

Cultivating Focal Firm's Supply Chain Process Integration Capabilities: The Investigation of Critical Determinants and Consequences

Chun-Der Chen, Yi-Wen Fan, and Cheng-Kiang Farn

Abstract—In today's competitive global business environment, the concept of supply chain management (SCM) continues to become increasingly market-oriented, shifting the primary driver of the value chain from supply to demand. Recent recommendations encourage researchers to focus investigations on the supply chain process integration (SCPI) capabilities that integrate a focal firm with its network of suppliers and business customers to create value for it. However, theoretical and empirical researches pertaining to the antecedents and consequences of a focal firm's SCPI capabilities have been limited and piecemeal. The purpose of this study is to investigate the critical determinants and consequences of a focal firm's SCPI capabilities. We test our proposed research framework using a sample of 139 sales managers of manufacturing industries in Taiwan, our research findings show that (1) both perceived business customer's power and focal firm's market-oriented culture positively influences a focal firm's SCPI capabilities, and (2) SCPI capabilities positively influence a focal firm's SCM performance, both operational and strategic benefits. Implications for practitioners and researchers and suggestions for future research are also addressed in this study.

Keywords—Supply chain process integration capabilities, Perceived business customer's power, Market-oriented culture, Supply chain management performance.

I. INTRODUCTION

SINCE the concept of supply chain management (SCM) was introduced in the 1980s, it has continued to become increasingly market-oriented, and transformed the primary driver of the value chain from supply to demand. The pursuit of supply chain efficiency have become essential prerequisites for staying competitive in the global race and for enhancing profitably [24,35,19]. In order to decrease costs and lead time as well as to increase quality and flexibility in the supply network, it is an imperative to improve coordination of the flow of goods and information across intra- and interorganizational boundaries. As such, recent recommendations encourage researchers to focus their investigations on the supply chain

process integration (SCPI) capabilities that integrate a focal firm with its network of suppliers and business customers in order to generate value [17,28].

Rai et al. [26] defined that SCPI capabilities is the degree to which a focal firm has integrated the flow of information, materials, and finances with its supply chain partners, especially, with its important business customers. Superior SCPI capabilities, both with focal firms and customers, are believed to lead to significant overall performance improvements, thereby making a company world class [26,34].

Despite the growing importance of SCPI capabilities in SCM, several gaps remain in extant knowledge regarding such issue. First, few studies have examined the determinants and consequences of such capabilities. Traditionally, research on buyer-supplier relationships focuses largely on resource dependence arguments concerning business customer's power is one of the influential factors that could affect inter-organizational business process integration [15], thereby passively generating focal firm's SCPI capabilities. However, more recently, scholars have argued for the need to expand traditional power reasoning [32,36] and to extend research beyond the boundaries of resource dependence by drawing on more active perspectives such as market orientation [22] or relational view [5]. Second, despite the benefits through SCPI capabilities have typically been examined from the viewpoint of business customers' power, however, there are small amounts of attentions given to the benefits accrued to focal firms (e.g., [32, 36]). Focal firms of a supply chain are at the forefront of the changes by virtue of being in the middle and operating on thin margins. They are squeezed from both business customers and suppliers to add more value in the value chain [6]. This is especially common for Taiwan's manufacturing focal firms. Relationships between them and business customers are largely asymmetric. However, more and more focal firms take active roles to make relationship-specific investments such as platforms in Internet in aggregating not only information and business process information but logistics and banking information as well. Through these websites, focal firms act as powerful information aggregators and coordinate with their suppliers and customers and, thereby fostering their potential SCPI capabilities and possible subsequent SCM performance [26,14]. Therefore, drawing on concepts from the interrelated literature

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streams, the objective of this study is to assess the relative importance of business customer's power and focal firm's market-oriented culture as explanations of focal firm's SCPI capabilities and subsequent SCM performance.

This paper proceeds as follows. Section II reviews the theoretical foundation from previous literature and then advance a research model and hypotheses. Section III details the methodology and research design, and Section IV presents the data analysis and hypotheses testing results. Section V discusses our research findings, and finally, Section VI concludes with limitations, implications, and potential topics for future research.

II. THEORETICAL BACKGROUND AND HYPOTHESES

Fig. 1 identifies the key constructs and main relationships examined in the study. As shown, perceived business customer's power (passive factor) and focal firm's market-oriented culture (active factor) are hypothesized to affect focal firm's SCPI capabilities. In additions, SCPI capabilities is hypothesized to affect it's SCM performance, both operational and strategic ones. The following section elaborates on these relationships and explains the theoretical underpinning of these hypotheses.

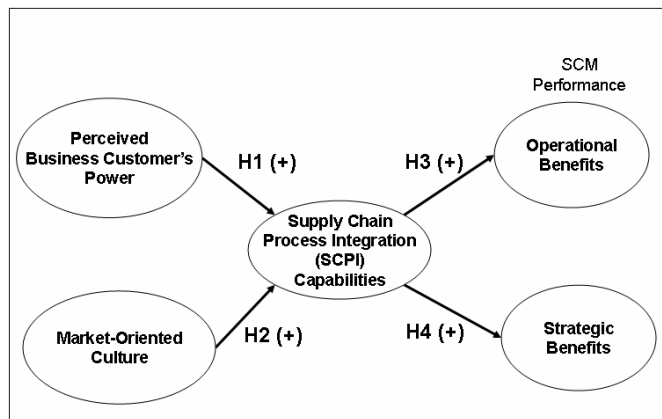


Fig. 1 The Proposed Conceptual Model and Research Hypotheses

A. Supply Chain Process Integration Capabilities

SCPI capabilities are conceptualized as a formative construct with three sub-constructs: information flow integration, physical flow integration, and financial flow integration [26]. Information flow integration is defined as the extent to which operational, tactical, and strategic information are shared between a focal firm and its supply chain partners. The sharing of demand-related information, inventory and sales positions, production and delivery schedules, and performance metrics are relevant indicators of information flow integration. Information sharing allows retailers, manufacturers, and suppliers to improve forecasts, synchronize production and delivery, coordinate inventory-related decisions, and develop a shared understanding of performance bottlenecks [29]. Physical flow integration is defined as the degree to which a focal firm uses global optimization with its supply chain partners to manage the stocking and the flow of materials and

finished goods. By increasing responsiveness to customer demand through strategies such as postponement of differentiation [8], physical flow integration can improve customer relationships and customer service [7]. Such integration is expected to improve long-term competitiveness and growth [12]. Financial flow integration is defined as the extent to which the exchange of financial resources between a focal firm and its supply chain partners are driven by workflow events. Important downstream flows to be managed include prices, invoices, and credit terms, while essential upstream flows to be coordinated include payments and account payables [26]. Financial flow integration can enable better working capital and cash flow management through event-based triggering of payables and receivables.

B. Perceived Business Customer's Power

Power and interdependence are generally considered to be important concepts for understanding buyer-supplier relationships. Power is defined as the ability of one individual or group to get another unit to do something [37]. French and Raven [11] were among the first to explore inter-firm power research in the development of the base of power. They found that there are five types of power base, reward, coercive, expert, referent, and legitimate powers. "Reward" and "coercive" remain the most transparent and widely recognized power bases, indicating the ability of the source to mediate dividends (e.g., increased business or shared benefits from cost reductions) or punishment (e.g., decreased business or dictated cost reductions) to the target. "Expert" power refers to the perception that one firm holds information or expertise that is valued by another firm. "Referent" power implies that on firm desires identification with another for recognition by association. And "legitimate" power infers that the target believes in the right of the source to wield influence.

Vertical interorganizational relationships in organizational networks are often characterized by considerable power asymmetries, and supplier firms are vulnerable to the exercises of power by more powerful firms (e.g., their business customer) [33]. For example, Maloni and Benton [20] found that supply chain integration in the automotive industry has tended to be driven more by issues of power and control rather than mutual, win-win intentions. Such an oligopolistic environment has allowed the manufacturers to extract safeguards for relationship-specific investments and authoritatively transfer responsibilities for cost reduction, product development, and inventory management back to the suppliers, forcing them to comply with strict performance guidelines or face replacement. As such, inter-firm power has the potential to upset the mutuality of supply chain relationships and subsequently presents a barrier to win-win integration. However, inter-firm power can also play a positive role in promoting the effective coordination of channel relationships for both the relatively powerful and the relatively dependent channel member [27].

Among supply chain management issues, the power of business customer is one of the most significant factors for inter-firm business process integration [37]. Power of business

customer plays a positive role in promoting the effective coordination of channel relationships [10,27]. For example, network leader of supply chain such as Chrysler, Dell, or Wal-Mart have made significant efforts to derive the benefits of coordination and collaboration with their focal firms by using supply chain management systems. In addition, the move to vendor-managed inventories shifts tasks related to monitoring and managing retail inventories to focal firms, creating benefits for network leaders while adding to the tasks performed by focal firms. Business customers can also use their bargaining power to appropriate supplier benefits from streamlining interfirm processes [32]. As such, we argue that business customer with greater power will ask for its focal firm to make more relationship-specific investments for them in business process and domain knowledge, thereby focal firms could thus passively generate their superior SCPI capabilities. Based on these arguments, the following is consequently hypothesized:

Hypothesis 1 (H1): *Perceived business customer power positively influences a firm's SCPI capabilities.*

C. Market-Oriented Culture

Narver and Slater [22] characterize market orientation as the company culture and philosophy that produce behaviors that create superior value for customers. This culture creates an environment that maximizes opportunities for learning about markets, for sharing information among functions in the organization that allows for common interpretation, and for taking coordinated actions [30]. It consists of three facets: customer orientation, competitor orientation, and interfunctional coordination.

Customer orientation includes the activities involved in acquiring information about the customers in the target market and disseminating it throughout the firm. To create superior values for customers, firms need to understand a customer's entire value chain, not only as it is today, but also as it evolves over time [30]. Therefore, knowing the customer, commitment to satisfying the customer and continuous monitoring are the characteristics of customer orientations. Competitor orientation involves acquiring information on existing and potential competitors, and understanding the short term strengths and weakness and long term capabilities of both the key current and potential competitors. Competitor orientation is also needed because competitor's strategies will affect the perceived value of a firm's products or services and firms need to respond to competitor activities and strategies. Interfunctional coordination reflects the extent to which different functions are well coordinated and information is disseminated across departments. Divisions and functions make well-coordinated decisions and execute them with a sense of commitment.

We argue that a focal firm with higher market-oriented culture is likely to generate its SCPI capabilities actively because a market-oriented firm will (1) share information and advantages with its channel partner without being asked to do so [31]; (2) convey favorable motives and intentions, which are necessary for increased levels of relationship-specific

investments; and (3) maintain open communications and responsiveness to customer needs, which should convey greater competence, credibility, and reliability to its trading partners (i.e., business customers). Although an association between market-oriented culture and SCPI capabilities has not been proposed in literature, by definition, a focal firm who is highly market-oriented will actively seek to put their customers' needs at the forefront of organizational concerns [4], thereby increasing the focal firm's intangible investments on its business customer, and getting its expected network resources and relational rents, namely SCPI capabilities. A non-market-oriented focal firm, conversely, may put its own goals and need ahead of its business customer's or resort to the use of punishment or coercion to force its customer compliance, which might lead channel conflict rather than collaboration. Therefore, we hypothesized that:

Hypothesis 2 (H2): *Market-oriented culture positively influences a firm's SCPI capabilities.*

D. Supply Chain Management Performance

A firm's aggregation performance is relative to its competition. In this study, we adopt operational benefits and strategic benefits for measuring a focal firm's SCM performance [21]. Operational benefits arise from lowered transaction and production costs through a focal firm's SCM system use. Examples include the faster invoicing and payment settlement, the more-efficient inventory management, and the automated and rationalized business processes. In contrast, strategic benefits arise from the positioning of firms themselves to take advantage of opportunities in the relationship. These include the development of new products and services, a richer understanding of the partner, the nuances of the exchange, and the ability to recognize and respond to changes in the relationship. This parallels the distinction between outcomes linked to cost reduction and those linked to end-product enhancement in interfirm relationships [21].

We argue that SCPI capabilities do not only generate a focal firm's internal rents but also the relational rents because each of the three dimensions of SCPI capabilities reflects its ability to perform cross-functional and interorganizational activities in supply chain management. SCPI capabilities impact a focal firm's SCM performance not only on the aspect of operational benefits such as eliminating order-entry errors, reducing inventory costs, submitting invoices electronically that could enable timely payments by customers, but also on the aspect of its strategic benefits such as learning about business customers' markets and their preferences, and developing new business opportunities with business customers in the future. Based on these arguments, the following is consequently hypothesized:

Hypothesis 3 (H3): *A focal firm's SCPI capabilities positively influence its operational benefits of supply chain management performance.*

Hypothesis 4 (H4): *A focal firm's SCPI capabilities positively influence its strategic benefits of supply chain management performance.*

III. METHODOLOGY AND RESEARCH DESIGN

A. Instrument Development

All constructs are measured by using multiple-item scales, and measurement items were adapted from the literature wherever possible, as indicated in Appendix. In addition, items associated with these constructs employ a seven-point Likert type scale where informants are asked to state their agreement with a given statement on a scale that ranged from “strongly disagree” to “strongly agree” with its midpoint anchored as “neither agree nor disagree.”

For measuring perceived business customer’s power, related scales are adapted from Wu et al. [37]. SCPI capabilities are based on Rai et al. [26]. The operational benefit items are adapted from Wang et al. [35]. Finally, as for the strategic benefit scales, we adopt them from Subramani [32].

B. Control Variables

To exclude the possible effects of extraneous factors, the research framework of this study incorporates two variables influencing a focal firm’s SCM performance: firm size and length of association between a focal firm and its business customers. Hypotheses related to these variables are not proposed because this study does not attempt to develop theory related to their effects. However, they are included in the research framework to assess the effects of the framework’s independent variables on dependent variables, beyond those attributable to these control variables.

C. Sample and Data Collection

A cross-sectional mail survey was administrated for collecting data from large and medium-sized manufacturing firms in Taiwan which are randomly selected. The sample firms for this study were drawn from “2006 Taiwan Top 1000” list issued by the Common Wealth Magazine, a leading business magazine in Taiwan. Ideally, informants need to have some knowledge of the degree of system and activity integration with their companies’ business customers, any enhancement of channel capabilities the firm has experienced, and the firm’s SCM performance. As such, target informants for the survey are selected as the sales manager of these firms since we believe that they should be the most knowledgeable and reliable informants within a company to answer our survey. In addition, informants are asked to select the company’s most important customer while responding to the questions on our research constructs.

A total of 1,000 questionnaires were sent out and 143 returned. Four questionnaires were found to be invalid. A total of 139 valid responses (13.90% response rate) were collected and analyzed. Samples of this study consist of manufacturers in a variety of areas. The majority of the respondents are from Electronics (27.22%), Semiconductor / Optoelectronics (15.65%), Metal (12.52%), Electromechanical (6.00%), and so on. Respondents that represented less than 4% of the sample come from the Plastics & Rubbers products, Cars & related parts, Non-Metal minerals, Communication Networks,

Pharmaceuticals & Biotechnology, Food/Drinks, and Paper industries, among others. Comparing to the “2006 Taiwan Top 1000” list, the sampling frame, we found that the distribution of our sampled firms is a good representation of the sampling frame. In addition, as indicated in Table I, the majority of the respondents are managers (61.15%), followed by executives (20.14%) and others (18.71%). The respondents averaged 10.29 years of working experience, and the average number of years in the respondents’ current position is 4.20. We believed that the respondents are sufficiently knowledgeable to answer the survey.

TABLE I
DEMOGRAPHIC PROFILE OF THE RESPONDENTS (N=139)

| Demographic Variables | Frequency | Percentage |
|---|-----------|------------|
| Respondent Position | | |
| Executive | 28 | 20.14% |
| Manager | 85 | 61.15% |
| Others | 26 | 18.71% |
| Respondent’s Service Year (Mean=10.29) | | |
| 0-10 | 81 | 58.27% |
| 10-20 | 37 | 26.62% |
| 20-30 | 19 | 13.67% |
| 30-40 | 2 | 1.44% |
| Years in Current Position (Mean = 4.20) | | |
| 0-5 | 89 | 64.03% |
| 5-10 | 38 | 27.34% |
| 10-15 | 10 | 7.19% |
| 15-20 | 2 | 1.44% |

IV. DATA ANALYSIS AND RESULTS

A. Scale Validation: Convergent Validity and Discriminant Validity

We conduct the data analysis in two parts - scale validation and hypothesis testing. Scale validation proceeds in two phases: convergent validity and discriminant validity analyses. Convergent validity of scale items was assessed by three criteria suggested by Fornell and Larcker [9]: (1) all item factor loading (λ) should be significant and exceed 0.5, (2) composite reliabilities (CR) for each construct should exceed 0.80, and (3) averaged variance extracted (AVE) for each construct should exceed 0.50; in other words, the square root of AVE should exceed 0.71. In addition, internal consistency reliability is generally considered a necessary but not sufficient condition for convergent validity. Hence Cronbach’s alpha was also computed for each construct, and it should be larger than 0.7 [23]. As indicated in Appendix, standardized CFA loadings for all scale items in the CFA model are significant at $p < 0.001$ and exceed the minimum loading criterion of 0.50. However, two items (MO1, MO11) were dropped from the study due their contribution to lower AVE for market-oriented culture (MO) construct. Meanwhile, as illustrated in Table II, we can see that AVE of each construct exceeds 0.5, and composite reliabilities

and Cronbach’s alpha of all factors also exceed the required minimum of 0.80 and 0.7. Hence all three conditions for convergent validity are met.

Meanwhile, discriminant validity means the degree to which measures of two constructs are empirically distinct [1]. Discriminant validity is shown when the square root of each construct’s AVE is larger than its correlations with other constructs [3]. From the data presented in Table III, we can see that the highest correlation between any pair of constructs in the CFA model is 0.70 between operational benefit (OP) and strategic benefit (STG). This figure is lower than the lowest square root of AVE among all constructs. Hence, the discriminant validity criterion is also met for our data sample.

TABLE II
MEAN, S.D., RELIABILITY AND AVE RESULTS

| Construct | Mean | S.D. | Cronbach’s Alpha | Composite Reliability | AVE |
|-----------|------|------|------------------|-----------------------|------|
| 1. POWER | 4.23 | 1.47 | 0.78 | 0.88 | 0.70 |
| 2. MO | 5.54 | 1.11 | 0.92 | 0.93 | 0.51 |
| 3. SCPI | 4.64 | 1.41 | 0.93 | 0.93 | 0.55 |
| 4. OP | 5.40 | 0.94 | 0.92 | 0.93 | 0.61 |
| 5. STG | 5.29 | 1.11 | 0.89 | 0.92 | 0.80 |

Notes:
a. S.D. as for standard deviation, AVE as for averaged variance extracted.
b. POWER as for perceived business customer’s power, SCPI as for SCPI capabilities, OP as for operational benefits, STG as for strategic benefits.

TABLE III
CORRELATION MATRIX AND SQUARE ROOT OF AVE RESULTS

| Construct | AVE | 1 | 2 | 3 | 4 | 5 |
|-----------|------|-------------|-------------|-------------|-------------|-------------|
| 1. POWER | 0.70 | 0.84 | | | | |
| 2. MO | 0.51 | 0.24 | 0.72 | | | |
| 3. SCPI | 0.55 | 0.38 | 0.42 | 0.74 | | |
| 4. OP | 0.61 | 0.44 | 0.55 | 0.69 | 0.78 | |
| 5. STG | 0.80 | 0.40 | 0.50 | 0.62 | 0.70 | 0.90 |

Notes:
a. The main diagonal shows the square root of the AVE (averaged variance extracted).
b. Significant at p <.01 level is shown in bold.
c. POWER as for perceived business customer’s power, SCPI as for SCPI capabilities, OP as for operational benefits, STG as for strategic benefits.

B. Hypothesis Testing

We examined the main effects specified in hypotheses H1 through H4 by using bootstrap analysis in PLS method. Bootstrap analysis is done with 500 subsamples and path coefficients are reestimated using each of these samples [13]. The main effects model (Fig. 2) examine the effect of perceived business customer’s power on SCPI capabilities (H1), the effect of market-oriented culture on SCPI capabilities (H2), the effect of SCPI capabilities on operational benefit (H3), and the effect of SCPI capabilities on strategic benefit (H4).

First of all, the two specified control variables, firm size and years of association, are not found to be significantly associated with SCM performance, both operational benefits and strategic benefits. Second, with regard to the specific hypotheses, we found:

- **Hypothesis 1 (H1) and 2 (H2):** As expected, both higher level of perceived business customer’s power (beta=0.263; p<0.001) and focal firm’s market oriented culture (beta=0.350; p<0.001) have strong

and significant effects on SCPI capabilities. Moreover, perceived business customer’s power and focal firm’s market-oriented culture jointly explain 26.3% of the variance in SCPI capabilities, with focal firm’s market-oriented culture contributing a larger proportion to that explanation.

- **Hypothesis 3 (H3) and 4 (H4):** As predicted, SCPI capabilities has significant and positive effect on both operational benefit (beta = 0.705; p<0.001) and strategic benefit (beta = 0.617; p<0.001). Furthermore, SCPI capabilities also explain a larger proportion of the variance in operational benefit (R² = 50.6%) and strategic benefit (R² = 39.4%).

We will discuss these findings in details in next section.

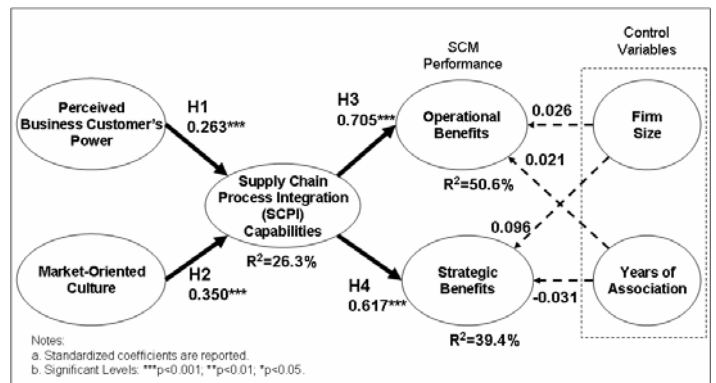


Fig. 2 Data Analysis Results

V. DISCUSSIONS

This study aims to shed light on the antecedents and consequences of a focal firm’s SCPI capabilities. As expected, the results suggest that both perceived business customer’s power and market-oriented culture significantly yields a focal firm’s SCPI capabilities. Moreover, the result shows that the effect of focal firm’s market-oriented culture on SCPI capabilities is greater than the effect of perceived business customer’s power on it. Such result is consistent with Wang et al.’s [36] reasoning that governance mechanisms such as power (authoritative) or trust (normative) could encourage investment in and provide conditions facilitating generation of creative approaches for dealing with business processes or activities in inter-organizational as buyer-supplier relationships. However, as markets become more competitive, a simple, direct and heavy-handed use of power is no longer suitable for managing inter-firm relationships and generating subsequent business value and capabilities [2]. The greater the alliance partners’ ability or willingness to employ self-enforcing safeguards (e.g., market-oriented culture), the greater the potential will be for relational rents [5]. Likewise, focal firm’s market-oriented culture, comparing to the passive factor – business customer power, could be the more effective and active way for cultivating its SCPI capabilities from a long term, inter-organizational perspective.

Meanwhile, our result confirms that a focal firm’s SCPI capabilities have a substantial effect on SCM performance,

both operational and strategic benefits. SCPI capabilities are deeply embedded into the structure of interfirm operational processes through intangible relation-specific investment. In addition to the requirement of significant time, such dedicated capabilities can be exploited in current interfirm operation or in the future to create value for supply chain partners [25]. Besides, the strong effect of SCPI capabilities on operational benefits ($\beta=0.705$) suggests that SCPI capabilities improve the operational performance relative to competition by squeezing out production cost, inventory cost, and distribution cost, and facilitates more product innovation or improvement. Furthermore, the strong effect on strategic benefits ($\beta=0.617$) also suggests that SCPI capabilities enable market penetration and provides the agility to ensure that sales opportunities associated with the launch of new products and time to market.

VI. IMPLICATIONS AND CONCLUSION

A. *Limitations and Suggestions for Future Researches*

We acknowledge that a number of research limitations exist in our research which should be overcome in the future. The first limitation is related to the choice of sample frame. The selection of firms in manufacturing industry for the sampling frame excludes other segments which possess equivalent supply chain collaboration relationship compared to the manufacturing industry. Thus, the study of SCPI capabilities should be extended to other industries, such as consumer goods or services, to help generalize the findings in the future study. Second, there are potential moderators which might moderate the relationship between perceived business customer's power, market-oriented culture and SCPI capabilities. Especially, it has been argued that moderating effects can be found for technology, market turbulence and competitiveness [16]. It would be interesting to test whether or not such effects can be found on the relationship level as well. In sum, these questions open up fertile grounds for future research opportunities.

B. *Implications and Conclusions*

This study offers several implications for theory. First, despite prior researches have identified the role of power on the study of buyer-supplier relationship and subsequent capabilities generations, no studies combine both power (passive factor) and market-oriented culture (active power) for investigating the influence on the formation of focal firm's SCPI capabilities through a more holistic view. This paper reinforces that both power and market-oriented culture are the important determinants of competitive advantage which lead to firm's relational capabilities [5]. In particular, focal firm's market-oriented culture has a stronger effect on the generation of its SCPI capabilities. Second, this paper also confirms that SCPI capabilities are critical complementary resource endowments that span firm boundaries so firms earn not only their internal rents but also relational rents, which are jointly generated with alliance partners [18]. Such capabilities enable focal firms to unbundle information flows from physical flows, and to share information with their supply chain partners to

create information-based approaches for superior demand planning, for the staging and movement of physical products, and for streamlining voluminous and complex financial work processes [26]. Consequently, these IT-enabled SCPI capabilities result in significant and sustained firm performance gains, especially in operational excellence and revenue growth.

For practitioners, an organization's ability to leverage resources and capabilities of supply chain partners has become increasingly important as business networks compete against each other. As such, today's competition is moving from "among organizations" to "between supply chains", and more and more organizations are increasingly adopting SCM practice in the hope of reducing supply chain costs and securing competitive advantage [19]. Despite some organizations have realized the importance of implementing SCM, they often do not know exactly what to implement because of the lack of understanding of what constitutes a comprehensive set of SCM practices. By validating a multi-dimensional and operational measurement of the construct of SCPI capabilities proposed by Rai et al. [26] and by demonstrating its efficacy in enhancing SCM performance in operational and strategic benefits, the present study provides managers of focal firms with a useful tool for evaluating the comprehensiveness of their current SCM practices.

Given the turbulence of many industries, understanding what facilitates the efficient delivery and cooperation way of products and services to satisfy customers' needs offers scholars continuously and increasingly important challenge. This study provides empirical evidence to support conceptual and prescriptive statements in the literature regarding the impact of SCPI capabilities. These higher-order boundary-spanning capabilities require the sharing of strategic, tactical, and operational information and global optimization of physical flows across supply chains. Development of SCPI capabilities position firms to realize improvements in their SCM performance, specifically operational and strategic benefits, thereby their sustained competitive advantages. We call managers and researchers to take up the challenge.

APPENDIX – MEASUREMENTS

* Please select your company’s most important customer (customer A) while responding to the questions on our research constructs.

| Constructs | Standardized Loadings |
|--|-----------------------|
| Perceived Business Customer’s Power [37] | |
| ● Customer A is powerful enough to ask your firm to readjust the price strategy | 0.82 |
| ● Customer A is powerful enough to ask your firm to readjust the product | 0.92 |
| ● Customer A can provide training support to your firm | 0.79 |
| Market-Oriented Culture [22] | |
| ● <i>Customer Orientation</i> | |
| ■ (MO1) our business objectives are driven primarily by customer satisfaction | dropped |
| ■ (MO2) we constantly monitor our level of commitment and orientation to serving customers’ needs | 0.60 |
| ■ (MO3) our strategy for competitive advantage is based on our understanding of customers’ needs | 0.67 |
| ■ (MO4) our business strategies are driven by our beliefs about how well we can create greater value for customers | 0.70 |
| ■ (MO5) we measure customer satisfaction systematically and frequently | 0.62 |
| ■ (MO6) we give close attention to after-sale service | 0.59 |
| ● <i>Competitor Orientation</i> | |
| ■ (MO7) our salespeople regularly share information within our business concerning competitors’ strategies | 0.66 |
| ■ (MO8) we rapidly respond to competitive actions that threaten us | 0.75 |
| ■ (MO9) top management regularly discusses competitors’ strengths and weaknesses | 0.73 |
| ■ (MO10) we target customers where we have an opportunity for competitive advantage | 0.68 |
| ● <i>Interfunctional Orientation</i> | |
| ■ (MO11) our top managers from every function regularly visit our current and prospective customers | Dropped |
| ■ (MO12) we freely communicate information about our successful and unsuccessful customer experiences across all business functions | 0.73 |
| ■ (MO13) all our business functions (e.g., marketing/sales, manufacturing, R&D, finance/accounting) are integrated in serving the needs of our markets | 0.83 |
| ■ (MO14) all of our managers understand how everyone in our business can contribute to creating customer value | 0.86 |
| ■ (MO15) all our business functions share resources with other business functions | 0.82 |
| SCPI Capabilities [26] | |
| ● <i>Financial Flow Integration</i> | |
| ■ Account receivables processes are automatically triggered when we ship to our customers | 0.56 |
| ■ Account payable processes are automatically triggered when we ship to our suppliers | 0.55 |
| ● <i>Physical Flow Integration</i> | |
| ■ Inventory holdings are minimized across the supply chain | 0.85 |
| | 0.70 |

| | |
|--|------|
| ■ Supply chain-wide inventory is jointly managed with suppliers and logistics partners | 0.63 |
| ■ Suppliers and logistics partners deliver products and materials just in time | 0.79 |
| ■ Distribution networks are configured to minimize total supply chain-wide inventory costs | |
| ● <i>Information Flow Integration</i> | 0.86 |
| ■ Production and delivery schedules are shared across the supply chain | 0.83 |
| ■ Performance metrics are shared across the supply chain | 0.84 |
| ■ Supply chain members collaborate in arriving at demand forecasts | 0.81 |
| ■ Our downstream partners (e.g., distributors, wholesalers, retailers) share their actual sales data with us | 0.75 |
| ■ Inventory data are visible at all steps across the supply chain | |
| Operational Benefits [35] | |
| Please indicate the extent to which you are receiving the following benefits as a result of your relationship with CUSTOMER A: | |
| ● production cost | 0.68 |
| ● inventory cost | 0.72 |
| ● distribution cost | 0.62 |
| ● put new product designs into production quickly | 0.82 |
| ● operate efficiently at different levels of output | 0.85 |
| ● develop or modify new product designs | 0.93 |
| ● produce a wide variety of product mix simultaneously | 0.74 |
| ● respond to market demand on time | 0.89 |
| Strategic Benefits [32] | |
| Please indicate the extent to which you are receiving the following benefits as a result of your relationship with CUSTOMER A: | |
| ● learning about customers and markets for our products | 0.89 |
| ● creation of new products, product enhancements | 0.85 |
| ● development of new business opportunities | 0.96 |

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