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INFLUENCE OF SUPPLY CHAIN ORIENTATION ON SUPPLY CHAIN PERFORMANCE THROUGH DYNAMIC COLLABORATION CAPABILITY

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Abstract. *This research investigates the impact of supply chain orientation (SCO), dynamic collaboration capabilities, all aimed at augmenting the supply chain performance. This study aims to evaluate strategic SCO and structural SCO on supply chain performance among manufacturing firms in South Korea. Accordingly, we verified the positive relationships among a strategic, structural SCO, dynamic collaboration capabilities, and supply chain performance. This study found that strategic and structural SCO were positively related to supply chain performance through dynamic collaboration capabilities.*
Keywords: Strategic SCO, Structural SCO, Dynamic collaboration capabilities, Supply chain performance

1. **Introduction.** In the sense of the needs to enhance the effectiveness of the inter-organizational business process, supply chain management (SCM) is an important field of research. In the past decades, the roles of SCM in the supply chain have rapidly changed the conditions for doing inter-organizational business around the world. Challenges and opportunities available within the supply chain are better managed by adopting SCM. SCM philosophy is the belief that each firm in the supply chain directly and indirectly affects the supply chain members [1,2].

Supply chain orientation (SCO) is going to implement the SCM philosophy, which consists of strategic SCO and structural SCO. Strategic SCO is integrating an SCM philosophy into the firm's strategy development, and reflects the extent to which top management decision and strategic direction contain an SCM philosophy. Structural SCO includes operational-level behaviors and actions of the firm that reflect the SCM philosophy, as embodied through strategic SCO [2,3].

In terms of prior studies, Allred et al. [4], Braunscheidel and Suresh [5], Patel et al. [2], and Tan et al. [6] demonstrate that supply chain partners have the ability to behave in an SCO. Within this context, it is presupposed that SCO is a driver of supply chain capabilities. Current SCM capability literature suggests that firms need to develop supply chain capabilities [6], collaboration capabilities [4] that integrate a firm with its supply chain partners to create value for the firm in the supply chain.

Superior collaboration capabilities result in effective inter-firm activity integration, goal sharing among firms in the supply chain, inter-firm coordination and quick response to market changes. Supply chain performance ultimately is affected. Thus, theoretical arguments made by the strategy-structure-performance (SSP) framework are used to explore the interdependent nature of strategic and structural SCO. Based on the SCO philosophy and dynamic capability, this paper proposes a new theoretical framework to examine

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how strategic SCO and structural SCO can influence supply chain performance through dynamic collaboration capability to enhance supply chain performance. This study contributes to enhancing an insight on firm's collaborative capability by providing theoretical insights and empirical findings.

2. **Literature Review and Hypothesis Development.** The SCM philosophy suggests that firms in supply chain can experience improved supply chain performance through supply chain capabilities. SCO enhances a firm's supply chain performance when it is combined with the firm's channel linking and bonding capabilities. SCO is defined as "the recognition by a company on the systemic, strategic implications of the activities and processes involved in managing the various flows in a supply chain" [1].

Min et al. [7] suggest that SCO involves building and maintaining internal, external behavioral elements that facilitate relational exchange in supply chain. Patel et al. [2] argue that it empirically tests the effects of strategic SCO and structural SCO on different dimensions of firm performance. Esper et al. [3] also suggest to integrate previous descriptions and further develop the structural element of SCO including the areas of organizational design, human resources, information technology, and organizational measurement.

SCO is a necessary antecedent to supply chain collaboration. Several theories implicitly or explicitly inform the importance and impact of collaboration as a dynamic capability. According to Allred et al. [4], they identified three streams of literature: (i) RBV of the firm, (ii) organizational orientations, and (iii) inter-functional and supply chain collaboration. A dynamic collaboration capability has been defined in different ways, and basically they fall into two groups of conceptualization: external collaboration focus and internal collaboration focus [4]. Following the logic of SCO philosophy on the definition of Allred et al. [4], *we defined dynamic collaboration capabilities as the ability of a focal company to identify, utilize, and assimilate both internal collaboration and external collaboration.*

Ongoing debates on relationships between SCO and dynamic capability has propelled the present investigators to examine: (a) how components of SCO (i.e., strategic SCO, structural SCO) affect the positional advantage of firms in terms of dynamic collaboration capabilities (i.e., internal collaboration, external collaboration); (b) how dynamic collaboration capabilities influence supply chain performance. We propose a research model that combines dynamic capability theory and the SSP framework. Based on the above discussion, Figure 1 provides a research model in this study.

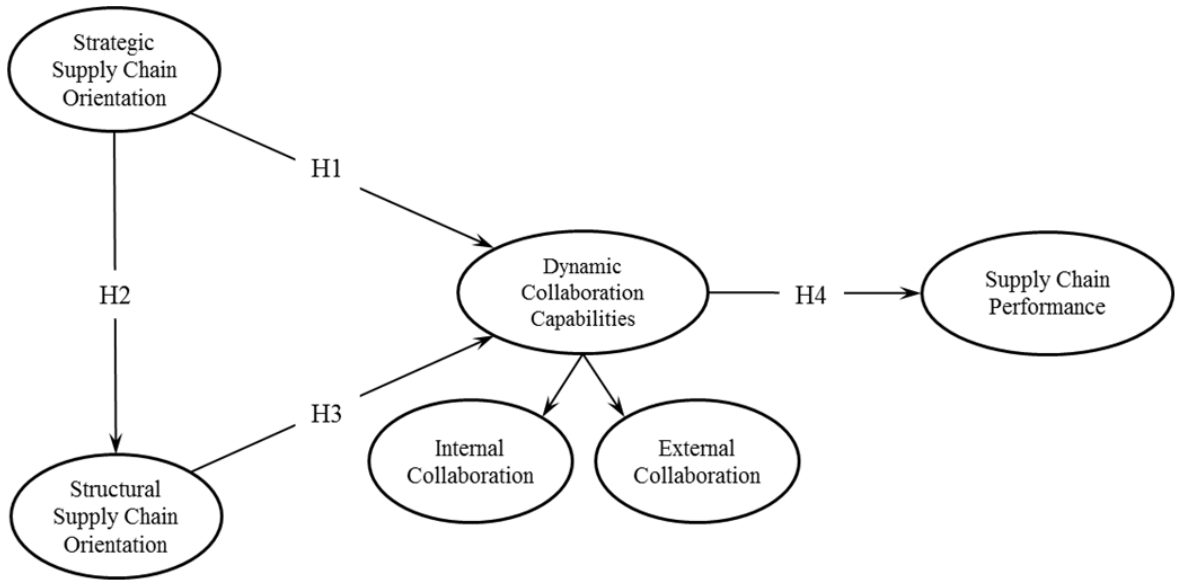

FIGURE 1. Research model

H1: Strategic SCO is positively associated with dynamic collaboration capabilities.
H2: Strategic SCO is positively associated with structural SCO.
H3: Structural SCO is positively associated with dynamic collaboration capabilities.
H4: Dynamic collaboration capability is positively associated with supply chain performance.

3. Research Methodology.

3.1. **Sampling and data collection.** The data for this study was drawn from managers of South Korea manufacturing firms via a survey. The target respondents were supervising manager or director in the manufacturing firms across the South Korea. A total of 500 firms were mailed. A total of 116 usable responses were analyzed. Table 1 provides a profile of the firms that participated in the study. In terms of industry sectors, 65.5% of the respondents came from automobile and machinery industry. In organizational size (based on the number of employees), 32.8% of the firms have between 150 and 300 employees.

Table 1. Profile of responding firms

Characteristics		Percentage
Industry	Automobile and machinery	65.5
	Electrical and electronics	25.9
	Other manufacturing	8.6
Number of employees	Less than 50	11.2
	50-150	31.9
	150-300	32.8
	300-500	12.9
	More than 500	11.2
Annual sales (Million USD)	Less than 30 Million	26.7
	30-60	25.9
	60-100	19.8
	100-200	17.2
	More than 200 Million	10.3

3.2. **Measurement model.** A partial least square (PLS) structural equation model was constructed for measurement validation and hypotheses testing because PLS places minimal restrictions on measurement scales and sample size. We employed Smart PLS2.0 to evaluate the measurement and structural models simultaneously. The measures used to operationalize the constructs included in the investigated model are mainly adopted from previous studies with modification. Table 2 shows the measurement items of the constructs in this study.

The cross loadings presented in Table 3 suggest that all the items load significantly on their posited constructs, ranging from 0.698 to 0.963. Reliability was examined by using the indicator loadings and the composite reliability (CR). Indicator loadings and CR values for most items are above 0.8. Three measures of reliability for internal consistency were used: Cronbach's α, composite reliability and average variance extracted. For Cronbach's α, a minimum value of 0.7 is considered as the acceptable for existing scales. Also, the average variance extracted (AVE) overall values were all above the 0.6 suggested for each construct. Table 4 shows the discriminant validity of constructs. In Table 4, the square root of AVE for each construct is larger than its correlations with all other constructs. Thus, these results show highly acceptable level of reliability, with convergent and discriminant validity.

Table 2. Measurement items

Construct		Item	Source
Supply Chain Orientation (SCO)	Strategic SCO	Consistency of goals with supply chain members	[2,8]
		CEO emphasis in importance of supply chain management	
		Agreement of our firm on the trading objectives with supply chain partners	
		Involvement of our firm on development of trading objectives	
	Structural SCO	Considering effects of supply chain decisions on business unit affairs	[2,8]
		Knowledge sharing about supply chain issues in business unit affairs	
		Willingness of our firm to make collaborative changes	
Dynamic Collaboration Capabilities (DCC)	Internal Collaboration	Information applications are highly integrated within the firm	[4]
		More process-oriented performance measures are tracking continuously	
		The culture of our firm promotes collaboration across functional areas	
	External Collaboration	Frequently open information sharing among supply chain members	[4]
		Efforts to establish common goals among supply chain members	
		Sharing of technical expertise with supply chain members	
Supply Chain Performance		Improvement of accuracy in product delivery	[9]
		Reducing the cost in maintaining supply chain	
		Improvement of order process (e.g., cost, time)	
		Enhancing competitive advantage	
		Improvement of fast communication	

3.3. **Structural model.** Results of the analysis for the structural model are presented in Table 5. As hypothesized, strategic SCO has positive influence (b = 0.331) on dynamic collaboration capabilities. Strategic SCO has significantly positive impact (b = 0.356) on structural SCO. Structural SCO also has positive influence (b = 0.368) on dynamic collaboration capabilities. These provided acceptance for H1, H2 and H3. The effect of dynamic collaboration capabilities (b = 0.619) on supply chain performance was positive and significant, providing support for H4.

The endogenous variables achieved R^2 values that were 0.126 for structural SCO, 0.332 for dynamic collaboration capabilities, and 0.383 for supply chain performance. Table 5 summarizes the results of all hypotheses testing. In the analysis of mediation effect, dynamic collaboration capabilities play (f^2 = 0.269) mediating role between SCO and supply chain performance (See Table 6, [10]).

4. **Discussion and Conclusions.** This study empirically tests the effects of strategic SCO and structural SCO on different dimensions of dynamic collaboration capabilities and supply chain performance. This study suggests a theoretical framework for explaining how strategic SCO and structural SCO as major dimensions of SCO can influence to

Table 3. Convergent validity

Variable		Item	Cross Loadings	Composite Reliability		Cronbach's α		AVE	
Supply Chain Orientation (SCO)	Strategic SCO	STRA1	0.776	0.874		0.807		0.634	
		STRA2	0.787						
		STRA3	0.787						
		STRA4	0.833						
	Structural SCO	STRU1	0.753	0.920		0.869		0.794	
		STRU2	0.963						
		STRU3	0.943						
Dynamic Collaboration Capabilities (DCC)	Internal Collaboration	IC1	0.864	0.912	0.938	0.883	0.901	0.635	0.835
		IC2	0.960						
		IC3	0.915						
	External Collaboration	EC1	0.910		0.905		0.841		0.762
		EC2	0.922						
		EC3	0.780						
Supply Chain Performance		SCP1	0.854	0.882		0.834		0.602	
		SCP2	0.813						
		SCP3	0.791						
		SCP4	0.698						
		SCP5	0.710						

Table 4. Discriminant validity

	Strategic SCO	Structural SCO	Internal Collaboration	External Collaboration	Supply Chain Performance
Strategic SCO	**0.796**				
Structural SCO	0.356	**0.891**			
Internal Collaboration	0.388	0.433	**0.914**		
External Collaboration	0.436	0.431	0.590	**0.873**	
Supply Chain Performance	0.438	0.271	0.554	0.550	**0.776**

Note: Items on the diagonal are square roots of AVE (bold)

Table 5. Results of hypothesis testing

Hypothesis	Path Coefficient	t-value	Result
H1 Strategic SCO → Dynamic Collaboration Capabilities	0.331	4.343**	Accepted
H2 Strategic SCO → Structural SCO	0.356	4.193**	Accepted
H3 Structural SCO → Dynamic Collaboration Capabilities	0.368	4.920**	Accepted
H4 Dynamic Collaboration Capabilities → Supply Chain Performance	0.619	8.293**	Accepted

Note: * $P < 0.05$, ** $P < 0.01$

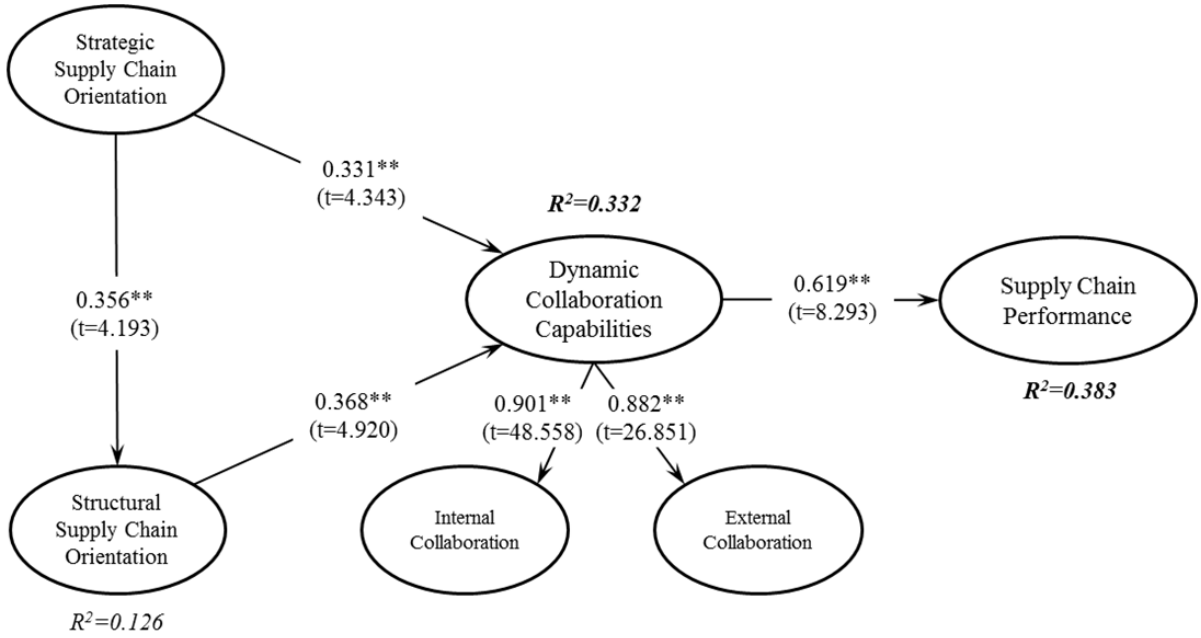

FIGURE 2. Results of hypothesis testing

TABLE 6. Mediation effect of dynamic collaboration capabilities

	R^2 value	ΔR^2	f^2 value
Full Model	0.383	0.166	n/a
Reduced Model (excluded dynamic collaboration capabilities)	0.217		**0.269**

Note: f^2 = (R^2 full model – R^2 reduced model) / (1 – R^2 full model)
f^2 value = small(0.0), medium(0.15), large(0.35)

facilitate dynamic collaboration capabilities and supply chain performance. Given the theoretical foundations of dynamic capability, this study provides comprehensive definition of strategic SCO and structural SCO as antecedents of dynamic collaboration capabilities. And this study defines supply chain performance as the consequence of dynamic collaboration capabilities. The results highlight the critical role of SCO and dynamic collaboration capabilities in achieving supply chain performance. Specific dynamic collaboration capabilities act as a mediator in linking SCO with supply chain performance. These results provide an insight that information processing across functional areas and information sharing with trading partners such as internal collaboration and external collaboration have important mediation effect, which is strengthened at higher levels of dynamic environment.

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