BUYER–SUPPLIER RELATIONSHIPS: THE IMPACT OF SUPPLIER SELECTION AND BUYER–SUPPLIER ENGAGEMENT ON RELATIONSHIP AND FIRM PERFORMANCE

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May 11, 2006
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ABSTRACT

Increasing competitive pressures are causing organizations to critically evaluate their supply chains and manage them more effectively. One element of supply chains that is taking on greater significance is the buyer-supplier relationship. While the dimensions of effective relationships as well as linkages between these dimensions and certain measures of performance have been investigated, important questions remain regarding the role and impact of the buyer-supplier relationship. This study uses structural modeling to analyze the impact of supplier selection and buyer-supplier engagement on the performance benefits attributable to the relationship. Further, it examines the effect of relationship benefits on broader measures of buyer performance. Results demonstrate the positive influence of engagement and supplier selection criteria on relationship performance. They also demonstrate that the success of the relationship directly and positively affects buyer performance.

Keywords: Structural Equation Modeling, Buyer-Supplier Relationships, Supplier Selection.
Introduction

Competitive forces are putting firms under pressure to improve quality, delivery performance, and responsiveness while simultaneously reducing costs. In response, firms are increasingly exploring ways to leverage their supply chains, and in particular, to systematically evaluating the role of suppliers in their activities. One result has been the increased outsourcing of activities not considered to represent core competencies (Prahalad and Hamel, 1990). This enables firms to better utilize their resources, increasing the value added attributable to them. It also allows them to be more flexible and responsive to changing needs. Moreover, outsourcing allows firms to exploit the capabilities, expertise, technologies, and efficiencies of their suppliers. Increased outsourcing however implies greater reliance on suppliers and a commensurate need to manage the supplier base. This has for some companies meant reducing and streamlining the supplier base, and/or developing closer relationships with suppliers (Scannell et al., 2000).

At an operational level, the benefit to a buyer of developing close relationships with key suppliers comes in the form of improved quality or delivery service, reduced cost, or some combination thereof. At a strategic level, it should lead to sustainable improvements in product quality and innovation, enhanced competitiveness, and increased market share. These should in turn be reflected by improvements in financial performance. A number of authors have examined the role of relationships in business in general, and more specifically, in the buyer-supplier context. The research stream can be traced back to early work in industrial marketing (Hakansson, 1982), though theoretical frameworks such as transaction cost economics (Williamson, 1985) and the resource based view of the firm (Wernerfelt, 1984) have also been used to explain why firms are motivated to outsource, and the impact this has on relationship
development. In recent years there has been considerable interest in empirical studies of buyer-supplier relationships. In particular, identification of when these relationships are appropriate, the dimensions of effective relationships, and how relationships can be a source of competitive advantage have received considerable attention in the literature (e.g., Ellram, 1995, Carr and Pearson, 1999, O’Toole and Donaldson, 2000, Corsten and Felde, 2004). While the literature is extensive, questions remain. For example, little evidence exists of the impact of supplier selection, a key attribute of the sourcing process, on relationship performance. There is also only limited evidence of the benefits attributable directly to these relationships, and how these affect broader measures of the buying firm’s performance. This study posits that positive outcomes from a buyer-supplier relationship are the direct result of both the criteria used to select key suppliers and efforts to engage suppliers in a manner conducive to relationship success. Moreover, it posits that a successful relationship directly and positively influences measures of the buying firm’s financial and market performance. A structural equation model is proposed and tested using data from a survey of senior purchasing and materials management professionals. The following section reviews the literature on buyer-supplier relationships and supplier selection and lays the foundation for the hypotheses and model to be tested. Subsequent sections describe the research methodology, results, and implications of the study.

**Buyer-supplier relationships**

Buyer-supplier relationships reflect recognition by the buyer and supplier that for certain purchases, cooperation rather than competition may be mutually beneficial. While the subject of relationships has received much attention within the literature, it is apparent that a relationship is not a unidimensional construct. Indeed, there is some discussion about what the term relationship implies. Campbell (1997) for example defined four types of relationship; self centered
(characterized by a focus on firm needs), personal loyalty (mutual responsibility and commitment), mutual investment (long term commitment for strategic advantage), and political control (mutual dependence and high levels of integration). O’Toole and Donaldson (2000) defined relationships as bilateral (characterized by mutual cooperation), recurrent (close but absent the closeness of a bilateral relationship), discrete (minimal interaction), or hierarchical (one partner is dominant). While for certain transactions self centered or discrete relationships, typically characterized as arms length, may be appropriate, for others, more collaborative relationships may be appropriate. Evidence from the literature on strategic supplier alliances, a particular manifestation of a long term, collaborative relationship, suggests that buyers tend to prefer closer relationships when they wish to control the dependability of supply or influence supplier quality and delivery schedules (Ellram, 1995). Suppliers may be similarly motivated when they seek to secure long-term, reliable markets, or to influence customer quality.

Much of the recent literature on buyer-supplier relationships focuses either on the underlying attributes of relationships, or how relationships impact performance (Table 1). Relationships have been characterized in a number of ways, for example, relationship strength (e.g., Carr and Pearson, 1999, Martin and Grbac, 2003, Benton and Maloni, 2005), closeness (Larson and Kulchitsky, 2000), or physical proximity (Narasimhan and Nair, 2005). They have also been examined from buyer (e.g., Carr and Pearson, 1999, Larson and Kultchiksy, 2000), supplier (e.g., Kalwani and Narayandas, 1995, Maloni and Benton, 2000), and dyadic (e.g., Jap, 1999, Johnston et al., 2004) perspectives. However, a number of common themes emerge. Traits such as coordination, collaboration, commitment, communication, trust, flexibility, and dependence, are widely considered to be central to meaningful relationships. It should be noted that the implicit assumption is that the subject is a cooperative rather than a more hands off
relationship. Similar traits can also be observed in the supplier alliance literature (e.g., Ellram, 1995, Vollman and Cordon, 1998, Whipple and Frankel, 2000). The underlying rationale behind these traits is that in their absence, interaction between buyers and suppliers to create mutually beneficial outcomes will be limited. Without signals and/or behaviors demonstrating a willingness to work together to increase rather than merely redistribute value within the supply chain, buyers and suppliers will be motivated to look out for their own interests. Willingness however to work together and to share risks allows benefits to be achieved not only in cost, quality, delivery, and productivity, but in product development, technology deployment, and problem solving (Fram, 1995, Hahn et al., 1990).

Take in Table 1

A number of studies have examined the linkages between relationships and performance. These have demonstrated gains to the buyer from successful relationships in terms of financial (e.g., Carr and Pearson, 1999, Martin and Grbac, 2003, Johnston et al., 2004), and lead time performance (e.g., Larson and Kulchitsky, 2000). In addition, these relationships can result in improved responsiveness and customer loyalty (e.g., Martin and Grbac, 2003), innovation (Corsten and Felde, 2004, Johnston et al., 2004), and quality (Johnston et al., 2004). From a supplier’s perspective, they can lead to reductions in inventory cost (Kalwani and Narayandas, 1995) and lead time (Kotabe et al., 2003), as well as improvements in product/process design, quality (Kotabe et al., 2003), financial performance and future relationship prospects (Duffy and Fearne, 2004). Successful relationships have also been shown to yield improvements in supply chain performance (e.g., Narasimhan and Nair, 2005, Benton and Maloni, 2005, Maloni and Benton, 2000). The literature on supplier alliances also provides empirical evidence of their
benefits in terms of cycle time and new product development time (Monczka et al., 1998),
delivery performance (Groves and Valsamakis, 1998, Zaheer et al., 1998), flexibility (e.g.,
Scannell et al., 2000, Stank et al., 1999, Zaheer et al., 1998), and product availability and
customer satisfaction (Stank et al., 1999, Stank et al., 2001). It also alludes to the potential of alliances with regard to reductions in transaction costs (e.g., Dyer, 1997, Landry, 1998), and improvements in access to technology (e.g., Singh, 1997) and technology transfer (e.g., Grant and Baden-Fuller, 1995, Heide and John, 1990).

In measuring the success of a buyer-supplier relationship, it is necessary to distinguish between the outcomes of the relationship itself, and broader firm level outcomes. While performance measures such as quality and lead time improvements, cost reductions, and overall financial and market related performance can be measured at the firm level, they implicitly incorporate the effects of factors other than those related to the relationship itself. It is inherently difficult to measure how performance can be attributed to specific initiatives and actions, and in particular to individual buyer-supplier relationships. With three notable exceptions however, the literature on linkages between relationships and performance has focused on measures of firm rather than relationship performance. Heide and Stump (1995) examined the effects of relationship continuity, asset specificity, and volume unpredictability on the value and percent of end item value of purchases from a supplier, and relationship length. Maloni and Benton (2000) and Benton and Maloni (2005) examined the impact of relative power within a relationship on relationship strength, and buyer, supplier, and supply chain performance relative to the absence of a relationship. Absent from the literature is evidence of the impact of key attributes of relationships on relationship performance itself. We posit that efforts to engage with suppliers to establish an environment conducive to relationship success, will directly and positively influence
relationship success. Given the lack of consensus on how to assess relationship success, we define it in terms of the buyer’s perception of how successful the relationship is in improving performance. The use of a perceptual measure is common in empirical research and consistent with related prior work. For example, Johnston et al., (2004) assessed perceptions of buyer satisfaction with a relationship. Similarly, Benton and Maloni (2005) measured perceptions of satisfaction with a partner and of performance improvements relative to the absence of a relationship. Specifically, we propose

\[ H_1: \text{Buyer-supplier engagement (BSE) positively impacts the success of buyer-supplier relationships (SBSR)} \]

From the buyer’s perspective, in addition to engaging with suppliers, a successful relationship is predicated on the selection of suppliers that are also motivated to achieve positive relationship outcomes. As firms increasingly manage their supply base as an extension of their own manufacturing systems (e.g., Carter, 1996, Giunipero and Brand, 1996) they become more reliant on suppliers to achieve performance objectives. Not all firms however make good partners (Vollmann and Cordon, 1998). This implies that the criteria used to select suppliers takes on added significance. The role of supplier selection criteria in the buyer-supplier relationship literature is notably absent. While several studies in the supplier alliance literature have suggested that supplier selection can positively impact alliance success (e.g., Handfield, 1993, Monczka and Trent, 1995, Monczka et al., 1998), even in this domain, empirical evidence of such a link is limited. Monczka et al., (1998) examined the relationship of the supplier selection process to alliance success, while McCutcheon and Stuart (2000) included supplier selection in a model of alliance success. Neither however empirically tested the relationship between selection criteria and relationship outcome.
Several studies have examined the criteria used to select suppliers. These have examined selection criteria under specific buying conditions, for example strategic buyer-supplier partnerships (Ellram, 1990, Spekman, 1988), buyers at different points in the supply chain (Choi and Hartley, 1996), single versus multiple sourcing (Swift, 1995), and purchase type (e.g., Johnson, 1981, Lehmann and O’Shaugnessy, 1982). Several have also addressed the relative importance of selection criteria under different buying conditions (e.g., Evans, 1982, Wilson, 1994). The conclusion of prior work is that while price, quality, delivery reliability, and service are the most important criteria used to screen potential suppliers, the specific criteria used and their relative importance depends on the type and circumstances of the purchase. Moreover, while there is a tendency to focus on measurable criteria, subjective criteria such as technical capability, flexibility, and the willingness of a supplier to work in a collaborative manner, can be important in certain buying circumstances, for example in the context of cooperative relationships. Based on prior evidence, we posit that the criteria used to select suppliers can positively and directly influence relationship success. Specifically

**H₂:** Supplier selection (SS) positively impacts the success of buyer-supplier relationships (SBSR).

While the success of a relationship is an important outcome, it is but a means to an end. Firms enter into a relationship in the hope and expectation that doing so will ultimately lead to improvements in broader measures of firm performance. As the earlier discussion suggests, buyer-supplier relationships can positively influence measures of firm performance. However, prior studies do not separate performance gains attributable to the relationship from those due to other factors. We therefore propose

**H₃:** The success of buyer-supplier relationships (SBSR) positively impacts the performance of buying firms (Perf).
Research methodology

The hypotheses can be represented by the structural equation model presented in Figure 1. To operationalize the supplier selection, buyer-supplier engagement, and buyer-supplier relationship success constructs, an initial list of variables was identified based on the literature. This was compared with company manuals provided by two prominent manufacturing firms with close relationships with key suppliers. Based on these sources, a revised list was developed and reviewed by ten industry professionals to ensure the variables were an accurate representation of industry practice. The revised survey instrument was further pre-tested by a different group of twenty industry professionals. As a result, seven indicators of buyer-supplier engagement, fourteen supplier selection criteria, and four measures of relationship success were identified (Appendix 1). A five point Likert scale was developed for each item that reflected the extent to which tactics used by the buyer to select and engage in relationships with suppliers were considered important to their sourcing activities, or the extent to which the relationships were successful in helping the buyer achieve its goals. In the absence of consensus regarding how to assess business performance in cross industry studies (Narasimhan and Nair, 2005, Tan et al., 1998), five commonly used measures of performance reflecting financial, market, and product performance, were identified. Five-point Likert scales were developed for each that sought information on the performance of the responding firm relative to that of its major competitors (Appendix 1).

A total of 5,470 surveys were mailed to senior purchasing and supply managers identified from the Institute for Supply Management (ISM) and the Association of Operations Management.
(APICS) membership lists. Efforts were made to target respondents familiar with their firms' supply management practices. Cost considerations precluded seeking data from more than one respondent from each target firm. Following standard mail survey procedures, the original mailing consisted of the survey and a postage-paid self-addressed return envelope (Dillman, 1999). A reminder in the form of a postcard was mailed two weeks later, followed by a second reminder two weeks thereafter consisting of a duplicate survey and a postage-paid self-addressed envelope. A professional company administered the survey to minimize errors.

A total of 527 usable surveys were returned. To verify that responses from the two membership lists were homogeneous and could thus be combined, t-tests were carried out for a number of randomly selected questions from each sample as well as the number of employees and annual sales. Results indicated no statistically significant differences in mean responses, thus the data was combined into a single data set. To test for non-response bias, surveys were separated into two groups based on return date. Late arriving surveys were considered representative of non-respondents (Lambert and Harrington, 1990). t-tests were again carried out on responses to a number of randomly selected questions items and the number of employees, and annual sales. Again, no statistically significant differences in mean responses were observed, indicating the absence of non-response bias.

Reliability analysis was carried out using Cronbach’s α (Cronbach, 1951) to ensure that items used to operationalize the constructs of interest measured the corresponding construct and were free of measurement error. The minimum generally acceptable value for α is 0.70, though for exploratory research, values in excess of 0.60 are considered acceptable (Nunnally, 1988). Results indicate that each of the constructs can be considered to be sufficiently reliable (Table 2).

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1 The mailing lists used contained only senior purchasing and supply managers as identified by the respective organizations.
To validate self reported performance data, responses from a sample of responding firms were compared to data obtained from the Dunn and Bradstreet database, Standard and Poor publications and company financial reports. Correlation analysis showed that the two were statistically significant \( p < 0.05 \) suggesting that self-reported data can be considered to be valid.

\[ \text{Take in Table 2} \]

**Structural equation modeling**

*Model development*

A two-step approach to structural model development was used (Anderson and Gerbing, 1988). Measurement models were first developed to assess construct validity, the degree to which measures of the same trait correlate higher with each other than they do with measures of other traits of the latent variables (Schoenfeldt, 1984). Predictive validity was then assessed using a structural model that defines hypothesized direct and indirect relationships between the latent variables. The ability to correctly estimate model parameters and determine model fit depends on sample size (Schumacker and Lomax, 1996). A minimum sample size of one hundred and fifty is needed (Anderson and Gerbing, 1988), though others have suggested that larger sample sizes may be necessary (e.g. Hu and Bentler, 1999). It has also been argued that five cases per variable are sufficient for normal and elliptical distributions, and ten cases per variable for other distributions (Bentler and Chou, 1987). The model to be tested in this study contains forty indicators and four latent variables, thus the sample size can be considered to be sufficiently large. LISREL8-SIMPLIS was used to develop and test the measurement and structural models (Jöreskog and Sörbom, 1993). The maximum likelihood estimation method, which assumes multivariate normality of the observed variables, was used. This requires that observations be independently and identically distributed (Schumacker and Lomax, 1996),
though it is robust to minor deviations from normality (Raykov and Marcoulides, 2000). Most structural equation modeling research in recent years has been based on Likert-type scaled data using the maximum likelihood estimation method (Byrne, 1998). Since each latent variable is estimated from the corresponding set of indicators, it has no absolute metric scale. A common modeling approach is thus to map the corresponding latent variable onto its indicators by constraining an indicator to have a value of 1.0 (Byrne, 1998). In this research, the first parameter estimate in each measurement model was thus fixed at 1.0.

*Measurement models*

Examination of the *buyer-supplier engagement* (BSE) measurement model to ensure parameter estimates exhibited the correct sign and size and were consistent with the underlying theory (Byrne, 1998) revealed that one measure, participating in the sourcing decisions of suppliers, exhibited large error variance (δ). In the interest of parsimony, the indicator was dropped from the measurement model (Byrne, 1998). Modification indices suggested adding an error covariance term between the indicators formal and informal information sharing (Figure 2). One would expect that as the amount of formal information sharing increases so does the amount of informal information sharing. A second error covariance term was also added linking formal information sharing with integration of activities across the supply chain. Formal information sharing is a precursor to supply chain integration. Integration across the supply chain is unlikely to occur without a structured, formal system for sharing information. It should be noted that while allowing error terms to correlate can improve model fit, it is appropriate to do so only if there is a theoretical basis to support the corresponding correlations (Byrne, 1998). Doing so will not significantly improve the fit of a poorly fitted measurement model.
The parameter estimate or factor loading ($\lambda$) describes the relationship between observed measures and their corresponding latent variable, and indicates the ability of the measures to measure the latent variable (Schumacker and Lomax, 1996). Parameter estimates shown in Figure 2 are standardized estimates ($R$). The standardized estimate of the fixed indicator for the measurement model is 0.36. Although many goodness-of-fit criteria/tests have been proposed\(^2\), no single test or index can absolutely identify a correct model (Byrne, 1998). While the comparative fit index (CFI) and normed fit index (NFI) are preferred by some researchers (Bentler, 1992), other measures are also commonly used\(^3\). All fit indices suggest the relationship quality measurement model fit the data well (Table 3).

Analysis of the supplier selection (SS) measurement model showed that six of the measures (items 3A, B, I, J, K and L) exhibited large error variance and should be dropped. Modification indices suggested that testing capability and the ability to meet due dates influence each other, as do scope of resources and technical expertise, and continuous improvement and ability to respond to changes in demand. Limited testing capability adversely affects a firm’s ability to deliver products on time, especially in the context of new product development efforts. Broad resource scope is consistent with the development of technical expertise, while continuous improvement facilitates a firm’s ability to respond rapidly to changes in demand. Error covariance terms were added and the measurement model modified (Figure 2). Fit indices suggest the revised measurement model fit the data well (Table 3).

\(^2\) A list of model fit indices and corresponding acceptance criteria can be found in Byrne, 1998.
\(^3\) Descriptions of these along with corresponding values indicative of good model fit can be found in Table 3.
Analysis of the *success of the buyer-supplier relationship* (SBSR) measurement model indicated that the data fit the model well without modification (Figure 2, Table 3). Modification indices suggested that in the *firm performance* (Perf) measurement model, market share is inversely related to both overall product quality and customer service levels. This is consistent with rapid increases in market share causing deterioration in product quality and customer service levels due to demand outpacing corresponding changes in the production infrastructure. Fit indices (Table 3) indicated that the data fit the modified model well (Figure 2). Although the value for RMSEA slightly exceeded the threshold level of 0.05, this index has been shown to be sensitive to the number of estimated model parameters. While index values less than 0.05 are indicative of good model fit, it has been suggested that values as high as 0.08 indicate reasonable fit (Byrne, 1998).

**Structural Model**

The structural equation model (Figure 3) was examined to ensure parameter estimates exhibited the correct sign and size and were consistent with underlying theory. All parameter estimates were statistically significant ($\alpha = 0.05$). With the exception of the p-value for the $\chi^2$ measure and the value of NFI, goodness of fit index values indicated good model fit. However, it is well documented that the $\chi^2$ statistic is sensitive to large sample sizes, tending to result in significant $\chi^2$ statistics indicative of poor model fit (Hoyle, 1995). It has also been suggested that slight non-normality of the data or small sample sizes can result in modest underestimation of the NFI (Hoyle, 1995). CFI takes sample size into account making it a preferable measure to NFI (Byrne, 1998). It can thus be concluded that fit indices are consistent with good model fit, suggesting that the structural model fit the sample data well. Further evidence of model fit can be obtained from the expected cross-validation index (ECVI) and Akaike’s Information Criteria.
(AIC) (Byrne, 1988). EVCI assesses the likelihood that a model can be validated using similar sized samples from the same population. Values close to that for the saturated model and far from that for the independence model are indicative of good model fit. For the current data, the model EVCI is 1.60 while the saturated and independence model EVCI’s are 1.83 and 5.85 respectively. AIC compares two or more models with different numbers of latent variables both for model fit and parsimony. The AIC value of 481.95 is closer to zero than both the values for the saturated model (552) and the independence model (1765.86), suggesting good model fit and a parsimonious model.

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Take in Figure 3
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Analysis

The results provide support for the proposed model. Both buyer-supplier engagement (H1, β = 0.19) and supplier selection criteria (H2, β = 0.51) affect relationship success. Firms recognize the increasing importance of working with suppliers for items that are not internal sources of competitive advantage. Doing so enables them to improve product development processes and improve product quality while driving down cost. They also recognize however that to leverage the capabilities and expertise of suppliers as a sustainable source of competitive advantage necessitates the development of the relationship infrastructure. Efforts to facilitate the flow of expertise, information, and technology, coupled with a commitment to working together to achieve common goals, are necessary components of this. Given the effort required, firms willing to develop this infrastructure are not going to do so arbitrarily. Both financially and strategically, they recognize the importance of identifying suppliers with objectives similar to their own, and who are willing to make a similar commitment to the relationship. This suggests
they will carefully scrutinize suppliers not only on dimensions such as price, but on criteria that reflect the supplier’s ability to be a good partner, and their commitment to work together to create value within the supply chain.

Results also support the hypothesis that a successful buyer-supplier relationship positively impacts firm performance ($H_3$, $\beta = 0.45$). The intent of a relationship is to provide mutual benefit to the buyer and supplier. From the buyer’s standpoint, this comes in the form of improved resource utilization and strategic focus, and the ability to leverage supplier expertise and capability. It manifests itself in improved product quality and competitiveness, which in turn drive market and financial performance. While there is an inherent logic behind the relationship between successful relationships and firm performance, there has until now been only limited empirical evidence to support it, thus the result is significant.

Conclusions

The results of this study provide evidence of the linkage between attempts to manage suppliers and the supply chain and broad measures of business success. Selecting the right suppliers and developing the infrastructure for successful buyer-supplier relationships forms an important basis of this linkage. Given competitive pressures for improved responsiveness yet reduced cost, alignment of buyer needs with supplier capabilities becomes increasingly important. It behooves buyers to carefully articulate their needs and to be discriminating in identifying suppliers. However, equally important is the need to create an environment in which the relationship with a supplier can be a source of value added. While traditional supplier selection criteria such as price and delivery performance are important, buyers must go beyond operational selection criteria, explicitly considering a potential supplier’s strategic orientation and commitment to meeting shared goals and objectives. One result of a competitive marketplace
is that there are limits to what one firm alone can do to influence its performance. Working with partners however increases the ability and opportunity of a firm to achieve a competitive edge. Not only do the results show that managing relationships with suppliers rather than merely purchasing from them can positively impact the buying firm’s performance, they demonstrate that the whole is greater than the sum of the parts.

The study is not without limitations. The proposed model was tested using self-reported data from only one respondent within a firm. While the potential for respondent bias is an inherent problem in survey research, its impact on the validity of results cannot be overlooked. Similarly, despite attempts to obtain a large, diverse sample, the size and composition of the sample limits the ability to generalize the results broadly. Additional analysis is required to examine whether the model holds for specific industry or purchase scenarios. While statistical analysis showed that the sample data fit the proposed structural equation model, the possibility exists that there are other variables pertinent to the constructs of interest, and that constructs may be multi-dimensional. The focus of this study was not on scale development or explaining how or why engagement and supplier selection drive relationship and firm performance. Rather, it was to validate the notion that buyer-supplier engagement and supplier selection are drivers of relationship and thus firm performance. As a result, the scope of the study may have resulted in the breadth of the constructs not being full realized. Nevertheless, the results provide the basis for further study of the role of buyer-supplier relationships in managing the supply chain.
REFERENCES


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APPENDIX: SURVEY QUESTIONS

1. **Buyer-Supplier Engagement (BSE)**
   How important are the following in engaging with your firm’s key suppliers?
   a. Participating in the sourcing decisions of your suppliers
   b. Use of informal information sharing with suppliers and customers
   c. Use of formal information sharing agreements with suppliers and customers
   d. Improving the integration of activities across your supply chain
   e. Communicating your firm’s future strategic needs to your suppliers
   f. Creating a greater level of trust among your firm’s supply chain members
   g. Creating a compatible communication/information system with your suppliers and customers

2. **Success of Buyer-Supplier Relationship (SBSR)**
   How successful are your relationships in terms of
   a. Increasing product quality
   b. Lowering product cost
   c. Reducing new product development time
   d. Increasing buyer-supplier cooperation/communication

3. **Supplier Selection (SS)**
   How important are the following when selecting key suppliers?
   a. Company size
   b. Ethical standards
   c. Testing capability
   d. Scope of resources
   e. Technical expertise
   f. Commitment to quality
   g. Supplier’s process capability
   h. Ability to meet delivery due dates
   i. Price of materials, parts and services
   j. Geographical compatibility/proximity
   k. Supplier’s willingness to share confidential information
   l. Percentage of supplier’s work commonly subcontracted
   m. Commitment to continuous improvement in product and process
   n. Reserve capacity or the ability to respond to unexpected demand

4. **Firm Performance (Perf)**
   What is the level of your firm’s performance compared to that of major competitors in terms of
   a. Market share
   b. Return on assets
   c. Overall quality
   d. Overall competitive position
   e. Overall customer service levels

   1 Items dropped from final model due to high error variance
Figure 1: Proposed Structural Equation Model
Figure 2: Measurement Models (Standardized Solutions)
Figure 3: Structural Equation Model (Standardized Solution)
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Perspective</th>
<th>Independent Variable(s) Pertinent to Current Study</th>
<th>Dependent Variable(s) Pertinent to Current Study</th>
<th>Key Findings Pertinent to Current Study (→ implies positive effect)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carr &amp; Pearson, 1999</td>
<td>Buyer</td>
<td>Strategic Purchasing (SP), Supplier Evaluation System (SE)</td>
<td>Relationship Strength; commitment, communication (RS), Financial Performance (P)</td>
<td>SP, SE → RS; RS → P</td>
</tr>
<tr>
<td>Larson &amp; Kulchitsky, 2000</td>
<td>Buyer</td>
<td>Information Quality; timeliness, accuracy (IQ)</td>
<td>Closeness of Relationship; trust, cooperation, cordiality, commitment, coordination, goal congruence (CR), Lead Time (LT)</td>
<td>IQ → CR; CR → LT</td>
</tr>
<tr>
<td>Martin &amp; Grbac, 2003</td>
<td>Buyer</td>
<td>Information Sharing (IS)</td>
<td>Relationship Strength; closeness, supplier flexibility (RS), Profit (P), Customer Loyalty (CL), Responsiveness to Customers/Competitors (R)</td>
<td>IS → RS; RS → P, CL, R (relationship for R valid for responsiveness to competitor price changes, customer needs, but not changes in competitor campaign tactics)</td>
</tr>
<tr>
<td>Corsten &amp; Felde, 2004</td>
<td>Buyer</td>
<td>Collaboration (C), Dependence (D), Trust (T)</td>
<td>Innovation (I), Purchase Cost (PC), Financial Performance (FP)</td>
<td>C, D, T → I (relationship for C stronger when low dependence of buyer on supplier); C → FP (relationship stronger when trust, dependence are low); T → PC</td>
</tr>
<tr>
<td>Narasimhan &amp; Nair, 2005</td>
<td>Buyer</td>
<td>Supplier Quality (SQ), Supplier Information Sharing/Trust (SI)</td>
<td>Buyer/Supplier Physical Proximity (PP), Alliance Formation (AF), Supply Chain Performance; market, financial, quality (P)</td>
<td>SQ, SI → PP; PP → AF; PP, AF → P</td>
</tr>
<tr>
<td>Heide &amp; Stump, 1995</td>
<td>Buyer, Supplier</td>
<td>Relationship Continuity (R)</td>
<td>Performance; value of purchases, percent of end item value, length of relationship (P)</td>
<td>R → P (under conditions of high supplier specific assets, volume unpredictability); buyer investments in supplier specific assets, volume unpredictability negatively impact R</td>
</tr>
<tr>
<td>Jap, 1999</td>
<td>Buyer, Supplier</td>
<td>Goal congruence (GC), Complementary Capabilities (CC), Trust (T)</td>
<td>Coordination (Co), Profit, Realized Competitive Advantage (RA)</td>
<td>CG, CC, T → Co; Co → P, RA</td>
</tr>
<tr>
<td>Johnston et al., 2004</td>
<td>Buyer, Supplier (trust in buyer)</td>
<td>Buyer Benevolence (BB), Buyer Dependability (BD), Joint Responsibility (JR), Shared Planning (SP), Flexible Arrangements (FA)</td>
<td>Buyer Performance; profitability, growth, innovation, costs, quality, product base (P), Buyer Satisfaction with Relationship (S)</td>
<td>BB, BD → JR, SP, FA; SP, FA → P; FA → S</td>
</tr>
<tr>
<td>Authors</td>
<td>Type</td>
<td>Participation in Long Term Relationship (LTR)</td>
<td>Sales Growth (SG), Inventory Costs (IC), Price (P)</td>
<td>LTR → IC; LTR has no adverse effect for SG but does for P</td>
</tr>
<tr>
<td>-------------------------</td>
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<td>-----------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Kalwani &amp; Narayandas</td>
<td>Supplier</td>
<td>Participation in LTR</td>
<td>Relationship Strength; cooperation, commitment, trust, conflict, conflict resolution (RS), Performance; buyer, supplier, supply chain relative to absence of relationship (P)</td>
<td>C, LL negatively impact RS; R, E, Re → RS; RS → P</td>
</tr>
<tr>
<td>Maloni &amp; Benton, 2000</td>
<td>Supplier</td>
<td>Participate in LTR</td>
<td>Relationship Strength; cooperation, commitment, trust, conflict, conflict resolution (RS), Performance; buyer, supplier, supply chain relative to absence of relationship (P)</td>
<td>C, LL negatively impact RS; R, E, Re → RS; RS → P</td>
</tr>
<tr>
<td>Kotabe et al., 2003</td>
<td>Supplier</td>
<td>Technical Exchanges (TE)</td>
<td>Performance; product/process design, quality, lead time (P)</td>
<td>TE → P for U.S firms; TT → P for Japanese firms. Relationship strengthens with length of engagement for both Japanese and U.S. firms C, T, Cm, CR → P (relationship weaker when there is greater asymmetry in dependence)</td>
</tr>
<tr>
<td>Duffy &amp; Fearne, 2004</td>
<td>Supplier</td>
<td>Interdependence (I), Collaboration (Co), Cooperation (Co), Commitment (Cm), Conflict Resolution (CR), Trust (T), Dependence Asymmetry (DA)</td>
<td>Performance; cost reduction, benefit sharing, change in sales/profits, future relationship prospects (P)</td>
<td>C, T, Cm, CR → P (relationship weaker when there is greater asymmetry in dependence)</td>
</tr>
<tr>
<td>Benton &amp; Maloni, 2005</td>
<td>Supplier</td>
<td>Non Mediated Power; expert, referent (NM), Coercive Power; coercive, legal legitimate (C), Reward Power (R)</td>
<td>Relationship Strength; cooperation, commitment, trust, conflict, conflict resolution (RS), Performance; buyer, supplier, supply chain relative to absence of relationship (P)</td>
<td>NM, R → RS (relationship for R not as strong as for NM); C negatively impacts RS; RS → P for all forms of power</td>
</tr>
<tr>
<td>Prahinski &amp; Benton, 2004</td>
<td>Supplier</td>
<td>Indirect Influence of Buyer; assessment of supplier performance, certification, recognition, site visits, training (II), Formal Communication/Evaluation by Buyer (FC), Feedback (C), Collaborative Communication; II, FC, C (CC)</td>
<td>Buyer Supplier Relationship; supplier perception of buyer commitment. Cooperation operational operational linkages (BSR), Performance; quality, delivery, price, responsiveness, service (P)</td>
<td>II, FC, F, CC → BSR; BSR positively affects supplier commitment but not performance</td>
</tr>
<tr>
<td>O’Toole &amp; Donaldson, 2000</td>
<td>Buyer</td>
<td>Relationship Type; bilateral/mutual cooperation (B), recurrent/close but not bilateral (R), discrete/minimal interaction (D), hierarchical/dominant partner (H)</td>
<td>Financial Performance (F), Non Financial Performance; quality, lead time, flexibility, responsiveness, collaboration (N)</td>
<td>B yields better performance for most measures of N than R, D, F and for several measures of F</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Key Literature on Buyer-Supplier Relationships</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campbell, 1997</td>
<td>Support for four definitions of partnership; self centered (focus on individual needs but aware of partners’ needs), personal loyalty (mutual sense of responsibility/commitment), mutual investment (long term commitment for mutual strategic advantage), political control (mutual dependence, high levels of integration)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O’Toole &amp; Donaldson, 2002</td>
<td>Identified dimensions for evaluating relationship performance; operational effectiveness, involvement in design, long term interaction, costs associated with dependence, risk of abuse of confidence/information sharing, financial performance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoyt &amp; Huq, 2000</td>
<td>Proposed that trust/cooperation will impact whether/how relationship survives extended recession. Proposed that competitive advantage based on trust/collaboration is insufficient to justify anti trust action against partners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Murray, 2001</td>
<td>Proposed that buyer trust in supplier, forbearance of supplier opportunism, communication, formalization of relationship → commitment to supplier; Proposed that when asset specificity is high, high buyer trust/commitment in supplier, technological uncertainty, transaction frequency → greater use of alliances for global sourcing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Key Literature on Buyer-Supplier Relationships
<table>
<thead>
<tr>
<th>Scale</th>
<th># of Items</th>
<th>Standardized α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buyer-Supplier Engagement</td>
<td>7</td>
<td>0.75</td>
</tr>
<tr>
<td>Supplier Selection</td>
<td>14</td>
<td>0.85</td>
</tr>
<tr>
<td>Success of Buyer-Supplier Relationship</td>
<td>4</td>
<td>0.64</td>
</tr>
<tr>
<td>Firm Performance</td>
<td>5</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Table 2: Reliability Analysis
<table>
<thead>
<tr>
<th>Index</th>
<th>Acceptable Level*</th>
<th>Comment</th>
<th>Measurement Models</th>
<th>Structural Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>-</td>
<td>$\chi^2$ is sensitive to sample size and departures from multivariate normality. Large sample size (&gt;200) tends to result in significant $\chi^2$ statistics. Non-significant p-values indicate data fit the model.</td>
<td>10.6 24.31 2.19 6.71 379.61</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>-</td>
<td></td>
<td>7 17 2 3 220</td>
<td></td>
</tr>
<tr>
<td>$\chi^2$/df</td>
<td>≤ 3.0</td>
<td></td>
<td>1.48 1.43 1.10 2.24 1.73</td>
<td></td>
</tr>
<tr>
<td>$\chi^2$ p-value</td>
<td>Insignificant</td>
<td></td>
<td>0.170 0.110 0.335 0.082 0.000</td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td>≤ 0.05</td>
<td>RMSEA ≤ 0.05 indicates good model fit. RMSEA ≤ 0.08 indicates acceptable model fit.</td>
<td>0.040 0.038 0.002 0.064 0.049</td>
<td></td>
</tr>
<tr>
<td>GFI</td>
<td>≥ 0.90</td>
<td>Indexes the relative amount of observed variance and covariance accounted for by a model.</td>
<td>0.99 0.98 1.00 0.99 0.90</td>
<td></td>
</tr>
<tr>
<td>AGFI</td>
<td>≥ 0.80</td>
<td>GFI adjusted for degrees of freedom.</td>
<td>0.97 0.96 0.98 0.96 0.88</td>
<td></td>
</tr>
<tr>
<td>NFI</td>
<td>≥ 0.90</td>
<td>Compares proposed model with a null model. Tends to underestimate fit for small samples.</td>
<td>0.96 0.96 0.98 0.98 0.88</td>
<td></td>
</tr>
<tr>
<td>NNFI</td>
<td>≥ 0.90</td>
<td>Compares the lack of fit of a target model to the lack of fit of a baseline model.</td>
<td>0.97 0.98 1.00 0.97 0.94</td>
<td></td>
</tr>
<tr>
<td>CFI</td>
<td>≥ 0.90</td>
<td>NFI that takes sample size into account.</td>
<td>0.99 0.99 1.00 0.99 0.95</td>
<td></td>
</tr>
<tr>
<td>CN</td>
<td>≥ 200</td>
<td>Focuses on the adequacy of sample size in yielding adequate model fit.</td>
<td>560.41 413.53 1297.9 527.70 219.91</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Model Fit Indices