises. The research questions were divided in three main parts:

- Awareness of impact of Covid-19 pandemic
- Perception of managers about the impact of Covid-19 pandemic on their enterprises
- Stabilization of Human Resource after covid-19 pandemic

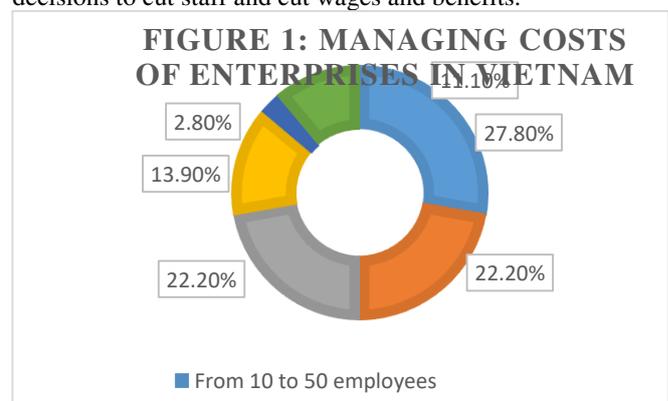
4. PERCEPTION OF BUSINESS LEADERS ABOUT RESPONDING TO THE IMPACT OF THE COVID-19 PANDEMIC ON HUMAN RESOURCE MANAGEMENT ACTIVITIES OF ENTERPRISES.

The Covid pandemic has clearly changed the previous human resource management methods. The perception of the need to change to cope with the actual situation has shown the agility of business leaders in the process of managing human resources during the crisis. According to the survey, most leaders realize the necessity of a number of issues: (1) Cost management and balancing human resource management activities; (2) Urgency in applying and stabilizing new working methods; (3) Immediate implementation of safety measures for workers to prepare to return to operation.

4.1 Awareness in managing costs and balancing to human resource management activities

During the 2 years of the pandemic, the production and business situation was continuously stalled because of the epidemic and the shortage of raw materials and workers caused most businesses to struggle and seriously reduce their revenue and the profit. This situation will continue in the near future. According to the report of VCCI, "The impact of the Covid-19 epidemic on Vietnamese businesses", the survey results show that 2020 is a difficult year when up to 87.2% of businesses are affected at "mostly" or "totally negative" due to the Covid-19 epidemic, only 11% of businesses said that they were "unaffected at all" and nearly 2% recorded an "totally positive" or "completely positive" impact "mostly positive". Many sectors have been significantly impacted by the covid-19 pandemic. Specifically, industries such as garment industry (97%), information and communication industry 96%, electrical equipment manufacturing industry 94%. For foreign direct investment (FDI) enterprises in Vietnam, the level of impact is as follows: 100% for real estate enterprises; 97% for communication enterprises; 95% for agriculture, fishery enterprises. Notably, those most negatively affected are new businesses operating under 3 years and micro and small scale enterprises. Particularly in Hanoi, according to the report of Hanoi Department of Planning and Investment, in August 2021, the unit carried out dissolution procedures for 244 enterprises; 833 businesses registered to suspend operations mainly due to difficulties caused by Covid-19 [2,3].

This forces business owners to consider applying the strictest and most effective capital control process. The capital control directly affects other management activities including human resources. This is probably the time when business leaders and managers have to deal with the problem of balancing human resources, both limiting labor cuts and assigning jobs in accordance with current human resources. According to the 2020 survey of businesses of VCCI, 35% of private enterprises and 22% of FDI enterprises have had to lay off their employees due to the impact of the epidemic. The general estimate shows that the number of employees who have to be laid off accounts for about 30% of the total number of employees in an enterprise. Facing the consequences of the Covid-19 pandemic, some businesses were forced to make decisions to cut staff and cut wages and benefits.



(Source: Navigos)

According to statistics of Navigos (Vietnam's leading human resource group) for 1,400 enterprises in Vietnam,

27.8% of enterprises with about 10-50 people have made this decision. At the same time, both enterprises with sizes from 51-100 and 101-300 are accounting for the same proportion of 22.2%. Most importantly, even with a large-scale operation, it is inevitable to reduce human resources. With a scale greater than 1000, about 11.1% of businesses are optimizing and tightening operating costs. In addition, multinational corporations, companies that mainly deal with foreign partners also face restrictions on movement, which negatively affects work efficiency [5,6].

4.2 Awareness of the urgency to adopt and settle into new ways of working.

In the new situation, when the epidemic has not ended and the global supply chain has not fully recovered, businesses will certainly have changes due to low or slow operational demand. The application and change of working methods, prominently the trend of working from home (WFH) is inevitable. Changing working methods will make a surplus of labor and therefore, the risk of having to reduce personnel is certain to occur, especially in commercial and service enterprises. Leaders of enterprises must be aware of the need to accelerate the automation process and apply new working methods in production and business activities.

When operating under a new working method, a human resource department will not have enough skills and technology to ensure work efficiency. It requires administrators to anticipate reduced work performance due to the lack of ability to work remotely and have timely response solutions. WFH has three core things to care about: infrastructure, corporate culture and data security. Some questions must be answered correctly like: Will customer service be affected? Are workers of different generations happy? Can the management and infrastructure meet the above? Which target group is needed first? (because not all professions can WFH effectively, such as bank teller, service...).

According to Ms. Thanh Le (office director of Adecco City, HCMC), to ensure efficiency in WFH, companies must invest in upgrading facilities such as intranets (VPNs), servers, cloud data storage, buy new technical equipment, buy software, support tools when working remotely...

From the perspective of a domestic business owner, Mr. Nguyen Si Trieu Chau (founder of Atoha Institute of Project Management) said that if the Millennial generation (born from 1981-1996) accumulated enough knowledge, most of the careers are stable or mature, so they have enough endurance to react appropriately to the "post-COVID" era, the story is very different from Gen Z. "Growing up in the technology age, so the personality and worldview are more affected by technology, less patient and difficult to concentrate than previous generations. During the pandemic, due to the implementation of epidemic prevention measures, young people often experience problems with higher levels of loneliness and depression than older people. Therefore, helping young people improve their own capacity to better adapt to a new working environment like WFH plays an important role [8,9,11].

Ms. Nguyen Thanh Huong (national human resource director of ManpowerGroup Vietnam) said that: In addition to providing flexible working policies, businesses should support training for employees in new ways of working, use digitization tools, arrange time, manage work... As for the leaders, they need to put in place a lean but effective management mechanism with a "digitized" mindset. Sharing and empathy is also something that employees always need at the management level during the WFH period, when daily communication and "hands-on" no longer exist. Mechanisms for monitoring and managing work should be clearer.

4.3 Awareness of the implementation of safety measures immediately for workers to prepare returning operations.

Returning to operation is inevitable. Business leaders have become seriously aware of the problem of changing requirements and measures to ensure workplace safety such as wearing masks, testing for employees, etc. face the process of reorganizing work positions to ensure distance. Implementation of the program "business green zone", "shifting, channeling"... are compulsory activities for enterprises. Although these activities cause a lot of costs for businesses.

5. ENTERPRISES' EFFORTS TO STABILIZE HUMAN RESOURCES AFTER THE PANDEMIC.

Before returning to operation, most enterprises focus on the questions: "How to ensure the safety and health of employees?", "We should arrange and set a schedule for the increase. How is the production speed?", "Will employees be assured to return to work? Can businesses reopen?", "What conditions will facilities in different countries, cities or locations have to pay attention to?", "How to maximize revenue in the short term?" during the COVID-19 period?", "What are the costs of getting employees back to work?". This will be even more complicated for organizations with multiple businesses and regulations. On an international scale, COVID-19 may affect businesses to varying degrees, and return to work times will vary significantly from region to region. Therefore, to answer the above questions, according to the research team's survey, most businesses consider decisions about returning to work based on 4 criteria: (1) Health & safety of employees, (2) Classification of types of work, (3) Financial situation of the enterprise, (4) Needs and aspirations of employees.

5.1 Health & safety of workers

Businesses need to consider whether they have ensured compliance with Government directives and health, safety and environment (HSE) regulations. Businesses are only allowed to operate when they meet the minimum requirements set by the state. The HR department should ensure a safe and hygienic work environment, establish rules for the shared use of equipment and workspaces, and consider appropriate medical practices as part of the re-opening process (Example: temperature check)... Businesses always need to be ready to check the environment, health, safety and emergency response to comply with regulations. "3 on-site" model (which involves eating, sleeping, and working without leaving aims to keep production going while ensuring COVID-19 control) is

considered an initiative during the epidemic season. According to the ILO summary, many factories of enterprises are built solely for production purposes and are not suitable environments for employees to stay under the "3 on-site" model. Enterprises need an assessment to ensure safety factors when allowing a large number of workers to stay in the factory. The fact that many workers stay in the factory for a long time can increase occupational safety and health risks in the workplace. The re-evaluation of these risks is very necessary and requires the participation of workers as well as trade union representatives to quickly implement remedial and preventive measures.

Businesses need to ensure compliance with Government directives on health, safety and environment (HSE) in activities such as: Monitoring and ensuring compliance with Government directives on HSE; Consider working with foreign or outsourced suppliers and global service providers, as many closures will affect business continuity; Understand and balance the need to protect personal data when performing due diligence activities to collect, use and share data to identify, reduce risks, and protect a safe work environment against direct risks.

At the same time, it is necessary to build a safe working environment through the following activities: Update policies and regulations on health and safety; Consider more stringent workplace hygiene practices; Consider reorganizing the workplace (e.g. retrofitting screens to limit close contact between employees); Disseminate social distancing guidelines on a regular basis; Establish a mechanism to control the movement of workers; Liaise with trade unions to adjust work regulations to ensure social distancing; Consider adjusting working hours to limit concentration in peak hours; Consider the mental health of employees, be aware of the impact and fear that the epidemic causes.

The basic requirement is that businesses need to comply with health regulations in order to establish a proper Return to Operation process. Check the use of personal protective equipment against the HSE guidelines; Review health checks (e.g., temperature measurement, questionnaire health) and balance them with other privacy policies and rights; Consider adding medical staff in the workplace or training first aid personnel to assist with medical problems; Develop a process of checking and screening visitors to work; strict human resource management; Know exactly where they are going in and out of the workplace, keeping track of where they've been before.

Businesses also need to review their health, safety and environmental and emergency response procedures to be consistent with HSE regulations. Prepare a process to quickly respond to new infections or outbreaks, including communication channels, plans to close the workplace/office, etc. Establish a plan to identify and monitor employees, relatives of employees suspected of being infected; Consider leveraging mobile tracking technologies.

For example, ABB Power Grids Vietnam Co., Ltd. has more than 700 officers and employees. During the period of isolation, the company implemented the "business green zone"

model under the guidance of the government and the Covid task force focused on solving health and safety issues for employees during the epidemic season. Covid-19 safety teams all have situation reports, if anyone is found with epidemiological factors, the company will provide test strips. With this model, there are currently 60 people working "3 on the spot"; 100% of workers are tested weekly; 95% of employees get 1st dose vaccine and 5% get 2nd dose vaccine. Along with that, the company removed the regulation on handover between 2 direct shifts. The working shifts do not meet, the first shift is finished, the next shift is new; Locations that can eat on the spot will receive lunch boxes, not concentrated meals. At ICHI Vietnam Company, the company implements "1 route 2 destinations", all employees must register the route and commit to do it correctly. With lunch, the company divides boxes of employees' positions to ensure distance.

5.2 Classification of types of work

In order to have a reasonable and effective reduction or transfer of personnel as well as effective change of remote working methods, the human resources departments of enterprises need to identify the main and mandatory services according to the contract. community and related roles; Identify locations where it is necessary to interact with others (at work or outside) or to share equipment and technology; Be aware of potentially hazardous jobs and compliance issues if work is not done in the workplace; Evaluate jobs that can significantly reduce productivity if working outside.

Businesses need to identify locations that require direct contact with others (onsite or offsite). Consider and evaluate how these activities will change with the new way of working; Is it necessary to have too much direct contact with customers? (Example: Head of Sales, Customer Relations). For positions where telecommuting is possible, consider a reasonable allocation of office and home time, e.g. possibly rotating weekly or shift work at the office.

At the same time, identify positions that require direct interaction with machines and technology. Evaluate jobs that will not be effective without technology or machines that are permanently located in the workplace. For jobs that must be performed in a workplace such as a manufacturing plant, consider arranging fixed shifts, or adjusting working hours to limit exposure.

Enterprises need to understand the work that is prone to risks and the issues to be followed if the work is not done on site. Identify risks, assess risk monitoring, and improve compliance when work is done on-site (e.g. trading operations). Assess data security/cybersecurity risks when working remotely or over a VPN network. Evaluate jobs and positions that will not be affected when working remotely, thereby planning future work arrangements with full technology support and resources.

Identify jobs and positions that have reduced productivity when working remotely. Evaluate the effectiveness of each position when working remotely during a crisis. This can be influenced by many different factors such as function, role, personal circumstances, technology. From there, understand

which jobs are effective and which are reduced when working remotely.

5.3 Financial situation of the enterprise

Understanding the costs incurred and the savings when employees return to work (eg. costs of security, hygiene, labor protection) is really necessary in the perception of businesses. In difficult times, only strong finance can help businesses get through the pandemic. According to statistics, it is difficult for SMEs with limited capital to overcome the pandemic. Simultaneously with cost savings, businesses need to identify and maintain new revenue streams or expand existing services (e.g. new products/services). In particular, it is necessary to plan for changes in business-specific needs during the recovery period.

Businesses need to understand the costs incurred or saved when bringing employees back to work (e.g. security fees, cleaning fees). Consider the costs involved in bringing employees back to work after the pandemic. For example: Regularly cleaning, disinfecting, disinfecting o Using personal protective equipment; Increase training in workplace health and safety; Reorganize working position (office, factory, workplace); Expenses for the implementation of medical measures; Meals and allowances; Determine the savings if you continue to work remotely. Example: Direct training costs; Facilities, food costs, workplace security, cleaning costs; Office services...

Identify and maintain new revenue streams or expand existing offerings (e.g. new products/services). Find and seize revenue generation opportunities in the post-pandemic context, such as expanding factories to develop essential products and services, creating new services, and more. Consider changing business strategies appropriately in the context of new realities, ranging from changes in employee working needs, customer habits to post-COVID-19 outsourcing options (e.g. business models). business / service model will become more basic, simpler than before the pandemic).

Plan for changes in business-specific needs during the recovery period: Scenarios for an increase or decrease in market demand as society gradually returns to normal; Understand more about your business' financial and operational issues after the upheaval (e.g., post-pandemic, restaurants can only operate at 50% capacity) [12,16,17]

5.4 Needs and aspirations of employees

Workers are suffering heavily from the pandemic when they are directly hit with wages and health. In order for employees to be mentally stable and ready to return to the system, enterprises need to assess workers' attitudes on health and safety and hygiene issues in the current situation and grasp personal circumstances. employees (eg, childcare, financial situation) and affect work performance. During the work-from-home, teleworking phase, HR also needs to assess the reliance of teleworking and consider the effectiveness of support tools. The survey process of enterprises will help businesses have clear orientations and solutions for their human resource management activities.

Businesses need to assess employees' attitudes towards their health and hygiene in the current context. Consider employees who need to stay home for extended or indefinite periods (the implications of this); Be aware of the impact on employee safety. Understand and address their anxiety and insecurities, and promote activities that support mental health; Know the location of employees and the means of transport they use, thereby assessing their exposure during daily travel; Assess the need between business travel and online meetings; Monitor and develop employee feedback channels to understand employees' opinions and feelings during the post-pandemic recovery period and take reasonable actions to address employee concerns, as well as encouraging their successes in times of crisis. Also according to the ILO's summary report, the psychological health of employees is one of the important issues businesses need to pay attention to. The process of working under the closed "3 on-site" model will be able to adversely affect the psychology of employees, cause distraction in the working process and affect the safety of workers. Taking care of the quality of meals and after-hours entertainment are good practices shared by businesses to create a more comfortable environment for employees during "3 on-site" implementation.

Businesses need to understand personal circumstances (e.g. childcare, financial problems). Working at "3 on-site" enterprises is often quite difficult for employees who are obliged to take care of their families. Enterprises need to prepare to support employees to keep in regular contact with their families as well as arrange support in other necessary cases when employees are absent from their families. Understanding an individual's circumstances, as well as understanding how social situations will affect their decision to return to work (e.g., if schools continue to be closed, employees may find it difficult to return to work). back to work because there is no one to look after the children). Consider how financial matters affect an employee's decision to return to work. Know your employees' needs and aspirations about each working method, understand their concerns from their perspective - for example, they may feel isolated when working remotely, or they may worry about anxiety and stress when returning to the workplace.

Finally, we need to evaluate the effectiveness of remote working through new tools and working methods. Therefore, businesses must prioritize investing in tools and platforms to continue to increase efficiency when working remotely such as collaboration software, network bandwidth, laptops, WiFi or VPN access (Virtual Private Network), managed access and security on the network. Businesses need to regularly evaluate whether working online is effective and maintain employee engagement to any degree.

5. CONCLUSION

The issue of human protection should lead with policies and fast and empathetic communication through activities that maintain two-way communication channels to capture the opinions of the workforce; Manage workforce data to ensure accurate employee tracking; Implement policies to protect and

support employees and ensure compliance with Government guidelines and regulations; Promote respect and inclusion, support employee health; Improve or establish employee benefits and support programs...

Ensure work safety and efficiency when implementing new ways of working and new forms of connection. HR needs to determine the effectiveness of a telework program; Develop and build solid telecommuting capabilities (for both employees and leaders); Measuring workforce productivity and engagement; Align HR program priorities (e.g. planning for key roles, performance and compensation evaluation, talent management); Promoting new ways of working through enhanced digitalization; Measure the effectiveness of the customer experience; Lead and connect with the workforce in different ways to inspire change and uncertainty.

Businesses need to evaluate short- and long-term labor cost measures to plan for sustainability. Assess roles and functions (compare supply and demand) and redeployment possibilities; Identify and calculate pre-reduction measures (e.g. employee benefits, insurance, shortening of work hours, temporary layoffs, division of labor or part-time work); Analyze the consequences associated with each of these short-term measures compared to using the Government's COVID-19 support package; Identify possible redeployment of workers to meet increased demand and secure key functions; Connecting and inspiring the workforce is retained to focus on the vision for the future beyond the crisis.

Prepare for increasing demand through strategic HR planning with HR strategy refreshes including organizational structure design; Identify aspects of post-crisis working practices; Continuing momentum across technology platforms by investing in specific skills and competencies; Maintain and establish access to key and critical human resources.

REFERENCES

- [1] Venkatesh Ganapathy, *Strategic Management of human capital*, NXB Bookboon, 2018.
- [2] Tổng cục thống kê (2021), “Tác động của dịch Covid-19 đến tăng trưởng các khu vực kinh tế quý III năm 2021”, <https://www.gso.gov.vn/du-lieu-va-so-lieu-thong-ke/2021/10/tac-dong-cua-dich-covid-19-den-tang-truong-cac-khu-vuc-kinh-te-quy-iii-nam-2021/>
- [3] VCCI, “Survey Report on the Impacts of Covid-19 on Business Performance”, Published on 5 May 2020.
- [4] ILO, “Tác động của đại dịch COVID-19 tới doanh nghiệp và người lao động trong một số ngành kinh tế chính: Ứng phó, điều chỉnh và khả năng phục hồi”, 2020).
- [5] Navigos, “Thị trường lao động trong làn sóng Covid-19 thứ 4”, 2021.
- [6] Đại học Kinh tế Quốc dân (2020), Báo cáo đánh giá tác động của Covid-19 đến nền kinh tế và các khuyến nghị chính sách
- [7] GSO, Report on impact of covid-19 pandemic on labour and employment of the second quarter of 2021, (2021)
- [8] World Health Organization, The WHO Special Initiative for Mental Health (2019-2023): Universal Health Coverage for Mental Health. World Health Organization. Geneva, 2019.
- [9] Brook S.K., Webster R.K., Smith L.E., Woodland L., Wessely S., and Greenberg, N. “The Psychological Impact of Quarantine and How to Reduce it: Rapid Review of the Evidence”. *Lancet*, 395, 2020.
- [10] Worldometers, “Covid-19 Coronavirus Pandemic”, 2021.
- [11] Xiong J., Lipsitz O., Nasri F., Lui, L., Gill, H., Phan, L., Chen-li, D., Iacobucci, M., Ho, R., Majeed A. and McIntyre, R. “Impact of COVID-19 Pandemic on Mental Health in the General Population: A Systematic Review”. *Journal of Affect Disorder*, 277, page 55–64, 2020.
- [12] Nguyễn Bích Lâm, “Đại dịch COVID-19, hệ lụy và giải pháp hỗ trợ doanh nghiệp”, Báo điện tử Chính phủ, 2020.
- [13] Shrestha, N. et al, The Impact of COVID-19 on Globalization, One Health, 2020.
- [14] The World bank, Ngân hàng Thế giới tại Việt Nam, 2021.
- [15] Tổng cục thống kê, Báo cáo tác động của dịch COVID-19 đến tình hình lao động, việc làm quý IV và năm 2020, 2021.
- [16] Everland News, Ảnh hưởng của dịch COVID-19 đối với kinh tế Việt Nam dưới góc nhìn chuyên gia, 2021.
- [17] Song, L. and Zhou, Y., “COVID-19 Pandemic and Its Impact on the Global Economy: What Does It Take to Turn Crisis into Opportunity? China World Economy, Vol.28, No.4, 2020.

Effect of Memorable Tourism Experiences on Revisit Intention to Community-Based Tourism Destination of Domestic Tourists in Vietnam

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Abstract—The intention to return to a destination is one of the important research topics in tourism. The antecedents of revisiting intention confirmed include trip satisfaction, destination image, tourist attitude, and, most recently, memorable tourism experiences. This study tests the hypothesis of the impact of memorable tourism experience components on the intention to revisit the destination of domestic tourists in the community-based tourism in Northern Vietnam. The memorable tourism experience components are adapted from the scale of Kim et al [16], Chandaral et al [6], and Coudounaris et al [9]. The study carried out exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and finally, linear structural equation model analysis (SEM). It confirmed eight components of memorable tourism experiences that positively influence the intention to revisit domestic tourists and do not support the hypothesis that adverse feeling experiences affect revisit intention. There is no difference in intention to revisit the CBT destination between gender groups and different age groups with the research sample obtained.

Index Terms—community-based tourism, destination, domestic tourists, memorable tourism experiences, revisit intention.

I. INTRODUCTION

PINE and Gilmore argue that the world is shifting towards an experience economy, and what businesses provide to their customers are designed experiences [24]. The tourism industry has been a pioneer in emphasizing the tourists' experience. Memorable travel experiences have been a topic of great interest since more than a decade ago. Quite a few studies show that this is a factor that directly impacts the behavioral intention of tourists. [7], [13], [14].

Community-based tourism is growing in Asian countries, including Vietnam. According to Nicole Hausler and Wolfgang Strasdas: "CBT is a form of tourism that mainly local people develop and manage."

Relying on the advantages of natural scenery and local culture, community-based tourism destinations in North Vietnam have attracted many domestic and international tourists. The research on community-based tourism experiences in Vietnam is quite limited, and especially there has not been much attention on the memorable tourism experiences and the relationship between revisit intention to the destination and memorable tourism experiences. This study was conducted to clarify this issue in the literature review further.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

A. Memorable Tourism Experiences

Memorable Tourism Experiences (MTEs) and the relationship between memorable tourism experiences and intention to revisit are topics of great interest from tourism experience scholars. Many studies have suggested that tourism experience is a subjective mental state perceived by tourists [20], [24] and exists in their perception or emotions [23], [26]. However, not every experience can be remembered for long. The relationship between memory and experience has been studied for a long time and has been confirmed in the studies of Arnold & Price [2], Quinlan Culter & Carmichael [26]. According to Kim, there are three different groups of factors affecting human memory ability that have been recorded in previous studies [18]. First, the more emotionally connected events are, the better they are remembered, and the higher the emotional level, the clearer the recall. Second, cognitive assessment (understood as a semantic analysis of the situation/event, a post-examination process that enriches or details the initial effects) increases recalled memories. Third, extraordinary events are better remembered than ordinary events. Based on that, the research group of Kim, Tung, and Ritchie has delved into the study of memorable tourism experiences and the antecedents and consequences of MTEs. Research results show that MTEs are formed from the experiences that tourists have through interactions during the trip and that MTEs are different for each person. In a 2012 study, Kim et al suggested that MTEs are experiences that tourists gain after a trip, are remembered and can be recalled after that trip.

MTEs are formed from tourism experiences. Therefore, MTEs are also affected by factors affecting tourism experience, including anything we can physically experience (landscape, plants, animals, weather, buildings, and other infrastructure...), social factors (culture, all relationships between tourists and tour guides, locals...), tourism services and products (transport services, hotels, food, services) medical, souvenirs ...) as well as internal factors of tourists: motivation, pretensions about the trip, tourists' understanding, ability to remember, self-awareness, and personal identity [26]. Tourism experience is said to have many different aspects, but only some aspects can be deeply remembered by tourists [6], [16], [24], [20]. Scholars reviewed a range of studies related to remembering previous experiences and recounted the components mentioned in previous studies. Based on the known components, they conduct qualitative research to discover and confirm the

components of MTEs before constructing a scale and putting them to the test: Hedonism, Relaxation, Stimulation, Refreshment, Adverse feelings, Social interaction, Happiness, Meaningfulness, Knowledge, Unexpected happenings, Personal relevance, Novelty ... It is worth noting that until Kim's study [16], no study has looked at all components of MTEs at once, and most previous studies have evaluated only one or a few memorized components of the tourism experience. Several previous studies have investigated the structure and factors that influence MTEs... Kim et al. and Chandarla et al. conducted studies to identify the memorable components of travel experiences in different contexts [16], [6]. Kim et al. introduced a 7-component MTEs scale, using 24 indicators [16]. Chandaral et al. introduced a 10-component MTEs scale, using 34 indicators [6]. Later studies have shown that MTEs have different components with different contexts. Ayazlar et al. tested Kim et al.'s scale with two groups of tourists from two different cultures [3], England and Turkey, visiting the same destination, Didim, Turkey, shows that the composition of memorable tourism experiences of these two groups is different. British tourists generally find local culture and knowledge more memorable, while hedonism and involvement are the most memorable components of the travel experience of Turkish tourists. This result shows differences in the memorable levels of components in different cultures.

B. Tourist's revisit intention and impact of MTEs on revisit intention.

Baker and Crompton argue that a tourist's revisit intention is a tourist's willingness to visit a destination again and also argue that this behavior is an expression of customer loyalty, similar to a willingness to repurchase a product [4]. Thus, the revisit intention in tourism can be understood as the ability of tourists to revisit the destination in the future. Kozak states that tourists' revisit intention is the expression of willingness to visit a particular destination or other destinations within the same country [19]. Other authors suggest that the intention to revisit a destination is expressed through the willingness to recommend the destination to relatives and friends [1]. Revisit intention has been considered an important research topic in scientific research and the tourism industry [12]. From the early twenty-first century, there has been quite a bit of research on intention to revisit tourist destinations to predict and explain their intention in making travel decisions [19], [31], [12], [11], [32]. The antecedent factors of revisit intention include emotion, satisfaction, attitude, previous experience, perception of the destination, and recently a memorable tourism experience.

Means-End Chain Theory (Means-End Chain - MEC) was developed by Gutman from applying value perspectives to the marketing of consumer products, focusing on the association between attributes that exist in the product, the consequences of those attributes, and the values the individual customer derives from those consequences. MEC theory holds that consumers decide to use a product/service not based on the benefits of the product/service itself but because they can achieve the desired benefits and values through these products/services. Therefore, consumers will make decisions based on the final values they feel after

experiencing the attributes of the product/service. The last perceived value mentioned above is the memorable tourism experiences of visitors. According to the Mean-Ends series theory, memorable tourist experiences influence tourists' subsequent choices, manifest through behavioral intention.

Many different studies have confirmed the positive impact of memorable tourism experiences on revisit intention a destination. In different contexts, memorable tourism experience components have different influences on revisit intention. Kim suggests that three components: enjoyment, participation, and local culture, have a positive impact on the intention to revisit tourists [18]. Sthapit used MTEs scale of Kim et al. to find memorable tourism experiences with a survey sample of tourists who visited Rovaniemi [27]. Research results show that local culture and novelty significantly influence tourists' intention to return to a destination. Chandralal and Valenzuela developed their scale and analyzed the relationship between the components of a memorable tourist experience and the intention to revisit [7]. Their findings showed that novelty travelers are not likely to revisit similar sites in that country but will often recommend them to others. Although studies on the impact of memorable tourism experiences on intention to return to a destination have been inconsistent in determining which components of a memorable tourism experience have a positive impact on the revisit intention of tourists, the positive impact on tourists' intention to revisit the destination is an argument that many studies have been reinforced. Therefore, considering the context of CBT in Vietnam, the following hypothesis is proposed:

H1: Remembered hedonism experiences positively impact the revisit intention of domestic tourists to the destination.

H2: Remembered refreshment experiences positively impact the revisit intention of domestic tourists to the destination.

H3: Remembered novelty experiences positively impact the revisit intention of domestic tourists to the destination.

H4: Remembered involvement experiences positively impact the revisit intention of domestic tourists to the destination

H5: Remembered surprising experiences positively impact the revisit intention of domestic tourists to the destination

H6: Remembered meaningfulness experiences positively impact the revisit intention of domestic tourists to the destination.

H7: Remembered knowledge experiences positively impact the revisit intention of domestic tourists to the destination

H8: Remembered local culture experiences positively impact the revisit intention of domestic tourists to the destination.

H9: Remembered adverse feeling experiences negatively impact the revisit intention of domestic tourists to the destination.

III. METHOD

A. Context

Community-based tourism development in Vietnam, in general, is still limited [10]. People and local authorities in many places still have problems developing products that are attractive to tourists, and at the same time, associated with the protection and development of local tangible and intangible resources. In the Vietnam northern mountainous region, Sapa and Mai Chau have a relatively large and stable number of tourists, while other community-based tourist destinations in Lang Son, Ha Giang, Cao Bang, Lai Chau, Dien Bien ... are still inefficient and straightforward [8], [29]. Community-based tourism destinations in Vietnam proliferate, but most tourism experience designs are not distinctive. It is also why the rate of tourists returning to community-based tourism destinations is lower in Vietnam than in some countries in Southeast Asia.

B. Participants and procedure

Before conducting the survey, we asked participants to recall the most memorable tourism experience with a CBT destination and recall the number of companions on the trip. Based on this recollection, they completed a 32-item scale on MTEs and a 4-item scale on revisit intention and provided additional demographic information. Out of the collected 458 questionnaires, we excluded 53 invalid questionnaires and left 405 valid responses for the analytical data.

The sample was selected by snowball sampling and convenience sampling. Each survey participant will be asked to send the survey to about five other people who already have MTEs in community-based tourism in Vietnam. Among the participants, 66.9% were male while 33.1% were female; 25.4% were 18–25 years old, 22.5% were 26–35 years old, 49.4% were 36–50 years old, and 2.7% were 51 years old and older. Of these, 272 people traveled in small groups (7 people or less), and 133 travel in large groups (8 people or more). Table 1 presents Sample Characteristics in greater detail.

Table 1. Sample Characteristics

Variable	Category	Distribution
Gender	Male	271 (66.9%)
	Female	134 (33.1%)
Age	18 to less than 25	103 (25.4%)
	25 to less than 35	91 (22.5%)
	35 to less than 50	200 (49.4%)
	more than 50	11 (2.7%)
Earnings (Million VND)	Less than 5	68 (16.8%)
	5 to less than 9	119 (29.4%)
	9 to less than 14	116 (28.6%)
	14 to less than 27	61 (15.1%)
	More than 27	41 (10.1%)

C. Questionnaires

The survey questionnaire has three parts. The detailed information of respondents is the first part. The next is tourists' reviews of the MTEs they have had, and part 3 is the questions related to the revisit intention of tourists. The author adapted the scales suggested by previous studies to suit the research context.

The MTEs scale is adapted from the seven components scale introduced by Kim et al. with the addition of the "Surprising experience" component from the Chandalar scale and the "Adverse feeling" component from Coudounaris et al. [16], [6], [9]. Thus, MTEs are measured using nine components (32 items). Thirty items are adapted from the original scales, and two new items are proposed. Four items for revisit intentions were adopted from the study of Kim et al. The questionnaire uses the Likert scale with five levels, from low to high scores, ranging from 1-5: 1. Strongly disagree; 2. Disagree; 3. Normal; 4. Agree; 5. Strongly agree.

D. Data analysis

All data were analyzed by SPSS 25.0 and AMOS 20.0 after being collected. Following Anderson and Gerbing's (1988) recommended procedure, the construct's reliability, convergent validity, and discriminant validity were tested before testing the structural model. The scale's reliability is tested by Cronbach's Alpha coefficient (a measure of internal consistency). Then, the study conducted exploratory factor analysis (EFA) to evaluate the factor structure of the measures and check their reliability. The formal evaluation of the scale to analyze the validity of the model was conducted based on confirmatory factor analysis (CFA). Finally, due to the relationship between the independent variables (interaction between feelings and emotions, evaluated in the forming of MTEs), the study tested the hypotheses by analysis of structural equation modeling (SEM) to be able to visually check the relationships that exist

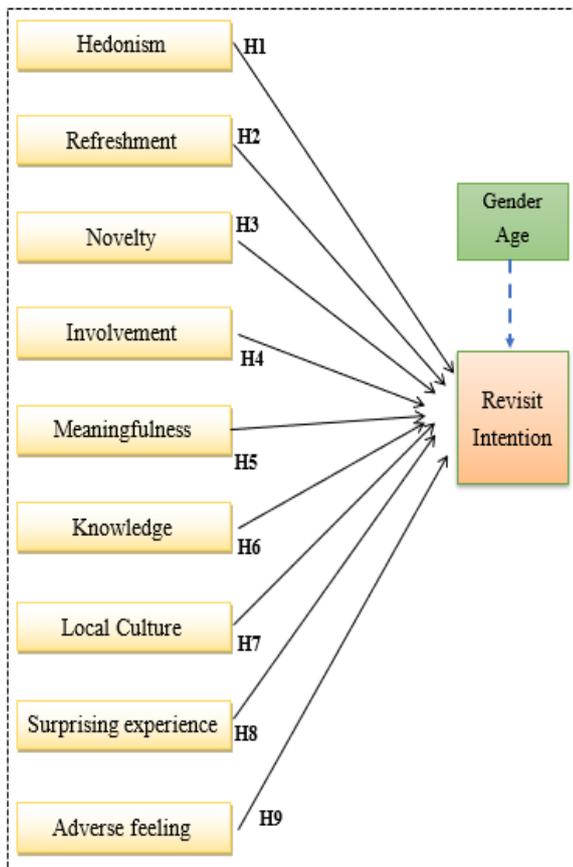


Figure 1: Research model

between the variables of interest. SEM also facilitates multi-group analyzes that can be carried out in the following studies (if any).

increased from 0.737 to 0.823. Therefore, all scales are eligible for EFA analysis.

Table 2: Measurement scale and construction source

Scale	Encode	Question	Source
Hedonism (TANHUONG)	TANHUONG4	Exciting	Kim et al. [16]
	TANHUONG3	I really enjoyed this tourism experience.	
	TANHUONG2	Indulged in the activities	
	TANHUONG1	Thrilled about having a new experience	
Novelty (DOCDAO)	DOCDAO4	Experienced something new	Kim et al. [16]
	DOCDAO3	Different from previous experiences	
	DOCDAO2	Unique	
	DOCDAO1	Once-in-a-lifetime experience	
Refreshment (THUGIAN)	THUGIAN4	Revitalized	Kim et al. [16]
	THUGIAN3	Refreshing	
	THUGIAN2	I enjoyed the sense of freedom.	
	THUGIAN1	Liberating	
Meaning- fulness (YNGHIA)	YNGHIA4	I was inspired	Kim et al. [16] and author's proposal
	YNGHIA3	Learned about myself	
	YNGHIA2	I did something important.	
	YNGHIA1	I did something meaningful.	
Knowledge (KIENTHUC)	KIENTHUC1	Exploratory	Kim et al. [16]
	KIENTHUC2	Knowledge	
	KIENTHUC3	New culture	
Involvement (THAMGIA)	THAMGIA1	I visited a place where I really wanted to go.	Kim et al. [16]
	THAMGIA2	I enjoyed activities which I really wanted to do.	
	THAMGIA3	I was interested in the main activities of this trip.	
Local culture (VANHOA)	VANHOA1	Good impressions about the local people.	Kim et al. [16]& author's proposal
	VANHOA2	Closely experienced the local culture.	
	VANHOA3	Local people in a destination were friendly.	
	VANHOA4	I really like the local food culture.	
Surprising experience (BATNGO)	BATNGO1	Unexpected good incidents, experiences during the trip	Chandara [6]
	BATNGO2	Certain random things that surprised me during the trip	
	BATNGO3	Unexpected benefits or advantages during the trip	
Adverse feeling (TIEUCUC)	TIEUCUC1	I was angry during the trip	Coudounaris et al [9]
	TIEUCUC2	I was frustrated during the trip.	
	TIEUCUC3	I was embarrassed during the trip.	
Revisit Intention (YDINH)	YDINH1	I want to revisit the CBT destination in the future	Kim et al [16]
	YDINH2	I plan to revisit the CBT destination in the future.	
	YDINH3	I will make an effort to revisit the CBT destination in the future.	
	YDINH4	I would like to visit similar CBT destinations in the future.	

IV. RESEARCH RESULTS AND DISCUSSION

A. Assess the reliability of the scales

According to Nunnally, the appropriate scale must have Cronbach's Alpha reliability greater than or equal to 0.7. Hair et al. also suggested that the scale to ensure unidirectionality and reliability should reach Cronbach's Alpha threshold of 0.7 or higher. The analysis results show that all variables have Cronbach's alpha coefficients above 0.7. All values in column Corrected Item - Total Correlation is more significant than 0.3, except for the observed variable DOCDAO1, which has a total correlation coefficient of 0.253. Thus, the observed variable DOCDAO1 is excluded from the research model. After removing this variable, the Cronbach's Alpha coefficient of the Novelty variable

B. Exploratory Factor Analysis

The study used PDF extraction with Promax perpendicular rotation method to summarize the observed variables included in factor analysis and help reduce the number of many observations to a smaller number of main factors for CFA test analysis and SEM linear model. The breakpoint of the EFA analysis is set based on the Eigenvalue coefficient with the number of extracted factors having an Eigenvalue of 1 or more.

The results of the first EFA showed that the observed variable THUGIAN4 uploaded to the 4th factor is not strong enough (Factor loading = 0.498 < 0.5). Therefore, the author removed the observed variable THUGIAN4 from the model. The results of the second EFA show that: KMO coefficient is

equal to $0.884 > 0.5$. According to Kaiser, using this data set for factor analysis is appropriate. Bartlett's test is also satisfactory with $\text{Sig.} = 0.00 < 0.05$. The number of factors extracted here is 10, corresponding to the Eigenvalue coefficient stopping at 1,007, and the total variance extracted is $61.152\% > 60\%$.

C. Confirmatory Factor Analysis (CFA)

According to the analysis results above, the component scales of memorable tourism experiences: Enjoyment, relaxation, originality, significance, participation, surprise, local culture, knowledge, negative emotions, and intention to return to the destination were tested by CFA. The results of CFA analysis of all scales have good indicators that reflect the goodness of fit of the model, specifically: $\text{CMIN/DF} = 1,070$; $\text{GFI} = 0.933$; $\text{CFI} = 0.995$; $\text{TLI} = 0.994$; $\text{RMSEA} = 0.013$; $\text{PCLOSE} = 1,000$.

Thus, according to Hu & Bentler, the model fits the data. The normalized weights of the model all have a value greater than 0.5, range from 0.686 to 0.856, and reach statistical significance with $p = 0.000 < 0.05$. Therefore, all observed variables have meaning in the scale. Based on normalized regression weights, the reliability, convergence, and discriminant indexes are calculated in Table 3. CR values are greater than 0.7, so the scales are reliable. The AVE values are all greater than 0.5, so the scales are all convergent. MSV values are smaller than AVE, so the discriminant of the scales is confirmed.

D. Differences in revisiting intention to CBT destinations across gender and age groups

The study used independent Sample T-Test and one-way ANOVA analysis to test the difference in intention to revisit destinations between men and women; between different age groups (shown in Table 1). Sig Levene's Test is equal to $0.984 > 0.05$. Sig t-test equals $0.991 > 0.05$, so there is no difference in intention between different sex groups. Sig Levene's Test is equal to $0.755 > 0.05$. Sig F-test is $0.303 > 0.05$, so there is no difference in intention between respondents of different ages. With the current sample of observations, the intention to revisit the CBT destination is not controlled for the gender and age variables.

E. Structural Equation Modeling (SEM) analysis and hypothesis testing

The study uses Structural Equation Modeling (SEM) analysis to assess the impact between the factors in the proposed research model. From the results of analysis by SEM, the study evaluated the model's suitability through Chi-square/df, CFI, IFI, RMSEA indexes and tested two hypotheses. The model's indexes are satisfactory, specifically: $\text{Chi-square/df} = 1,086 < 3$; $\text{GFI} = 0.932 > 0.9$; $\text{CFI} = 0.993 > 0.9$; $\text{TLI} = 0.992 > 0.9$; $\text{RMSEA} = 0.015 < 0.08$; $\text{PCLOSE} = 1,000 > 0.05$. The analysis results show that the research model is in agreement with the experimental data as shown in Figure 3.

As reported in Table 4, 8 research hypotheses were supported. Research Hypothesis 1 to 8, in which they hypothesized that the hedonism (TANHUONG), refreshment (THUGIAN), novelty (DOCDAO), involvement (THAMGIA), meaningfulness (YNGHIA), knowledge (KIEN-THUC), local culture (VANHOA), surprising experience (BATNGO) components of a memorable tourism experience positively affects revisit intentions, was supported ($p\text{-value} < 0.001$). Among the memorable travel experience components, the relaxation component has the most substantial influence on future behavioral intentions (Standardized Regression Weights = 0.22).

That means that the more refreshed tourists feel during their trip, the more likely they are to return to their destination. Besides refreshments, novelty and hedonism are also two factors that strongly impact the intention to revisit CBT destinations of domestic tourists. Local cultural factors have the most insignificant influence on revisit intention to a destination of domestic tourists. In other words, the local cultural values or the friendliness of the locals in the destination did not play an essential role in making domestic tourists want to revisit these CBT destinations. The analysis results show that adverse feelings impact negatively revisiting intention, with $p\text{-value} = 0.291 > 0.05$, hypothesis H9 is rejected. Squared Multiple Correlations results show that the independent variable revisits intention (YDINH) has $R^2 = 66.8$. Thus, the independent variables in the model explained 66.8% of the variation of the dependent variable.

Table 3: The reliability, convergence and discrimination of all scales

	CR	AVE	MSV	Y-NGHIA	YDINH	VAN-HOA	TAN-HUONG	BAT-NGO	THAM-GIA	DOC-DAO	THU-GIAN	KIEN-THUC	TIEU-CUC
YNGHIA	0.857	0.599	0.339	0.774									
YDINH	0.879	0.646	0.336	0.548***	0.804								
VANHOA	0.839	0.566	0.336	0.442***	0.580***	0.752							
TANHUONG	0.823	0.538	0.292	0.256***	0.540***	0.384***	0.734						
BATNGO	0.846	0.647	0.147	0.185**	0.339***	0.193**	0.086	0.804					
THAMGIA	0.846	0.648	0.339	0.582***	0.534***	0.418***	0.235***	0.251***	0.805				
DOCDAO	0.832	0.623	0.289	0.379***	0.537***	0.351***	0.520***	0.090	0.331***	0.789			
THUGIAN	0.819	0.601	0.331	0.352***	0.575***	0.540***	0.484***	0.062	0.304***	0.351***	0.775		
KIEN-THUC	0.805	0.579	0.113	0.136*	0.336***	0.237***	0.130*	0.311***	0.122*	0.127*	0.141*	0.761	
TIEUCUC	0.792	0.559	0.147	-0.057	-0.137*	-0.072	-0.076	-0.384**	-0.035	0.007	0.017	-0.045	0.748

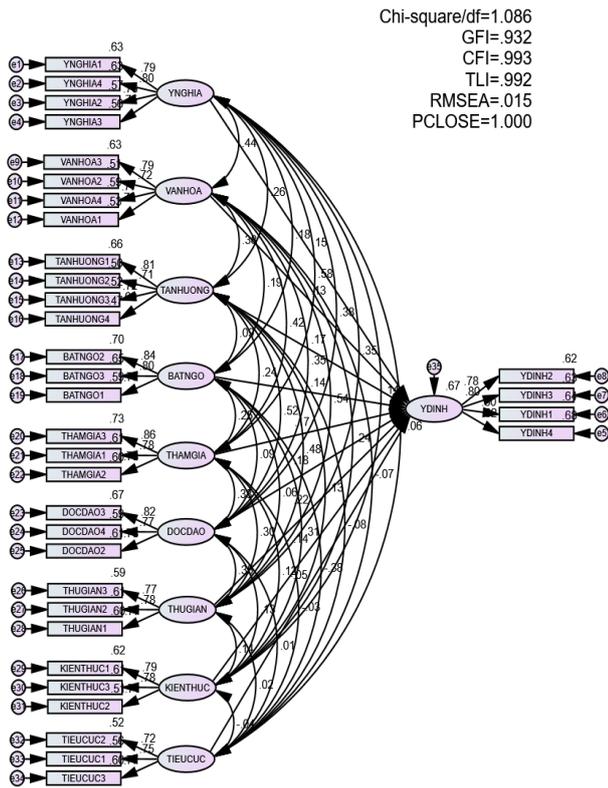


Figure 2: Standardized linear structural equation model

Table 4: Testing of hypotheses based on SEM

Hypotheses path	Regression Weights	Standardized Regression Weights	P-value	Hypotheses
H1: Hedonism => Revisit intention	.110	0.173	.002	Supported
H2: Refreshment => Revisit intention	.140	0.22	***	Supported
H3: Novelty => Revisit intention	.127	0.182	***	Supported
H4: Involvement => Revisit intention	.115	0.169	.002	Supported
H5: Meaningfulness => Revisit intention	.115	0.154	.005	Supported
H6: Knowledge => Revisit intention	.094	0.145	.001	Supported
H7: Local Culture => Revisit intention	.086	0.129	.020	Supported
H8: Surprising experience => Revisit intention	.099	0.136	.005	Supported
H9: Adverse feeling => Revisit intention	-.047	-0.148	.291	Not supported

F. Discussion

Research with community-based tourism in Vietnam has added two new indicators for the Meaningfulness and Local Culture components. The item VANHOA4 about local cuisine reflects the difference in CBT experience in Vietnam when the culinary element is emphasized. Tourists care about food, not new in tourism research, but this result reflects that tourists view cuisine as an important recognition and memory sign of local culture. The item YNGHIA4, about tourists being inspired through tourism experiences, also proves the characteristics of culture, landscape, activities, festivals... in CBT have great inspirational power. It will be an advantage in developing tourism experiences

that combine tourism with charity or public activities for the locality.

Research shows that in CBT in Vietnam, the memorable components extend more than the memorable tourism experience components identified in previous studies with different contexts. There are nine memorable tourism experience components identified in the community tourism context (Hedonism, refreshment, involvement, novelty, meaningfulness, knowledge, local culture, surprising experience, adverse feeling). This number is more than studies conducted with the mass tourism context in large cities (7 components - Kim et al; 8 components - Coudounaris et al.), tourism yoga calendar (5 components - Sharma and Nayak), national park tourism (6 components - Bigne et al.) [17], [9], [26], [5] ... This shows the travel experience at CBT destinations in Vietnam is quite rich. It makes a deep impression on domestic tourists.

This study also has the same conclusion as the study of Coudounaris et al. that adverse feelings-related tourism experiences have no impact on revisit intention of tourists [9]. This result can be explained by the "rose view" theory [21]. These researchers suggest that a person's post-experience perception is more favorable than the experience he or she has. Revisit intentions in tourism are usually medium-term or long-term intentions.

After a while, due to the "rose view" effect, although tourists still remember the existence of these adverse feelings, they are much less sad, stressed, or embarrassed than at the time it occurred. Therefore, this component had little or no influence on their intention to revisit.

In the results of this study, the local cultural composition has the slightest influence on tourists' intention to revisit. In previous studies, the local cultural component is always one that significantly impacts the intention to revisit. The author believes that the cause of this difference is that the survey participants in the study are domestic tourists. With the expansion of media and transport, most people in all regions of Vietnam have access to simulated cultural experiences of

other localities. Traditional costumes appear on stage in costume rental shops. Folk games are held in schools, team building programs. Local cuisine can be found in restaurants ... The impact of local culture on the revisit intention of international tourists can be more significant because they do not have many opportunities to access these simulated cultural experiences.

V. CONCLUSION AND FUTURE RESEARCH

Based on the obtained results, the author gives some solutions and recommendations for the design of community tourism experiences in Vietnam, specifically as follows:

First, local communities and tourism service providers need to design their own travel experiences. CBT experience designs in many destinations are simple and often copied from other successful destinations. It will reduce the uniqueness, making tourists less eager for experiences at the destination.

Second, when designing tourism experiences, it is necessary to focus on those components that have the most substantial impact on tourists' intention to revisit. Refreshment, novelty, and hedonism are these factors in CBT in Vietnam. This conclusion shows that CBT destinations need to focus on designing experiences that enhance these three dimensions to create memorable tourism experiences and increase tourists' revisit intention. To do this, the local community and travels service providers need to consult with experienced design experts and the practical knowledge of visitors.

Third, experience designs need to be continuously improved to deliver the best experiences for tourists and be diversified to suit each tourist group. For example, domestic and international tourists' needs will undoubtedly have many differences, so the design of experiences must also be different.

One of the most significant limitations of the study is that the sample size is not substantial, and the scope of the study is still small.; the survey participants are domestic tourists. The study also did not explore the relationship between memorable tourism experiences and tourists' intention to revisit among different groups of tourists in terms of age, size, cost of travel... The author will expand the research scope and sample size in future studies to retest the obtained results and add control variables to the model.

REFERENCES

- [1] Ajzen, I., & Driver, B. L. (1992). Application of the Theory of Planned Behavior to Leisure Choice. *Journal of Leisure Research*, 24(3), 207–224.
- [2] Arnould, E., and L. Price. (1993). "River Magic: Extraordinary Experience and the Extended Service Encounter." *Journal of Consumer Research*, 20: 24–45.
- [3] Ayazlar, G., & Arslan Ayazlar, R. (2017). A Cross-cultural Investigation of Tourists' Memorable Experiences between Two Nationalities. *Almatourism - Journal of Tourism, Culture, and Territorial Development*, 8(15), 136–151.
- [4] Baker, D. A., and J. L. Crompton. 2000. "Quality, Satisfaction, and Behavioral Intentions." *Annals of Tourism Research* 27 (3): 785–804.
- [5] Bigne, E., Fuentes-Medina, M. L., & Morini-Marrero, S. (2020). Memorable tourist experiences versus ordinary tourist experiences are analyzed through user-generated content. *Journal of Hospitality and Tourism Management*, 45, 309–318.
- [6] Chandralal và Valenzuela (2015), Memorable Tourism Experiences: Scale Development, *Contemporary Management Research*, Vol. 11, No. 3, 291-310.
- [7] Chandralal, L., & Valenzuela, F. (2013). Exploring memorable tourism experiences: Antecedents and behavioral outcomes. *Journal of Economics, Business, and Management*, 1(2), 177–181.
- [8] Chu Hieu (2019), Community-based tourism development in Cao Bang, Ethnic and mountainous photojournalism, accessed March 12, 2020, <https://dantocmiennui.vn/du-lich/cao-bang-phat-trien-du-lich-cong-dong/230455.html>.
- [9] Coudounaris, D. & Sthapit, E (2017) Antecedents of memorable tourism experience related to behavioral intentions, *Psychology & Marketing*, Volume34, Issue12, 1084-1093.
- [10] Doan Van Tuan (2015), To strongly develop community-based tourism in Vietnam, *Economics and Forecast No. 7*, pp.57-59.
- [11] Han Chen, Imran Rahman (2018) Cultural tourism: An analysis of engagement, cultural contact, memorable tourism experience, and destination loyalty, *Tourism Management Perspectives* 26 (2018) 153–163.
- [12] Jang, S., & Feng, R. (2007). Temporal destination revisit intention: The effects of novelty seeking and satisfaction. *Tourism Management*, 28(2), 580–590.
- [13] Kerstetter, D., & Cho, M. (2004). Tourists' information search behavior: The role of prior knowledge and perceived credibility. *Annals of Tourism Research*, 31(4), 961–985.
- [14] Kim, J.-H., Ritchie, J. R. B., & Tung, V. W. S. (2010). The Effect of Memorable Experience on Behavioral Intentions in Tourism: A Structural Equation Modeling Approach. *Tourism Analysis*, 15(6), 637–648.
- [15] Kim, J.-H. (2017). The Impact of Memorable Tourism Experiences on Loyalty Behaviors: The Mediating Effects of Destination Image and Satisfaction. *Journal of Travel Research*, 57(7), 856–870.
- [16] Kim, J. H., Ritchie, J. R. B., & McCormick, B. (2012). Development of a scale to measure memorable tourism experiences. *Journal of Travel Research*, 51(1), 12–25.
- [17] Kim, J. H., & Ritchie, J. R. B. (2013). Cross-cultural validation of a memorable tourism experience scale (MTES). *Journal of Travel Research*, 53(3), 323–335.
- [18] Kim, J., Ritchie, J. R. B., & Tung, W. S. V. (2010). The effect of memorable experience on behavioral intentions in tourism: A structural equation modeling approach. *Tourism Analysis*, 15, 637–648.
- [19] Kozak, M. (2001) Repeaters' Behavior at Two Distinct Destinations. *Annals of Tourism Research*, 28, 784-807.
- [20] Larsen, S. (2007). "Aspects of a Psychology of the Tourist Experience." *Scandinavian Journal of Hospitality & Tourism*, 7 (1): 7-18.
- [21] Mitchell, T. R., Thompson, L., Peterson, E., & Cronk, R. (1997). Temporal Adjustments in the Evaluation of Events: The "Rosy View." *Journal of Experimental Social Psychology*, 33(4), 421–448.
- [22] Nicole Häusler, Wolfgang Strasdas (2002), Training Manual for Community Based Tourism, InWent Capacity Building International, Germany, 2002
- [23] Otto, J.E., & Ritchie, J. R. B. (1996). The service experience in tourism. *Tourism Management*, 17(3), 165–174.
- [24] Pine và Gilmore (1998), *The Experience Economy: Work Is Theatre and Every Business a Stage*, Harvard Business School Press, Boston.
- [25] Quinlan Cutler, S. & Carmichael, B. (2010) The dimensions of the tourist experience. In M. Morgan, P. Lugosi & B. Ritchie (Eds) *The Tourism and Leisure Experience: Consumer and Managerial Perspectives* (pp. 3-26). Bristol: Channel View Publications.
- [26] Sharma, P., & Nayak, J. K. (2019). Examining experience quality as the determinant of tourist behavior in niche tourism: an analytical approach. *Journal of Heritage Tourism*, 1–17.
- [27] Sthapit (2013) Tourists' perceptions of memorable experiences: testing the Memorable Tourism Experience scale (MTEs) among tourists to Rovaniemi, Lapland, pro graduate thesis.
- [28] Tran Thi Mai An (2017), Ethnic community tourism in Vietnam: trends in adapting to the needs of cultural integration, *Southeast Asian Studies*, No. 12, pp.73-78
- [29] Tung, V. W. S., & Ritchie, J. R. B. (2011). Exploring the essence of memorable tourist experiences. *Annals of Tourism Research*, 38(4), 1367–1386.
- [30] Um, S., Chon, K., & Ro, Y. (2006). Antecedents of revisit intention. *Annals of Tourism Research*, 33(4), 1141–1158.
- [31] Zhang, H., Wu, Y., & Buhalis, D. (2018). A model of perceived image, memorable tourism experiences, and revisit intention. *Journal of Destination Marketing & Management*, 8, 326–336.

Leadership Styles and Talent Retention from Higher Education Institutions in Viet Nam A Conceptual Framework

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Abstract—In recent years, several universities have implemented the accomplishments of the industrial revolution (4.0) in education. This demonstrates the importance of talent retention in the workplace, and brilliant individuals are seen as one of competitive advantage. Managers should have suitable talent management plans because talented individuals are scarce, valuable, and hard to substitute. Through the characteristics that leadership styles will affect, such as reward and recognition, learning orientation, and organizational justice, it will provide the organization with a perspective on the members' feelings about the factors affecting the intention to work long-term at higher education institutions. As a result, the authors propose exploring the talent retention model through leadership styles, which will impact the aspects that employees in an organization feel would be interesting and relevant to them. The authors to guide this study will conduct two phases: qualitative research and quantitative research. To investigate the fundamental factors of leadership style behavior, relating to the talent retention strategy of university leaders in Vietnam, qualitative research will be conducted on 8 universities in three regions. North, Central, and South of Vietnam by semi-structured interview method after interview questions with 8 leaders representing higher education institutions. Quantitative research will be conducted by gathering data from lecturers, researchers from organizations in order to test hypotheses based on the findings of qualitative research.

Index Terms—Leadership styles, talent retention, reward and recognition, learning orientation, organizational justice.

I. INTRODUCTION

LEADERSHIP is frequently mentioned in human resource management as a vital aspect in retaining talent [1]. The leader or manager must have in his hand an important weapon: a suitable leadership style that allows him to fulfill both the demands of employees and the needs of the employee's personal and organizational strengths. There are many elements that influence talent attraction and retention, but the two most essential sets of factors that each organization must pay special attention to are factors connected to the organization and its group of people [2]. Employee retention depends on the role of leadership and supervision, argues that employees leave managers, not the organization [3]. As a result, in order to be successful in its operations, a company must place a premium on the human component.

In today's educational environment, lecturers are a group of highly educated individuals who teach as well as conduct research. As a result, higher education institutions are continually on the lookout for individuals who can contribute to both the organization's performance and the educational

knowledge treasure. Many recent researches have found that type of leadership such as transformational leadership and transactional leadership have a significant positive impact on lecturers' work satisfaction [4]. Lecturer job satisfaction is linked to retention in a number of ways, including satisfaction with university leadership [5]. Much prior research has demonstrated that leadership behavior has separate effects on rewards and recognition (RAR), organizational justice (OJ), and learning orientation (LO) and, revealing it as a factor influencing the decision to work at an organization for a long time.

Although the terms "leadership" and "talent retention" have been researched for decades and in a variety of sectors, leadership and retention of talent in higher education organizations is a relatively new subject of research that has received little attention. Furthermore, throughout the protracted impact of the covid-19 pandemic, higher education institutions will face a challenge in determining a more appropriate leadership style to guide the development of employees and organizations. The author's intent in this study is to propose an exploratory model and explore the role of RAR, OJ, and LO as intermediate variables in order to confirm the strong impact of two leadership styles on activities connected to the organization's talent retention. The study focuses on the leadership behavior of leaders in higher education institutions to address this issue. The authors intend to increase knowledge of higher education leadership and present new findings on the leadership behavior's impact on strategic success in retaining talent in higher education institutions. The current study's goal was to look at the impact of two elements on talent retention from their employment: the impact of leadership styles (transformational or transactional) and the mediating roles of reward and recognition, organizational justice, and learning orientation in university.

II. LITERATURE REVIEW

A. Leadership styles and talent retention

Reference [6], leadership is the art of inspiring and assisting others to accomplish things on their own initiative, rather than because they have been asked or are terrified of the repercussions of non-compliance. Influential leadership does not imply that the leader has the ability to manage or direct personnel toward the goals that the leader desires; rather, the results are influenced by the leader's activities. employee ac-

tivities and conduct [7]. Research on employee talent retention strategies by [8] indicates that the decision of employees to engage with the organization is often strongly related to the type of leadership. This research proposes to investigate the role of different leadership styles in influencing talent retention including two styles transformational leadership and transactional leadership. Transactional leadership is defined by an exchange process in which followers comply with the leader's demands but fail to raise in inspiration and dedication for a mission goal. [9]. On the other hand, according to [10] transformational leadership is where the leader inspires, motivates, and encourages subordinates to always be determined and passionate about their work. Previous research has highlighted the link between transformational leadership and talent retention. [11, 12, 13].

This study uses the Multifactor Leadership Questionnaire (MLQ-5X) as the specific tool to evaluate the behavior for transformational and transactional leadership models [14]. The Multifactor Leadership Questionnaire (MLQ-5X) has been translated into many languages and used by scholars in their research around the world. In which, MLQ-5X evaluates the behavior of transformational leadership based on 5 aspects including, idealized influence attributed; idealized influence behavior; inspirational motivation, individualized consideration and intellectual stimulation. In contrast, MLQ-5X evaluates transactional leadership on four dimensions including laissez-faire; contingent reward; passive management by exception; active management by exception. One of the most essential concerns in today's organizations is retaining competent people. According to [15], The loss of highly competent and well-trained employees is the most significant cost associated with employee turnover. These expenses include recruitment expenditures as well as other expenses made by the company to guarantee that a substitute employee is properly addressed and developed inside the company [16]. In the field of education, especially in higher education, organizations are always looking for talented graduates from home and abroad or with high academic qualifications to work at universities. Therefore, retaining talent, even more, emphasizes its role after attracting talent to work for the organization. Organizations can have measures to attract talent, but it does not mean that they will retain talented people who are committed to the organization in the long run.

B. Leadership styles and talent retention through mediating role reward and recognition

Individuals are motivated to work better in the organization when they are rewarded and recognized. Whereas, compliments, group celebrations, and written acknowledgment are some examples of non-monetary rewards that might benefit a group or team formation [17]. When an organization has a good reward system in place, the employee is motivated to achieve high-level organizational goals, who feel safe and know that continual learning and career advancement are valued and encouraged [18]. According to, managers should build and implement efficient reward and recognition systems for individuals to establish a balance between mutual aims, keeping employees with high morale to encourage optimal organizational performance [19], [20]. Furthermore, a number of academic studies have found that

motivation, reward, recognition, passion, and effective talent management are some of the factors that leaders consider to be effective businesses must address in order to mitigate turnover rate and retain talented employees in the organization. [21]. Through previous studies, we have clarified the impression in a type of leadership on reward and recognition and shown the correlation between reward and recognition and talent retention. This study proposes to examine the mediating correlation between the type of leadership and talent retention through reward and recognition.

C. Leadership styles and talent retention through mediating role organizational justice

One of management's most essential responsibilities is to establish a positive work environment for employees, which influences their decision to commit and stay with the company even when alternative job prospects exist outside of it. [22]. Equity in the organization is demonstrated as the employee's perception of the perceived fairness that occurs in the organization [23]. It is very important to perceive something that feels fair or unfair to an employee, which will affect employee behavior i.e., desire to leave a job, job satisfaction of employees, commitment to work, and participation in work [11]. There are many approaches to aspects of organizational justice, but in this study, the authors will exploit organizational justice from three aspects: interactional justice, distributive justice, and procedural justice. Procedural Justice addresses perceptions regarding the fair rules and procedures governing a process [24]. The existence of this type of justice makes satisfaction with the organization [25], [26]. The perception of fairness is referred to as interactional justice in treating individuals with each other [20]. It has to do with people's perceptions of compassion and respect when making conclusions and looking at information. [27]. Distributive justice addresses employees' perceptions of the fairness of the reward system [20]. Compared to other employees, an employee must believe that awards are distributed fairly and without discrimination, i.e. in proportion to their point of giving and effort. [28]. In particular, the authors believe that in an academic environment, employees are considered as one of the most knowledgeable and highly qualified workers, therefore, the perception of organizational justice plays an important role in employing and retaining people of the organization. Highly qualified workers, especially in the field of education such as lecturers, will tend to move to other educational institutions if they do not feel organizational justice because they have enough knowledge and sensitivity to feel it justice where they work. Through previous studies, we have clarified the influence of the type of leadership and organizational justice [29] and showed the correlation between organizational justice and talent retention [24], [30]. This study proposes to examine the mediating role between leadership styles to talent retention through organizational justice.

D. Leadership styles and talent retention through mediating role learning orientation

Learning orientation is defined as a fundamental attitude toward learning, as well as organizational and managerial traits that support learning in the organization. [25]. Learning orientation provides potentially behavior-changing insights

[31] by impressing employees with their aspiration to continuously build up and broaden their knowledge and abilities [32]. Organizations want to keep their employees, it's critical to pay attention to their learning and development goals. Allowing employees to do more and learn more of what they excel at motivates them to stay with the company. [33]. Higher education institutions are places where the learning orientation of workers should be taken into account. Lecturers are subjects who both play two important roles: teaching and research. Therefore, the study orientation for this group of workers is aimed at expanding knowledge, improving expertise in teaching, and supporting lecturers in conducting research. Learning orientation is measured from four dimensions including shared vision, intra-organizational knowledge-sharing, commitment to learning and open-mindedness, and [34], [35].

Leadership has an important role in sharing organizational learning, acquiring new knowledge, and applying this knowledge to improve organizational performance [36]. Leadership creates an atmosphere of openness and mental safety for organizational learning [37], [38], [39]. By modeling learning behavior, encouraging employees to offer new ideas, and assuring knowledge distribution to stimulate creativity, transformational leaders provide critical support to employee learning and growth. Transformational leaders treat employees as independent individuals who show interest in their employees' unique problems and approaches to work and create opportunities for growth. They transfer autonomy to their staff and use their superior knowledge and expertise to help them grow. [40]. A positive association between transactional leadership style and organizational learning has been found in several researches [41], [42], [43]. There's a point illustrating that transactional leadership behaviors improve and extend existing knowledge structures [42]. However, other studies have shown a negative correlation between transactional leadership and learning [44].

In addition, a number of researches have also shown the relationship between learning orientation affecting talent retention, arguing that this is one of the vital elements for retaining talent in organizations [45]. Through previous studies, we have clarified the influence of the style of leadership on learning orientation and showed the correlation between learning orientation and talent retention. This study proposes to examine the mediating role between leadership styles to talent retention through learning orientation.

From theoretical arguments, the authors propose to study the leadership styles relationship model to talent retention through testing the mediating role of the following three components: reward and recognition, organizational justice, learning orientation. In which leadership styles include transformational leadership and transactional leadership.

III. RESEARCH METHODOLOGY

This study aimed to explore leadership styles that impact talent retention through exploring mediating effects including reward and recognition, organizational justice, learning orientation. By using a multifactor leadership questionnaire (MLQ) to explore the behavior of two types of leaders. The scale has five factors for transformational leadership including idealized influence attributed; idealized influence behav-

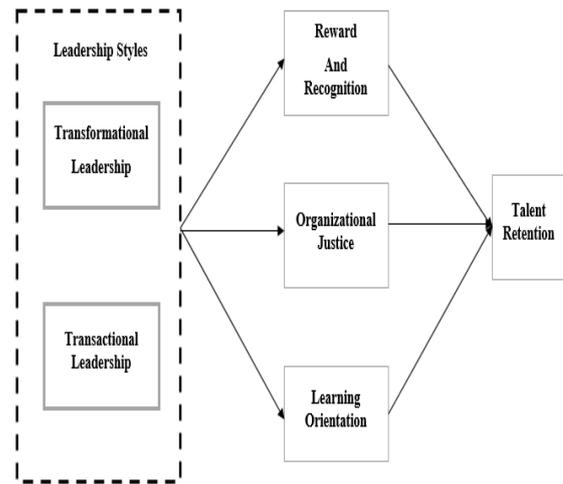


Fig. 1. Conceptual Framework

ior; inspirational motivation, individualized consideration and intellectual stimulation. [46]. The scale has four factors for transactional leadership: contingent reward; active management by exception; passive management by exception; laissez-faire [46]. Research is divided into two processes including qualitative research and quantitative research. Qualitative research explores how leadership styles influence talent retention. Quantitative research based on qualitative research is conducted based on a formal questionnaire with the form of data collection from the responders who meet the conditions before entering the official data collection to meet the level of satisfaction exactly that the research scope of the topic is formed. In addition, quantitative research will test the relationships proposed in the research model through support tools.

A. Qualitative Research

Although there are many ways to collect data in qualitative research, according to [47], the in-depth interview method is the method used mainly and popularly in qualitative research. An in-depth interview is an exchange of views between two people on an issue, in which the interviewer tries to understand the issue based on the interviewee's point of view. The semi-structured question-based in-depth interview method gives the interviewer the freedom to dive deeply into the responders' thoughts, feelings, and motives in relation to the study problem [48]. On the other hand, it helps naturalize the interview, enabling responders to express their experiences, ideas, and feelings more honestly.

Purposeful sampling is the purposeful selection of information-rich subjects [49], [50] to assist the researcher in best understanding the research question and phenomenon [47] and enables the researcher to meet the research topic's specific requirements. Therefore, in this study, the authors select the subjects to interview are 10 leaders with 5 years of management experience or more in higher education operating for 5 years or more. The subjects that the authors propose to conduct in-depth interviews should include leaders or managers of both male and female genders, diverse professions, and diverse ages. Through qualitative research, the authors aim to receive sharing from school leaders in talent retention behavior through their organizations. Thereby discovering

more factors constituting leadership styles, affecting the components considered as important strategies in retaining talent, including reward and recognition, organizational justice, learning orientation.

Potential responders to interview in this research will be selected on the basis of the following classification characteristics: (1) working in higher education institutions (2) experience managing or leading for 5 years or more (3) higher education institutions that have been inactive for more than 10 years. After introducing the content and purpose of the study and receiving the consent of the responders, the researcher will arrange an appointment to conduct an in-depth interview. These interviews will be recorded (with the consent of the responders) to serve the purpose of storing and analyzing more detailed information after these conversations. The recording will be translated into text. On average, each interview lasted about 30 to 45 minutes. The researcher will begin the interview by introducing the purpose of the study and asking the responders to allow the researcher to share the content of the interview. The personal information of the interviewees including names, phone numbers, and email is kept confidential. A list of open-ended questions is used to keep the conversation around the research topic and to ensure all relevant content is covered. At the end of the interview, the researcher acknowledged the responders and asked them to contact them in case of any feedback or retraction of the information provided.

B. Quantitative research

Quantitative research will be based on elements built from qualitative research and provide a formal questionnaire. Using the convenience method sampling technique for the purpose of collecting data for the purpose of the study, the authors propose to limit the scope of the information collected from employees who include lecturers, researchers, with at least 3 years of working experience in higher education institutions representing three regions of North, Central, and South in Vietnam. With work experience with superiors, the authors approach the interview with the desire to receive open and honest feedback on how responders believe their leadership has influenced talent retention through aspects including reward and recognition, organizational justice, learning orientation. The authors propose to use Likert 7 - point scale ranging from "strongly disagree" to "strongly agree" in the survey collecting data from responders, because it responds better than the actual assessment responder, is easier to use, and provides more data points for the operation of the information system [51].

IV. CONCLUSION

The authors propose to study the impact model between leadership styles on talent retention by examining the mediating roles of reward and recognition, organizational justice, learning orientation to emphasize the role of leadership styles on their behavior. After empirical research takes place, it will create scientific value and implications for practitioners. That helps leaders at universities have the right orientation in the strategy of talent retention through results of research. Empirical research will explore the correlation between leadership style and talent retention to show the mediating effects

that a leader needs to make to retain talent in a higher education institution. However, the limitation of the model is that it has not exploited all aspects based on the characteristics constituting leadership styles, the model only clarifies the impact between leadership styles on talent retention through mediating roles. Future framework research is proposed to explore more factors affecting talent retention that this study has not mentioned. In addition, the future research model should coordinate to explore the role of demographic variables that play the role of moderator variables in the model. Furthermore, the function of mediator factors can be investigated to elucidate the level of influence between the components.

REFERENCES

- [1] B. Meyer *et al.*, "What good leaders actually do: micro-level leadership behaviour, leader evaluations, and team decision quality," *Eur. J. Work Organ. Psychol.*, vol. 25, no. 6, pp. 773–789, 2016, doi: 10.1080/1359432X.2016.1189903.
- [2] B. L. Das and M. Baruah, "Employee Retention: A Review of Literature," *IOSR J. Bus. Manag.*, vol. 14, no. 2, pp. 08–16, 2013, doi: 10.9790/487x-1420816.
- [3] I. Journal, "Reflections on the determinants of voluntary turnover," *Int. J. Manpow.*, vol. 22, no. 7, pp. 600–624, 2000.
- [4] Y. N. Azziah *et al.*, "Transformational or transactional leadership style: Which affects work satisfaction and performance of islamic university lecturers during COVID-19 pandemic?," *Syst. Rev. Pharm.*, vol. 11, no. 7, pp. 577–588, 2020, doi: 10.31838/srp.2020.7.82.
- [5] M. Betancourt-Smith, D. Inman, and L. Marlow, "Professional Attrition: An Examination of Minority and Nonminority Teachers At-Risk," *Pap. Annu. Meet. Mid-South Educ. Res. Assoc. Nashville, TN*, pp. 1–10, 1994.
- [6] J. A. Okumbe, *Educational Management: Theory and Practice*. African Books Collective Ltd.: The Jam Factory, 27 Park End Street, Oxford OX1 1HU, United Kingdom, 1998.
- [7] B. M. Wakabi, "Leadership Style and Staff Retention in Organisations," *Int. J. Sci. Res.*, vol. 5, no. 1, pp. 412–416, 2016, doi: 10.21275/v5i1.nov152642.
- [8] J. Zhang, M. F. Ahammad, S. Tarba, C. L. Cooper, K. W. Glaister, and J. Wang, "The effect of leadership style on talent retention during Merger and Acquisition integration: evidence from China," *Int. J. Hum. Resour. Manag.*, vol. 26, no. 7, pp. 1021–1050, 2015, doi: 10.1080/09585192.2014.908316.
- [9] N. Izidor and I. E. B. J., "Nexus Between Leadership Styles, Employee Retention and Performance in Organizations in Nigeria," *Eur. Sci. J.*, vol. 11, no. 13, pp. 185–209, 2015.
- [10] K. Nielsen, J. Yarker, S. O. Brenner, R. Randall, and V. Borg, "The importance of transformational leadership style for the well-being of employees working with older people," *J. Adv. Nurs.*, vol. 63, no. 5, pp. 465–475, 2008, doi: 10.1111/j.1365-2648.2008.04701.x.
- [11] M. A. Y. Yamin, "Examining the role of transformational leadership and entrepreneurial orientation on employee retention with moderating role of competitive advantage," *Manag. Sci. Lett.*, vol. 10, no. 2, pp. 313–326, 2020, doi: 10.5267/j.msl.2019.8.039.
- [12] Á. R. Para González, Lorena; Jiménez Jiménez, Daniel; Martínez Lorente, "Exploring the Mediating Effects Between Transformational," *Empl. Relations*, vol. 40, no. 2, pp. 412–432, 2018, [Online]. Available: <https://doi.org/10.1108/ER-10-2016-0190>.
- [13] X. Yizhong, Y. Baranchenko, Z. Lin, C. K. Lau, and J. Ma, "The influences of transformational leadership on employee employability: Evidence from China," *Empl. Relations*, 2019.
- [14] B. M. Bass and B. J. Avolio, *MLQ, Multifactor Leadership Questionnaire sampler set: technical report, leader form, rater form, and scoring key for MLQ form 5x-short*, 2nd ed. Redwood City, CA.: Mind Garden, ©2000, 2000.
- [15] S. Makhubela and M. Ngoepe, "Knowledge retention in a platinum mine in the North West Province of South Africa," *SA J. Inf. Manag.*, vol. 20, no. 1, pp. 1–8, 2018, doi: 10.4102/sajim.v20i1.905.
- [16] M. R. Mey, P. Poisat, and C. Stindt, "The influence of leadership behaviours on talent retention: An empirical study," *SA J. Hum. Resour. Manag.*, vol. 19, pp. 1–9, 2021, doi: 10.4102/sajhrm.v19i0.1504.
- [17] R. Cacioppe, "Using team – individual reward and recognition strategies to drive organizational success," *Leadersh. Organ. Dev. J.*, vol. 20, no. 6, pp. 322–331, 1999, doi: 10.1108/01437739910292634.

- [18] S. C. Bushardt, D. W. Glascoff, and D. Harold Doty, "Organizational culture, formal reward structure, and effective strategy implementation: A conceptual model," *J. Organ. Cult. Commun. Confl.*, vol. 15, no. 2, pp. 57–70, 2011.
- [19] P. M. Koech and G. Namusonge, "The Effect of Leadership Styles on Organizational Performance at State Corporations in Kenya," *Int. J. Bus. Commer.*, vol. 2, no. 1, pp. 1–12, 2012, [Online]. Available: www.ijbnet.com.
- [20] S. C. Selden and J. E. Sowa, "Voluntary Turnover in Nonprofit Human Service Organizations: The Impact of High Performance Work Practices," *Hum. Serv. Organ. Manag. Leadersh. Gov.*, vol. 39, no. 3, pp. 182–207, 2015, doi: 10.1080/23303131.2015.1031416.
- [21] N. Mngomezulu, M. Challenor, E. Munapo, P. Mashau, and C. Chikandiwa, "The impact of recognition on retention of good talent in the workforce," *J. Gov. Regul.*, vol. 4, no. 4, pp. 372–379, 2015, doi: 10.22495/jgr_v4_i4_c3_p2.
- [22] S. Michael, "Using Motivational Strategy as Panacea for Employee Retention and Turnover in Selected Public and Private Sector Organisations in the Eastern Cape Province of South Africa," University of Fort Hare, 2008.
- [23] N. Silitonga *et al.*, "The Relationship of Transformational Leadership, Organizational Justice and Organizational Commitment: a Mediation Effect of Job Satisfaction," *J. Crit. Rev.*, vol. 7, no. 19, pp. 89–108, 2020, [Online]. Available: <http://www.jcreview.com/?mno=101999>.
- [24] R. Imran and K. Allil, "The impact of organizational justice on employee retention: Evidence from Oman," *Int. Rev. Manag. Mark.*, vol. 6, no. 2, pp. 246–249, 2016.
- [25] A. Fatima, R. Imran, H. Shahab, and S. Zulfi qar, "Knowledge sharing among Pakistani IT professionals: Examining the role of procedural justice, pay satisfaction and organizational commitment," *Adv. Sci. Lett.*, vol. 21, no. 5, pp. 1189–1192, 2015.
- [26] T. Nabatchi, L. B. Bingham, and D. H. Good, "Organizational justice and workplace mediation: A six-factor model," *Int. J. Confl. Manag.*, vol. 18, no. 2, pp. 148–174, 2007, doi: 10.1108/10444060710759354.
- [27] R. Bies and J. . Moag, "Interactional justice: Communication criteria of fairness," *Res. Negot. Organ.*, vol. 1, no. 1, pp. 43–55, 1986.
- [28] M. Alsalem and A. Alhaiani, "Relationship between organizational justice and employees performance," *Aledari*, vol. 108, pp. 97–110, 2007.
- [29] N. Gillet, E. Fouquereau, A. Bonnaud-Antignac, R. Mokoukolo, and P. Colombat, "The mediating role of organizational justice in the relationship between transformational leadership and nurses' quality of work life: A cross-sectional questionnaire survey," *Int. J. Nurs. Stud.*, vol. 50, no. 10, pp. 1359–1367, 2013, doi: 10.1016/j.ijnurstu.2012.12.012.
- [30] R. A. Gohar and Q. A. Qureshi, "Connecting Talent Management and Employees' Retention: A Mediating Role of Organizational Justice," *City Univ. Res. J.*, no. 11, pp. 124–143, 2021, [Online]. Available: <https://search.proquest.com/openview/a06bd74f95dcd1dbd5c8eff90ca6256a/1?pq-origsite=gscholar&cbl=2068970>.
- [31] G. P. Huber, "Organizational Learning: The Contributing Processes and the Literatures," *Organ. Sci.*, vol. 2, no. 1, pp. 88–115, 1991, doi: 10.1287/orsc.2.1.88.
- [32] A. K. Kohli, T. A. Shervani, and G. N. Challagalla, "Learning and performance orientation of salespeople: The role of supervisors," *J. Mark. Res.*, vol. 35, no. 2, pp. 263–274, 1998, doi: 10.2307/3151853.
- [33] N. Govaerts, E. Kyndt, F. Dochy, and H. Baert, "Influence of learning and working climate on the retention of talented employees," *J. Work. Learn.*, vol. 23, no. 1, pp. 35–55, 2011, doi: 10.1108/13665621111097245.
- [34] G. T. M. Hult and O. C. Ferrell, "Global Organizational Learning Capacity in Purchasing: Construct and Measurement," *J. Bus. Res.*, vol. 2963, no. 96, pp. 97–111, 1997.
- [35] R. F. Hurley and G. T. M. Hult, "Innovation, market orientation, and organizational learning: An integration and empirical examination," *J. Mark.*, vol. 62, no. 3, pp. 42–54, 1998, doi: 10.2307/1251742.
- [36] B. Khalifa and R. M. Ayoubi, "Leadership styles at Syrian higher education: What matters for organizational learning at public and private universities?," *Int. J. Educ. Manag.*, vol. 29, no. 4, pp. 477–491, 2015, doi: 10.1108/IJEM-03-2014-0036.
- [37] Chris Argyris and Donald A. Schön, *Organizational learning II: Theory, method and practice Reading*, 2nd ed. Reading: Addison Wesley, 1996.
- [38] A. Edmondson, "Psychological safety and learning behavior in work teams," *Adm. Sci. Q.*, vol. 44, no. 2, pp. 350–383, 1999, doi: 10.2307/2666999.
- [39] E. H. Schein, "How can organizations learn faster?: the problem of entering the Green Room," *Japanese Soc. Biofeedback Res.*, vol. 19, no. Alfred P. Sloan School of Management, Massachusetts Institute of Technology, pp. 709–715, 1992, [Online]. Available: <http://hdl.handle.net/1721.1/2399>.
- [40] T. Dvir, D. Eden, B. J. Avolio, and B. Shamir, "Impact of transformational leadership on follower development and performance: A field experiment," *Acad. Manag. J.*, vol. 45, no. 4, pp. 735–744, 2002, doi: 10.2307/3069307.
- [41] A. F. Coad and A. J. Berry, "Transformational leadership and learning orientation," *Leadersh. Organ. Dev. J.*, vol. 19, no. 3, pp. 164–172, 1998, doi: 10.1108/01437739810210211.
- [42] J. J. P. Jansen, D. Vera, and M. Crossan, "Strategic leadership for exploration and exploitation: The moderating role of environmental dynamism," *Leadersh. Q.*, vol. 20, no. 1, pp. 5–18, 2009, doi: 10.1016/j.leaqua.2008.11.008.
- [43] W. A. Nafei, N. M. Khanfar, and B. A. Kaifi, "Leadership Styles and Organizational Learning An Empirical Study on Saudi Banks in Al-Taif Governorate Kingdom of Saudi Arabia," *J. Manag. Strateg.*, vol. 3, no. 1, pp. 2–17, 2012, doi: 10.5430/jms.v3n1p2.
- [44] M. Amitay, M. Popper, and R. Lipshitz, "Leadership styles and organizational learning in community clinics," *Learn. Organ.*, vol. 12, no. 1, pp. 57–70, 2005, doi: 10.1108/09696470510574269.
- [45] A. D'Amato and R. Herzfeldt, "Learning orientation, organizational commitment and talent retention across generations: A study of European managers," *J. Manag. Psychol.*, vol. 23, no. 8, pp. 929–953, 2008, doi: 10.1108/02683940810904402.
- [46] J. Rowold, "Multifactor Leadership Questionnaire," *Psychom. Prop. Ger. Transl. by Jens Rowold*, no. Mind Garden, 2005.
- [47] J. W. Creswell, *Qualitative, quantitative and mixed methods approaches*, 4th ed. Thousand Oaks: Sage, 2014.
- [48] D. M. Tran, W. Fallon, and M. H. Vickers, "Leadership in Vietnamese state owned enterprises (SOEs): Exploring multi-stakeholder perceptions—a qualitative study," *Asia-Pacific J. Bus. Adm.*, vol. 8, no. 1, pp. 21–36, 2016, doi: doi.org/10.1108/APJBA-10-2014-0116.
- [49] M. Patton, *Qualitative research and evaluation methods*. London: Sage Publications, 1978.
- [50] J. Ritchie, J. Lewis, C. . Nicholls, and R. Ormston, *Qualitative research practice: A guide for social science students and researchers*. Los Angeles, California: Sage, 2013.
- [51] A. Joshi, S. Kale, S. Chandel, and D. Pal, "Likert Scale: Explored and Explained," *Br. J. Appl. Sci. Technol.*, vol. 7, no. 4, pp. 396–403, 2015, doi: 10.9734/bjast/2015/14975.

The problem of adaptation and evolution to overcome the COVID-19 epidemic for service quality of Hanoi old quarter hotels (During the period of the COVID- 19 epidemic)

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Abstract—This study examines the factors affecting the service quality of Hanoi old quarter hotels. The investigation results of 150 customers who have used accommodation services in the Hanoi old quarter. From there, analyze results and identify shortcomings and points that need to be overcome. Make the most intuitive conclusions to solve problems for hotel businesses here.

Index Terms—service quality, Hanoi old quarter hotel, COVID- 19 epidemic, hotel

I. INTRODUCTION

THE HOSPITALITY and tourism industry is gradually becoming a critical spearhead economic sector, making a significant contribution to the country's overall economy. In recent years, the evolution of the accommodation service business has become exciting. According to figures, in 2019, Vietnam's tourism industry achieved a "golden" miracle of growth, welcoming more than 18 million international visitors, an increase of 16.2% compared to 2018, serving 85% of domestic tourists, the number of tourists increased. The spike caused some places to have high occupancy, but overall, the average room capacity of the accommodation system decreased. [4]

With its position as the 'heart' of the country with advantages, potential, and greater responsibility than other localities, Hanoi increasingly asserts itself as one of the attractive destinations of the region and world. In recent years, Hanoi has been on the list of 1/7 nominations for "World's Leading Cities Destinations 2018" of World Travel Award -WTA, Traveler's Choice Awards 2019, and many other ratings. The problem for Hanoi is how to preserve and develop this "brand" sustainably. One of the most prominent features in Hanoi is the old quarter. It contains historical relics, the most beautiful landscapes, typical of Vietnamese folk architecture with the harmonious and lively combination of the overall architecture and the convenience in daily life were a surprise, bringing many experiences. They are significant benefits to attracting and retaining tourists for Hanoi. Although the old town has great potential, it has not been able to bring into full play its potential. While service providers want to improve service quality, add more rooms to meet growing demand, but still have to preserve the structure and ancient features of the Hanoi old quarters. [12]

This article explores the impact of the COVID- 19 epidemic on hospitality in the Hanoi old quarter, thereby pointing out the advantages and disadvantages facing the hospi-

tality industry. The article uses quantitative methods and analysis, thereby giving results on the factors affecting the service quality of Hanoi old quarter hotels. These impacts both create opportunities for the hotels and cause them to face other challenges. The article also offers solutions that can help the Hanoi old quarter hotels to improve the service quality and overcome the crisis.

From analyzing the factors affecting the quality of hotel services in many aspects, thereby helping hotel managers and business owners understand the importance of each factor from which to have the most overview to allocate resources in each time and stage of business activities. Moreover, at the time of the study, when the Covid 19 epidemic was developing intensely both at home and abroad, it was helpful for changes in policies to overcome the pandemic.

II. LITERATURE REVIEW

A. Hotel

To give a complete definition of a hotel, we first need to understand the history of the birth and development of the hotel from which to have a more comprehensive view of this concept.

The term hotel in Vietnamese or commonly known as Hotel is derived from the French word used to refer to a place that serves overnight guests, and it was introduced to our country in the early years of the twentieth century.

According to the American research group, "A hotel is where anyone can pay to rent a room to stay overnight. Each bedroom for rent inside must have at least two small rooms (bedroom and bedroom). Every other room has a bed, a phone, and a television. Other services, besides the bedroom service, can be offered, such as luggage transportation, a business center (including photocopying equipment), a restaurant, a bar, and various other forms of entertainment. Hotels can be constructed near or within business districts, resorts, or airports. According to Clause 12, Article 4 of the Law on Tourism of Vietnam, "Hotel is an establishment that rents out rooms and beds and provides other services to guests, and a hotel is a significant tourist accommodation establishment.

Although there are many different interpretations, it can be summarized as follows: a hotel is first and foremost a typical accommodation establishment built at a specific lo-

cation and provides products and services to customers. Customers to make a profit

B. Service quality

A hotel business that wants to survive and grow in the market must guarantee that the objective is to attract and retain many clients while also ensuring and satisfying their demands. This necessitates firms paying close attention to service quality at all times. So, what exactly is service quality?

Up to now, there are many definitions of service that have been given in different ways.

- Services are intangible products produced and consumed at the same time. In the broad sense of marketing, a service is an intangible product. [13]

- Another definition, service is a process that includes behind-the-scenes and front-end activities, where customers and suppliers interact. Service is a highly intangible process. [14]

- Services are business transactions between service providers and customers with the ultimate aim of satisfying customers. [15]

- A service is any measure or advantage that one party can provide to the other that is mainly undetectable and does not result in appropriation. The performance of the service may or may not include the use of the commodities in their physical form. [16]

The hotel's products and services comprise two significant services and two extra services: the leading service is room service and food service to meet intense demands, while supplementary services are other services to satisfy secondary needs during their stay at the hotel. The appropriateness of a product or service to fulfill specified or predetermined client needs is referred to as service quality. In other words, service quality is the gap between customers' requests and services given; if the want surpasses the capacity to satisfy, the client is dissatisfied.

As a result, hotel service quality is measured by comparing the perceived volume and the expected quality of the hotel's offerings.

C. Methodology

1) Sample

The paper topic consists of 25 variables, so the minimum sample is 125. Including the risk cases in case the reference participant does not answer, or the answer sheet is invalid, the actual sample of the interview will be 150 samples and collect 134 quality assurance votes, discarding 16 votes. The paper was conducted to evaluate the factors related to the quality of service delivery to customers in the Hanoi Old Quarter. The study's data are primary data collected from the distribution of votes to 150 customers who have used the service and are using the accommodation service in Hanoi Old Quarter. The paper uses the quantitative method to measure the quality of the service. The accommodation services are provided to customers in the old quarter of Hanoi. Through seminars to meet business enterprises, hotel service groups on social networks, and through the help of brothers, friends, and instructors, we have sent 150 direct or email surveys to accommodation businesses in Hanoi Old Quarter via Google Forms tool, served April and May 2020 in Viet-

nam. After two months, we got 134 answers with a response rate of 89.3%

2) Measures

Based on the research model proposed earlier and information from previous research, along with the additions appropriate to the research situation in Vietnam, we develop the scale of the six impact factors, including Tangibility, Reliability, Responsiveness, Confidence, Communication, satisfaction[8][1][9]

We use 5-point Likert-type scales with the following marks: 1 is disagree, 2 is not agree, 3 is neutral, 4 is agree, and 5 is completely agree.

TABLE I: THE SCALE USED FOR THE STUDY[13]

	Dimension Scale item
	Tangibility
HH1	The front desk was visually appealing
HH2	The employees had clean, neat uniforms
HH3	The restaurant's atmosphere was inviting
HH4	The shops were pleasant and attractive
HH5	The outdoor surroundings were visually attractive
HH6	The hotel was bright and well lighted
HH7	The hotel's interior and exterior were well maintained
HH8	The hotel was clean
	Reliability
TC1	My reservation was handled efficiently
TC2	My guest room was ready as promised
TC3	TV, radio, A/C, lights, and other mechanical equipment worked properly
TC4	I got what I paid for
	Responsiveness
PH1	Employees responded promptly to my requests
PH2	Informative literature about the hotel was provided
PH3	Employees were willing to answer my questions
PH4	Employees responded quickly to solve my problems
PH5	Room service was prompt
	Confidence
TT1	Employees knew about local places of interest
TT2	Employees treated me with respect
TT3	Employees were polite when answering my questions
TT4	The hotel provided a safe environment
TT5	The facilities were conveniently located
	Communication
GT1	Charges on my account were clearly explained
GT2	I received undivided attention at the front desk
GT3	Reservationists tried to find out my particular needs
GT4	Employees anticipated my needs

TABLE II: SCALE TO EVALUATE THE LEVEL OF INFLUENCE

Code - No	Customer Satisfaction
HL1	I am satisfied with the quality of hotel service
HL2	I will recommend to others the hotel in the old town
HL3	I will choose hotels in the Old Quarter area to stay in the next time I come back to Hanoi

III. RESULTS

A. Reliability analysis

Cronbach's Alpha is a measure of the scale's reliability. Using Cronbach's Alpha, unsuitable variables are removed. All scales are eligible since their Cronbach's Alpha coefficients are more than 0.6. tangibility, with the exception of scale 4, where the measurement of interest rates will be removed because it is unrelated to the scale.

The population's Cronbach's Alpha coefficient of 0.825 is notable, ranging from 0.6 to 1.

The variable correlation coefficient - total (Corrected Item-Total Correlation) of observable variables HH1, HH2,

HH3, HH4, HH5, HH6, HH7 is 0.610; 0.682; 0.409; 0.532; 0.641; 0.628; 0.470 is larger than 0.3, so the scale is standard and accurate.

1) Reliability

The Cronbach's Alpha coefficient of the population 0.766 ranges from 0.6 to 1, which is significant.

The variable correlation coefficient - total (Corrected Item-Total Correlation) of observable variables TC1, TC2, TC3, TC4 is 0.539, respectively; 0.585; 0.586; 0.553 are all greater than 0.3, so the scale is standard and accurate.

2) Responsiveness

The Cronbach's Alpha coefficient of the population 0.803 ranges from 0.6 to 1, which is significant.

The variable correlation coefficient - total (Corrected Item-Total Correlation) of observable variables PH1, PH2, PH3, PH4,PH5,PH6 is 0.624, respectively; 0.567; 0.650; 0.439; 0.533; 0.545 are all greater than 0.3, so the scale is standard and accurate

3) Confidence

The Cronbach's Alpha coefficient of the population 0.700 ranges from 0.6 to 1, which is significant.

The variable correlation coefficient - total (Corrected Item-Total Correlation) of observable variables TT1, TT2, TT3, TT4 is 0.445, respectively; 0.556; 0.465; 0.490 are all greater than 0.3, so the scale is standard and accurate.

4) Communication

The Cronbach's Alpha coefficient of the population 0.664 ranges from 0.6 to 1, which is significant.

The correlation coefficient - total (Corrected Item-Total Correlation) of the observed variables GT1, GT2, GT3, GT4 is 0.345 0.448, respectively; 0.580; 0.420 are all greater than 0.3, so the scale is standard and accurate.

4.2 Identify influencing factors by the Exploratory Factor Analysis (EFA)

The observed variables used to quantify the features of each element that impact the customer's usage of predatory loans will be evaluated after examining the Cronbach's Alpha reliability coefficient. Components' factor analysis with varimax rotation was used to examine the possible dimensionality of variables. The correlation matrix for all variables evaluated was correlated by KMO (to verify the suitability of factor analysis), resulting in 0.876 (> 0.5), and Bartlett's Test of Sphericity showed that variables utilized in this research are unrelated with the Sig 0,05. This implies that EFA is relevant to the data.

TABLE III: KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin Measure of sampling Adequacy		.876
Bartlett's Test of Sphericity	Approx. Chi-Square	1258.756
	df	300
	Sig.	.000

Through checking the necessary conditions to carry out the EFA analysis method, it shows that: the correlation matrix for all the variables tested for correlation by KMO is 0.876 > 0.5, proving that the factor analysis is appropriate with research data. In addition, the result of Bartlett's test is 1258,756 with the sig significance level of 0.000 < 0.5, so it is sufficient to reject the hypothesis Ho, so the data collected using the factor analysis method is entirely appropriate.

TABLE IV:

	Component					
	1	2	3	4	5	6
HH2	.735					
HH5	.696					
HH4	.694					
HH1	.691					
HH6	.635		.392			
HH3	.603		-.319			
PH6		.622				
PH5	.322	.594				
PH1		.549		.371		
TT4		.539			.430	
TC1		.536	.462			
TC2			.751			
TC3			.638			
PH2		.399	.511			
PH3		.431	.470	.332		
GT1				.694		
GT2				.690		
PH4		.479		.523		
TC4	.320		.435	.494		
TT1					.728	.371
TT3					.692	
HH7	.533				.552	
TT2		.364	.341		.487	
GT4						.814
GT3				.335		.727
HH2	.735					

Principal Component Analysis was used as the extraction method.

Varimax with Kaiser Normalization is the rotation method used.

- a. After seven iterations, the rotation converged. According to hair and ctg (2009, 116) Multivariate Data Analysis, Prentice Hall International, Inc, Factor loading is the criterion to ensure the practical significance of EFA

+, If 0.3= Factor loading = 0.4 is considered to have reached the minimum level

+, If Factor loading >= 0.5 is considered practical significance Looking at the Rotated Component Matrix table above, there are 6 columns, indicating that there are 6 factors generated from 25 independent variables, and 12 variables with unacceptable factor loading: TT2, HH7, TC4, PH4, PH3, PH2, TC1, PH5, TT4, PH1, HH3, HH6. Due to ensure convergence value (Factor Loading load factors must be greater than 0.5) and ensure discriminant validity (In the same line, the difference between the greatest and second-largest number must be more than 0.3); therefore, we delete

TABLE V: TOTAL VARIANCE EXPLAINED

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	4.041	31.086	31.086
2	1.604	12.340	43.426
3	1.216	9.357	52.783
4	1.006	7.738	60.520
5	.855	6.577	67.098
6	.786	6.044	73.142
7	.661	5.088	78.231
8	.614	4.722	82.953
9	.581	4.469	87.422
10	.494	3.799	91.221
11	.431	3.314	94.535
12	.363	2.789	97.324
13	.348	2.676	100.000

these variables from the list of variables on the "Factor Analysis" page and perform EFA with the remaining variables, yielding the value shown below. Results of the 2nd EFA analysis

TABLE VI:

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	4.041	31.086	31.086
2	1.604	12.340	43.426
3	1.216	9.357	52.783
4	1.006	7.738	60.520
5			
6			
7			
8			
9			
10			
11			
12			
13			

TABLE VII:

Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
	2.436	18.736	18.736
1	2.022	15.558	34.294
2	1.876	14.431	48.725
3	1.533	11.795	60.520
4			
5			
6			
7			
8			
9			
10			
11			

B. Results of factor analysis

Recognizing and removing several ineligible variables that are TT2, HH7, TC4, PH4, PH3, PH2, PH5, TC1, TT4, PH1, HH3, HH6, we get a cumulative % of 60.520%, or these 4 factors can explain 60,520 % variation of observed variables or data.

After rotating the model for the second time, we can re-group the factors as follows:

Factor 1: includes 4 observed variables

HH4: The interior is conveniently arranged

HH1: The reception desk is attractively arranged

HH5: Clean hotel

HH2: Clean staff, neat uniforms

2nd multiplier: includes 2 observed variables

TT3: The staff is polite when answering my questions

TT1: Employees know about local attractions

The third factor: includes 2 observed variables

TC2: My room is ready as promised

TC3: TVs, radios, A/Cs, lights, and other devices work correctly and efficiently

Factor 4: including 1 observed variable

PH6: Room service is speedy

Factor 5: includes 4 observed variables

GT4: Employees anticipate my needs

GT3: The front desk staff went out of their way to understand my specific needs

GT1: My bill is clearly explained

GT2: I was given a fair reception.

Regardless of the front desk realizing the close relationship between the variables, these factors are considered factors affecting the quality of accommodation service provision.

TABLE VIII:

	Component					
	1	2	3	4	5	6
HH2	.735					
HH5	.696					
HH4	.694					
HH1	.691					
HH6	.635		.392			
HH3	.603		-.319			
PH6		.622				
PH5	.322	.594				
PH1		.549		.371		
TT4		.539			.430	
TC1		.536	.462			
TC2			.751			
TC3			.638			
PH2		.399	.511			
PH3		.431	.470	.332		
GT1				.694		
GT2				.690		
PH4		.479		.523		
TC4	.320		.435	.494		
TT1					.728	.371
TT3					.692	
HH7	.533				.552	
TT2		.364	.341		.487	
GT4						.814
GT3				.335		.727
HH2	.735					

Principal Component Analysis is the extraction method used.

Varimax rotation with Kaiser normalization.

a. After 5 repetitions, the rotation converged.

C. Results of factor analysis

The regression method shows the relationship of challenge factors affecting the quality of accommodation service provision in the Old Quarter area as follows:

$$M = B1N1 + B2N2 + B3N3 + B4N4 + B5N5$$

TABLE IX:

N	Effects related to Tangibles	
1		
N	Influences related to Credibility	Tổng của 2 biến quan sát
2		
N	Effects related to Feedback	Tổng của 1 biến quan sát
3		
N	Influences related to Confidence	Tổng của 2 biến quan sát
4		
N	Influences related to Communication	Tổng của 4 biến quan sát
5		
M	Impact on the quality of accommodation service provision in the Old Quarter on customer satisfaction	Tổng của 3 biến quan sát

To guarantee that the regression model analysis is carried out appropriately, the relationship between the dependent and independent variables and the relationship between the components must be tested. The regression analysis will be

done if there is a correlation between the independent and dependent variables but no correlation between the independent variables.

TABLE X: CORRELATION ANALYSIS RESULTS

		N1	N2	N3	N4	N5	M
N1	Pearson Correlation	1	.392**	.267**	.265**	.308**	.556**
	Sig. (2-tailed)		.000	.002	.002	.000	.000
	N	135	135	135	135	135	135
N2	Pearson Correlation	.392**	1	.366**	.401**	.410**	.351**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	135	135	135	135	135	135
N3	Pearson Correlation	.267**	.366**	1	.261**	.440**	.359**
	Sig. (2-tailed)	.002	.000		.002	.000	.000
	N	135	135	135	135	135	135
N4	Pearson Correlation	.265**	.401**	.261**	1	.288**	.222**
	Sig. (2-tailed)	.002	.000	.002		.001	.010
	N	135	135	135	135	135	135
N5	Pearson Correlation	.308**	.410**	.440**	.288**	1	.476**
	Sig. (2-tailed)	.000	.000	.000	.001		.000
	N	135	135	135	135	135	135
M	Pearson Correlation	.556**	.351**	.359**	.222**	.476**	1
	Sig. (2-tailed)	.000	.000	.000	.010	.000	
	N	135	135	135	135	135	135

The correlation between the independent variables of the person test has a sig value of 1 (> 0.05), so the hypothesis Ho is rejected, proving that the independent variables do not correlate with each other. From pearson results, see whether the model is stable or does not exist multicollinearity. From there, we continue to run the regression.

The conclusions of the regression model analysis to quantify the effects of the effect on the quality of housing service delivery in the Old Quarter are calculated using data from 134 research samples. The influencing factors are produced from the EFA analysis findings; each factor recovered using this factor analysis technique is determined as the average of the observed variables. - This study employed various linear regression analysis models with a one-pass input approach to examine the individual effect of each factor on visitor enjoyment and service quality (Enter). Thus, the six grouping parts indicated above are independent variables, and the influence on the quality of lodging service given on customer satisfaction is the independent variable (Dependent) that will be applied concurrently.

Synthetic results of the regression model

TABLE XI:MODEL SUMMARY^b

Mode l	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.650a	.423	.400	.43454

- a. Predictors: (Constant), N5, N4, N1, N3, N2
- b. Dependent Variable: M

TABLE XII:RESULT OF ANOVA TEST

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	17.834	5	3.567	18.889	.000b
Residual	24.359	129	.189		
Total	42.193	134			

- a. Dependent Variable: M
- b. Predictors: (Constant), N5, N4, N1, N3, N2

The results also show that R Square = 0.423, which explains 42.3% of the variation of the process affecting the quality of accommodation service provision through 5 factors that directly affect this process

TABLE XIII:

Model		Unstandardized Coefficients		Standardized Coefficients
		B	Std. Error	Beta
1	(Constant)	.616	.357	
	N1	.388	.067	.430
	N2	.025	.067	.030
	N3	.086	.060	.112
	N4	-.015	.072	-.016
	N5	.295	.082	.286

TABLE XIV:

Model		t	Sig.	Collinearity Statistics	
				Tolerance	VIF
1	(Constant)	1.724	.087		
	N1	5.771	.000	.806	1.241
	N2	.371	.711	.675	1.482
	N3	1.451	.149	.754	1.326
	N4	-.210	.834	.806	1.240
	N5	3.618	.000	.715	1.399

Among the factors affecting the quality of accommodation service provision in the Old Quarter area, the factor with the most impact is Tangible (b1=0.388), followed by Communication factor b4=0.295 and the human factor. The least influential factor is Confidence b4= -0.015.

From this we can derive the following equation:

$$M= 0.616 + 0.388N1+ 0.025N2+ 0.086N3 - 0.015N4 + 0.295N5$$

The factors affecting the quality of accommodation service provision in the Old Quarter area, the most significant influencing factor is tangible, but the factors related to communication also significantly affect the quality of accommodation services. The quality of accommodation service providers in the Old Quarter area, while the factors of confidence, responsiveness, and trustworthiness are also the factors that are predicted to contribute the most to the quality of the service provided. Accommodation services in the old town area, but all factors have low influence

IV. DISCUSSION AND LIMITATIONS

A. Discussion

The Getty et al. Lodgingquality .'s index scale of service quality is employed in this investigation. Consequently, the scales are being found, altered, and augmented, verifying the findings of previous researchers on service quality scales for the specific region and unit, namely transportation service.

The findings demonstrate that five characteristics influence excellent service: tangibility, dependability, responsiveness, confidence, and communication.

Before writing the research paper, the hotel service in the old town was highly appreciated, but when the covid 19 pandemic broke out, it affected the world economy, the Vietnamese economy, and the service industry. Avoiding the heavy impact of the decline are confirmed on traveloka, ivivu, avia, traveler ... Seeing the big problem of the service industry, the author has written this study to point out the factors that affect the service industry, service quality, and some solutions. Due to the limitation of the article, there are many things that the author cannot specifically present here, and the author hopes to contribute something through the research to help the service industry overcome the pandemic.

B. Limitations

The study and research time are restricted; gathering client information will only take a month (April 2020), indicating that the coverage of the research issue has not been valued. To develop a more general quality scale for lodging service supply, a bigger sample size, more complex and professional methodologies, and a longer observation time are required. The study solely looked at the elements influencing the quality of lodging service provided because it had a short time frame and a restricted budget for implementation. There might be many more aspects not listed by the model, such as prestige, the hotel's reputation, the hotel care program, advertising, and so on. Hopefully, the subsequent research will go further.

REFERENCES

- [1] Bello Yekini Ojo , Majebi enesi C. (2018). *Lodging quality index approach: exploring the relationship between service quality and customer satisfaction in the hotel industry*. Nigeria.
- [2] Danh, N. T. (2018). *Các yếu tố ảnh hưởng đến chất lượng dịch vụ lưu trú của hệ thống khách sạn 3-5 sao tại TP Hồ Chí Minh*. Hà Nội.
- [3] Edmundas Jasinskis , Dalia Streimikere , B. (2016). *impact of hotel service quality on the loyalty of customers*.
- [4] Giang, T. (2020). *2019 , du lịch Việt Nam đạt kỳ tích 'vàng' tăng trưởng*.
- [5] Grant Thornton. (2018). *VietNam Hotel upscale Lodging- Hotel Survey 2018*.
- [6] Hà, L. T. (2008). *Giải pháp nâng cao chất lượng dịch vụ phòng tại khách sạn Hoàng Hà*. Hà Nội: Kinh tế.
- [7] Hunter, V., & Michl, J. (2000). *Maximizing customer satisfaction and loyalty to drive growth and profitability*. Velocity.
- [8] Juliet M. Getty , Robert L. Getty. (2013). *Lodging quality index assessing customer's perceptions of quality delivery*.
- [9] Parasurama A., Zeithaml V and Berry L. (1998). *A multiple-item scale for measuring consumer perceptions of service quality . Journal of Retailing*.
- [10] Phan Chí Anh, N. N. (2013). *Nghiên cứu các mô hình đánh giá chất lượng dịch vụ* . Hà Nội.
- [11] Thanh Giang. (2019). *Du lịch việt nam đạt kỳ tích 'Vàng' tăng trưởng*. Hà Nội.
- [12] Tạp Chí Tài Chính. (2017). *Một số giải pháp phát triển ngành du lịch Việt Nam*. Hà Nội: Kinh tế.
- [13] Team Trilyo. (2018). *service quality & customer satisfaction in the hotel industry*.
- [14] Tổng Cục Thống Kê. (2019). *Thông cáo báo chí về tình hình kinh tế - xã hội quý IV năm 2019*. Hà Nội.
- [15] Principles of Marketing, Nguyen Dinh Tho-Nguyen Thi Mai Trang, 2008
- [16] Bui Nguyen Hung, Nguyen Thuy Quynh Loan, 2004
- [17] Ramaswamy, 1996
- [18] Philip Koler, 2002

The impact of CG on the earnings quality of enterprises listed on the stock market in Vietnam

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Abstract—The paper examines the influence of corporate governance (CG) on the earnings quality (EQ) of listed companies in Vietnam. We consider the issue of CG integrated from each component of the board and the supervisory board using the GLS regression. The data are collected at energy enterprises listed on the Vietnam stock market in 2010 - 2018, with 2162 observations. The research results have found that the board positively impacts the EQ, while the supervisory board does not affect the earnings quality. Besides the audit quality, the ratio of liabilities positively affects the EQ; in contrast to the percentage of state ownership, the company's size has an opposite effect. In addition, foreign ownership ratio, profitability do not affect the EQ. The empirical research results are a valuable basis to help companies improve the EQ, thereby helping companies consider the elements of the board and supervisory more effectively for each company.

Index Terms—Corporate governance, Board of Directors, Supervisory Board; Earnings management; Earnings quality.

I. INTRODUCTION

FINANCIAL statements play an essential role in providing information about the performance of a business [33]. Meanwhile, information in financial statements depends on the quality of the firm's earnings [7]. Therefore, the quality of information about earnings has increasingly attracted the attention of many studies worldwide [17]. One of the critical factors affecting earnings quality is CG, including individual characteristics and representative factors.

There are many studies about this topic, such as [34], [32], [46]. The results are quite different when assessing the impact of the company's board of directors (BD) and the supervisory board on the quality of profits. The independent member of BD in [46], [18], [25] increases quality of profit, while this characteristic has no impact on EQ in [35], [22], [42], [9],[10]. The board size is positively related to EQ, such as [4], contrary to the research [24], the board size. However, in the study of [9], the board size does not affect the EQ. Thus, the heterogeneous results among the authors made it difficult to conclude, assess the impact of CG on the EQ, and cause many difficulties when using grounded theory in the interpretation. Several studies have examined this effect using aggregated indicators rather than individual factors such as [8], [30], [11], [12], [14], [29], [28], [43]. Based on that approach, this paper also examines the impact of CG on the quality of earnings in Vietnam.

II. LITERATURE REVIEW

[15] reviewed the EQ measurement method based on (1) company characteristics, (2) accounting methods, (3) CG and

internal controls, (4) auditing, (5) market dynamics, and (6) external factors.

[38] measured EQ of listed companies through EM level. The author evaluates the factors affecting EQ related to the characteristics of BD. In addition, the study also analyzes the influence of control variables such as company size, financial leverage. Another study in Malaysia by [39] examined the relationship between audit firm size, internal audit setting, audit fee, firm size, number of subsidiaries, number of auditor certificates, corporate audit partners, and audit delay with the quality of financial statements. The selected sample size includes 113 companies listed on the Malaysian stock exchange. The authors also used a cross-sectional adjusted Jones model to measure EQ. [5] studied the influence of board independence on EQ. The results show that only the audit firm type factor does not affect EQ. In addition, the impact of CG on EQ through earnings management (EM) was carried out by [2], in the Arab country; [45] in Kenyan in Africa; [3] at the Bursa Malaysia stock exchange; [6] in Turkey. In Nigeria, [25] showed that financial leverage, BD, ownership ratio of the organization, size, independence, and several meetings positively influence EQ. Meanwhile, managers' ownership rates hurt EQ.

In individual studies on how CG effects EQ, research results worldwide are not uniform. On the plus side, earnings quality can fluctuate with board size. The reason is that a more significant number of board members with financial management experience can better supervise and control management activities [34], [46]. In the negative direction, the size of BD and the control of financial information will fluctuate in the opposite direction because the timely transmission of information between the directors and BD will be costly and time-consuming. In addition, the differing and sometimes contradictory opinions of a large BD can lead them to misrepresent their financial statements [1].

Independent members of BD play an essential role in monitoring management activities and contribute to making important decisions of the enterprise, thereby protecting the interests of shareholders [46], [37]. Meanwhile, it can be more challenging to ensure the quality of profits because they have less information about its specific activities. The supervision of independent members of BD has not been promoted optimally [36]. In addition, financial information can be manipulated in cases where power is concentrated too much on one subject [41]. However, this does not always hurt the EQ. [21] examined and concluded that some companies tend to have the Chairman of BD concurrently the Gen-

eral Director because that will avoid conflicting operating and managing problems.

In addition to research on CG by individual components affecting the earnings quality by each aspect, there are also some studies using integrated CG [8]. The author studies non-financial companies in the US. The study results of individual factors in the multivariable regression equation, the size of BD, and the independent members have a negative relationship with the income management behavior or the members of BD. The more independent members, the better the monitoring effect reduces earnings management. The remaining variables: number of meetings, activities of independent members, qualifications of independent members have no impact on earnings management behavior. The general factor representing CG and EQ has a negative relationship. At the same time, the results also acknowledge that combining the supervisory in the effective board reduces earnings management behavior. This study also suggests that it is advisable to consider the aggregate factor when studying CG and earnings management and build good CG practices that contribute to earnings management behavior. [25] conducted this study to examine the impact of CG on earnings management behavior in enterprises with a sample of 60 observations in the 2008-2010 period in the Nigerian stock market. The regression results of the multivariate model demonstrated that only two CG representative influences the specific earnings management: the proportion of independent members has a negative correlation with the earnings management at the 1% significance level, meaning the more independent members, the higher the ability to monitor the activities of the managers, limiting earnings management behavior.

EQ has also been measured in many different ways. Each study often focuses on CG, company characteristics, and heterogeneous results. In emerging economies, studying the impact of CG on EQ is often considered on many factors due to differences in markets and economic structures.

III. MODEL AND RESEARCH METHOD

A. Model

Based on the literature reviews, the proposed research model is as follows:

$$\text{Earning quality}_{it} = \beta_0 + \beta_1 \text{BD}_{it} + \beta_2 \text{AC}_{it} + \beta_3 \text{STATEO}_{it} + \beta_4 \text{FOREIGO}_{it} + \beta_5 \text{BIG4}_{it} + \beta_6 \text{SIZE}_{it} + \beta_7 \text{LEV}_{it} + \beta_8 \text{ROA}_{it} + \epsilon_{it} \quad (1)$$

The EQ measurement is based on the quality of the accruals [16]:

$$\frac{WCA_{it}}{A_{it-1}} = \alpha_1 \frac{CFO_{it-1}}{A_{it-1}} + \alpha_2 \frac{CFO_{it}}{A_{it-1}} + \alpha_3 \frac{CFO_{it+1}}{A_{it-1}} \quad (2)$$

In which, WCA_{it} is the accumulated working capital of enterprise i in year t ; CFO_{it-1} , CFO_{it} , CFO_{it+1} are operating cash flows.

From equation (2), the model's residuals are used to measure EQ. Table 1 explains variables more clearly.

TABLE I
VARIABLES IN THE MODEL

Variables	Name of variables	Measures	Expectations
EQ	Earning quality	The absolute residual value of the model estimates the cumulative quality multiplied by (-1). $CACC_{it} = \alpha + \beta_1 CFO_{it-1} + \beta_2 CFO_{it} + \beta_3 CFO_{it+1} + \epsilon_{it}$	
BD			
BSIZE	Board Size	BSIZE equals one if the size is larger than the median.	
BIND	The independence of the board	BIND equal one if the proportion of independent members is more significant than the median	
BMEET	Meeting frequency of the board	BMEET is one if the number of meetings in the company is greater than the median	
CEODUAL	A plurality of the board	Dummy variables	
AC			
ACSIZE	Supervisory board size	ACSIZE is one if there are at least 3 or 4 members	
ACEXP	Financial expertise of the supervisory board	ACEXP is one if the supervisory has one member with expertise in finance and accounting.	
ACMEET	Frequency of meetings of the Supervisory Board	ACMEET is 1 if the number of meetings is greater than the median	
STATEO	State ownership		-
FOREIGO	Foreign ownership		+
BIG4	Auditing firm size	Dummy variable	+
SIZE	Firm size	Log base 10 of total assets	+
LEV	Debt ratio	Total liabilities / Total assets	+
ROA	Profitability	Profit after tax / Total assets	+

Source: Summary of the authors

B. Research Method

The study uses listed companies in Vietnam with 2162 observations in 2010-2018. The model uses the GLS method.

C. Results and Discussion

Also, according to Table II, the mean of the supervisory board members is 2.96, the highest is 5, and the lowest is 1. The average ratio of the members is financial, accounting at 15.8%. The average number of meetings is 3,689, and the lowest is 1, and 65 is the highest. The average female member in the supervisory board is 52.3%.

Table III shows the difference in the performance of listed companies. Some enterprises have low performance due to a lack of necessary CG characteristics. The supervisory Board (AC) variable is a composite variable representing all the individual factors representing the performance of AC, includ-

TABLE II
DESCRIPTIVE STATISTICS OF CG CHARACTERISTICS

Variable	Obs	Mean	Std.Dev	Min	Max
BOARDSIZE	2162	5.558	1.330	3	12
BOARDIND	2162	0.682	0.171	0.2	1
BOARMEET	2162	10.142	9.816	1	78
BOARDDDUAL	2162	0.243	0.429	0	1
BOARDGENR	2162	0.158	0.179	0	1
AUDITCSIZE	2162	2.962	0.449	1	5
AUDITCEXP	2162	0.158	0.242	0	1
AUDITCMEET	2162	3.685	4.404	1	65
AUDITCGENR	2162	0.523	0.312	0	1

Source: Author calculated from Stata 14.0

ing the complex components: the size, the financial expertise, accounting of the members, the number of times the board of controllers meets, the percentage of female members of controllers. The average value of AC reaches 2,085, with the standard deviation being 1,140. For control variables, the average State ownership is 24.6%, the average foreign ownership is 10.3%, 25.3% of enterprises are audited by an audit firm of Big4, the size of according to the average, after logarithm, the enterprise by assets is 11,749, the average ratio of liabilities to total assets is 50.5%, and the ratio of profit after tax to total assets (ROA) is 5.8%.

TABLE III
STATISTICS DESCRIBING VARIABLES IN THE RESEARCH MODEL

Variable	Obs	Mean	Std.Dev	Min	Max
EQ	2162	-0.087	0.100	-0.914	0
BD	2162	2.537	1.153	0	5
AC	2162	2.085	1.140	0	4
STATEO	2162	0.246	0.237	0	0.910
FOREIGO	2162	0.103	0.137	0	0.780
BIG4	2162	0.253	0.435	0	1
SIZE	2162	11.749	0.694	10.132	14.459
LEV	2162	0.505	0.212	0.012	0.993
ROA	2162	0.058	0.077	-0.853	0.784

Source: Author calculated from Stata 14.0

In the autocorrelation matrix, it can be seen that the variable BD is positively correlated with the EQ. In contrast, the variable AC is positively correlated with EQ. The correlation coefficient between the independent variables in the model with no pair is more significant than 0.8, so there is a slight possibility of multicollinearity.

In Table V, BD and EQ have a positive relationship. This result supports the theory that BD' effectiveness reduces conflicts between owners and managers, consistent with the findings of [8]. According to agency theory, BD plays a massive role in monitoring the behavior of managers and resolving conflicts of interest.

TABLE IV
CORRELATION MATRIX

	EQ	BD	AC	STATEO	FOREIGO	BIG4	SIZE	LEV	ROA
EQ	1								
BD	0.035	1							
AC	0.049	0.119	1						
STATEO	0.112	0.098	0.039	1					
FOREIGO	0.050	0.073	0.034	0.101	1				
BIG4	0.002	0.073	0.031	0.007	0.354	1			
SIZE	0.098	0.032	0.091	0.006	0.377	0.021	1		
LEV	0.024	0.012	0.111	0.005	-0.152	0.023	0.023	1	
ROA	0.049	0.041	0.086	0.008	0.118	0.073	0.024	0.084	1

Source: Author calculated from Stata 14.0

TABLE V
REGRESSION RESULTS

	VIF	FEM model	REM model	GLS model
BD	1.09	0.00101	0.00465*	0.00458**
AC	1.09	-0.00833*	-0.00162	-0.00118
STATEO	1.08	-0.012	-0.0240*	-0.0543***
FOREIGO	1.35	-0.142***	-0.128***	-0.0218
BIG4	1.47	-0.00649	0.0327***	0.0213***
SIZE	1.93	-0.156***	-0.0812***	-0.0258***
LEV	1.54	0.141***	0.101***	0.0387***
ROA	1.21	0.122***	0.105***	-0.0208
_cons		1.704***	0.812***	0.200***
N		2162	2162	2162
R-sq		0.214		
F test		F(8,1901) = 64.60 Prob > F = 0.0000		
LM test		Wald chi2(8) = 302.94	Wald chi2(8) = 87.82	Wald chi2(8) = 87.82
		Prob > chi2 = 0.0000	Prob > chi2 = 0.0000	Prob > chi2 = 0.0000
Hausman test		chi2(8) = 212.99 Prob>chi2 = 0.0000		
Modified Wald test		chi2(253) = 1.3e+06 Prob>chi2 = 0.0000		
Wooldridge test		F(1, 248) = 876.437 Prob > F = 0.0327		

t statistics in brackets * p<0.1, ** p<0.05, *** p<0.01

Source: Author calculated from Stata 14.0

Besides, BD meets the requirements to increase the effectiveness of supervisory activities, improve the quality of earnings; in other words, BD has a diversified structure and functions to increase the quality of earnings [27], [8].

Research results show that AC does not affect the change of income quality, so it is not consistent with the original expectation of the author. Thus, the results of this study do not support the agency theory, the resource dependency theory, which holds that the conflict of interest between managers and owners is controlled through activities.

State ownership (STATEO), according to the model regression results with the dependent variable of earnings quality with coefficient = -0.0543, with a 1% significance level, the STATEO variable harms the EQ, or companies with more state ownership, the lower the EQ. The research results support the author's expectations and the state-owned companies' implementation of many earnings management behaviors, leading to a decrease in the quality of corporate profits. This research result does not agree with the research result of [20].

Besides, the research results show that enterprises audited by Big4 audit firms increase income quality. This means that when the company has a large-scale audit, the reputation index of Big4 increases EQ. This result can be explained because Big4 companies have good professional teams, experience, and a strict audit process. The managers of the Big4 audited companies became more hesitant to implement earnings management, resulting in an increased quality of earnings. This result is also consistent with the study of [46].

The variable debt ratio (LEV), the regression result with the coefficient = 0.0387 at the 1% significance level. This means that when a company has a higher liabilities ratio, it increases the earnings quality. Therefore, this research result is contrary to the views of [45], [40], [44], [13], [23].

IV. CONCLUSIONS

The article has reviewed enterprises in Vietnam from 2010 to 2018 to assess the impact of CG on earnings quality. We have shown that the management of BD has a positive impact on the profitability of companies. Meanwhile, the general supervision did not affect the quality of the companies' profits. Control variables such as state ownership, audit quality (Big4), firm size, and financial leverage also affect EQ. Apart from the foreign ownership ratio, the profitability of companies does not affect EQ. On that basis, we propose some recommendations:

- The importance of CG needs to be clarified, especially the role of BD in the quality of profits. Enterprises need to build a CG model following the law. In which the structure of BD should meet the requirements.

- Information about the enterprise needs to be supplemented fully and clearly in CG activities. This will assist analysts and investors in evaluating businesses based on quantitative models.

- Companies should consider choosing large and reputable auditing units to ensure the best quality of the information provided. Besides, investors can rely on the audit company's information on the audited financial statements to determine the quality of profits on the figures of the financial statements, thereby making investment decisions.

REFERENCES

- [1] Abdul Rahman, R., & Haneem Mohamed Ali, F. (2006). Board, audit committee, culture and earnings management: Malaysian evidence. *Managerial Auditing Journal*, 21(7), 783-804. doi:<https://doi.org/10.1108/02686900610680549>
- [2] Abed, S., Al-Attar, A., & Suwaidan, M. (2012). CG and earnings management: Jordanian evidence. *International business research*, 5(1), 216-225. doi:<https://doi.org/10.5539/ibr.v5n1p216>
- [3] Ahmed, S. (2014). Board of director characteristics and earnings management in Malaysia. *GSTF Journal on Business Review (GBR)*, 2(4), 94-99. doi: DOI: 10.5176/2010-4804_2.4.255
- [4] Al-Othman, L. N., & Al-Zoubi, M. N. (2019). The Impact of BD Characteristics on Earnings Quality of Listed Industrial Companies on the Amman Stock Exchange. *Academy of Accounting and Financial Studies Journal*, 23(1), 1-16.
- [5] Alves, S. (2014). The effect of board independence on the earnings quality: evidence from portuguese listed companies. *Australasian Accounting, Business and Finance Journal*, 8(3), 23-44. doi:<http://dx.doi.org/10.14453/aabfj.v8i3.3>
- [6] Aygun, M., Ic, S., & Sayim, M. (2014). The Effects of corporate ownership structure and board size on earnings management: Evidence from Turkey. *International Journal of Business and Management*, 9(12), 123-132. doi:<https://doi.org/10.5539/ijbm.v9n12p123>
- [7] Ball, R., & Shivakumar, L. (2005). Earnings quality in UK private firms: comparative loss recognition timeliness. *Journal of accounting and economics*, 39(1), 83-128. doi:<https://doi.org/10.1016/j.jacc.2004.04.001>
- [8] Carcello, J. V., Hollingsworth, C. W., Klein, A., & Neal, T. L. (2006). Audit committee financial expertise, competing CG mechanisms, and earnings management. Available at SSRN: <https://ssrn.com/abstract=887512> or doi:<http://dx.doi.org/10.2139/ssrn.887512>
- [9] Chaharsoughi, M. T., & Rahman, R. A. (2013). CG and earnings quality: the experience of listed companies in Iran. *Journal of Modern Accounting and Auditing*, 9(6), 790-797.
- [10] Chalaki, P., Didar, H., & Riahinezhad, M. (2012). CG attributes and financial reporting quality: Empirical evidence from Iran. *International Journal of Business and Social Science*, 3(15), 223-229.
- [11] Dang, H. N., Nguyen, T. T. C., & Tran, D. M. (2020). The Impact of Earnings Quality on Firm Value: The Case of Vietnam. *The Journal of Asian Finance, Economics and Business (JAFEB)*, 7(3), 63-72.
- [12] Dang, H. N., Pham, C. D., Nguyen, T. X., & Nguyen, H. T. T. (2020). Effects of CG and Earning Quality on Listed Vietnamese Firm Value. *The Journal of Asian Finance, Economics and Business (JAFEB)*, 7(4), 71-80.
- [13] Dang, H. N., & Tran, D. M. (2019). Relationship between Accrual Anomaly and Stock Return: The Case of Vietnam. *The Journal of Asian Finance, Economics and Business*, 6(4), 19-26.
- [14] Dang Ngoc, H., Truong Thanh, H., Van Thuy, V. T., Nguyen Thi Thanh, L., Hoang Thi Viet, H., Nguyen Thi Lan, A., & Nguyen Thi Hong, N. (2020). Accounting Conservatism and Cash Dividend Policy of Enterprises in Vietnam. Paper presented at the IFCAA 2020, Ha Noi, VietNam.
- [15] Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of accounting and economics*, 50(2-3), 344-401. doi:<https://doi.org/10.1016/j.jacc.2010.09.001>
- [16] Dechow, P. M., & Dichev, I. D. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, 77(s-1), 35-59. doi:<https://doi.org/10.2308/accr.2002.77.s-1.35>
- [17] Dechow, P. M., Kothari, S. P., & Watts, R. L. (1998). The relation between earnings and cash flows. *Journal of accounting and economics*, 25(2), 133-168. doi:[https://doi.org/10.1016/S0165-4101\(98\)00020-2](https://doi.org/10.1016/S0165-4101(98)00020-2)
- [18] Ebrahim, A. (2007). Earnings management and board activity: an additional evidence. *Review of Accounting and Finance*, 6(1), 42-58. doi:<https://doi.org/10.1108/14757700710725458>
- [19] Epstein, B. J., & Jermakowicz, E. K. (2008). *IFRS Policies and Procedures*: John Wiley & Sons.
- [20] Essa, S., Kabir, R., & Nguyen, H. T. (2016). Does CG affect earnings management? Evidence from Vietnam. Paper presented at the Vietnam symposium in Banking and Finance (VSBF).
- [21] Finkelstein, S., & D'aveni, R. A. (1994). CEO duality as a double-edged sword: How boards of directors balance entrenchment avoidance and unity of command. *Academy of management Journal*, 37(5), 1079-1108. doi:<https://doi.org/10.5465/256667>
- [22] Gulzar, M. A. (2011). CG characteristics and earnings management: Empirical evidence from Chinese listed firms. *International Journal of*

- Accounting and Financial Reporting, 1(1), 133-151. doi:DOI: 10.5296/ijaf.v1i1.854
- [23] Ha, H. T. V., Van, V. T. T., & Hung, D. N. (2019). Impact of Social Responsibility Information Disclosure on the Financial Performance of Enterprises in Vietnam. *Indian Journal of Finance*, 13(1), 20-36. doi:10.17010/ijf/2019/v13i1/141017
- [24] Hashim, H. A., & Devi, S. (2008). Board characteristics, ownership structure and earnings quality: Malaysian evidence. *Research in Accounting in Emerging Economies*, 8(97), 97-123. doi: [https://doi.org/10.1016/S1479-3563\(08\)08004-3](https://doi.org/10.1016/S1479-3563(08)08004-3)
- [25] Hassan, S. U., & Ahmed, A. (2012). CG, earnings management and financial performance: A case of Nigerian manufacturing firms. *American International Journal of Contemporary Research*, 2(7), 214-226.
- [26] Hassan, S. U., & Bello, A. (2013). Firm characteristics and financial reporting quality of listed manufacturing firms in Nigeria. *International Journal of Accounting, Banking and Management*, 1(6), 47-63.
- [27] Hoang, T. C., Abeysekera, I., & Ma, S. (2018). Board diversity and corporate social disclosure: evidence from Vietnam. *Journal of Business Ethics*, 151(3), 833-852. doi:<https://doi.org/10.1007/s10551-016-3260-1>
- [28] Hung, D. N., & Van, V. T. T. (2020a). Researching the Firm Characteristics Affecting the Earnings Quality: The Case of Vietnam. *Calitatea*, 21(179), 106-112.
- [29] Hung, D. N., & Van, V. T. T. (2020b). Studying the impacts of earnings quality on stock return: Experiments in Vietnam. *International Journal of Advanced and Applied Sciences*, 7, 45-53.
- [30] Kang, H. H., & Liu, S. B. (2014). Corporate social responsibility and corporate performance: a quantile regression approach. *Quality & Quantity*, 48(6), 3311-3325.
- [31] Kang, S.-A., & Kim, Y.-S. (2012). Effect of CG on real activity-based earnings management: Evidence from Korea. *Journal of Business Economics and Management*, 13(1), 29-52. doi:10.3846/16111699.2011.620164
- [32] Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of accounting and economics*, 33(3), 375-400.
- [33] Mackenzie, B., Coetsee, D., Njikizana, T., Chamboko, R., Colyvas, B., & Hanekom, B. (2012). *Wiley IFRS 2013: Interpretation and Application of International Financial Reporting Standards*: John Wiley & Sons.
- [34] Marrakchi Chtourou, S., Bedard, J., & Courteau, L. (2001). CG and earnings management. Available at SSRN: <https://ssrn.com/abstract=275053> 1-35. doi:<http://dx.doi.org/10.2139/ssrn.275053>
- [35] Murhadi, W. R. (2011). Good CG and earning management practices: An Indonesian cases. *Jurnal Manajemen*, 10(2), 143-155.
- [36] Park, Y. W., & Shin, H.-H. (2004). Board composition and earnings management in Canada. *Journal of Corporate Finance*, 10(3), 431-457.
- [37] Peasnell, K. V., Pope, P. F., & Young, S. (2005). Board monitoring and earnings management: Do outside directors influence abnormal accruals? *Journal of Business Finance & Accounting*, 32(7-8), 1311-1346.
- [38] Qinghua, W., Pingxin, W., & Junming, Y. (2007). Audit committee, board characteristics and quality of financial reporting: An empirical research on Chinese securities market. *Frontiers of Business Research in China*, 1(3), 385-400.
- [39] Radzi, S., Islam, M. A., & Ibrahim, S. (2011). Earning quality in public listed companies: A study on Malaysia exchange for securities dealing and automated quotation. *International Journal of Economics and Finance*, 3(2), 233-244.
- [40] Rahmani, S., & Akbari, M. A. (2013). Impact of firm size and capital structure on earnings management: evidence from Iran. *World of Sciences Journal*, 1(17), 59-71.
- [41] Saleh, N. M., Iskandar, T. M., & Rahmat, M. M. (2005). Earnings management and board characteristics: Evidence from Malaysia. *Jurnal Pengurusan (UKM Journal of Management)*, 24.
- [42] Soliman, M. M., & Ragab, A. A. (2014). Audit committee effectiveness, audit quality and earnings management: an empirical study of the listed companies in Egypt. *Research Journal of Finance and Accounting*, 5(2), 155-166.
- [43] Van Khanh, V. T., & Hung, D. N. (2020). Impact of Earnings Quality on the Debt Maturity: The Case of Vietnam. *Asian Economic and Financial Review*, 10(1), 1-12.
- [44] Van Linh, N., Hung, D. N., Dang, T. B., Van, V. T. T., & Anh, N. T. M. (2019). The Effects of Business Efficiency to Disclose Information of Sustainable Development: The Case of Vietnam. *Asian Economic and Financial Review*, 9(4), 547-558.
- [45] Waweru, N. M., & Riro, G. K. (2013). CG, firm characteristics and earnings management in an emerging economy. *Journal of Applied Management Accounting Research*, 11(1), 43-64.
- [46] Xie, B., Davidson, W. N., & DaDalt, P. J. (2003). Earnings management and CG: the role of the board and the audit committee. *Journal of Corporate Finance*, 9(3), 295-316.

Analysing the behavior of students and lecturers in using social networks for academic and educational purposes

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Abstract—This paper aims to study the behavior of using social networks by students and lecturers for learning and training purposes based on a literature review on this topic in different regions of the world in the past 10 years. The results of the review show that there is a difference in the technological behavior between lecturers and their students; which may reduce the effectiveness of educational activities. Based on the research finding, the author proposes some solutions to encourage teachers to use social networks for their work.

Index Terms—social network, social networking behavior, technology acceptance behavior, learning activities.

I. INTRODUCTION

SOCIAL networks, in the recent time, are widely accepted and gradually become one of the most important means of communication among students [16]. Research by the authors in different regions shows that university students now use social networks as a space to interact with friends, lecturers; to exchange learning materials, to sharing knowledge, to consolidate specialized knowledge, to research and cooperate [4]. While students consider social networks as an indispensable channel to exchange and seek for information, teaching staff seem to be slower in accepting and using social networks for the same purpose. Because of this contradiction, the paper focuses on solving the following questions: How do students use social networks for learning purposes? Why do they use social networks for learning? How do teachers use social media in their work? Why is there a difference in technology acceptance behavior by lecturer staff and their students?

II. LITERATURE REVIEW

A. Student's behavior of using social networks for learning purposes- How and Why.

In terms of learning purposes, a relatively large amount of research suggests that Facebook is the most useful platform in helping students in learning activities. Ref. [11] was carried out on a sample of 600 students in Pakistan and found that nearly 90% of students used Facebook for learning purposes. At Delhi University, 71.25% of students said they use Facebook for research purposes and to collaborate with classmates. Meanwhile, 60% of Boston University students use twitter to increase professional awareness and professional knowledge [12]. An investigation in Israel found that Facebook and Twitter accounts set up at some universities were effective in sharing knowledge [4].

Regarding the correlation between facebook and learning motivation, Nkhoma et al. found that Facebook has a positive impact on students' learning motivation, through interactive activities, communication, sharing point of views, interests as well as learning materials. The study also shows that the main benefits of social networks in higher education are reflected in the following aspects: strengthening relationships, promoting learning motivation, exchanging learning materials, developing learning and cooperating ability. This means that activities on social networks have the ability to enhance interaction between students and motivate students to participate in the class, especially students with introverted psychological characteristics, who tend to be afraid of face-to-face discussions in class and feel more confident when communicating online. Social networks also allow students to study and work in groups outside of class time. Ref. [5] and [7] argue that cyberspace encourages students to communicate more than when they sit in class, especially in classrooms arranged in such a traditional way (tables and chairs are arranged in a straight line, students must not face each other). Ref. [6] also has an interesting finding that in the process of interacting with teachers via social networks, students can share more personal information. Thanks to which, the lecturer can understand more about the characteristics of the students, including hometowns, interests, and interests. Student profiles can help instructors personalize lessons or have a more effective way of working and approaching. In terms of psychology, Ref. [19] and Ref. [2] carried out in 2012 and 2016 respectively, all agree that students feel more comfortable when exchanging information about academic issues through discussions with other group members.

Regarding learning effectiveness, ref. [14] affirmed that the cooperation and interaction between classmates and teachers via social networks has a positive influence on the working performance of students at universities. 71.25% of the respondents strongly agree with the above statement because students through social networks can combine online and offline group work to enhance their learning efficiency. The authors found a correlation between frequency of using facebook for academic activities and test results. Most of the students with the best results use facebook to serve their learning. However, this does not mean that the time using facebook is directly proportional to the learning results, the effectiveness of using social networks also depends on the

purpose of using facebook and the students' time management skills.

Research models and research results of [6] have identified the independent variables as interaction with friends, engagement with class, interaction with teachers through social networks has a positive effect on the dependent variable of learning efficiency. The interaction with classmate was the most strongly impact factor, while the interaction with teachers was identified as the least one; which can be explained by two reasons: first, lecturers adopt technology later than students; the second is because a part of students are shy and have not actively communicated with their teachers, even on social networks.

In another study, 90% out of 600 Pakistani students surveyed agreed that Facebook is very useful for their study and research activities, especially in exchanging information with colleagues and friends abroad [11]. Social networks are also a space to encourage learners as well as lecturers to share information about learning materials, research, tests, and ask for feedback in groups. By sharing personal research, the person sharing the document will receive suggestions and feedback, the rest of the members could consider that document as learning materials or reference sources.

An Australian study also concluded that social media helps students develop professional knowledge at a deeper level. [18]. Ref. [7] and Ref. [9] agree that exercises at a high level of training have a certain complexity. The students, therefore, are required to spend more time searching for information sources and communicating with classmates, as well as faculty. They soon realize that social networks are an effective support tool. Furthermore, there is a fact that learning theory in class is not enough for students to understand the problem deeply and it is not possible to immediately apply that theoretical knowledge into practice. After class, students need to talk more with classmates, with lecturers and experts, as well. As a result, they can understand more deeply and broadly and have the opportunity to observe the actual work.

From the above literature review, it can be said that studies on the effectiveness of social networks, especially facebook, have been studied over the past ten years in different geographical areas. Although it is interpreted and approached from different angles, most of the authors agree on the positive influence of social networks on the learning motivation of students and their effective learning in the world.

B. Lecturer's behavior of using social networks for educational purposes- How and Why.

As discussed in the previous sections, the tendency of students to use social networks for learning purposes is an objective phenomenon, and the effectiveness of using these platforms as a learning channel has also been initially recognized in different regions of the world. However, many researchers agree that there is a certain delay in the behavior of adopting technology and using social networks as a teaching tool and supporting teaching activities of lecturers. Ref. [7] shows a number of obstacles in the process of using social networks in training and educating: teachers have not updated technology, teachers adopt technology later than students, teachers are afraid of copyright issues concerning

sharing documents. The authors argue that lecturers belong to the previous generation, their perception of social networks has certain differences compared to students. Studies also show that lecturers, especially those of Generation X, who are now over the age of 40, behave quite discreetly on Facebook. They do not have the habit of sharing personal information as well as sharing values on social networks, while Gen Y teachers are more open and both groups expressed concerns about copyright and intellectual property. However, the demonstrations of the effectiveness of social networks for learning in a series of recent studies provide great encouragement for them to use this tool for educational purposes. Similarly, Ref. [2] and Ref. [13] also agree that lecturers have not strongly used social networks for training and educational purposes as their students, Canadian, American, South African, Australian, UK lecturers rarely use Facebook as an educational tool.

However, the researchers also suggest that educators should use this tool because their research reveals positive results. Ref. [16] and Ref. [8] suggest that educators and software developers should consider applying social networks platforms in educational activities. The authors believe that using Facebook will enhance communication and cooperation between teachers and learners. Furthermore, teachers can encourage students to participate in the learning process. Ref. [10] shows that if lecturers post academic content on Facebook, students' trust in lecturers will increase. Ref. [17] also commented that when lecturers communicate with students on social networking platforms, the distance between lecturers and students is shortened, which can encourage students to participate more actively.

Application of social networks in teaching is a revolution in training because it transcends the boundaries of the traditional classroom. In addition, using social networks also aligns with the student-centered educational philosophy by creating a more flexible and creative learning environment.

III. DISCUSSION AND SUGGESTIONS.

Students today have a different way of learning than previous generations. The way teaching and learning has recently moved from passive learning to co-production of academic content. The content being taught can be flexibly adapted to the needs of each class and every single learner. Social networks have become an indispensable requirement for connecting and exchanging information among Universities, training instructors, professional communities and professional communities with students. Basing on the overview, analysis and discussion of articles on the topic of using social networks in learning and training activities of university students and lecturers, the author give the following suggestions for lecturers to improve the training effectiveness:

Actively interacting with students via social networks: Interacting with students on social networks will make them feel more motivated in exchanging learning information. Lecturers also get faster and more accurate feedback to adjust teaching activities in time. Students, with their own interests, have very diverse and in-depth conversations regarding the subject matter of the faculty. Therefore, lecturers

themselves will also have the opportunity to expand their knowledge, further research and develop their expertise. Building individual brands and sharing values with students on social networking platforms. According to the reviewed studies, the prestige of the lecturer increases when students see the teacher's sharing about academics, experiences, point of view and personal interests as well.

Enhancing online teaching skills: Due to objective requirements, the demand for online learning tends to increase. According to the researchers, this demand has increased sharply in the past two years under the impact of the global epidemic. However, this demand will continue to increase even after the epidemic ends, partly due to the improvement in students' online studying skills, partly due to advances in technological infrastructure, especially virtual reality technology in recent times. Due to differences between face-to-face training and online training, instructors should not completely impose lecturing scenarios, teaching methods and learning materials from direct to online classes; trainers need to have their own design for each type.

IV. LIMITATIONS OF THE PAPER.

The paper has a fairly rich source of references in many regions of the world about the behavior of using social networks for the purposes of learning and teaching among students and lecturers. However, the paper has not gathered the studies in Vietnam on this issue. Recommendations are made on the assumption that the technological behavior of young people is similar, regardless of cultural, economic, psychological and social differences. However, we hope that the topic can be suggestive for further studies on the technological behavior of Vietnamese students for learning purposes. Simultaneously, the topic is also a suggestion for studies on lecturers' skills on social media platforms.

REFERENCES

- [1] Al-Rahmi, W. and Othman, M., 2013. The impact of social media use on academic performance among university students: A pilot study. *Journal of information systems research and innovation*, 4(12), pp.1-10.
- [2] Cooke, S. Social teaching: Students perspectives on the inclusion of social media in Higher education, 2018
- [3] Deng, N; Tavares, J. L. From Moodle to Facebook Exploring students' motivation and experiences in online communities students' perceptions of facebook for academic purposes. *Comput. Educ.* 2013, 68, 167-176.
- [4] Forkosh-Baruch, A., Hershkovitz, A. A case study of Israeli higher education institutes sharing scholarly information with the community via social networks. *Internet High. Educ.* 2012, 15, 58-68
- [5] Gray, K., Chang, S., and Kennedy, G. (2010). Use of social web technologies by international and domestic undergraduate students: implications for internationalizing learning and teaching in Australian University, *Technology Pedagogy and education*, 19, 31-46
- [6] Griffith, S., and Liyanage, L. (2008). An introduction to the potential of social networking sites in education. Paper presented at the Proceedings of the second emerging technologies conference.
- [7] Kennedy, G., Dalgarno, B., Bennet, S., Gray, K., Waycott, J., Judd, T., et al. (2009). *Educating the net generation: A handbook of findings for practice and policy*. California, USA: Creative commons.
- [8] Khan, T; Kend, M; Robertson, S. Use of social media by University accounting students and its impact on learning outcomes. *Acc. Educ.* 2016, 25, 534-567
- [9] Hemmi, A., Bayne, S., & Land, R. (2009). The appropriation and repurposing of social technologies in higher education *journal of assisted learning*, 25 (Special issue), 19-30
- [10] Hew, F K. Students' and teachers' use of Facebook. *Comput. Hum. Behav.* 2011.27,662-676
- [11] Hussain, I. A study to evaluate the social medial trends among University students. *Procedia Soc. Behav. Sci.* 2012, 64,639-645
- [12] Madhusudhan, M. Use of social networking sites by research scholars of the University of Delhi: A study. *Int. Inf. Libr. Rev.* 2012, 44, 100-113
- [13] Manca, S; Ranieri, M. Facebook and others. Potentials and obstacles of social media for teaching in higher education. *Comput. Educ.* 2016, 95, 216-230
- [14] Mazer, J.P; Murphy, R E; Simonds, C. J. I will see you on Facebook: The effects of computer-mediated teacher self-disclosure on student motivation, affective learning, and classroom climate. *Commun.Educ.* 2007, 56, 1-17
- [15] Nkhoma, M., Lam, T., Richardson, J., Kam, B., and Lau, K.H. (2016), "Developing case-based learning activities based on the revised bloom's taxonomy". *Insite 2016: Informing science and IT education Conference*. Informing science Institute, pp85-93.
- [16] Peruta, A.; Shields, B.A. Social Media in Higher education: Understanding How Colleges and universities Use Facebook. Available on line (accessed on 30 October 2018)
- [17] Sanchez, A.R; Cortijio, V; Javed, U. Students' perception of Facebook for academic purposes. *Comput.Educ.*2014, 70, 138-149
- [18] Tower, M; Latimer, S; Hewitt, J. Social networking as a learning tool Nursing students' perception of efficacy. *Nurse Educ. Today* 2014, 34, 1012-1017
- [19] Wodzicki, K; Schwammlein, E; Moskaliuk, J. "Actually, I want to learn" –Study-related knowledge exchange on social networking sites. *Internet High.Educ.* 2012, 15, 9-14

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