

Supply Chain Integration and Operational Performance: Moderating role of Organizational Culture

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Abstract

In the current global market, competition is not between organizations but among their supply chain. We found a number of rationales from the global market that the well renowned global organizations (such as Wal-Mart, Procter & Gamble, Pfizer, Allied Business Intelligence Inc., Target Corp., etc.) that integrate with their suppliers and customers, and prevailed in the global market. By acknowledging the significance of supply chain integration, the study is aimed at exploring the relationship between supply chain integration and operational performance of organizations operating in Pakistan. Further study has explored the moderating impact of organizational culture on this relation, as the culture play a vital role in the supply chain integration of an organization and its performance. The paper is based on empirical study undertaken on textile-base firms operating in Pakistan.

A theoretical grounded conceptual model is developed to organize a mechanism through which supply chain integration influences on operational performance with the moderating effect of organizational culture. With the help of this model 2 hypotheses were developed. To analyze the hypothesized relationship, multiple statistical tools were applied with the help of SPSS. These hypotheses were tested with the help of data collected through questionnaires that were filled from a sample of 150 employees of 10 dominant firms prevailed in textile industry of Pakistan. Theory, and the data collected from employees verified the proposed hypotheses and suggested that if management of an organization wants to improve its operational performance it would have to develop strategic collaboration with its suppliers and customers, and there should be a cross functional integration within the organization. Findings also reveal that

organizational culture moderate the relationship of supply chain integration and operational performance.

Key Words: Supply chain integration, Organizational culture, Operational performance.

Research Background

By acknowledging the significance of Supply Chain Integration (SCI) in business performance, reported by the various researchers and practitioners in the advance countries such as (USA, Canada, Australia, UK, France, etc), the authors have studied the concept of SCI in the context of developing countries like Pakistan as this concept is in its initial stages in these countries. We acknowledge that there is a huge work conducted in context of supply chain management and firm performance (Frohlich and Westbrook, 2001; Simatupang, Wright and Sridharan, 2002; Vickery et al. 2003; Cousins and Menguc, 2006; Mitra and Singhal, 2007, Flynn, Huo, and Zhao, 2010), but when we study the underlying concept in context of Pakistan, we come to know that there is a relatively little published empirical evidence who discuss this phenomenon. Further, most of the researchers who shed light on the role of supply chain integration for the successful business, did not consider the critical contextual factors like organizational culture which play a prominent role in the successful business of an organization. The relationship between internal organizational factors and supply chain integration has been largely overlooked. To fill this gap in the literature, we have try to developed a mechanism through which supply chain integration influences operational performance of an organization with the moderation of organizational culture. So, the present study will be a step forward by investigating the impact of organizational context i.e., organizational culture on supply chain integration.

To study the moderating impact of culture, we have adopted Organizational Culture Frame work, which was developed by Denison and Spreitzer (1991). Based on Quinn and Rohrbaugh (1981), this framework focuses on conflicts within a system, specifically the conflict between stability and change, and the conflict between the internal organization and the external environment. Given the nature of supply chain integration, this framework is considered appropriate for examining the relationship between organizational culture and supply chain integration.

On the basis of above discussion, we have developed the following three research questions that will guide the present study.

1. Is there any association between supply chain integration and operational performance?
2. Weather organizational contextual characteristic, i.e., organizational culture, influence the degree of supply chain integration?
3. Weather organizational culture moderate the relationship of supply chain integration and operational performance?

The study will illustrate how SCI substantially contributes to operational performance. Moreover, we also theorize that organizational culture, as one of the critical characteristics, will expressively influence the degree of integration between a focal firm and its partners within its supply chain. Different forms of organizational culture might influence the level of SCM

differently, and accordingly, certain types of organizational culture could either endorse or hinder the integration process. Examining this phenomenon through an empirical study will enhance our understanding of the nature of integration within a supply chain. The main focus of the present study is to investigate the role of organizational context i.e., organizational culture in supply chain integration of an organization. Notwithstanding, the previous studies on supply chain integration, we believe that this research will still contribute to enhance supply chain management knowledge by using different population and context, and further examining organizational contextual characteristics.

The study consists of five sections. In the first section it shed light on a brief literature with respect to supply chain integration, organizational culture, and their significance contribution to the operational performance of an organization. The second section encompassed conceptual framework which organized the mechanism through which supply chain integration work in any organizational setting and influence its performance. On the basis of this model research hypotheses are developed to study the impact of SCI on firm performance. In the third section research methodology to proceed in empirical study is discussed. Forth section covers the analyses to test the hypothesized relationship among the various variables of the study. In the fifth section findings of the analyses are explained. At the end of the study implication section have unraveled a number of managerial implications that arise from this study. In the last section conclusion discussed the scope of the study and shed light on the boulevards originated from this research.

Literature review

1. Supply chain management

Literature in context of SCM dated back to 1980s and it has received many definitions over the past years as It gained popularity, with most definitions describing it as a network of different entities (and its processes) interacting together to make materials and information flow (Lummus and Vokurka, 1999; Cooper *et al.*, 1997).). Infect a literature review by Stock *et al.* (2010) revealed 166 unique definitions of SCM. To an extent, SCM suffers (or benefits) from being studied from a wide range of academic disciplines and diverse theoretical perspectives. On the other hand this encourages a rich and lively debate, but it may also lead to a fragmented literature, with overlapping constructs and a failure to produce consistent findings. Stock and Boyer (2010) provided a comprehensive examination of 166 SCM definitions which have appeared in the literature and summarized many of the points by concluding that, “ Without the adoption of a uniform agreed upon definition of supply chain management (SCM), researchers and practitioners will not be able to “advance the theory and practice” of the discipline. An integrated definition of SCM would greatly benefit researchers’ efforts to study the phenomenon of SCM and those practitioners attempting to implement SCM”.

The concept of SCM evolved around the two basic dimensions; GSCM, SSCM. Green Supply Chain Management (GSCM) concerned with a firm works with their suppliers to improve the environmental performance of products and manufacturing processes (Simpson and Power, 2005; Zhu *et al.*, 2005). It requires a paradigm shift from the conventional association of success around financial parameters, and a holistic environment concern (Varma *et al.*, 2006). Further,

Green supply chain management (GSCM) integrates environmental issues into SCM processes by identifying costs, benefits and risks, along with opportunities (Zhu et al., 2008) to manage and reduce waste with the ultimate aim of waste elimination (Handfield et al., 2005). It also has the potential to reduce the direct and indirect environmental impacts of an organization's final product (Darnall et al., 2008). Sustainable supply chain management (SSCM) incorporates both social and environmental sustainability into supply chain practice and management which is the newest field in context of SCM. There was no single definition of social sustainability used in the reviewed literature it was recognized that profit is only one element in the long-term success of companies, and the future of people (internal and external) and the planet are new legitimacy concerns (Kleindorfer et al., 2005). Sustainability should be an ethical code for human survival and progress (Sharma and Ruud, 2003). Social sustainability can be formed into the four main categories of internal human resources, which includes practices related to employment stability and health and safety; external population which encompasses human, productive and community capital; stakeholder participation which includes information provision and stakeholder influence issues; and macro social performance issues of socio-economic and socio-environmental performance (Labuschagne et al. in (Sarkis et al., 2010)). Environmental sustainability can be defined as integrating environmental management system in supply chain by identifying costs, benefits and risks, along with opportunities (Zhu et al., 2008) to manage and reduce waste with the ultimate aim of waste elimination (Handfield et al., 2005).

2. Supply chain integration and operational performance

Literature reveals that before 1980s there was a concept of vertical integration as being 100 percent owned operations by a firm that are physically interconnected to supply 100 percent of a firm's need. After 1980s various researchers and the practitioners argues that this practice outmoded and stated that it does not necessarily correspond to ownership of the whole chain. One of the early contributions acknowledging the phenomenon is Harrigan's (1984) study. He introduces the concept of "tapered integration". According to her study, an organization does not own 100 percent of the adjacent business units in the supply chain, but relies on other organizations to provide some portion of its input and output. After that several studies point out various levels of supply chain integration in practice (Frohlich and Westbrook, 2001; Rosenzweig et al., 2003). Most empirical studies have focused on either upstream integration (Peterson, Handfield and Ragatz, 2005) or downstream integration (Rosenzweig, 2009); however, an empirical study by Frohlich and Westbrook (2001) has shown that companies with the widest degree of integration with both suppliers and customers have the strongest association with performance improvement.

We found a number of rationales from researchers and practitioners on the contribution of SCI in operational performance of an organization. For example (Stanley et al. 2008) state that SCI can cause inventory reduction, improved delivery service, and shorter product development cycles. Further (kim 2006) argued that Supply chain management (SCM) seeks to improve competitive performance by closely assimilating the internal functions within a company and effectively linking them with the external operations of suppliers, customers, and other channel members. Narasimhan and Carter (1998) suggest that efficient SCM and purchasing practices have a significant effect on firm performance. Their study disclosed that

sales, market share, and market position are influenced by not only advertising, competition level, product pricing and positioning, and degree of innovation in product lines. This means that the purpose and performance of a firm to improve the efficiency of a firm itself can be different depending on the application focus of supply chain practice. Lambert and Stocks (1993) also stresses that supply chain integration is needed for satisfying customer demands. On the basis of above discussion, we have hypothesized that:

Hypothesis.1 *Supply chain integration is positively associated with operational performance.*

3. Organizational culture in context of supply chain integration

Organizational culture has been studied extensively in the literature of social sciences especially in the area of operation management in context of implementing new technology (Zammuto and O'Connor, 1992; McDermott and Stock, 1999). Barney (1986) describes organizational culture as “a complex set of values, beliefs, assumptions, and symbols that define the way in which a firm conducts its business” (p. 657). Schein (1996) defined organizational culture as: the basic tacit assumptions about how the world is and organization to be that a group of people share and that determines their perceptions, thoughts, feelings, and their overt behaviors. Contextual factors of an organization that might be influence supply chain integration comprise organizational culture.

By nature, the organizational culture is context-specific and its study therefore requires careful attention to the contextual details. For this reason, we choose the CVF (Key values framework) by Cameron and Quinn (1999) for its theoretical validity and wide acceptance. According to Al-Khalifa and Aspinwall (2001, p. 420), CVF is “a useful model for organizations to adopt in taking a system perspective of their businesses and to plan and manage major change”. CVF by Cameron and Quinn (1999) defines four key types or dimensions of organizational culture: hierarchical, rational, group, and developmental. These four dimensions of organizational culture shows the differences in terms of focus, leadership styles and criteria for effectiveness, management of employees, organizational glue and criteria of success (Cameron and Quinn, 1999). Furthermore, these dimensions reflect the level of integration among members of a supply chain.

The above discussion provides the rationales for developing the following hypothesis.

Hypothesis.2 *Organizational culture moderates the relationship between supply chain integration and operational performance.*

Hypothesis.2.1 *Group Culture moderates the relationship between supply chain integration and operational performance.*

Hypothesis.2.2 *Hierarchical culture moderates the relationship between supply chain integration and operational performance.*

Hypothesis.2.3 *Developmental culture moderates the relationship between supply chain integration and operational performance.*

Hypothesis.2.4 *Rational Culture moderates the relationship between supply chain integration and operational performance.*

Methodology

Theoretical framework

On the basis of a brief literature review we have developed the following conceptual model to pursue our study. The model illustrates the various relationships between studied variables which were developed after careful study of literature.

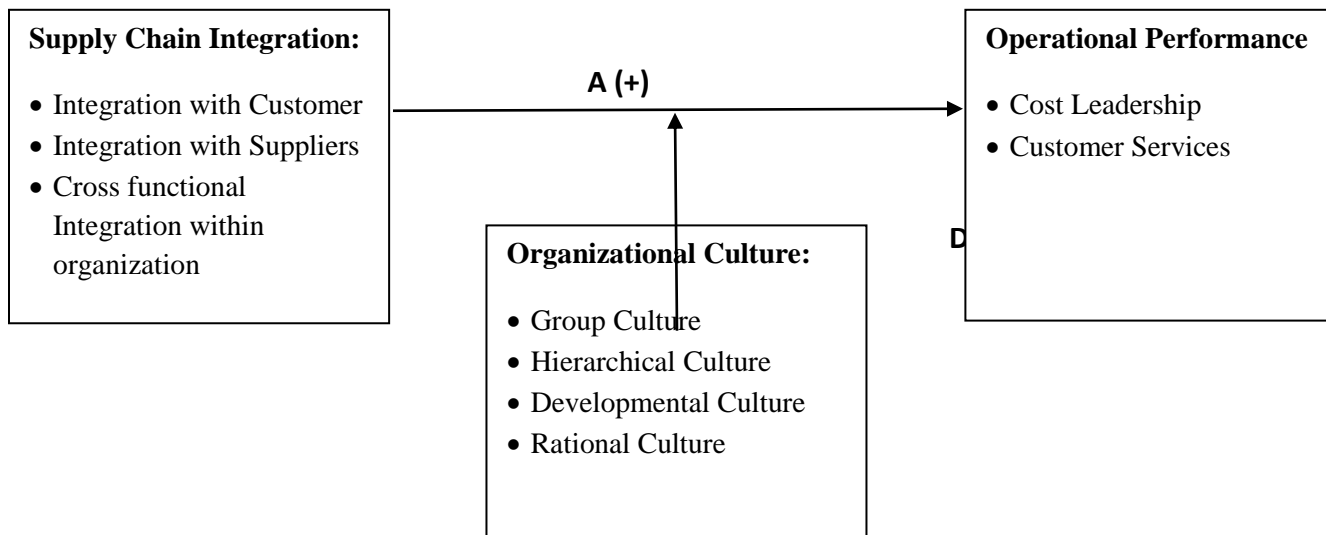


Figure 1. Theoretical Frame work

The figure determines a brief introduction of the variables of the present study. Independent variable consist of Supply Chain Integration, which cover integration with customer, integration with supplier and cross-functional integration with in organization. Dependent variable is Operational Performance which include Cost leadership and Customer services. Moderating variable is Organizational culture which comprise Group culture, Hierarchical culture, Developmental culture and Rational culture. Furthermore, the model states that there is a positive relationship between supply chain integration and operational performance of a firm. The model also postulates that organizational culture act as a moderator between the association of supply chain integration and operational performance. The model depicts the direct effect of supply chain integration on operational performance as well as indirect effect of supply chain management on operational performance with the moderation of organizational culture.

Procedure and Sample

Sample frame was developed on the basis of purpose of the study and was selected from textile industry, as it is the largest manufacturing industry of Pakistan and also the largest export sector of our country. For sampling frame five major units were selected consist of Interloop

Limited, Masood Textile Mills, Sitara Textile, Ibrahim Fibers and Crescent Textile (Pvt) Ltd Faisalabad. All these firms have their supply chain department through which, these firms have established their strategic relations with their suppliers and customers. Sample was selected through stratified random sampling and middle level managers were selected as sample from each unit. Thirty-five questionnaires were filled from the respondent of each unit. Data were collected (on five point likert scale) through personally administered questionnaires survey from overall 175 respondents of the focal firms after obtaining the informed consent from them and prior permission from board of directors or CEOs. From 175, 150 respondents participate in the present research with the response rate of 85%.

Measures

The scale used in the present study consisted of two main sections. The first section included participants' demographic (gender, age, marital status, level of education, job position and department in organization etc.). The second section include the main constructs of study's variables (Supply chain integration, Operational performance and Organizational culture). Supply chain integration was measured with the twenty-one items construct, developed by kim 2006. Construct items were further divided in three sub construct; Company's integration with suppliers, Company's integration with customers and Cross functional integration within a company. Operational performance was measured with a twelve items construct developed by Kims (2006), which was subdivided into two categories; cost leadership and customer service. Organizational culture was measured by four dimensional construct; group culture, hierarchical culture, developmental culture and rational culture. This construct consists of sixteen items and was developed by (Quinn and Spreitzer, 1991).

Table 1. *Reliability of the Scale*

Sr. #	Variable Name	No of Items	Reliability
1	Integration with Suppliers	6	.747
2	Integration with Customers	6	.779
3	Cross-Functional Integration	7	.826
4	Group Culture	4	.749
5	Hierarchical Culture	4	.792
6	Developmental Culture	4	.741
7	Rational Culture	4	.760
8	Cost Leadership	6	.781
9	Customer Services	6	.748

Table.1 State that cronbach alpha values of all of the construct are above from the general acceptable threshold of (.700). Company’s integration with supplier was measure by 6 item scale of which alpha value is .747. Company’s integration with customer was measure by 6 item scale of which cronbach alpha is .779. Cross functional integration was measure by 7 item scale which hold the alpha value of .826. Group culture was measure with 4 item construct of which alpha value is .749. Hierarchical culture was measure with 4 item construct of which alpha value is .792. Developmental culture was measure with 4 item construct of which alpha value is .741. Rational culture was measure with 4 item construct of which alpha value is .760. Cost leadership was measure with 6 item construct of which alpha value is .781 and Customer service was measure with 6 item construct of which alpha value is .748. So on the basis of these results, we can say that our scales are reliable to measure the variables of the research and to proceed to conduct further analyses for testing the hypotheses of the study.

Results and Discussion

Table 2. Correlation Analyses
Correlation between all of the research variables

	Integration with Supplies	Integration with Customer	Cross-functional Integration	Cost Leadership	Customer Services
Integration with Supplies	1				
Integration with Customer	.580**	1			
Cross-functional Integration	.468**	.575**	1		
Cost Leadership	.332**	.434**	.408**	1	
Customer Services	.427**	.466**	.420**	.490**	1

Note: ** Coefficient are significant at $p > 0.01$

Table.2 states the correlations between all of the dependent, moderator and independent variables of the study. Correlation between CIS and OPCL is 0.322 and it is significant at the 0.01 level. The correlation between CIC and OPCL is 0.434 and it is significant at the 0.01 level. The correlation between CFI and OPCL is 0.408 and it is significant at the 0.01 level. Correlation

between CIS and OPCS is 0.427 and it is significant at the 0.01 level. The correlation between CIC and OPCL is 0.466 and it is significant at the 0.01 level. The correlation between CFI and OPCL is 0.420 and it is significant at the 0.01 level. So, all of the correlations state that there is positive correlation independent and dependent variables that support our first hypothesis of the research which states that there is a positive association between supply chain integration and operational performance of an organization.

Table.3 Regression analysis (Model-1)

Impact of SCI on Cost Leadership

Model 1	Unstandardized Coefficients		Standardized Coefficients		95.0% Confidence Interval		
	Beta	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound
(Constant)	6.239	1.072		5.822	.000	4.120	8.357
CIS	.071	.101	.066	.708	.048	-.127	.270
CIC	.259	.095	.274	2.721	.007	.071	.448
CFI	.174	.074	.216	2.359	.020	.028	.319

Note: OPCL is dependent variable in the model

In the above table. 3, results of regression analysis state the direct effect of independent variables; CIS, CIC and CFI on 1st dependent variable OPCL. The result shows that there is a positive effect of all of the independent variables on dependent OPCL, as the beta coefficient of CIS, CIC and CFI are .066 significant at<.05, .274 significant at<.05 and .216 significant at<.05 respectively. So the results of regression analyses verify the first hypothesis of underlying study.

Table.4 Regression analysis (Model-2)
Impact of SCI on Customer Services

Model 2	Unstandardized Coefficients		Standardized Coefficients		95.0% Confidence Interval		
	Beta	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound
(Constant)	5.463	1.029		5.307	.000	3.428	7.498
CIS	.186	.097	.173	1.926	.036	-.005	.377
CIC	.256	.092	.272	2.794	.006	.075	.437
CFI	.144	.071	.181	2.038	.043	.004	.284

Note: OPCS is dependent variable in the model

Table. 4 State the direct effect of independent variables; CIS, CIC and CFI on independent variable OPCS. The result shows that there is a positive effect of all of the independent variables on 2nd dependent OPCL, as the beta coefficient of CIS, CIC and CFI are .173 significant at<.05, .272 significant at<.05 and .181 significant at<.05 respectively. So the results of regression analyses verify the first hypothesis of underlying study.

Table. 5 Moderation Analysis

Moderating impact of Group Culture between the relationship of Integration with Customer and Customer Service

Models	Unstandardized Coefficients		Standardized Coefficients		T	Sig.
	Beta	Std. Error	Beta			
1 (Constant)	12.644	.225			56.131	.000
Zscore(CIC)	1.444	.226	.466		6.390	.000
2 (Constant)	12.648	.223			56.835	.000
Zscore(CIC)	1.280	.236	.413		5.428	.000
Zscore(GC)	.508	.236	.164		2.153	.033
3 (Constant)	12.478	.236			52.957	.000
Zscore(CIC)	1.160	.241	.375		4.818	.000
Zscore(GC)	.622	.240	.201		2.590	.011
CICGC	.535	.263	.151		2.031	.044

Note: OPCS is dependent variable in the model

To test the significance of H-2, 2.1, 2.2, 2.3 and 2.4, which state that organizational culture act as a moderator between the relationship of supply chain integration and operational performance, regression analysis was run. The interaction effect of organizational culture was measure by multiplying Z scores of CIC and GC. The 3rd model state that the beta coefficient of

interaction term is (.151) which is significant ($p < 0.05$). The results show that there is a marginally significant moderating effect of GC on the relationship of CIC and OPCS. The outputs also state that there is no significant moderating effect of HC, DC and RC between dependent and independent variables of the research. Only the hypotheses 2 and 2.1 are supported by the output of the moderation analyses as the interaction term of CIC and GC reveals a significant value of beta coefficient.

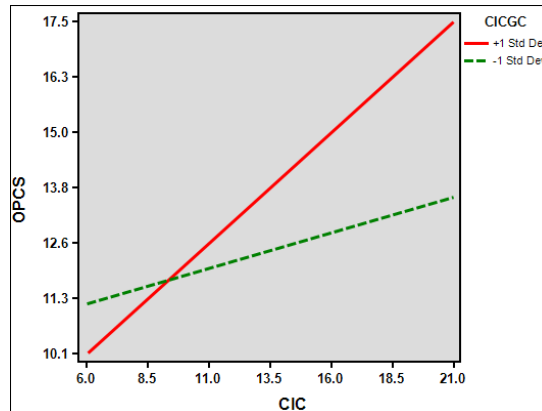


Figure.2 Interaction Graph of moderator

The figure depicts the moderating role of GC for the relationship between CIC and OPCS. As evident from the figure, high level of GC acts as a moderator for the relationship of CIC and OPCS by strengthening their positive relationship whereas, the situation where the level of GC is low, the positive relationship between CIC and OPCS becomes weak.

Discussion

Literature provides clear insights into the significance of supply chain integration and its positive relationship with operational performance of an organization. Even though useful, it provides less than comprehensive perspective of supply chain integration. The present study has developed a theoretical framework which reveals the moderating impact of internal organizational characteristic i.e., organizational culture between the relationship of supply chain integration and operational performance. The study proclaimed that, in a different population such as textile industry of Pakistan, supply chain integration still have a positive influence on firm performance as β values of integration with supplier, integration with customers and cross-functional integration are .071, .259 and .174 respectively with respect to cost leadership. SCI also has a positive impact on customer service as the β values of integration with suppliers, integration with customers and cross-functional integration are .186, .256 and .144 respectively with respect to customer service. Furthermore, as the main focus of the present study was to investigate the impact of different types of organizational culture (group culture, developmental culture, hierarchical culture and rational culture) on firm performance, the study provides a new insight in the literature by providing empirical rationales on this phenomenon. Findings of the analyses proclaimed that firms with a Group Culture (Internal-focus and a flexibility orientation) have a higher degree of supply chain integration and have better performance than those with other organizational culture traits, as the β value of interaction term of Group Culture is 0.535 which is significant at $p < 0.05$. Notwithstanding the

significance previous studies on supply chain integration, we believe that the findings of this research still contributes to the enhancement of supply chain management knowledge by using different population and context, and further examining organizational contextual characteristics.

Implications

A number of implications originate from the findings of underlying study for the firms striving to diffuse SCM strategies in Pakistan. The results indicate that managers should be cautious to note the critical role of organizational contexts i.e., culture, affecting the relationship between supply chain integration and operational performance. In particular, internally focused and flexibility oriented culture can strengthen the relationship between supply chain integration and operational performance. Further, the present study implies that a firm should be flexible and adaptable to be able to integrate with its supply chain partners. These characteristics are a reflection of flexibility orientation. Flexibility orientation emphasizes growth, resource acquisition, creativity, and adaptation to the external environment. Consequently, firms with a flexibility orientation will go through the integration process more easily and therefore achieve a higher level of integration as well as operational performance.

Limitations

Several limitations are embedded in this research. First, this research used cross-sectional data, and therefore firm performance is measure at the same time as we measure the predictors of the study. The effect of organizational culture on supply chain integration and the effect of supply chain integration on firm performance will obviously take time, and thus the ideal research design should incorporate an appropriate time lag. Future studies could consider this perspective when examining supply chain integration. Finally, in our attempt to examine the relationship between supply chain integration and firm performance, we use perceptual measures of operational and business performance. Although using two informants from one organization reduces common method bias, the measurement still uses informant's perception as the main approach to collect performance data. Future studies might want to combine the perceptual measures with objective data.

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