

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.

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