The Impact of the Social Capital on the Resilience of a Manufacturing Supply Chains: The Mediating Role of Agility of a Supply Chain and the Moderating Role of Absorptive Capacity of Supply Chains

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Abstract- **The present study contributes to the SCM and marketing literature, concerning the roles of SCM alignment and firm's absorptive capacity to utilize social capital for achieving supply chain resilience. Firstly, understanding means to enhance supply chain resilience via social capital, therefore, in this regard taking absorptive capacity into account is necessary. Secondly, this study highlights that SCM alignment has the power to restrict the extent that social capital supports the firm's absorptive capacity. Thirdly, the study has examined the moderating role of supply chain agility in the relationship between the social capital and supply chain resilience. Finally, the supply chain resilience outcomes were examined. As a result, those conditions and means were also explained through which firms utilize accumulated external resources in the form of social capital and achieve supply chain resilience to enhance organizational performance. The study has used the SEM-PLS for the analysis of the data. The response rate of the current study is 75.1 percent. The data is collected from the manufacturing firms listed in Indonesian stock exchange. The results of the study highlight that firms mostly possess valuable resources that are entrenched within inter-organizational ties, and a few such resources may remain inactive if not utilized against adversities and risks. Hence, absorptive capacity must be developed and activated by the firms to capitalize social capital in an effort to develop supply chain resilience.**

Keywords; *Supply Chain resilient, social capital, agility, absorptive capacity*

1. Background

In today's global marketplace, organizations have been increasingly faced with unquantifiable threats in the form of risks and disruptions, which may affect their success and survival in the long run as well as reverse the traditional firm-centric management practices [1, 33-35]. Firms frequently face disruptions which may compromise their ability to perform effectively. Such as, Boeing's plan of outrunning its competitors by launching 787 Dreamliner, which was afflicted with unexpected and severe disruptions in the SC, resulting in cost hikes, and production delays and raised serious questions regarding its SC resilience. Moreover, in 2014, when Russia and 25 other economies were imposed with trade sanctions, a major reorganization rapidly took place in the Russian SC to deal with such disruptions. In the Russian shipbuilding industry, 90% of Russian SMEs use inputs from outside Russia through imports, therefore [2] discussed in their study that how these SMEs reconfigured their SC by diverting from Western to the Chinese providers. A firm manager explained that through proactive development of production processes, business relationships, and R&D, their firm successfully developed relationship with a Chinese firm, while operating among existing SC partners [3]. Therefore, during disruptions, since they have developed SOCC and mutual trust, they increased their order volume at low risk, with the same supplier. Eventually, they were able to cater existing customers as well as gained increased market share by surpassing those competitors who were also facing challenges in terms of suppliers.

Therefore, developing SC resilience (SCR) is becoming an essential capability for the firms to deal against adversities, uncertainties and challenges and accept complexity for sustained customer value creation [4]. Nonetheless, with such sizeable disruptions and adversities, only relying on firm's internal resources does not seem viable for the survival and performance in the long run. This paper emphasizes upon SOCC as a potential SCR enabler, by observing the role of absorptive capacity as a mediator and in case of the relationship between SC management and marketing[5]. Therefore, in this study we assume SCM alignment and absorptive capacity as the critical factors for linking SC resilience (SCR) and SOCC.

[6] have suggested that absorptive capacity as a remarkable boundary spanning capability of using the firm's intangible resources that are obtained as a result of inter-organizational relationships, because the resources

that are external to the firm may have both negative and positive outcomes and consequences. Absorptive capacity allows to take advantage from the key organizational resources that are ingrained within the firm's relationships, in addition, it also allows effective utilization of these organizational resources to achieve sustained competitive advantage. However, while assessing the firm's absorptive capacity, the role of cross-functional alignment strategies cannot be ignored, since these strategies are embedded in the same domain in which it is implemented [7]. Furthermore, adjusting the value creating functions of a firm may significantly contribute to the effectiveness and application of absorptive capacity in marketing and SCM domains to survive and fight against adversities and external turbulence. Consequently, there is a need to develop a deeper understanding of absorptive capacity and SOCC linkage, and how these linkages can be moderated with SCM alignment, to resist hardships and turmoil. Similarly, an empirical development of a linkage among organizational performance and SCR is also required to present strong arguments concerning SCR value [8]. Thus, this study aims to examine SCM alignment and absorptive capacity's role in realizing the impact of SOCC on the SC resilience (SCR). In addition, the current study attempts to analyze that in what ways absorptive capacity takes the form of SOCC to achieve SCR, at different SCM levels. The model in this study was tested by obtaining dual responses from 265 firms. The model postulates the mediating role of absorptive capacity and moderating role of SCM alignment on the SCR and SOCC nexus. The findings obtained from this study partially supports this study model and validates the role of SCM alignment and absorptive capacity's role in relaying SOCC's impact on the SC resilience (SCR) [4].

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2. Literature Review and Hypotheses Development

Resource accumulation and providing social access to such resources (such as, SOCC, in terms of relationships, cognition and structures) is the basic function of inter-organizational relationships [9]. The term SOCC refers to the sum of potential and actual resources that are available through, ingrained within and comes from the relationships possessed by a social unit or an individual. It usually comprises of cognitive (shared meaning and understanding between parties of a network), relational (of personal relationships within the network) and structural (overall connection pattern between the actors) dimensions. According to [10] SOCC is identified to add value to the network of firms, since it helps in accessing information and resources. Thus, SOCC is a well-acknowledged concept in the SCM and marketing literature and an essential constituent of the inter-organizational linkages [11]. However, recent studies suggest SOCC as a potential barrier against complexities and adversities. Therefore, the key argument behind this stream of research is that SOCC may serve as a key relational resource for surviving, facing, and adapting to the adverse changes. Therefore, weak and strong social relationships act as the necessary ingredients to develop SC resilience, since weak ties offer diverse resources and access to new ideas, whereas, strong ties offer social cohesion and unique capabilities (deep connectedness and sense of belonging [11]. [12] describe SOCC as an external resource having no proportional costs with increased usage. Therefore, in order to become resilient, firms must possess slack resources, while closely observing their cost.

[13] stated that information processing can be restricted through dysfunctional identification processes, while over-commitment towards relationships results in the delaying of structural adjustment, which inhibits the usage of positive SOCC and affects the firm's to resist against disruptions. Generally, SOCC is combined with organization's reliance and dependence on external entities, thereby converting their weaknesses into potential threats. Developing strong SOCC and engaging in intensive ties enable firms to face highly unstable supply risk and opportunity costs [14]. Therefore, there is a need for those processes and capabilities that help to reduce and transform negative SOCC consequences into positive force. In the SCR context, firms can be a part of social networks to perform emergency operations and regular business operations. Such as, several non-profit and government organizations may combine with SCs during emergencies that usually would not occur during regular business operations. Thus, firms are required to decide which ties are more beneficial for firms to recover from disruptions and adversity. Hence, it is important to develop both inter-firm relationships, i.e. relationships with SC firms and intersectional ties, i.e. relationships across different sectors [15]

In a relationship network, SOCC influences the exchange of resources by providing opportunities, facilitates learning and offer access to both intangible and tangible resources. In fact, developing organizational capabilities and resources based on the availability of SOCC [16]. In this regard, the first hypothesis (H1A & H1B) in this study postulates basic linkage among absorptive capacity, SOCC and SC resilience (SCR). This study also examined various other concepts, for instance, information technology capabilities and organizational compatibility as absorptive capacity antecedents. Thus, we emphasized SOCC as an absorptive capacity's potential antecedent, from relational source of external knowledge context. Firm's SOCC can be utilized to develop ties with new partners and exchange information [17].

Furthermore, strong structural relationships with the partnering firms allow to exchange resources and other

routine among the partners. Such as, developing trust among firm and partners helps in exchanging information smoothly between them and also enable and encourage valuable and tacit knowledge sharing by the SC partners. Another noticeable fact is that absorptive capacity is one of the dynamic capabilities which develop and generally applies to the inter-firm context, in order to achieve organizational innovation and learning[18]. SOCC (such as, network ties, relationship quality and social interaction) increases the knowledge acquisition from knowledge exploitation and organizational relationships. Therefore, the obtained results support network ties and social interaction relationships, which thus confirms that higher SOCC enhances the ability of a firm to absorb knowledge, while frequent interactions increase organizational learning. In addition, SOCC is identified as a significant driver to acquire knowledge from inter-organizational ties and facilitates further knowledge transfer. [19] therefore, argue that SOCC as well as its elements allow to achieve success through accurate identification and acquisition of external information, to use and assimilate this information within the organizational boundaries.

H1. SOCC of a firm positively affects its absorptive capacity.

Meanwhile, for the long-term effectiveness of SC, mutually beneficial connections and trust are needed for risk reduction. In the SOCC literature [20] trust has been highlighted as a cooperative mechanism which helps in conflict management among the SC partners. In addition, SOCC's relational aspect, such as, goodwill and trust, increases the chances of resource exchange and resource sharing among the partners. In case of unexpected SC disruptions or events, relational SOCC is likely to facilitate firms in quickly recovering from the unexpected event or shock, since trusted and loyal partners tend to prioritize higher SOCC customers and improve situation. Among SC partners, SOCC serves as a barrier against spur collective action, adversities and facilitate to remain coherent in response to sudden disruptions and events [21]. However, access to broader network may offer alternative distribution or supply routes to the firms to quickly respond against contingencies.

H2. A firm's absorptive capacity SC resilience (SCR) is positively influenced by its SOCC.

The relationship among SC partners that is reflected by the cohesiveness between them, is a primary or an essential element for a SC to remain resilient. Besides, collaborative partnerships also facilitate to effectively manage risks and disruptions [22]. Hence, there is a need to develop strong relationships, resource allocation and joint information for sustained cohesion throughout the organization, to remain intact and survive hardships. Similarly, those firms which are equipped with collaborative inter-organizational ties are likely to be resilient and effectively respond to SC disruptions [23]. Besides, the lack of information, uncertainty and cloud judgment require firms to get external environment knowledge to survive and navigate their organizational activities. Hence, absorptive capacity may act as a critical SCR driver by allowing external information acquisition, transformation, exploitation and assimilation. According to [24] absorptive capacity must be there to convert collaborative relationships into beneficial and positive outcomes. Firms as well their SCs may achieve absorptive capacity in order to obtain and utilize the acquired knowledge and to respond to sustained and unexpected difficulties. In addition, using absorptive capacity may also seem critical in using innovation related knowledge against adversities and disruptions, to develop SCR. Moreover, it has been reported in recent research [25] that absorptive capacity improves the firm's ability to alleviate those SC risks which may damage SCR. In this regard, understanding and knowledge of SC structures (i.e. relational, intangible and physical), may assumed to be the critical enablers of SC resilience (SCR).

H3. A firm's SC resilience (SCR) is positively influenced by its absorptive capacity.

H4: ABSACP mediates the relationship between the SOCC and firm's SC resilience (SCR).

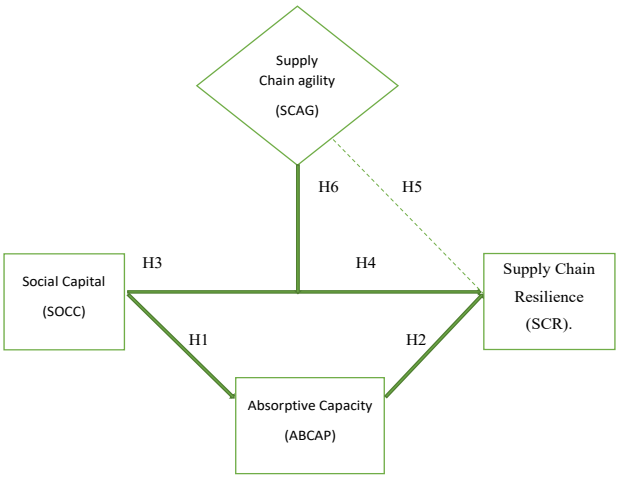

Figure 1. Conceptual Model[1]

The study has used the earlier study of [20] as a base study for the developmnet of conceptual framework. However, the authors has contributed in the body of literature by

[1] The study has used the earlier study of Gölgeci et al., (2020) as a base study for the development of conceptual framework. However, the authors have contributed in the body of literature by

I- Incorporating the supply chain agility as moderator

II- By examining the proposed framework in entirely new sample settings of Indonesia

2.1. Role of Agility as a Moderator

Incorporating SCRMC in a firm may positively influence the whole operating structure of an organization [26]. Inadequate information sharing is found to be one of the major obstacles in achieving firm visibility. Reduction in practical visibility results in the lack of awareness among organizational members regarding disruptions, which could result in unsafe conditions. Hence, there must be proper communication concerning the situation and relevant potential changes must be made among the SC members. In addition, it is essential to share unfettered knowledge while implementing risk awareness programs [27]. Thus, managers must essentially strive for developing appropriate management procedures and policies as well as evaluation practices, in order to recover from disruptions and uncertainties[28]. In this regard, a communication among top managers and their subordinates is required to grant them the required authority. Resultantly, the speed of recovery and visibility of the members will be improved. On the basis of aforementioned statements, we postulate that:

Besides the components of resilient capability [29] identified agility to be one of the powerful methods to achieve SC resilience. Firm' rapidly adjusting capability in response to quick SC changes must be taken as an essential quality for maintaining uninterrupted operations and system sustainability, known as agility. Agility also refers to a SC's ability to quickly act against changes through returning back to stable configuration. Agility has been studied in the literature from two perspectives, i.e. agility as a driver to resilience, and agility as part of SC agility [30]. As the focus of this study is SCR, therefore, we consider it from the former perspective i.e. resilience.

H5: SC agility has significant impact on the firm's SC resilience (SCR).

H6: SC agility the relationship between the SOCC and firm's SC resilience (SCR).

3. Methodology

In this study we have used a survey-based study. We had distributed total 358 questionnaires among employees of insurance companies in Palestine, we received total 269 questioners, whereas 11 questionnaires were having some missing information or were not completed by respondents so, they were rejected and for the analysis we have used only 258 questionnaires. Therefore 75.1% was the response rate for present study. We have adopted the social capita scale from the study [21], supply chain agility from [25], absorptive capacity from [26] and supply chain operational performance from the [29]. For the current study we have used 20.0 version of SPSS and SEM and Partial Least Square (PLS-SEM) for analyzing the data. In this study additionally we have used a combination of descriptive and inferential statistics. PLS-SEM is best alternate of CBSEM approach because of its distinctive features. And now researchers are frequently using this technique in business related research [18].

4. Results

Before the evaluation of relations in overall model the researcher must make sure that the used construct measures are valid and reliable. Later on, in measurement model we have also tested the reliability and validity of items and their constructs. We have also measured the construct reliability of individual items by testing the item loadings of latent constricts by using PLS[31].

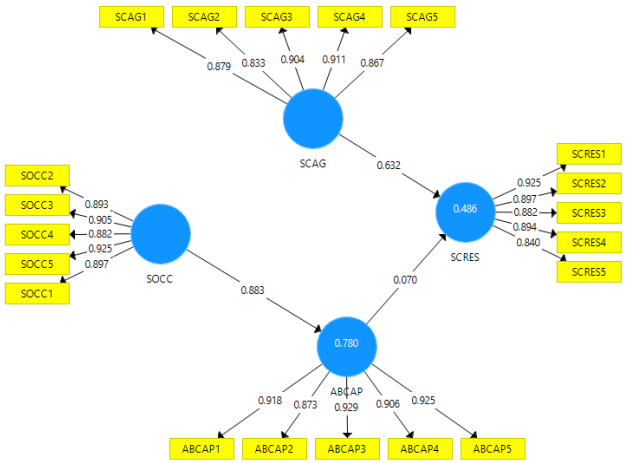

Figure 2. Measurement Model

The value of factor or indicator loadings should be greater than 0.70. The most important test in measurement model is factor loading test. For examining each item loading of respective constructs we use the measurement model. Factor loadings shows that the items of construct are consistent or not. Factor loadings will be high according to the consistency of construct items [16]. The value of factor loading must be greater than 0.70, but if it is greater than 0.7 then it indicates the strong consistency between construct measurements. Scores of factor loadings are mentioned in Table 4.7.

Table 1. Outer Loading

	ABCAP	SCAG	SCRES	SOCC
ABCAP1	0.918			
ABCAP2	0.873			
ABCAP3	0.929			
ABCAP4	0.906			
ABCAP5	0.925			
SCAG1		0.879		
SCAG2		0.833		
SCAG3		0.904		
SCAG4		0.911		
SCAG5		0.867		
SCRES1			0.925	

SCRES2			**0.897**	
SCRES3			**0.882**	
SCRES4			**0.894**	
SCRES5			**0.840**	
SOCC2				**0.893**
SOCC3				**0.905**
SOCC4				**0.882**
SOCC5				**0.925**
SOCC1				**0.897**

According to the study of [13], the degree or extent at which for measurement of construct we use an item which indicates higher percentage of common variance is known as convergent validity. We have used different methods for checking convergent validity between the items of construct like Composite Reliability (CR), indicators factor loading (outer loading) and Average Variance Extracted (AVE).

Table 2. Reliability

	Cronbach's Alpha	**rho_A**	**CR**	**(AVE)**
ABCAP	**0.948**	**0.950**	**0.960**	**0.829**
SCAG	**0.926**	**0.930**	**0.944**	**0.773**
SCRES	**0.933**	**0.934**	**0.949**	**0.789**
SOCC	**0.942**	**0.943**	**0.955**	**0.811**

The composite reliability (CR) is known as the degree at which constantly same latent construct is interpreted by an item. The shared variance assessment is provided by the composite reliability of individual indicators, which is a measure of internal consistency reliability. For the establishment of convergent validity at construct level the common measure is AVE [13]

Table 3. Validity

	ABCAP	**SCAG**	**SCRES**	**SOCC**
ABCAP	0.901			
SCAG	0.865	0.879		
SCRES	0.849	0.797	0.888	
SOCC	0.783	0.706	0.791	0.901

For the evaluation of construct validity, we use discriminant validity as an indicator. The degree at which a construct is completely different from the empirical slandered constructs is known as discriminant validity (DV) [13]. Discriminant validity make sure that construct is strongly associated with its measures as compare to other constructs. After the assessment of MM, the next step is the measurement of structural model. At which we examine the predictive relations and capabilities of constructs [13].

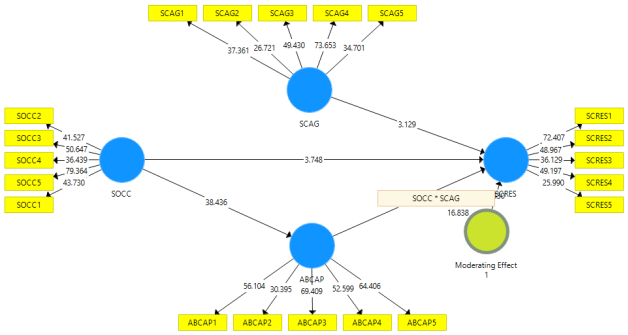

Figure 3. Structural Model

We can interpret the hypothesis testing of structural model in PLS as the standardized beta coefficients of ordinary least squares regressions. With the help of bootstrapping procedures, we can examine the significance of individual path coefficients. Earlier hypothesis was not supported by the hypothesized directions while the purposed casual relations were empirically supported by hypothesized directions of significant paths [13]. All the direct path is significant at p-value less than 0.05.

Table 5. Direct Relationships

	(O)	**(M)**	**(STDEV)**	**(|O/STDEV|)**	**P Values**
ABCAP -> SCRES	0.605	0.699	0.107	4.974	**0.000**
Moderating Effect 1 -> SCRES	0.591	0.593	0.064	4.430	**0.000**
SCAG -> SCRES	0.491	0.493	0.157	3.129	**0.001**
SOCC -> ABCAP	0.883	0.883	0.023	38.436	**0.000**
SOCC -> SCRES	0.327	0.326	0.152	2.145	**0.016**

The results of the mediation of the **ABCAP is shown in the table 5. Results revealed the fact that SOCC -> ABCAP -> SCRES is significant at p-value less than 0.05**

Table 6. Mediation

	(O)	**(M)**	**(STDEV)**	**(|O/STDEV|)**	**P Values**
SOCC -> ABCAP -> SCRES	0.592	0.587	0.095	0.970	**0.000**

For the evaluation of structural model, the value of R square is common measure. The predictive accuracy is measured by the R square.

Table 7. R-square

	R Square
ABCAP	0.780
SCRES	0.486

The value of q square which is a predictive relevance shows another criterion for examining the quality of structural model [28]

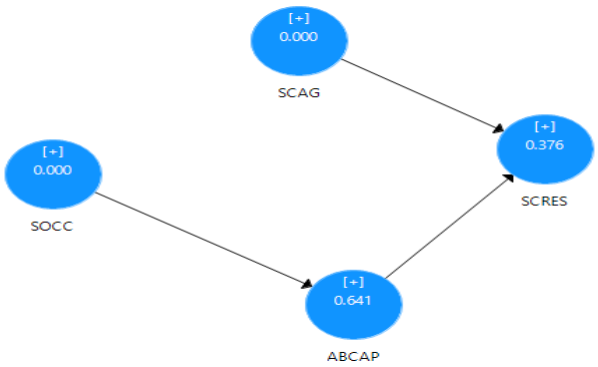

Figure 4. Blindfolding

As per literature if cross-validated redundancy (Q2) value of endogenous latent construct is greater than zero then it shows that predictive relevance sign of explanatory latent constructs.

Table 7. Q-square

	SSO	SSE	Q^2 (=1-SSE/SSO)
ABCAP	1085.000	389.248	0.641
SCAG	1085.000	1085.000	
SCRES	1085.000	676.937	0.376
SOCC	1085.000	1085.000	

5. Conclusion

It is difficult for the firms to operate under increasingly disruptive and hostile environments by solely relying on internal strategies and resources. In such cases, the social capital that is derived from organizational ties offer resources and alternative routes to be used in response to disruptions and adversities. Although there is limited knowledge concerning when and how social capital leads to SCR. It also emphasizes the need to investigate and focus more on the SCR's factors and consequences. In addition, it also reveals the basic assumption of this study that SCM alignment and absorptive capacity may actively play their role to describe how social capital can be utilized by the firms to make their supply chain resilient and enhance organizational performance. Findings of this study indicate that absorptive capacity is capable of creating a linkage among SCR and social capital and also describe the way it can be used for developing SCR. According to [32] since social capital is essential and an operand resource, therefore, the absorptive capacity's boundary-spanning capability is needed for channelizing this capacity in the direction of strategic ends, to be able to realize its potential and assess its impact on SCR. It thus adds to the existing set of literature on SCR antecedents, which merely focuses and analyzes the immediate drivers, while ignoring its mediating effects, which acts as a channel among SCR and intangible external resources.

There is a need for those processes and capabilities that help to reduce and transform negative social capital consequences into positive force. In the SCR context, firms can be a part of social networks to perform emergency operations and regular business operations. Another noticeable fact is that absorptive capacity is one of the dynamic capabilities which develop and generally applies to the inter-firm context, in order to achieve organizational innovation and learning. Social capital (such as, network ties, relationship quality and social interaction) increases the knowledge acquisition from knowledge exploitation and organizational relationships

There are two important managerial implications of this research findings for those firms which are seeking to develop SCR and higher performance under uncertain environments. Firstly, benefit from the firm's social capital using the firm's absorptive capacity. Firms mostly possess valuable resources that are entrenched within inter-organizational ties, and a few such resources may remain inactive if not utilized against adversities and risks. Hence, absorptive capacity must be developed and activated by the firms to capitalize social capital in an effort to develop SCR. Although, for the absorptive capacity, both behavioral and financial investments are needed for developing, utilizing and maintaining it, since it can significantly contribute against adversities, particularly in the long run. However, to achieve higher performance, prior researches have given more attention to agility and relatively less to the SCR perspective. Therefore, this study has addressed the research gap and attempted to analyze agility under the dynamic capability perspective.

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