Why Do They Share Information with Supply Chain Partners? A Comparison of Supplier and Buyer Perspectives

Completed Research Paper

Introduction

For well over a decade, firms have increasingly sought to improve their profitability and competitive position in markets by looking beyond firm boundaries and towards their supply chains. As firms transition their relationships with supply chain partners from transactional to collaborative, the strength and effectiveness of the partnerships is in part reliant on the extent to which they share information (Kim et al. 2006). Information sharing allows supply chain partners to improve forecasts, synchronize production and delivery, coordinate inventory-related decisions, and develop a shared understanding of performance bottlenecks (Rai et al. 2006; Simchi-Levi et al. 2007). Additionally, information sharing provides firms in the supply chain network visibility, and reinforces the collaborative nature of the relationship and the ability to respond in a timely fashion to supply and demand signals (Patnayakuni et al. 2006; Zhou et al. 2007).

Given the critical role played by information sharing in supply chains, the topic is of interest to researchers in operations management, marketing and information systems among other disciplines (see Patnayakuni et al. 2006 for a review of the literature). However, much of this research focuses on examining the consequences of information sharing on various outcomes ranging from improved visibility to gains in supply chain performance (Hsu et al. 2008; Klein et al. 2009). Klein and Rai (2009) point out there has been limited attention on the factors that shape information sharing between supply chain partners. The few studies that have examined such factors have looked at trust beliefs (Klein et al. 2009), IT infrastructure integration (Rai et al. 2006), and relational preconditions in the form of relationship specific assets, interaction routines and long-term orientation towards supply chain partners (Patnayakuni et al. 2006).

Most of these studies adopt the relational view of the firm and/or the traditional economic view of firm behavior, usually drawing on transaction cost economics to examine the effects of relation-specific factors on information sharing. To complement the more traditional economic and relational account of firm behavior, we draw upon institutional theory and strategic management literature to account for the strategic position of the focal firm and its embeddedness in institutional networks (Palmer et al. 1993). Specifically, we argue that the information sharing behavior of the focal firm is shaped by internal strategic factors in the form of top management's participation in articulating a strategy for the supply chain and its relational orientation, relation-specific power factors that examine the pressures placed upon supply chain partners and external institutional factors arising from currently prevalent industry and professional practices. Furthermore, existing research implicitly assumes that suppliers and buyers share the same views and motivations for information sharing. Some recent studies on supplier-buyer relationships have pointed out that suppliers and buyers may have different motivations for collaboration and benefit differently from the relationship (e.g., Nyaga, 2010). Comparing and contrasting the factors that influence information sharing from supplier and buyer perspectives would provide us with useful insights on upstream and downstream supply chain relationships. In this study we attempt to fill these gaps. Specifically, we address the following two research questions:

RQ1: How do internal strategic, relation-specific power and external institutional factors affect information sharing in supply chains?

RQ2: How do suppliers and buyers differ in their perspectives on the factors influencing information sharing?

Our study makes the following contributions: (i) we highlight the importance of top management participation and relational orientation on shaping the information sharing behavior in supply chain management; (ii) we delineate the effects of partners' coercive power *on* the firm and power *by* the firm on its partners to influence information sharing in supply chains; (iii) we extend the current studies on

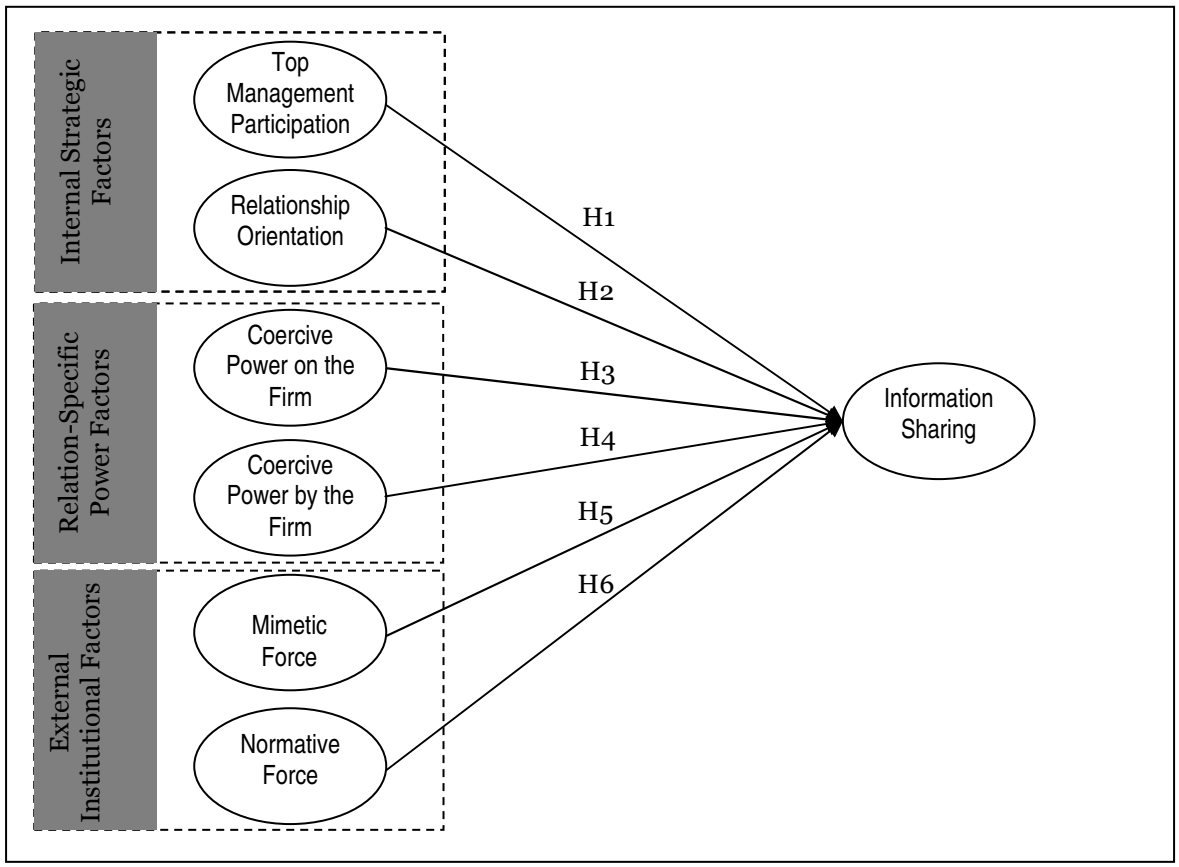
supply chain management that focus on the strategic choices of the focal firm to include the institutional influences from peers and other firms in the industry; and (iv) we compare and contrast the impacts of these strategic, power, and institutional factors on information sharing by suppliers and buyers to examine similarities and differences.

The paper proceeds with the theoretical foundations for our research model and each of our hypotheses. We follow this with a description of the research methodology and the empirical results. We then discuss the theoretical and practical implications that can be drawn from the results.

Theoretical Development

Increasingly, firms have adopted a collaborative approach with their supply chain partners, engaging in collaborative practices for planning, forecasting, replenishment, inventory management and scheduling; all of which are predicated on sharing information (Yigitbasioglu 2010). Initiatives to foster collaboration have gained momentum with the availability of advanced interorganizational information systems that provide digital platforms for information sharing over public or private networks such as the Internet (Rai et al. 2006). The structure of supply chains is such that information is distributed across firm boundaries where inaccessibility and delay can lead to reduced information visibility, poor levels of interaction, and mismatches between demand and supply (Lee et al. 1997; Zhou et al. 2007). One often-quoted problem caused by poor information visibility is the bullwhip effect where amplified order variation occurs as demand signals travel across the supply chain; resulting in significant market mediation costs from stock-outs and stockpiles at different locations in the supply chain (Simchi-Levi et al. 2007). In new product markets and in hypercompetitive environments which are characterized by high levels of uncertainty, information sharing can mitigate the effects of coping with emergent demand patterns (Fine 2000). Thus, information sharing provides members of a supply chain network with visibility across the supply chain, reinforces the collaborative nature of relationships, and the ability to respond in a timely fashion to supply and demand changes (Hsu et al. 2008; Patnayakuni et al. 2006; Zhou et al. 2007). Building systems and interorganizational platforms to support such collaboration need a better understanding of what motivates firms to share information with their supply chain partners.

Information sharing with supply chain partners, referred to as information sharing in this study is the extent to which critical private information is conveyed to firm's partners so as to allow them to interpret, sense and anticipate change in their supply chain (Gosain et al. 2004; Nyaga et al. 2010). In order to accomplish this, firms need to share information in a broad range of areas. This may include sharing order information from routine transactions, production-related information about resource conditions and plans, financial information related to revenue and profit-related metrics, and marketing related information for competitive positioning (Seidmann et al. 1997). Going beyond exchanging simple transactional information, information sharing as considered here allows firms to sense the needs of partners and in turn communicate their needs to supply chain partners (Gosain et al. 2004). As a contrast to the traditional economic account of firm behavior adopted by most prior research, in this study we examine information sharing in supply chains as shaped by the strategic (top management participation and relational orientation), power (coercive power on and by the firm) and institutional factors (mimetic and normative forces) (Figure 1).



Strategic Management of Supply Chain

The manner in which the focal firm views the supply chain and pursues its supply chain strategy influences its information sharing behavior with its partners. The focal firm's view of the role of supply chain can be captured by the extent of participation of its top management, which is defined as the behavior and actions performed by the top management (Liang et al. 2007) to facilitate supply chain management. Information sharing among partners requires substantial material and managerial resources to set up the data exchange protocols and routines among partners. Top management can convey the strategic role of supply chain management by articulating its vision for managing the supply chain and formulating related strategy. By publicly championing the strategic role of supply chain management it lends legitimacy to supply chain initiatives including sharing information with partners. Such legitimacy is especially important to overcome the security concerns and inertia often associated with information sharing among employees. Top management participation creates the incentive to facilitate and initiate supply chain collaboration activities with partners, increasing the range of information shared among partners. Thus, we posit,

H1: Higher level top management participation in articulating and formulating supply chain strategy leads to a higher extent of information sharing with partners

Relational orientation is defined as the focal firm's approach to relationship building with supply chain partners (Garbarino et al. 1999; Sharma et al. 2003). Research from multiple disciplinary perspectives has suggested that value from network membership is realized through cooperative behavior (Patnayakuni et al. 2006). As more and more firms strategically move away from adversarial relationships to collaborative ones (Nyaga et al. 2010), relational orientation of a firm towards its partners will be characterized by long-term considerations, mutual gains, and informal governance; a strategic consideration in managing its supply chain. Relational orientation can affect information sharing in the following ways. First, effective collaboration usually requires sharing proprietary information which may expose the firm to opportunistic behavior by the other party. The intention to maintain long-term cooperative relationships

with partners is associated with both trust (Anderson et al. 1989) and dependence (Ganesan 1994), which can offset concerns about opportunistic behaviors and abuse of shared information by partners. Second, the expectation for mutual gains from the relationship in the long run makes partners willing to invest in relational-specific assets and to develop "experience-based assets," facilitating efficient communication and information exchange (Williamson 1985). Therefore, we posit,

H2: A higher level of relational orientation leads to a higher extent of information sharing with partners

Power forces among the partners:

Power is defined as the capability of a firm to exert influence on other firms to act in a prescribed manner (Hart et al. 1997). Our definition for power is slightly different from the coercive pressure in institutional theory, in which it may stem from a variety of sources including resource-dominant organizations, regulatory bodies, and parent corporations and is usually considered as unidirectional. In this study, we focus on the specific power wielded by supply chain partners since they are in a unique position of not only affecting normal day-to-day operations but also in realizing the strategic objectives of the focal firm. Since suppliers and buyers get into exchange relationships for mutual gain and power can be exercised in different ways (Hart et al. 1997), we argue that power can be bilateral in supply chain relationships, i.e., a focal firm can both be subject to the coercive power of its partners as well as exert power on its partners.

In the supply chain context, suppliers and buyers depend on each other to obtain resources for day-to-day operations, profitability and the long-term viability of the firm. Coercive power can thus stem from such dependence to influence the partners' plausible choices and actions (Pfeffer et al. 2003). For instance, General Motors was successful in "persuading" its car dealers to tender payment for the vehicles sold through ACH debit transfers (Knudson et al. 1994). Recently, Wal-Mart has requested its top suppliers to implement RFID if they want to continue their relationships with Wal-Mart. Therefore,

H3: A higher level of coercive power on the firm by its partners leads to a higher extent of information sharing with partners

Similarly, if the focal firm is in a dominant position, it can exert its coercive power on its partners to share information. If the focal firm is not in a dominant position, it can also influence the resource-dominant firms' actions through negotiation, mutual-adjustment and their investment in relationship specific assets (Subramani et al. 2003). In addition, since information sharing is usually bilateral and involves private information, the focal firm may be more willing to share information with its partners when it feels that it is in relative position of power over its partners. Thus,

H4: A higher level of coercive power on the partners by the focal firm leads to a higher extent of information sharing with partners

Institutional forces on Supply Chain Management

In addition to the strategic factors and the influence of power between partners, we argue that the information sharing behavior of the focal firm is in addition to and subject to the influence of the institutional environment in which the firm is situated. Drawing from the institutional perspective, we examine the impacts of mimetic and normative forces on information sharing.

Mimetic influences may cause a firm to change over time to become more like other firms in its environment (DiMaggio et al. 1983). Mimetic influences manifest themselves in two ways: the prevalence of a practice in the focal firm's industry and the perceived success of firms that have adopted the practice (Haveman 1993). Extending this logic into the context of this study, we define mimetic influence on supply chain management as the extent to which the focal firm mimics the actions of other firms on supply chain management initiatives. If information sharing has been widely adopted in the focal firm's industry, the focal firm may model itself after other firms to acquire status-conferring legitimacy or social fitness in a wider social structure (DiMaggio et al. 1983). In addition, the focal firm may attribute the success of other firms to their supply chain practices, such as information sharing, and may perceive the need to adopt such practices to maintain parity, prevent loss of market share or simply the desire to replicate practices with the expectation of improved performance. Accordingly we propose the hypothesis,

H5: A higher level of mimetic influence on supply chain management of the firm leads to a higher extent of information sharing with partners

Normative influences are considered to occur primarily as a result of professionalization (DiMaggio et al. 1983). As supply chain practices including information sharing become prevalent and widely accepted, they become a part of the knowledge pool that is institutionalized to become a part of the curricula in higher education programs, professional certifications, continuing education and dissemination through professional and trade associations. Professionals who have similar formal education and are employed at similar positions in different firms are likely to exhibit similarity in how they perform their tasks and consequently the importance they attribute to certain priorities, work practices and structures. Thus, normative influence on information sharing, defined as the extent to which the focal firm is influenced by professionals and associated institutions.

H6: A higher level of normative influence on supply chain management of the firm leads to a higher extent of information sharing with partners

Comparing supplier and buyer perspectives on information sharing

While suppliers and buyers enter into relationships for mutual gains, existing research has identified that suppliers and buyers may have different views on their relationships, which may lead to different motivations for collaboration behaviors, such as information sharing. For example, Whipple and Frankel (2000) found that trust was ranked as the most important factor in alliance success by buyers, while their supplier counterparts ranked trust as the second most important factor for success after senior management support.

Suppliers and buyers can have different perceptions about the power wielded by their partners on them and also the power imposed by them on their partners. Corsten and Kumar (2005) found that suppliers were much more likely than buyers to feel inequity in obtaining benefits from the relationships. Since buyers and suppliers may often belong to different industries, the mimetic influence and normative influence may be different and thus have different impacts on their respective decisions on information sharing.

Moreover, suppliers and buyers may share information for different purposes. Whipple et al. (2002) found that suppliers were more interested in timely information from their customers because suppliers rely on information from customers in order to start their internal planning processes, while buyers were more interested in accuracy of the information because if a problem arises, buyers need accurate information to adjust their procurement plans appropriately. Further, since information shared among partners is usually proprietary, buyers and suppliers might be exposed to opportunism by the other party. This concern can be further exacerbated if one party feels that it is sharing sensitive and valuable information often because of the power held by the supply chain partner.

Given the lack of understanding of both suppliers and buyers perspectives on information sharing in supply chain management, we explore supplier and buyer similarities and differences. Following the logic of the existing literature on the different perspectives of suppliers and buyers, we posit the following hypothesis,

H7: The proposed internal strategic factors, relation-specific power factors, and external institutional factors affect information sharing differently for suppliers and buyers

Specifically, we test the model and hypothesized relationships separately using independent samples of suppliers and buyers. Multi-group invariance analysis is used to evaluate (1) if the hypotheses are supported similarly across the buyer and supplier sample; and (2) if the relationships between constructs are similar or different across the supplier and buyer samples.

Research Methodology

We developed our measures for constructs through successive stages of literature review, theoretical modeling, and refinement, as suggested by Churchill (1979). Whenever possible, existing measures were adopted and adapted to fit in our research context. All the measurement items and their informing sources are listed in Appendix A.

Given the difficulties of collecting data of this complexity, e-Rewards[1], a professional marketing research institution, was employed to gain access to its business panel members in the U.S. The membership profile of e-Rewards' business panel[2] is comparable to the membership profile of professional institutes, such as the Institute of Supply Management (ISM)[3]. E-mail invitations stating the purpose of the research were sent by e-Rewards to its panel members. Based on their profiles, members willing to participate were directed to an online survey about either their information sharing activities with their buyers or with their suppliers. Of the 367 sales professionals and 375 procurement professionals who received the invitation, 140 (completion rate = 38.1%) and 124, respectively completed the surveys (completion rate = 33.1%). In both samples, over 70percent of the respondents have a job title of sales/procurement or mid-level manager. On average, the sales professionals have been in their functional role for 7.4 years (S.D. = 5.0) and the procurement professionals have 6.9 years of experience in their functional role (S.D. = 6.2). On a 1 (not at knowledgeable) to 7 (very knowledgeable) scale, 83.6 percent of sale professionals reported levels 6 and 7 (mean = 6.40, S.D. = 0.995), while 71.8 percent of procurement professionals reported levels 6 and 7 (mean = 6.05, S.D. = 1.414). Table 1 presents the summary information regarding the size and industry distribution of the two samples.

Table 1: Demographic Information of the Two Samples

	Suppliers		Buyers	
Industry	No. of Firms	Percent	No. of Firms	Percent
Automotive	53	37.9	43	34.7
Chemicals	21	15.0	26	21.0
Computer/Electronic Equipment	36	25.7	26	21.0
Machinery/Equipment	30	21.4	29	23.4
Number of Employees	No. of Firms	Percent	No. of Firms	Percent
1 – 100	46	32.9	39	31.5
101 –1,000	38	27.1	27	21.8
1,001 – 10,000	24	17.1	20	16.1
>10,000	32	22.9	38	30.6
$ Sale (in Million)	No. of Firms	Percent	No. of Firms	Percent
<10	26	18.6	24	19.4
10 – 100	26	18.6	16	12.9
100 – 1,000	23	16.4	12	9.7
>1,000	32	22.9	30	24.2
Missing	33	23.6	42	33.9

Two tests were conducted to assess non-response bias after data collection. First, using ANOVA, we compared those respondents who did not complete the survey with those who did, based on both the number of employees in their firms and the firm's annual revenue (Armstrong et al. 1977). Second, using a chi-square test, we examined the difference between the expected and the observed number of

[1] www.e-rewards.com

[2] The U.S. business panel of e-Rewards (http://www.e-rewardsresearch.com/downloads/US_Business_Panels.pdf (accessed on Jan. 25, 2009)

[3] Source: http://www.ism.ws/files/membership/MemDemReport2006.pdf (accessed on January 25, 2009).

respondents across industries. No statistical differences were detected using these two tests, suggesting that non-response bias is not evident in the samples.

As suggested in recent research, we took steps to safeguard against common methods bias when designing the instrument (Podasakoff et al. 2003). Specifically, we separated our key measures stated above into several subsections and used different formats (e.g., circled responses vs. written responses) and scales to reduce simply "straight line" responses by managers. After data collection, Harmon's one-factor test was conducted to investigate common method variance (Podasakoff et al. 1986). Using exploratory factor analysis, we estimated a model for each sample that had all items for the seven latent constructs, which revealed the presence of seven distinct factors with eigen values exceeding 1. The first factor accounts for 27.4 percent of the total variance for the supplier sample and 28.9 percent of the total variance for the buyer sample. The rotated component matrix indicated that all items loaded on the corresponding factors. When we forced the extraction of a seven-factor model, results remained the same. Finally, we included a common method factor in the structural model and the estimated results for all hypothesized effects were unchanged in terms of level of significance. Taken together, these results suggest that common method bias is an unlikely concern in this study.

Empirical Tests

Descriptive statistics for both the supplier and the buyer samples are reported in Appendix B. The correlation matrix did not indicate any exceptionally correlated constructs. The highest correlation (0.61) is between normative influence and mimetic influence in the supplier sample, which is still below the 0.8 threshold for caution on a lack of discriminant validity suggested by Bagozzi et al. (1991).

Measurement model

We adopted standard procedures to ensure the content validity and the construct validity of the measures, and to evaluate their psychometric properties (Bagozzi et al. 1991; Nunnally et al. 1994). We used covariance-based structural equation model using AMOS 18.0 to conduct a confirmatory factor analysis (CFA) to evaluate all items. The overall fit of the measurement model was good for both the supplier and customer samples (Hu et al. 1999) (For the supplier sample: χ^2 = 638.129, *df* = 410, χ^2/ *df* =1.556, CFI= 0.900, NNFI = 0.868, RMSEA = 0.067; for the buyer sample, χ^2 = 720.908, *df* = 410, χ^2/ *df* =1.758, CFI = 0.890, NNFI = 0.818, RMSEA = 0.074). All measures exhibited high convergent validity with composite reliability (bolded item in Appendix A) and Cronbach's α (bolded items in parentheses) higher than 0.800, and all items loaded strongly and significantly on their respective factors (Appendix A). Discriminant validity was supported as the average variance extracted for each latent factor exceeded the respective squared correlation between factors (Fornell et al. 1981) (Appendix B). Also, when each pairwise correlation was constrained to 1, the model fit deteriorated significantly, providing additional evidence of discriminant validity (Anderson et al. 1988; Hu et al. 1999).

Finally, we evaluated the measurement invariance of the constructs across the supplier and buyer samples by progressively incorporating restrictive equality constraints to the measurement model across the two groups. In sequence, we imposed equality constraints to the measurement weights and the structural covariances (Steenkamp et al. 1998). We did not constrain the equivalence of measurement residuals as it is widely accepted to be overly restrictive (Byrne 2001; Meredith 1993). For each of the constrained models, the overall model fit indices remained comparable to the unconstrained model. The CFI did not drop by more than 0.011 for any of the restrictive models in comparison to the unconstrained model, providing strong evidence of configural and metric invariance across the buyer and supplier sample (Cheung et al. 2002) (Table 2). We can thus meaningfully interpret similarities and differences in the structural relationships among constructs across the two samples. Collectively, these results suggest that all measures exhibit satisfactory validity and can be meaningfully used for hypothesis testing.

Table 2: Measurement Invariance Test for the Supplier and the Buyer Samples

Model	χ^2	*df*	χ^2/ *df*	CFI	NNFI	RMSEA
Unconstrained	1359.037	820	1.657	0.894	0.875	0.050
Measurement Weights	1399.113	844	1.658	0.891	0.868	0.050
Structural Covariances	1467.910	872	1.683	0.883	0.857	0.053

Results

A structural model was estimated to assess the effects shown in Figure 1 and compare the results across the two samples (Byrne 2001). The overall model provided a good fit to the data (χ^2 = 1485.576, df = 846, $\chi 2$/ df =1.756, CFI=0.905, NNFI = 0.872, RMSEA=0.063). Since the sample size of both the supplier and the buyer samples is slightly smaller than the recommended threshold (five times the number of measurement items), we also tested our research model using PLS and OLS, both of which returned the same results with even stronger relationships in terms of higher path coefficients and more significant results. Due to the recent criticism of PLS's and OLS's suboptimal ability to handle multi-item constructs and inability to compare groups, we choose to report the SEM results in this study.

As reported in Table 3, five out of the six hypothesized paths are significant at $p<0.05$ for the supplier sample. In accordance with our proposed hypotheses, top management participation (H1), coercive power on the firm (H3), coercive power by the firm (H4), and normative influence on supply chain management (H6) positively affect the information sharing activities of suppliers. These results suggest that the proposed research model was generally supported by the results from the supplier sample.

Surprisingly, we did not find relational orientation to significantly impact information sharing in the supplier sample. This lack of effect may be because suppliers in general would always prefer getting repeat business from the customers and to that extent may be more transaction oriented rather than adopt relational orientation for sharing information with their customers. Viewed together with the difference across the supplier and buyer samples with respect to power, it can be seen that the supplier sample perceives coercive power to play a significant role in the extent to which they share information. In contrast, the relationship is not significant in the buyer subsample. This suggests the when dealing with downstream supply chain partners, firms perceive coercive power to play a greater role in shaping their information sharing behavior rather than a relational orientation.

While mimetic influence on supply chain management of the focal firm (H5) has a significant effect on information sharing, it is the opposite of our hypothesized positive impact. A possible explanation for this quite surprising result is that mimetic influence functions in the model primarily as a suppressor of variance in other predictors and that it is irrelevant to the dependent variable. A post hoc analysis of the zero-order correlation confirms this suspicion and reveals that mimetic influence suppresses the variance of normative influence. This may indicate that information sharing among supply chain partners bears risks and is complicated in terms of how and what to share with partners, which make it difficult for the focal firm to mimic information sharing activities directly from competitors. Rather, companies may be inclined to hire the same type of supply chain professionals as their peers in order to mimic their supply chain processes. Thus, the mimetic influence exerts its effect on information sharing by the nature of hiring by the focal firm where they hire the same kind of professionals who are then likely to follow industry practices similar to their peers.

Only three out of the six hypothesized relationships are significant for the buyer sample. It is interesting to notice that only one of the two factors in each category is significant and it is important to note that the three significant relationships are very strong ($p<0.01$). Of the two strategic factors, relationship orientation has a significant impact on information sharing (H2) while top management participation has no significant effect (H1). This suggests that sharing information by buyers is more likely when they view their suppliers as long-term trusted partners. Since the buyers need to share private and sensitive information, such as marketing campaigns, planning and sales information, there exists a greater risk of exposure that suppliers may act opportunistically with such information. But long-term cooperation can cultivate trust and incur joint asset- and relational-specific investment from both parties, which can safeguard against opportunistic behavior (Anderson et al. 1989). Thus, buyers may be more willing to share information with long-term trusted suppliers. The results also highlight the differences in relational orientation across the two subsamples of suppliers and buyers. Of the two power factors, the coercive power by the firm has significant impact on information sharing (H4) while coercive power on the firm has no significant effect (H3). This result indicates that the buyers perceive themselves to wield more power over their suppliers and that it plays a greater role in information sharing. It may well be that they are only willing to share information when they perceive that they have relative power/control over their suppliers. Of the two institutional factors, the normative influence of SCM has a significant impact on information sharing (H6) while mimetic influence of SCM has no significant effect (H5). This shows that

buyers are more likely to following institutionalized professional norms on information sharing, but less likely to adopt supply chain practices in response to practices adopted by competitors.

Table 3: SEM Results

	Hypothesized Path	Supplier [a]	Buyer [a]	Difference Significance
H1	Top Management Participation → Information Sharing	0.134*	n.s.	
H2	Relationship Orientation → Information Sharing	n.s.	0.354**	
H3	Coercive Power on the Firm → Information Sharing	0.238*	n.s.	
H4	Coercive Power by the Firm → Information Sharing	0.183*	0.307**	0.000
H5	Mimetic Influence on SCM → Information Sharing	-0.198*	n.s.	
H6	Normative Influence on SCM → Information Sharing	0.209*	0.284**	0.000

[a] Standardized path coefficients are reported

* $p<0.05$ **$p<0.01$

While the test results suggest that internal strategic, relation-specific power, and external institutional factors affect the information sharing behaviors for both the suppliers and buyers, different and interesting patterns of significance emerge from the two samples when we compare them (Table 3), which provides strong support for H7. First, suppliers and buyers appear to have quite different views on what strategic factors motivate information sharing behaviors. While top management participation has a significant positive effect on information sharing in the supplier sample, it has no impact on information sharing for the buyer sample. Similarly, while relational orientation has no effect on information sharing in the supplier sample, it strongly influences information sharing in the buyer sample. These results indicate that suppliers believe that top management participation can influence the extent of information sharing with buyers, while buyers tend to share information with suppliers when they view them as long-term partners.

Second, suppliers' and buyers' views on the influence of power factors on information sharing reveal both similarities and differences. While suppliers perceive that they are subject to the coercive power of buyers to share their information, buyers are less likely, if not completely unlikely, to share information in response to the coercive power of suppliers. While both suppliers and buyers believe that they will share information with their partners when they feel they have coercive power over their partners, buyers appear to perceive it to play a greater role when it comes to sharing information with their suppliers. These results reveal the perceived inequitable position of suppliers and buyers in influencing the extent to which information is shared in relationships. The results suggest that buyers are more inclined to share information when they perceive that they have the dominant position in the relationship. This finding is consistent with the literature that found more examples of buyer firms initiating trust-building actions when compared to the actions taken by supplier firms (McCutcheon and Stuart 2000).

Third, the two institutional factors have different impacts on information sharing for the supplier and buyer samples. While mimetic force has significant negative effect on information sharing for the supplier sample, it has no effect in the buyer sample. While both suppliers and buyers acknowledge the influence of industrial norms on their sharing behaviors, buyers are much more likely to be subject to normative influences. These results indicate that firms do not perceive themselves to be subject to the strong influence of industrial norms.

Discussion

Despite recognition of the role of inter-firm relationships in creating sustainable value, many firms have failed to realize the anticipated benefits of such relationships, which has been attributed to their inability

to leverage information flows within the supply chain (Hsu et al. 2008). In order to take advantage of partner firm capabilities firms need to share information and support these with IT platforms for information exchange. The role of IT infrastructure in building and maintaining collaborative relationships is well recognized (Gosain et al. 2004; Rai et al. 2006). In markets with rapidly shrinking product life cycles, firms must continuously design and deliver high-quality products and services in a timely manner. Lack of information sharing limits a firm's ability to leverage collaborative relationships for improved firm performance. In this study, we integrate strategic management, resource-dependency perspective and institutional theory to examine the strategic, power, and institutional factors that affect the extent of information sharing among supply chain partners and the different perspectives of suppliers and buyers. Specifically, we make the following four theoretical contributions to the literature on information sharing in supply chain management.

First, we highlight the internal strategic role of top management participation and relational orientation in shaping the information sharing activities for both suppliers and buyers. Our results indicate that suppliers perceive the importance of active participation of top management in articulating a vision and formulating strategy for supply chain management to establish legitimacy of information sharing. Buyers on the other hand perceive the need for relational orientation to promote investment on relationship-specific assets and experience-based assets to facilitate information sharing among partners. Our results confirm that the strategic position of the supply chain practice affects the information sharing behavior of the focal firm.

Second, we delineate the effects of power on the firm and power by the firm on information sharing in supply chain management by making the distinction between power exerted by the organization and the pressure it perceives as being exerted by its supply chain partners. This enables us to identify the context under which relative power of partners shapes information sharing. Notably, the study contrasts the distinction between the influence of power (by the firm and on the firm) by comparing the results from the supplier and buyer samples, a distinction that has not been examined extensively in prior research. Our results reiterate the notion that the buyers tend to wield power on the suppliers. Suppliers perceive that their participation in information sharing is more influenced by the power held by their customers. More importantly, the results indicate that buyers are more comfortable sharing internal and sensitive information with their suppliers when they perceive that they have power over them.

Third, we extend the current literature on information sharing by incorporating institutional theory into our model. We view the focal firm as embedded in a social network, whose behaviors would be affected by the institutional environment in which it is situated. Our results suggest that the firms are more likely to share information with their supply chain partners by hiring the same kind of supply chain professionals and complying with industry standards on supply chain practice. The surprising negative and insignificant impacts of mimetic influence on information sharing for suppliers and buyers respectively indicates that information sharing bears risks and uncertainties and is more complicated in terms of how and what information can be shared among partners, which in turn makes it difficult for the focal firm to copy directly from its competitors.

Fourth, we reveal the different perspectives of suppliers and buyers on the impacts of strategic, power, and institutional factors on information sharing among partners by comparing and contrasting the test results across supplier and buyer samples. The distinct results from the two samples suggest that the inability of the focal firm to leverage information flows within the supply chain may be due to the different perspective of its partners on information sharing and the distinct functional roles within the firm across sales and procurement. The differences between the two functional roles of the focal firm, as a buyer and as a supplier are interesting and insightful. Rather than take a unidimensional view of a focal firm, our research suggests that approach to supply chain management is more nuanced and dependent on the context of whether the supply chain is viewed upstream or downstream from the focal firm. The differences maybe in the relational vs. transactional orientation of different functional roles in the firm's supply chain. Alternatively, they may be due to the attention top management gives to the firm's upstream vs. downstream roles.

Our results bring valuable insights to supply chain management professionals. Based on our study, the supply chain management professionals can evaluate their current partner management strategy to find areas that they can work on to improve or facilitate information sharing. Rather than simply forcing the

supplying company to provide the required information, the buying company can get it by involving itself in interaction routines and collaborative initiatives. The supplying company would be more willing to participate in this type of collaboration if it feels that it can have a say in the decision-making process. Similarly, the supplying company can influence the information sharing behavior of the buying company through establishing a long-term relationship and giving it a dominant feeling in the relationship. For both types of companies, it would be easier to get support from their partners if information sharing is considered to be the industry norm or standard for doing business.

Conclusion

Our research calls for further research initiatives on comparing supplier and buyer perspectives on the different aspects of supply chain management. This type of comparison research could help suppliers and buyers identify mismatches between their expectations about the relationship and formulate effective strategies to promote collaborative initiatives with partners. Rather than viewing the supply chain as isomorphic irrespective of the different roles played by the focal firm in a supply chain, the research recognizes the differences and highlights the factors that shape information sharing that are dependent on the supplier vs. buyer role of the focal firm in a supply chain.

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APPENDIX A: Questionnaire with Informing Source and Path Loading

		Suppliers	Buyers
Top Management Participation in SCM (Chatterjee et al. 2002; Liang et al. 2007)		**0.966 (0.948)**	**0.967 (0.949)**
TMP1	Senior management of our firm/SBU actively participates in articulating a vision for the supply chain.	0.946	0.953
TMP2	Senior management of our firm/SBU actively participates in formulating a strategy for the supply chain.	0.957	0.957
TMP3	Senior management of our firm/SBU actively participates in establishing goals and standards for supply chain initiatives.	0.950	0.948
Relationship Orientation (Patnayakuni et al. 2006)		**0.912 (0.880)**	**0.928 (0.904)**
RO1	Maintaining long-term relationships with our buyers/suppliers is important to us.	0.836	0.823
RO2	We believe that goodwill and trust form the basis of our relationship with buyers/suppliers.	0.884	0.849
RO3	We focus on long-term goals in our relationship with our buyers/suppliers.	0.853	0.894
RO4	Our buyers/suppliers care about the success of our relationship.	0.753	0.801
RO5	There is a strong bond of loyalty between us and our buyers/suppliers.	0.771	0.876
Coercive Power on the Firm (Liang et al. 2007; Teo et al. 2003)		**0.878 (0.816)**	**0.800 (0.864)**
COF1	Our main buyers/suppliers require us to adopt procedures and policies specified by them.	0.769	0.704
COF2	Our main buyers/suppliers require us to require our IT platform/applications to interface with their systems seamlessly	0.779	0.739
COF3	Our main buyers/suppliers require us to execute supply chain processes in a specific manner	0.843	0.785
COF4	Our main buyers/suppliers require us to provide data in specified formats.	0.819	0.891
Coercive Power by the Firm (Liang et al. 2007; Teo et al. 2003)		**0.909 (0.869)**	**0.913 (0.871)**
CBF1	We require our buyers/suppliers to require their IT platform/applications to interface with our systems seamlessly.	0.884	0.744
CBF2	We require our buyers/suppliers to provide data in specified formats.	0.852	0.902
CBF3	We require our buyers/suppliers to execute supply chain processes in a specific manner.	0.893	0.890
CBF4	We require our buyers/suppliers to adopt procedures and policies specified by us.	0.747	0.858
Mimetic Influence on SCM (Liang et al. 2007; Teo et al. 2003)		**0.874 (0.839)**	**0.863 (0.794)**
MIF1	Our main competitor(s) are successful because their supply chain is	0.565	0.639

	highly integrated with their suppliers (customers).		
MIF2	We admire firms with highly integrated supply chains.	0.893	0.831
MIF3	Buyers/Suppliers in our industry are more willing to do business with firms with highly integrated supply chains.	0.919	0.850
MIF4	We have to offer similar supply chain capabilities as our main competitor(s) in order to compete.	0.776	0.796
Normative Influence on SCM (Liang et al. 2007; Teo et al. 2003)		**0.844 (0.735)**	**0.843 (0.726)**
NIF1	There are a standard set of supply chain practices in our industry.	0.675	0.794
NIF2	We closely follow best practices put forth by professional (for ex APICS, CSCMP etc.) and industry associations.	0.871	0.877
NIF3	Most of our personnel are professionally qualified and/or certified in supply chain, logistics, purchasing or related area.	0.850	0.729
Information Sharing (Gosain et al. 2004)		**0.915 (0.894)**	**0.905 (0.880)**
IS1	Details of upcoming product or service related changes	0.608	0.723
IS2	Future plans (such as promotion and marketing plans, long-term production plans, capital investments, capacity utilization, etc.)	0.740	0.764
IS3	Information related to market demand trends and forecasts	0.840	0.800
IS4	Information on demand shifts and changes in customer preferences	0.824	0.817
IS5	Information about each other's internal processes	0.808	0.629
IS6	Information on internal operating metrics (such as inventory levels, product availability, production volumes, etc.)	0.785	0.718
IS7	Information related to changes in Information content (such as catalog information, technical specifications, part numbers, etc.)	0. 727	0.647
IS8	Information related to each other's performance	0.716	0.792

APPENDIX B: Descriptive Statistics

	Constructs	Mean	Std. Deviation	AVE	1	2	3	4	5	6	7	AVE	Mean	Std. Deviation
1	Top Management Participation	5.66	1.22	0.90		**0.26**	**0.21**	**0.36**	**0.52**	**0.51**	**0.30**	0.91	5.67	1.37
2	Relational Orientation	5.96	0.83	0.67	**0.32**		0.04	0.12	**0.41**	**0.32**	**0.43**	0.72	5.92	0.80
3	Coercive Power on the Firm	5.01	1.32	0.64	0.14	**0.21**		0.05	0.13	0.17	0.03	0.52	3.82	1.51
4	Coercive Power by the Firm	4.29	1.51	0.72	0.08	-0.03	**0.41**		**0.40**	**0.37**	**0.37**	0.72	5.24	1.32
5	Mimetic Influence on SCM	5.22	1.14	0.64	**0.33**	**0.28**	**0.38**	**0.37**		**0.46**	**0.33**	0.61	5.32	1.05
6	Normative Influence on SCM	4.92	1.25	0.65	**0.51**	**0.25**	**0.30**	**0.38**	**0.64**		**0.40**	0.64	5.04	1.23
7	Information Sharing	4.48	1.19	0.58	**0.24**	0.12	**0.30**	**0.26**	0.13	**0.28**		0.55	4.71	1.14

*The table below the diagonal presents descriptive statistics for the supplier dataset (n= 140), the above presents descriptive statistics for the buyer dataset (n=124).

** Bolded items are significant at P<0.05, two-tailed t-test.