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Organizational Culture Context, Supply Chain Integration and Performance

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Abstract

The increasing emphasis on integration among members of a supply chain has led to new mechanisms to help firms coordinate the flow of products, services, and information through the supply chain. Many studies support the importance and influence of supply chain integration on firm performance, but only a few focus on the organizational contextual factors influencing the integration. This research proposes organizational culture as a potential determinant of supply chain integration effectiveness. Specifically, this study would investigate the impact of different types of organizational culture (i.e.: Group, Developmental, Hierarchical, and Rational culture; Quinn and Rohrbaugh, 1981) on supply chain integration. Based on two dimensions of organizational culture (flexibility-control orientation and internal-external focus) and four dimensions of supply chain integration (logistics synchronization, information sharing, incentive alignment and collective learning), it is hypothesized that a Developmental culture will be the most effective in implementing supply chain integration.

Keywords: supply chain integration, organizational culture, firm performance

1. Introduction

The concept of supply chain management has gained increasing interest since the 1980s when organizations saw the benefits of collaborative relationships within and beyond their own organization (Lummus and Vokurka, 1999). As organizations become more specialized, they search for suppliers that provide quality materials with low cost rather than owning their source of supply. It becomes critical for organizations to manage the entire network of supply to optimize overall performance (Lee, 2002). Therefore, as Hill (2000) proposes, organizations need to integrate their supply chains to secure maximum support for competitiveness in their market.

There is extensive supply chain literature focus on the interaction among firms within a supply chain and how supply chain integration positively impacts supply chain 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). However, there is relatively little published empirical evidence on factors that may influence the integration. The association between internal organizational factors and supply chain integration has been largely ignored. This study is an initial step toward investigating how an organizational context, i.e., organizational culture, could influence supply chain integration. This study will extend this examination to further check the robustness of the relationship between organizational culture and supply chain integration with respect to potential influence of firm size, age, and industry type.

Three research questions will guide this study: (1) To what extent do firms integrate with their supply chain partners? (2) Will supply chain integration be positively related to firm

performance? (3) Will an organizational contextual characteristic, i.e., organizational culture, influence the degree of supply chain integration?

This study attempts illustrate how supply chain integration substantially contributes to firm performance. Moreover, we also posit that organizational culture, as one of the critical characteristics of an organization, will significantly influence the degree of integration between a focal firm and its partners within its supply chain. Different types of organizational culture might impact the level of supply chain integration differently, and consequently, certain types of organizational culture could either promote or hinder the integration process. Examining this possibility through an empirical study will enhance our understanding of the nature of integration within a supply chain.

The paper consists of four sections. The first section reviews the literature concerning supply chain integration, organizational culture, and firm performance. Based on this review, the second section will cover the process of building a research model and developing hypotheses. Research methodology will be discussed in the third section, followed by a summary of this research proposal, a brief discussion about some limitations of the study and directions for further research.

2. Literature Review

In this section we review previous literature related to supply chain integration and organizational culture. This review will serve as a foundation to build the conceptual framework and develop relevant hypotheses.

2.1. Supply Chain Integration

The integration among organizations within a supply chain occurs in various degrees and does not necessarily correspond to ownership of the whole chain. One of the early contributions acknowledging the phenomenon is Harrigan's (1984) study, in which she argues, "the old concept of vertical integration as being 100 percent owned operations that are physically interconnected to supply 100 percent of a firm's need is outmoded" (p. 640). These days, many organizations decide on a lower level of integration, or as referred by Harrigan (1984) as "tapered integration". With this strategy, 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. Supply chain integration reflects this tapered integration, where an organization need not own the adjoining business units in the supply chain but still gains many of the same benefits of integration through collaboration.

Swink et al. (2007) argue that the integration process includes activities that require, share, as well as consolidate, strategic knowledge and information with parties outside the immediate organization. Rosenzweig, Roth, and Dean Jr. (2003) further define supply chain integration as the linkages among various supply chain elements. Supply chain integration includes the internal linkages among "the departments, functions, or business units within the firm that 'source', 'make', and 'deliver' products" and the external linkages "with entities outside the enterprise, including the network of direct suppliers and their suppliers and direct customers and their customers" (p. 440).

A number of participants play a role in the supply chain. Jespersen and Skjøtt-Larsen (2005) argue that power or dominance is an important factor in determining the extent to which a supply chain is suitable for integration and the level of supply chain integration. In a supply chain where

one organization is highly dependent on the other participants but not vice versa, the less dependent organization will have a power advantage and can force strong and effective relationships in the supply chain. Supply chain integration is established when the self-seeking dominant partner is convinced of the need for integration and takes the initiatives to mobilize all partners (Jespersen and Skjøtt-Larsen, 2005).

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.

Furthermore, abundant literature has investigated the positive association of supply chain integration with performance (e.g., Vickery et al. 2003; Cousins and Menguc, 2006; Flynn et al., 2010). However, in their study of 36 papers on supply chain integration, Fabbe-Costes and Jahre (2008) report that the result of supply chain integration has been mixed. They conclude that more integration does not always improve performance; therefore, they call for clearer definition, as well as better measures, of supply chain integration.

In order to gain a better perspective of supply chain integration, Fawcett and Magnan (2002) identify four types of integration: (1) internal, cross-functional process integration; (2) backward integration with key first-tier suppliers, or a natural extension of this integration would involve second-tier suppliers; (3) forward integration with key first-tier customers, or with the customers' customers; and (4) complete forward and backward integration, or expressed as integration from "suppliers' supplier to the customers' customer".

Three dimensions constitute supply chain integration and determine the level of supply chain integration (Lee, 2000). These dimensions are information sharing, coordination and resource sharing, and organizational relationship linkage. Based on Lee's study, Simatupang et al. (2002) extend this framework by offering different modes of coordination required to integrate the supply chain processes of different partners. The coordination modes are logistics synchronization, information sharing, incentive alignment, and collective learning. Higher level of collaboration with respect to these four coordination modes indicates a higher degree of supply chain integration.

2.2. Organizational Culture

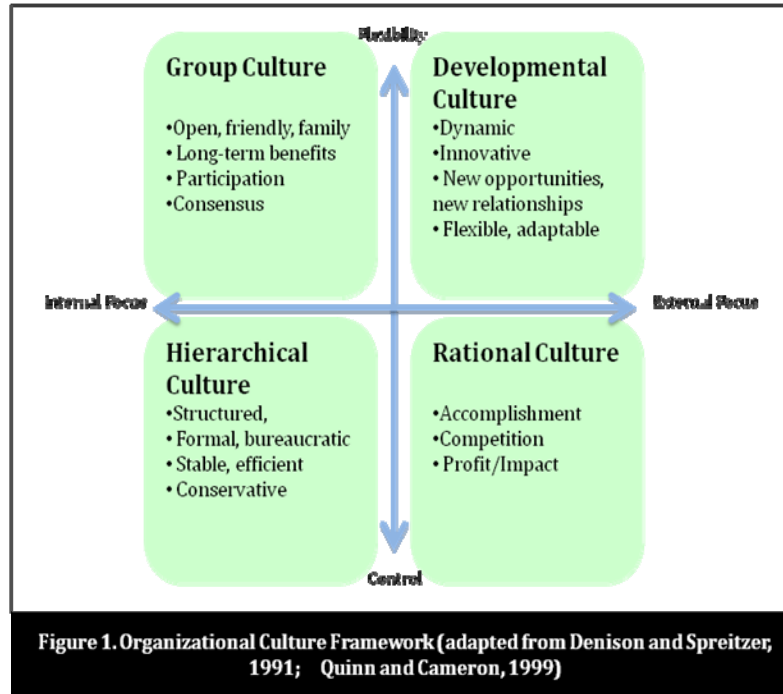
One organizational characteristic that might be related to supply chain integration is organizational culture. Organizational culture has been studied extensively, especially in the social sciences, for over 60 years. In the operations management field, culture has been investigated to have an impact on the implementation of technology (Zammuto and O'Connor, 1992; McDermott and Stock, 1999); however, the influence of organizational culture on any area of operations management has been very limited (McDermott and Stock, 1999). In this study, we will explicitly examine the relationship between organizational culture and supply chain integration.

Barney (1986) defines 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). In his study of sustainable competitive advantage, he argues that organizational culture has all-encompassing effects on a firm because it not only defines who this firm's relevant employees, customers, suppliers, and competitors are, but it also defines how this firm interacts with its

stakeholders. Furthermore, organizational culture might influence the efficiency and effectiveness of organizational goals (Denison and Mishra, 1995).

Denison and Spreitzer (1991) propose a competing values framework to examine organizational culture. 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.

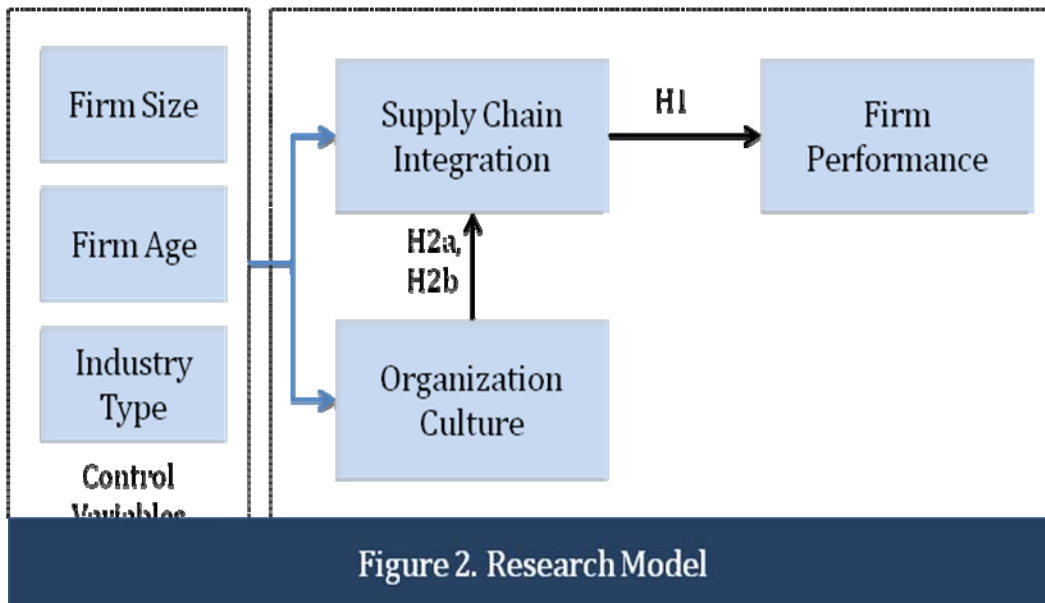
Figure 1 identifies two dimensions on which the competing values framework of culture is based. The first dimension is the flexibility-control axis, which reflects the competing demand of change and stability. The second dimension is the internal-external focus axis, which reflects the competing demands of internal and external organization focus. Four types of organizational culture can further be identified from the juxtaposition of these two dimensions, i.e., a group culture, a developmental culture, a rational culture, and a hierarchical culture. The characteristics of each type are displayed in Figure 1.



McDermott and Stock (1999) suggest that an assumption underlies this organizational culture framework. Each quadrant as shown in Figure 1 is an ideal type. An organization is likely to have a combination of different cultures; yet, one type of culture would be more dominant than others.

3. Research Model and Hypotheses

In this section, we develop the theoretical rationale for our research model as shown in Figure 2. We first present a hypothesis related to supply chain integration and performance, followed by a hypothesis related to organizational culture and supply chain integration.



3.1. Linking Supply Chain Integration and Firm Performance

Previous studies put emphasis on investigating the impact of supply chain integration of supply chain performance (Frohlich and Westbrook, 2001; Vickery et al. 2003; Rosenzweig et al., 2003; Cousins and Menguc, 2006; Mitra and Singhal, 2007). In their studies, Frohlich and Westbrook (2001) describe the strategic importance of supply chain integration and argue that this integration can be defined in terms of the direction (toward suppliers and/or customers) and the degree of supply chain activities. Extending Frohlich and Westbrook's study, Rosenzweig et al. (2003) suggest that supply chain integration is required to enable firms to deal with increasing complexity and uncertainty in the environment. They argue that highly integrated firms will gain competitive advantage over their competitors due to the increased information visibility and operational knowledge shared among members of their supply chain, as well as the reduction of the overall supply chain costs (Rosenzweig et al., 2003).

However, as has been reviewed in the previous section, several studies provide more ambivalent results of the effect of supply chain integration on performance (see Fabbe-Costes and Jahre (2008) for more detail). The mixed findings could be a result of different definitions and measures of performance. Therefore, further investigation of supply chain integration is needed.

We argue that as firms integrate with their supply chain partners, they will share more information that would enable them to reduce the bullwhip effect, work together with key suppliers and customers to reduce costs or solve inventory problems, and collaborate to improve product design and service levels. Therefore, we hypothesize that:

Hypothesis 1: Supply chain integration is positively related to firm performance.

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

3.2. Linking Organizational Culture and Supply Chain Integration

As discussed previously, four dimensions reflect the level of integration among members of a supply chain. These dimensions, or coordination modes as termed by Simatupang et al. (2002), are logistics synchronization, information sharing, incentive alignment, and collective learning.

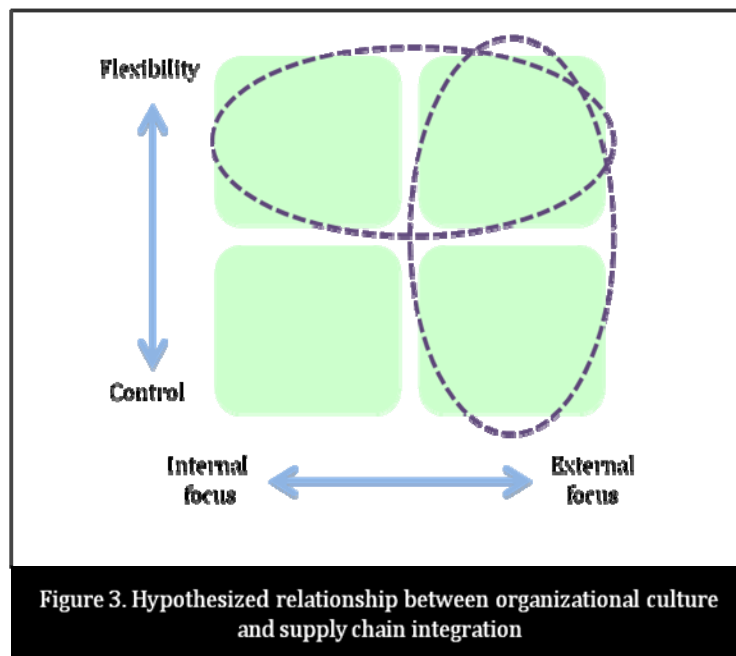
Logistics synchronization means jointly coordinating inventory management, facility and transportation with participants of the supply chain (Simatupang et al., 2002). This typical coordination aims to match the variety of products reaching the marketplace with customers' needs and wants (Fisher, 1997). *Information sharing* is usually the basis for organizations in developing partnerships. Firms share demand and inventory data with their supply chain partners

in an attempt to efficiently and effectively manage their inventory along the chains. *Incentives alignment* is developing and adjusting specific incentive schemes across supply chain members that link to the global performance of a supply chain (Simatupang and Sridharan, 2002). This alignment is necessary to reduce conflicts of interest, which is likely to occur if the existing incentives lead to actions that maximize personal gain but often reduce the total profitability (Simatupang et al., 2002). The activities of *collective learning* deal with acquiring knowledge and disseminating it across organizations in a supply chain. In a number of industries, it is common to find that partnerships are built to enable a transfer of knowledge and/or technology among the different organizations that comprise the supply chain network (Spekman, Spear and Kamauff, 2001).

These coordination modes indicate that the focus of an organization is more on outward orientation rather than just inward. The supply chain integration process will require extensive joint activities with suppliers and customers, and even to suppliers' suppliers or customers' customers (Fawcett and Magnan, 2002). Positioning this characteristic on the internal-external focus continuum, supply chain integration will be more dominant in the external-focus side rather than the internal-focus side. Internal focus means integrating and buffering to sustain the existing organization, while external focus reflects a focus on adaptation and interaction with the environment (Denison and Spreitzer, 1991). Consequently, firms with an external-focus culture will undergo the integration process more smoothly relative to those with an internal-focus culture.

Moreover, the integration of a firm with its supply chain members is also a representation of the firm's dynamic characteristics. 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 (Denison and Spreitzer, 1991). Stability orientation, on the other hand, emphasizes internal efficiency, uniformity, and conservatism (Denison and Spreitzer, 1991; Cameron and Quinn, 1999). Firms with this type of culture will have difficulty in adapting to change. Consequently, firms with a flexibility orientation will go through the integration process more easily and therefore achieve a higher level of integration than those with a stability orientation. Figure 3 shows the competing values model and the hypothesized relationships.



Based on this discussion, we will posit the following relationship,

Hypothesis 2: Organizational culture moderates the relationship between supply chain integration and firm performance, such that the level of performance of firms with an external focus and an internal orientation (Developmental Culture) will be higher than those with an internal focus and/or a control orientation (Group/Rational/Hierarchical Culture).

3.3. Control variables

As described by Shah and Ward (2005), firm size and age might have a significant impact on company performance. In their study, they found that large size was actually a disadvantage with respect to operational performance. Therefore, we will treat firm size and age as control variables. The total number of employees will measure firm size, while the actual age of the firm will measure firm age. Further classifications are detailed in Appendix A.

Shah and Ward (2005) also found that industry type provided a significant effect on performance. Therefore, industry effect based on SIC code will be treated as another control variable in this study.

4. Research Methodology

This study employs a survey methodology to collect data that will be used to test the hypotheses developed in the previous stage. The research design of this study is briefly described below.

4.1. Instrument development

The constructs in this study will be measured using previously validated scales from the literature. Rosenzweig et al. (2003) developed a sound measurement of supply chain integration that was grounded in previous literature (Cronbach's alpha 0.71). The measurement of firm performance will follow the study of Rosenzweig (2009), which defined firm performance in terms of operational performance and business performance (composite reliability values are 0.89 and 0.93, respectively).

Furthermore, the measurement of organizational culture is adopted from Quinn and Spreitzer (1991), where four items are used to measure each culture type. Each respondent will be asked to indicate the extent to which the cultural attributes characterize the respondent's organization. Cronbach's alpha for this measurement ranges from 0.77 to 0.84.

All items will be assessed using a 5-point Likert scale. The items representing the constructs, as well as their sources, are presented in Appendix A.

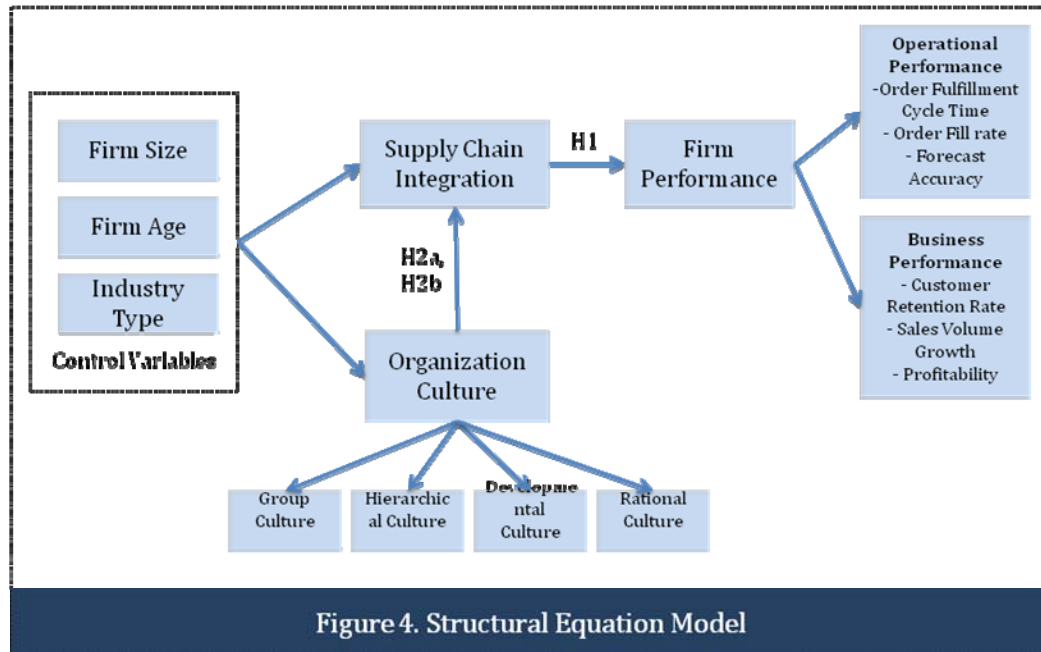
4.2. Sampling frame and data collection

This study examines the relationships between supply chain integration, organizational culture, and firm performance. To address the two research hypotheses, a survey of companies in Indonesia will be conducted and the sampling frame will be obtained from the Directory of Indonesian Manufacturers. Moreover, this study attempts to gather data from two informants at each firm (i.e., CEO and VP Supply Chain) to increase the validity of the results.

Prior to testing the hypotheses, the reliability of the responses obtained from multiple raters within a firm will be assessed. The measurements will also be tested for reliability, convergent validity, and divergent validity.

4.3. Hypothesis testing

For hypothesis testing, this study will use the structural equation modeling (SEM) technique. However, if the sample size is not large enough, PLS (partial equation modeling) will be used.



Conclusion

Existing literature provides clear insights on the importance of supply chain integration and its positive relationship with organization performance. Even though useful, they provide less than comprehensive perspective of supply chain integration. This study offers a theoretical framework of the impact of organizational culture on supply chain integration.

It is proposed that, in a different population such as Indonesian manufacturers, supply chain integration will still have a positive relationship with firm performance. Furthermore, firms with an external-focus and a flexibility orientation are hypothesized to have a higher degree of supply

chain integration than those with other organizational culture traits. This study will control for the effect of firm size, age, and industry type on the hypothesized relationships.

Empirical data will be collected through a survey methodology in which each measurement and hypothesis will be further tested. Analyses of instrument reliability and validity will employ confirmatory factor analysis (CFA) and a test of hypotheses will employ structural equation modeling (SEM) or partial least squares (PLS).

This research would be premature without careful consideration of several limitations embedded in this research design. First, this research is a cross-sectional study, and therefore firm performance will be measured at the same time as its predictors. 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.

A second limitation of this study is the use of an existing scale of supply chain integration. The instrument has been developed and empirically tested, and the results show sound reliability and validity (Rosenzweig et al., 2003). However, this five-item scale might not adequately reflect all the dimensions of supply chain integration, especially the degree of coordination modes underlying the integration process. Further progress will be required to develop a rigorous and all encompassing, yet parsimonious, measure of 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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Appendix A. Construct measurements

<p>Supply Chain Integration (Rosenzweig et al., 2003) using 5-point Likert scale (1=none, 5=high)</p> <p>How integrated is your business unit's supply chain?</p> <p>(a) Integrated closely within your own organization (e.g., cross-functional management). (b) Integrated closely with raw material suppliers (c) Integrated closely with distributors/retailers (b) Integrated closely with customers</p>
<p>Firm Performance (Rosenzweig, 2009) using 5-point Likert scale (1=worse, 5=substantial improvement)</p> <p><u>Operational performance</u> a. Order fulfillment cycle time b. Order fill rate/line item fill rate c. Forecast accuracy</p> <p><u>Business performance</u> a. Customer retention rate b. Sales volume growth c. Profitability</p>
<p>Organizational Culture (Quinn and Spreitzer, 1991) using 5-point Likert scale (1=disagree and 5=agree)</p> <p><u>Group culture</u> Employees are empowered to act Employees participate in open discussion Consideration is given to employee concerns and ideas Good teamwork and cohesion creates human relations environment</p> <p><u>Hierarchical culture</u> Control and centralization are normal here Management is routine, formal and structured Stability, continuity and order define activity here Our performance outcomes are predictable</p> <p><u>Developmental culture</u> There is an emphasis on acquiring new resources and ideas My superiors are positive and creative Innovation and change are encouraged The working environment is flexible and decentralized</p> <p><u>Rational culture</u> The company's product reflects excellence and quality Our organization is a very production oriented place Our organization is efficient, productive and economic We have clear direction, objective setting and goal clarity</p>
<p>Control Variables (Shah and Ward, 2005)</p> <p><u>Firm size</u> Small = less than 250 employees Medium = 250 – 999 employees Large = 1000+ employees</p>

Firm age

New = less than 10 years old

Adolescent = 10 – 20 years old

Old = more than 20 years old

Industry Type

SIC Code