



Contents lists available at ScienceDirect

The Asian Journal of Shipping and Logistics

Journal homepage: www.elsevier.com/locate/ajsl



An Empirical Study on the Impact of Individual and Organizational Supply Chain Orientation on Supply Chain Management



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ARTICLE INFO

Article history:

Received 15 July 2016

Received in revised form 25 November 2016

Accepted 30 November 2016

Keywords:

Individual Supply Chain Orientation

Organizational Supply Chain

Orientation

Strategic Supply Chain Management

Operational Supply Chain Management

ABSTRACT

This study empirically identifies individual supply chain orientation (SCO) components as antecedents of organizational SCO and analyzes the causal relationships between organizational SCO and supply chain management (SCM). A survey was conducted with Korean firms and the partial least squares method was used to test the proposed hypotheses. The results show that individual SCO has a significant influence on organizational SCO. Organizational SCO has a significant influence on strategic SCM, whereas only information technology for SCO affects operational SCM. Strategic SCM has a significant influence on operational SCM. This study extends our understanding of the social and behavioral elements of SCM by classifying SCO into individual and organizational SCO and identifying the causal relationships between them.

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1. Introduction

Today, supply chain management (SCM) has been widely adopted in various industry sectors. SCM involves integrating corporate functions using business processes within and across companies (Lambert and Cooper, 2000). Trust, mutual dependence, cooperation, and shared goals between supply chain partners are considered to be the ultimate core capabilities (Min et al., 2005; Sanders and Premus, 2005) and the driving force behind effective SCM (Horvath, 2001). Based on the body of work on the exchange flows within and across supply chain members that facilitate effective SCM, more recent research has added supply chain orientation (SCO) to the body of supply chain research to emphasize a firm's disposition to view the supply chain as an integrated entity (Mello and Stank, 2005; Hult et al., 2008). SCO is defined as "a shared value and

belief system that aids in understanding how the organization should strategically manage its supply chain, and the behavioral norms needed inside the organization" (Esper et al., 2010, p. 163). The idea is that an organization must have philosophies on the strategic awareness and embracing of SCM within an individual supply chain firm before it can effectively engage in process flows within and across supply chain members (Esper et al., 2010).

Existing studies of SCO research have focused on the firm's disposition such as SCO strategy and SCO structure at the firm level of analysis. However, some evidence suggests that it is the individuals inside the organization who must change and adopt a mindset to execute supply chain initiatives (Davis et al., 2005; Omar et al., 2012). Some scholars

argue that without understanding organizational members' individual perceptions and viewpoints of SCM, identifying those interrelationships between SCOs may be difficult (Omar et al., 2012).

Thus, this study proposes different levels of SCO by which individual SCO positively affects organizational SCO. This study also suggests different aspects of organizational SCO and finally the causal relationships between organizational SCO and SCM. More generally, this paper responds to several scholars' calls for a more holistic understanding of the social and behavioral elements involved in the supply chain phenomenon (Boyer and Swink, 2008; Mello and Flint, 2009). The results of this study contribute to the theoretical expansion of the social and behavioral elements in SCM by differentiating and identifying the causal relationship between individual and organizational SCO.

2. Theoretical Development

2.1. Supply Chain Orientation

Supply chain orientation is defined as "the recognition by an organization of the systemic, strategic implications of the tactical activities involved in managing the various flows in a supply chain" (Mentzer et al., 2001, p. 11). It means that when a company possesses SCO, firms with employees are aware of the implications of managing the upstream and downstream flows of products, services, finances, and information across their suppliers and customers. Without a management philosophy inside a firm, it is hard to effectively engage in the strategic management of supply chain processes (Esper et al., 2010). According to previous research, SCO can be divided into two dimensions, namely strategic SCO and structural SCO (Esper et al., 2010). The difference between these concepts is that strategic SCO has tacit characteristics, while structural SCO has more formal characteristics. Strategic SCO focuses on ensuring employees are aware of the whole supply chain process as well as the whole flow of SCM and pursuing internal and external integration (Min and Mentzer, 2004). In a similar context, strategic SCO is more likely to emphasize the understanding and perception of members in a company regarding the various flows in a supply chain. We thus regard strategic SCO as emphasizing each member's perception and awareness of SCM as individual SCO.

In contrast to strategic SCO, structural SCO focuses on organizational artifacts that facilitate SCM. For example, Min et al. (2007) suggest that SCO involves building and maintaining internal behavioral factors that facilitate relational exchange. They describe trust, commitment, compatibility, and top management support as elements of SCO (Esper et al., 2010). According to Trent's (2004) work, structural SCO consists of the following four categories: organizational design, human resources, information technology, and organizational measurement. Based on the conceptual foundation suggested by Trent, we divide structural SCO into three variables.

Organizational design "includes the process of developing the structure and formal system of coordination and control required to achieve company and supply chain goals" (Esper et al., 2010, p.165). Previous literatures viewed three essential areas that describe organizational design for SCO: integration, structure, and collaboration.

Human resources for SCO are another facet that constitutes structural SCO. Myers et al. (2004) argue that SCM is a human-centric phenomenon. Although financial, equipment, technological, and market-based resources are necessary for effective SCM, the employees that actually accomplish

the work of the company are critical for the effective functioning and exploitation of each of these resource categories (Richey et al., 2006). Considering the importance of human resources for SCO, many scholars have suggested several human resources issues that contribute to more effective SCM. They argue that if a certain structuring and management of human resources makes SCM succeed, that will fall within two primary categories: (i) supply chain-related knowledge, skills, and abilities and (ii) human resources strategies that develop and support the use of knowledge in supply chain organizations.

Finally, information technology for SCO serves as a coordinating mechanism that connects departments within an organization and across firms in the supply chain (Simchi-Levi et al., 2008). Information technology has been widely accepted as a key factor for effective logistics and SCM for over 20 years (Forman and Lippert, 2005; LaLonde and Masters, 1990). SCO firms strive to integrate and collaborate with supply chain partners, which is both supported and facilitated by information technology.

2.2. Supply Chain Management

Supply chain management refers to an integrative philosophy of managing the total flow of a distribution channel from the supplier to the ultimate user (Cooper et al., 1997). As a philosophy, SCM requires a systems approach to viewing the supply chain as a single entity, rather than as a set of individual firms, each performing its own function (Mentzer et al., 2001). To adopt an SCM philosophy, firms should establish management practices that help them act or behave in alignment with the philosophy. Therefore, many scholars have emphasized such activities that constitute SCM. Previous studies have suggested various activities required to successfully implement an SCM philosophy. Mentzer et al. (2001) describe several SCM activities such as integrated behavior, mutually sharing information, mutually sharing risks and rewards, cooperation, establishing the same goal, and integrated processes.

A well-managed supply chain usually establishes strategic objectives as well as operational objectives by matching the activities at each level. Strategic SCM is a set of activities aiming for long-term organizational goals that sets the major benchmarks for SCM success and can be used by management to guide decision-making. Strategic SCM influences a two-to-four-year plan that will allow the company or organization to achieve successful supply chain performance. In contrast to strategic SCM, operational SCM refers to a set of activities focusing on daily, weekly, or monthly projects or tasks that implements larger strategic objectives. Operational SCM, also called tactical activities, is thus a set of activities with strategic objectives in mind, and it provides a means for management and staff to break down larger strategic activities into workable tasks. As with strategic SCM, operational SCM should be measurable and specific, although its focus is narrower.

3. Conceptual Model and Hypotheses

In this study, we investigate the causal relationships among individual SCO, organizational SCO, strategic SCM, and operational SCM. Fig. 1 shows a conceptual model of this study.

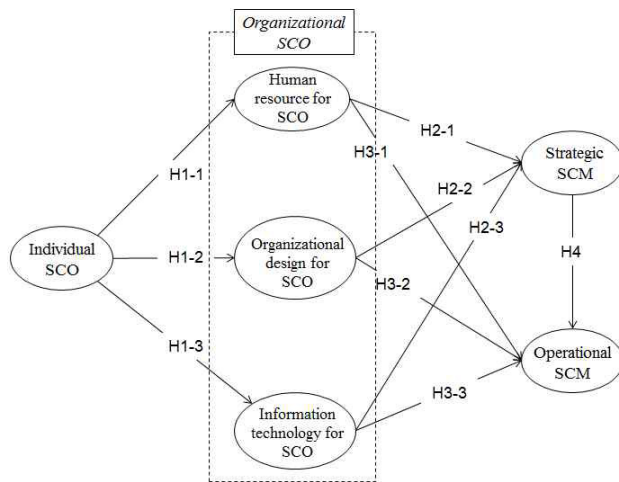


Fig. 1. Conceptual model and research hypotheses

3.1. Individual SCO and Organizational SCO

An organization is a social unit of people structured and managed to meet a need to pursue collective goals. Therefore, an individual employee's opinions, perceptions, and behaviors constitute the color of the organization. Organizational theorists have maintained that organizations change only when the employees that work in them change (Shapiro, 2003; Greer and Ford, 2009). To move from traditional supply chains to create an efficient, successful supply chain, the key factor is supply chain managers who change their thinking from a myopic firm-centric to a holistic supply chain view and share synergistic interfirm interests through collaboration (Ketchen and Hult, 2007; Omar et al., 2012). Supply chain managers without a collaborative culture and/or communication of the supply chain strategy are more likely to respond to the change with confusion and/or apathy. Instead, supply chain managers who view their supply chain members as open to new ideas and ready to collaborate are more likely to seek and actively respond to change (Omar et al., 2012). In the same context, this kind of a member's perception allows the organization to focus on organizational artifacts to implement SCM. Therefore, the following hypotheses are formulated:

H1-1: Individual SCO is positively related to human resources for SCO.

H1-2: Individual SCO is positively related to organizational design for SCO.

H1-3: Individual SCO is positively related to information technology for SCO.

3.2. Organizational SCO and SCM

Organizational SCO requires a distinctive separation from SCM. Organizational SCO is organizational artifacts that facilitate efficient and effective SCM such as human resources for SCO, organizational design for SCO, and information technology for SCO (Trent, 2006). Firstly, organizational design forms an organizational culture that can control and coordinate the structure of the organization to achieve its supply chain goals. Establishing coordinated goals and being aware of those goals will have positive impacts on SCM activities (Hamel and Prahalad, 1994). Secondly, some scholars argue that recognizing the importance of supply chain knowledge, skills, and abilities helps implement SCM activities (Richey et al., 2006; Murphy and Poist, 1998; Myers et al., 2004). Finally,

forming an organizational culture by recognizing the importance of information sharing promotes information sharing among supply chain partners (Allen and Masters, 1988; Forman and Lippert, 2005). The above-mentioned organizational SCOs are the environmental factors that must be built before SCM activities can be performed. Therefore, the following hypotheses are formulated:

H2-1: Human resources for SCO is positively related to strategic SCM.

H2-2: Organizational design for SCO is positively related to strategic SCM.

H2-3: Information technology for SCO is positively related to strategic SCM.

H3-1: Human resources for SCO is positively related to operational SCM.

H3-2: Organizational design for SCO is positively related to operational SCM.

H3-3: Information technology for SCO is positively related to operational SCM.

3.3. Strategic SCM and Operational SCM

Most firms formulate a supply chain strategy based on their overall strategy and use SCM facilitators to realize the supply chain strategy and achieve organizational goals (Chopra and Meindl, 2001). In the same context, Prajogo and Olhager (2012) identify that information integration, which includes information sharing and information technology, has a positive impact on logistics integration, leading to operational integration with suppliers in logistics activities. Furthermore, Ramanathan and Gunasekaran (2014) find that collaborative planning and collaborative decision-making positively influence collaborative execution. In supply chain collaborations, supply chain partners carry out production and distribution planning jointly with other partners. A supply chain's promotional sales, discounted sales, and new product introductions are often decided by all supply chain partners (Ramanathan, 2012). Ramanathan and Muyldermans (2010) argue that such collaborative decision-making has a positive impact on the implementation of sales plans in retail stores.

An organization is unlikely to perform strategic SCM if it fails to effectively translate it into workable operational SCM activities. At the same time, operational SCM will lack cohesion if it is not aligned with strategic SCM. As strategic SCM is well established and planned, it allows operational SCM activities to be performed efficiently and effectively. Hence,

H4: Strategic SCM is positively related to operational SCM.

4. Research Methods

4.1. Survey Administration and Data Collection

We targeted SMEs in the Korean manufacturing sector (i.e., firms with 300 or fewer employees). Data were collected via a postal survey from August to October 2011. The questionnaires were sent to 2,000 SMEs, and after discarding the responses with excessive missing data, 344 responses (17.2%) were finally used in the statistical analyses (Table 1).

Table 1
Descriptive statistics (n=344)

Respondents' titles		Firm size (employees)	
CEO/Director	5.8 % (20)	Less than 20	14.8% (51)
General Manager	18.0 % (62)	20 - 50	20.9 % (72)
Manager	24.7 % (85)	50 - 100	23.5 % (81)
Assistant Manager	31.4 % (108)	100 - 150	16.6 % (57)
Staff	18.9 % (65)	150 - 200	11.1 % (38)
Miscellaneous	1.2 % (4)	200 - 250	3.8 % (13)
		250 - 300	9.3 % (32)
Respondents' work experience		Firm size(sales, Korean won)	
Less than 2 yrs.	5.5 % (19)	Less than 0.5 mil.	4.1 % (14)
2 - 5 yrs.	27.9% (96)	0.5 - 1 mil.	4.7 % (16)
5 - 10 yrs.	29.7% (102)	1 - 5 mil.	16.6 % (57)
10 - 15 yrs.	20.3 % (70)	5 - 10 mil.	9.9 % (34)
15 - 20 yrs.	10.8% (37)	10 - 50 mil.	33.4 % (115)
20 - 25 yrs.	3.8 % (13)	50 - 100 mil.	8.1 % (28)
25 - 30 yrs.	1.4 % (5)	100 -mil., and over	23.2 % (80)
Over 30 yrs.	0.6 % (2)		

4.2. Measurement Instrument

This study sought to discover if there is a causal relationship between individual SCO, organizational SCO, and SCM. To ensure the quality of our measures, we used measurements developed and used in previous studies. All items were measured on a seven-point Likert scale ranging from “not at all” to “to a very great extent” or from “strongly disagree” to “strongly agree” as appropriate (see Appendix 1 for the measurement instruments).

4.3. Data Analysis and Hypotheses Tests

To test the causal relationships among the variables, firstly, we analyzed the reliability and validity of the measurements composing each latent variable, using SPSS 18.0 and SmartPLS v.2.0 M3 (Ringle et al., 2005). The results for internal reliability using Cronbach's alpha show that all variables exceed the cut-off value of 0.7, ranging from 0.836 to 0.873. Convergent validity was assessed by average variance extracted (AVE) and composite reliability (CR). As all the AVE and CR values are larger than 0.5 and 0.7, respectively, ranging from 0.623 to 0.756 for AVE and 0.892 to 0.908 for CR, these results provide strong support for convergent validity (Fornell and Larcker, 1981) (Table 2). Discriminant validity was assessed by comparing the square-rooted AVE for each factor as well as the correlations between them. The results reveal most of the square-rooted AVEs are greater than the correlations (see Table 3). This finding indicates that there are no significant discriminant validity issues in our measures (Gefen and Straub, 2005). Based on the literature review, we regard strategic SCM and operational SCM as sufficiently conceptually different to keep for further statistical analysis.

Table 2
Construct analysis

Factors	Cronbach's Alpha	AVE	C.R.
ISCO	0.864	0.711	0.908
HRSCO	0.836	0.756	0.902
ODSCO	0.836	0.752	0.901
ITSCO	0.879	0.735	0.917

SSCM	0.873	0.663	0.908
OSCM	0.848	0.623	0.892

Table 3
Construct-level correlation matrix (n=344)

Factors	Mean	S.D.	1)	2)	3)	4)	5)	6)
ISCO	4.83	1.11	.867					
HRSCO	4.15	1.16	.506**	.869				
ODSCO	4.26	1.16	.492**	.850**	.857			
ITSCO	4.27	1.11	.603**	.824**	.813**	.843		
SSCM	3.88	1.01	.411**	.715**	.680**	.692**	.789	
OSCM	3.94	1.00	.400**	.694**	.662**	.683**	.866**	.814

** Correlation is significant at the 0.01 level (2-tailed), parentheses are square-root of AVEs

4.4. Analysis and Results

We used partial least squares (PLS) equation modeling to test our hypotheses. The purpose of this tool is to maximize the variance of the dependent variable (Hair et al., 2011). First, we tested the fit of the PLS model. Generally, the model fit of PLS is assessed by calculating the R² of the dependent variable, which provides sufficient predictive validity when the value exceeds 10% (Falk and Miller, 1992). The R² values in this study range from 24.3% to 78.2%, which exceeds the cut-off value. Second, we tested the hypotheses by using bootstrapping with 500 resamples. Fig. 2 shows the results of the structural modeling.

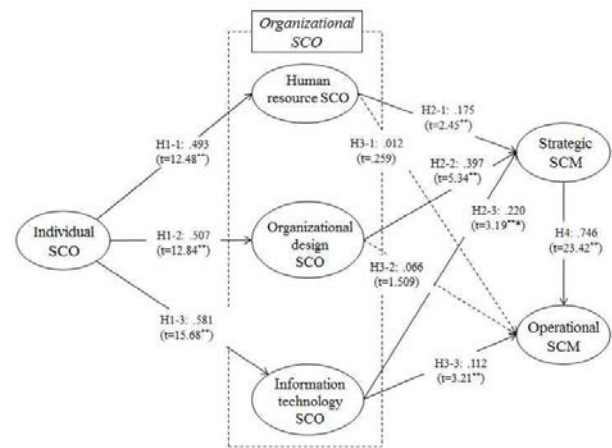


Fig. 2. The results of the structural modeling

The results of the analyses indicated support for H1-1 to H1-3, which postulated that individual SCO is positively and significantly related to each of organizational SCO, human resources for SCO, organizational design for SCO, and information technology for SCO. The results of the analyses also indicated support for H2-1 to H2-3, which postulated that the three variables of organizational SCO are positively and significantly related to strategic SCM. On the contrary, not all the hypotheses between organizational SCO and operational SCM were supported. The only hypothesis supported was H3-3, which postulated that information technology for SCO is positively and significantly related to operational SCM. Finally, H4 was supported, indicating a positive and significant causal relationship between strategic SCM and operational SCM.

5. Conclusion

This study proposes different levels of SCO by which individual SCO positively affects organizational SCO. This study also suggests different aspects of organizational SCO and confirms the causal relationships between organizational SCO and SCM.

Based on the above results, this study makes several theoretical contributions to the SCM literature. First, we empirically differentiated individual SCO and organizational SCO. Individual SCO, which consisted of four measurements—"the individual understands the direction of the organization's SCM," "the individual believes that a collaborative relationship is important," "the individual believes that compatibility is important," and "the individual trusts the supply chain partners"—positively influenced human resources for SCO, organizational design for SCO, and information technology for SCO. In particular, we answered the calls for a more holistic understanding of the social and behavioral elements involved in the supply chain phenomenon by verifying individual SCO as an antecedent of organizational SCO.

Second, the results provide support for the argument that the strategic awareness and embracing of SCM within an individual supply chain firm is a necessary antecedent of effective SCM (Esper et al., 2010; Min and Mentzer, 2004). Therefore, this study contributes to the existing SCO literature by empirically identifying the integration with more specific SCM variables that may facilitate the further development of the SCO and SCM concepts.

Third, this study divided SCM activities into strategic and operational tasks and confirmed the causal relationship between these two concepts. Existing studies of SCM have mostly examined relationship management or process integration. Most research on process integration divides it into internal and external process integration, finding relationships between them (Chen et al., 2009; Droge et al., 2004; Flynn et al., 2010; Germain and Iyer, 2006). Despite the existence of strategic decision-making as well as plans that affect the operational execution of strategies, conceptualizing the variables into strategic SCM and operational SCM and analyzing the causal relationships between them has been rare. By empirically verifying the hypothesis that strategic SCM influences operational SCM, this study adds reliability to the theoretical relationship between strategic and operational SCM.

Furthermore, our findings constitute useful insights for practitioners. First, top management and senior managers should take into consideration the importance of boundary-spanning individuals who play a variety of roles at the interfaces between organizations and their environments (Stock, 2006) to facilitate the organizational management philosophies of SCM. For example, firms are recommended to hire BSIs (e.g., supply chain managers, employees in the SCM department) who have a certain understanding of SCM philosophies such as the recognition of sharing benefits/costs between supply chain partners or joint goals and policies by collaboration in order to enhance organizational SCO.

Second, top management can use this study to expand their understanding of the role of philosophy and structure for enhancing effective SCM. They can also use human resources for SCO, organizational design for SCO and information technology for SCO as a framework to determine strategy and/or structural management areas that can become more supply chain-oriented, thereby facilitating effective strategic SCM.

Finally, practitioners should emphasize the need for communication with partners as well as information sharing within the firm and across the supply chain based on a joint IT system to enhance operational SCM. In contrast to the other organizational SCOs, information technology for SCO is closely related to both strategic SCM and operational SCM. One step further to the body of work on the impact of IT systems and/or information sharing on successful SCM, consensus on sharing information and a joint IT system is a critical factor in advance of the effective and

efficient implementation of SCM. In summary, those firms that want to successfully adopt SCM must develop a management philosophy inside a firm by recognizing the systemic, strategic implications of the activities and processes involved in managing the various flows in a supply chain (Mentzer, 2001).

While SCM has been widely adopted in various industry sectors, a number of prior studies have identified the core capabilities for effective SCM. Building on past research, this study proposes that the antecedents of SCM include the strategic awareness and embracing of SCM within an individual supply chain firm before it can participate in process flows and implement SCM activities within and across the supply chain.

This study is a first step to identifying the relationships between individual SCO and organizational SCO. Thus, further studies need to support or modify the research model by conceptually or empirically re-examining these relationships.

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Appendix 1.
Measurement instruments

Factor	ID	Title	References
Individual SCO	ISCO1	I recognize the importance of joint goals and policies by collaboration.	Cachon and Lariviere, 2005; Chauhan and Proth, 2005; Chen et al., 2009; Mentzer et al., 2001
	ISCO2	I think benefits/costs should be shared with supply chain partners.	
	ISCO3	I recognize the mutual compatibility in our supply chain.	
	ISCO4	I think it is right to defend my partners when they are criticized unreasonably.	
Human Resource SCO	HSCO1	CEO of my company emphasizes the collaborative relationship with partners.	Richey et al., 2006; Murphy and Poist, 1998; Myers et al., 2004
	HSCO2	My company has lot of interest in training manpower for supply chain management.	
	HSCO3	My company has lot of interest in education, knowledge transfer systems about supply chain management.	
Organizational Design SCO	OSCO1	My company has lot of interest in establishing collaborative process among partners.	Hamel and Prahalad, 1994; Trent, 2006
	OSCO2	My company has standardized process with partners.	
	OSCO3	My company uses manual for SCM a lot.	
Information Technology SCO	TSCO1	My company has lot of interest in building joint IT system.	Closs et al., 1997; Forman and Lippert, 2005; La Londe and Masters, 1994
	TSCO2	My company shares information by internal IT system.	
	TSCO3	My company has lot of interest in information sharing with partners.	
	TSCO1	My company emphasizes the need for communication with partners.	
Strategic SCM	SSCM1	Establish mid-to-long term planning and strategy with supply chain partners	Cachon and Lariviere, 2005; Min and Mentzer, 2004, Mentzer et al., 2001
	SSCM2	Joint establishment of planning and strategy with supply chain partners	
	SSCM3	Share benefits/costs with supply chain partners	
	SSCM4	Collaborate with supply chain partners in long term perspective	
	SSCM5	Well standardized process	
Operational SCM	OSCM1	Use of compatible information systems with supply chain partners	Chen et al., 2009; Li et al., 2006; Lee and Billington, 1992
	OSCM2	Share of technologies, knowledge, and know-how for SCM with supply chain partners	
	OSCM3	Collaborative management of demand, manufacturing, and sales with supply chain partners	
	OSCM4	Share of facilities and equipment with supply chain partners	
	OSCM5	Share of integrated logistics process	