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Asset specificity, uncertainty and relational norms: an examination of coordination costs in collaborative strategic alliances

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Abstract

The paper draws on transaction cost and relational exchange theories to develop a model of the determinants of coordination costs in a collaborative contractual alliance. While some empirical research has examined certain dimensions of alliance performance, almost no studies have attempted to evaluate alliance performance by directly examining exchange costs. Data examining 393 original equipment manufacturer (OEM) supplier relationships that are governed by relational contracts found support for both the transaction cost and relational exchange perspectives. Asset specificity and environmental uncertainty directly increase coordination costs and, by altering the behavioral orientation of the alliance, relational norms lowered exchange costs.

Keywords: Transaction costs; Alliance performance; Relational exchange

1. Introduction

Firms are turning in increasing number to strategic alliances to help them compete. Yet, a number of researchers including Lyons et al. (1990); Cavinato (1992) argue that the costs of coordinating activities outweighs the benefits that these alliances can provide. A crucial question to be addressed then is, ‘what are the factors that determine these coordination

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costs?' Pilling and Zhang (1992) suggest that answering this question may be the key to allowing a firm to realize the potential gains from alliance involvement.

This paper examines the determinants of the cost of coordinating exchange between buyers and suppliers who rely on relational contracting, as described by Macneil (1980), to govern their exchange. Relational contracting highlights the importance of sociological factors such as the behavioral norms between transactors in determining the effectiveness of a governance mechanism. Accordingly, as Zaheer and Venkatraman (1995) point out, relational contracting implies that the cost of coordinating exchange is a function of both the actual type of structure underlying the transaction and the process by which the exchange partners interact.

We also adopt the perspective of Crocker and Masten (1991), who argue that contracts are 'extremely imperfect tools for controlling opportunism,' (p. 70). While relational contracts may mitigate some opportunistic behavior, significant residual opportunism may remain. Indeed, it is possible that transactors using relational contracts may incur significant ex-post bargaining costs as they periodically negotiate contract adjustments. Thus, relational contracts create two types of contracting costs; the ex ante costs of initially establishing the contract, and perhaps more significantly, the ex post costs of periodically renegotiating and adjusting those contracts. It is this latter type of cost that is the focus of this paper. Moreover, consistent with the arguments forwarded by Macneil and Zaheer and Venkatraman among others, we suggest that the extent and type of relational norms in an exchange are highly influential in determining the magnitude of these ex post bargaining costs.

While bargaining costs are critically important to both the relational exchange and transaction cost (Williamson, 1985) stories, few researchers have empirically examined the determinants of these costs. Rather, researchers such as Monteverde and Teece (1982); Masten (1984) who use the transaction cost framework have traditionally examined the impact of asset specificity or uncertainty on the decision to make or buy, without directly examining the costs of coordinating exchange. More recently, researchers such as Noordeweir et al. (1990) combined the transaction cost and relational exchange perspectives and changed the focus from predicting make or buy to other intermediate outcomes such as inventory turnover, buyer control, and a supplier's delivery performance. Other studies have investigated the role which relational contracting plays in the maintenance of exchange. Goldberg and Erickson (1987) found that relational norms such as information sharing and long-term reliance play an important role in the contracting practices in the petroleum coke industry. Crocker and Masten (1991) found that relational contracting is more likely to be used as a governance mechanism when uncertainty is high.

While these studies demonstrate the viability of relational contracting in influencing performance and maintaining exchange, none directly examines interfirm bargaining or 'transaction' costs (Williamson, 1985). There are at least two primary reasons why studies of relational contracting and the associated cost of conducting exchange have not been investigated more extensively. The first is that instead of one or two governance regimes, relational governance involves a continuous range of relational norms. Since as Dow (1987) states, 'the objective of transaction cost economics is to match governance structure to the attributes of the transaction in a discriminating way' (p. 15), transactors likely develop relational norms with the intent of minimizing bargaining costs stemming from asset specificity and uncertainty. Whether greater relational norms result in lower bargaining costs for firms

with the same level of specific assets and uncertainty is an empirical question about the outcomes of these multiple equilibria. If the relational contract itself reduces opportunism associated with asset specificity and uncertainty, but does not eliminate it, one would still expect to see asset specificity associated with high bargaining costs and, all else equal, relational norms associated with lower costs.

The second problem is that endogeneity and sample selection problems may complicate the estimation of bargaining costs as a function of governance. If one simply implies a relationship between governance and the costs of negotiating, it is possible that since governance is a choice of the firm, this choice could be the outcome of some other firm characteristic that is not independent from negotiation costs. A spurious relationship between negotiation costs and governance may result. Sample selection bias is a related but different problem. It arises from the need to differentiate between governance mistakes and those that are transaction costs minimizing governance choices (Masten, 1993).

This paper seeks to address the shortcomings in the existing literature by developing a model of the determinants of coordination costs between an *original equipment manufacturer* (OEM) and its external component suppliers. In addition, we employ statistical techniques to eliminate the problems of endogeneity and sample selection bias. By developing and testing our model, we evaluate whether transaction specific assets and environmental uncertainty directly increase coordination costs as suggested by TCE, and whether, as Macneil (1980) argues, relational norms can act to lower these costs.

2. Research model and hypotheses

2.1. Coordination costs: an operationalization

Although OEMs incur numerous costs when coordinating activities with their suppliers, this research focuses on one specific cost dimension, *OEM negotiation costs*. Formally, we define *OEM negotiation costs* as the resources expended by an OEM in negotiating changes to contracts with its existing suppliers. As defined by Rubin and Carter (1990), a negotiation refers to any situation in which a buyer and supplier bargain on the essentials of a purchase contract such as prices, delivery, specifications and so on to arrive at an agreement.

While a lack of consensus exists, many influential researchers place the costs of negotiating at the center of the total transaction costs of conducting exchange. For example, Williamson (1985) definition of transaction costs includes the cost of drafting and safeguarding contracts, and the ‘bargaining and haggling costs of moving contracts from x to y’ (p. 21). Moreover, Demsetz (1988), defines transaction costs as simply the ‘cost of negotiating’ between two parties (p. 151, note 5), and Dow (1987) argues that transaction costs are simply those costs that arise from the interfirm negotiations that occur as firms attempt to adapt to changing environments. Thus, as negotiations become more costly, the ability of the parties to rapidly adapt to changing conditions declines, damaging the long-term viability of the exchange.

Although contract negotiations result in a wide variety of costs such as travel expenses and computer time, Dobler et al. (1990) argue that the majority of costs tend to be labor-related. We, therefore, use a similar approach as that suggested by Anderson and Narus (1990) and use the amount of time the OEM spends preparing for and actually negotiating sup-

ply contracts and the extent of conflict in the negotiation as observable indicators of our dependent variable. It should also be noted that our measure of OEM negotiation costs seeks to examine the OEM's cost of negotiating adjustments to their existing contracts. Thus, we measure the costs of negotiation that occur after the initial contract is signed.

2.2. Theory development

Contracting. To predict OEM negotiation costs, we focus on two factors suggested by the transaction cost framework, transaction specific assets and environmental uncertainty. As Williamson (1985) points out, both of these factors increase the likelihood of opportunistic behavior by the transactors. To protect themselves, the parties to the exchange frequently develop some type of governance structure

To protect against the hazards of opportunism created by specific assets and uncertainty, the majority of exchanges between OEMs and their external suppliers are governed by the formal legal contract (Dyer, 1997). These contracts allow transactors to specify the obligations of the exchange such as price, quality, delivery schedules and the like. Crocker and Masten (1991) suggest that the more precise the contract specifications, the less likely it becomes that the specific terms of the contract will be violated. If one party does violate the terms of the contract, the other has the right to go to the courts to apply corrective action. The approach forwarded by Macneil (1978); Williamson (1979) provides a useful classification of contracts as either classical, neoclassical or relational in nature. Classical contracts are those where each transactor's responsibilities are explicitly specified in the document. Classical contracts are most efficient for those simple transactions where the terms of the exchange can be relatively easily defined, i.e., where uncertainty and asset specificity are low. As asset specificity and uncertainty increase, it becomes increasingly difficult for exchange partners to create complete contracts upfront that outline all terms of the exchange. Rather, transactors have additional incentives to write increasingly complex (i.e., neoclassic) contracts, that attempt to specify each party's behavior in the event of potential contingencies. These contracts, while providing additional flexibility are more costly to write, enforce and monitor, than the classic contract.

A third type of contracting between buyers and suppliers, and the one examined in this paper, is relational contracting. As enunciated by Williamson (1991), relational contracting replaces the assumption that contracting is discrete — i.e., between autonomous parties with limited communication; by the recognition that a relation reflects the characteristics of 'a mini-society with a vast array of norms beyond those centered on the exchange and its immediate processes,' (p. 238). Thus, relational governance is based on the proposition that economic exchange contains a significant social component as well, which is reflected in the behaviors and social relationships of the transactors (Macneil, 1978, 1980).

As described by Goldberg (1976), relational contracts do not attempt to spell out the complete set of terms and conditions for the entire contract term ex ante, but rather define a general process for periodic renegotiations to adjust price, quantity and the like over the life of the contract. Crocker and Masten (1991) state that the advantage of these relational contracts is that 'because they do not attempt to explore and stipulate responses to every possible event, such agreements are considerably simpler to draft than contingent claims

contracts, yet at the same time remain flexible in the face of changing circumstances.' Indeed, researchers studying the natural gas industry and Air Force procurement practices have found that these less structured, relational contracts are more likely to be utilized in response to uncertainty (Crocker and Masten, 1991; Crocker and Reynolds, 1993).

While relational contracts may lower ex ante contracting costs and improved relationship flexibility, it is important to note that transactors may still incur significant ex post bargaining costs as they attempt to negotiate periodic adjustments to those contracts. Indeed, as Goldberg (1976) points out, the primary emphasis of these contracts is not to attempt to mitigate all potential opportunism upfront by delineating all of the terms of the exchange (as would be the case in a classical contract). Instead, the emphasis is to define the process by which the terms of the contract can be adjusted over time. Thus, while the relational contracts may mitigate some of the potential for opportunism by defining the general terms of the exchange, enough residual opportunism continues to exist so that as Crocker and Masten state 'considerable scope may remain for exercising more subtle, though still costly, bargaining strategies' (p. 77).

Theory suggests then, that the effectiveness of a relational contract depends not only on the *structure* of the relationship, as reflected in the actual type of contract that controls the exchange, but also the *process* by which the relationship is managed (Zaheer and Venkatraman, 1995). Indeed, if the exchange partner's process of conducting periodic contract renegotiations results in extremely difficult negotiations, the transactors may find that their ex post negotiation costs may more than offset the flexibility advantages that the relational contract provides.

Relational norms. What then, are the process elements that can moderate the ex post bargaining costs? Scholars such as Macneil (1978, 1980); Dore (1983) have argued that the key to determining how efficiently contract renegotiations are carried out lies in the relational norms between the transactors. For example, the degree to which transactors engage in joint planning or their extent of interfirm information sharing, are process elements that determine the costs associated with periodically renegotiating contracts. Those transactors who have established behavioral norms that can simplify and smooth the renegotiation process can reasonably expect to incur lower ex post bargaining costs than those who have not.

It is important to note that while two OEM-supplier dyads may be governed by similar relational contracts, they may differ significantly in the extent and type of relational norms that support the contract. As Ring and Van de Ven (1992) point out, relational norms evolve over time, as exchange partners establish behavioral rules for processes such as conflict resolution, monitoring, joint problem solving, and the like. Since each specific buyer–seller relationship is unique, the manner in which they evolve, and the types of norms that are developed also differ between dyads (Dwyer et al., 1987). Thus, despite having similar relational contracts, and similar levels of asset specificity and uncertainty, two OEM-supplier dyads may incur different ex post negotiation costs because they have different relational norms supporting that contract.

While scholars differ on the specific relational norm examined, they generally agree that increasing the relational content of an exchange can act to encourage cooperation between transactors and thereby discourage opportunistic behavior (Goldberg and Erickson, 1987; Noordeweir et al., 1990). Thus, relational norms may act as an effective safeguard for specific assets by moderating the opportunism associated with those assets and thereby attenuating

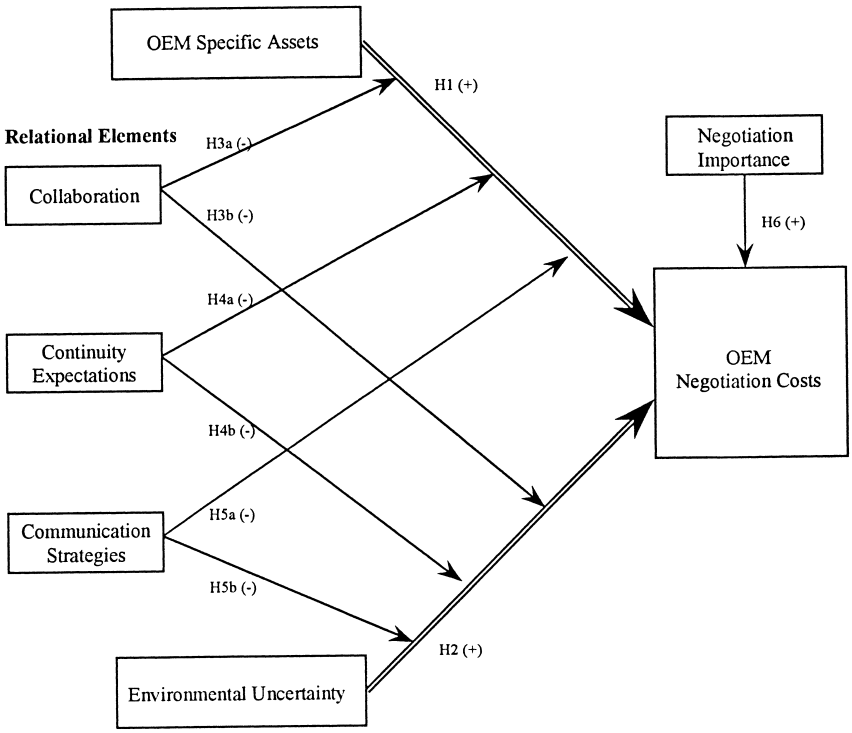

Fig. 1. Determinants of OEM negotiation costs.

their impact on *OEM negotiation costs*. Moreover, Shapiro (1985) argues that increasing relational norms encourages transactors to more closely coordinate their activities as their futures become increasingly intertwined. Thus, by promoting a long-term perspective, increasing the relational elements of an exchange can enhance relationship adaptability, and moderate the adverse impact of *environmental uncertainty* on *OEM negotiation costs*.

Three such relational norms are considered here: *collaboration* (e.g., Mohr and Spekman, 1994), *continuity expectations* (e.g., Heide and Miner, 1992), and *communication strategies* (e.g., Boyle et al., 1992). Preliminary field interviews indicated that these three dimensions have particular relevance in the OEM-supplier context.

Our hypothesized relationships are summarized in Fig. 1. The following description of the links in the model begins with the two dimensions identified by TCE. These identify the expected direct effects of these factors on *OEM negotiation costs* if no relational elements were in place and provide a benchmark by which to identify the effects of relational norms. Then we turn our attention to the three relational norms described previously.

2.3. Transaction cost factors

We focus on three types of asset specificity that are particularly relevant in the OEM-supplier context: human, physical and temporal specificity. As defined by Heide and John

(1992), human asset specificity addresses areas such as OEM technical knowledge specialized to a particular supplier's product, or the time and effort that goes into learning about a supplier's specific requirements. Physical asset specificity refers to items such as specialized production equipment, computer technology and related interorganizational systems that link OEM and supplier production and scheduling activities. Finally, as described by Masten et al. (1991) temporal asset specificity is concerned with the extent to which timely performance by a supplier is critical. The more timely performance becomes increasingly important the more difficult it is for the OEM to acquire the supplier's product from another supplier. As the difficulty of finding alternative suppliers increases, more committed the OEM is to the incumbent supplier.

While an OEM's investments in transaction specific assets can provide benefits by lowering product costs and improving product quality, TCE theory suggests that these assets can also negatively impact OEM performance. Specifically, as *OEM transaction specific assets* increase, an OEM's negotiation costs may also rise as it is increasingly willing to expend effort to establish contractual safeguards to protect its investment (Joskow, 1985). Furthermore, the dependence created by these assets may reduce the OEM's control over the supplier, thereby necessitating more bargaining and haggling before agreement is reached. Heide and John (1992) also argue that negotiation intensity may also rise as the OEM engages in more aggressive bargaining to attempt to achieve its objectives. Thus, consistent with one of the core premises of TCE, we expect to find support for the following hypothesis:

Hypothesis 1. *In the absence of relational norms, OEM transaction specific assets is positively related to OEM negotiation costs.*

Environmental uncertainty. Using the definition of Walker and Weber (1987), we define environmental uncertainty as the inability to predict changes in relevant factors surrounding the OEM-supplier exchange. As environmental uncertainty increases, different expectations and goals about future supply requirements develop. Consequently, the OEM and the supplier will likely desire different contract terms. For example, if a supplier is unable to accurately forecast the price of its product inputs, it will be reluctant to enter into a contract which locks it into a fixed price for an extended period of time. Rather, that supplier is likely to insist on negotiating agreements that address this price uncertainty and allow for periodic price adjustments (Crocker and Masten, 1991). Similarly, Walker and Weber argue that an OEM's inability to predict the demand for its end products makes it hesitant to commit to purchasing a specified quantity of a supplier's component. However, without this OEM commitment, the supplier will be hesitant to invest in production capacity for fear that it will be stuck with costly excess capacity if OEM sales do not materialize.

The above discussion suggests that *environmental uncertainty* makes it more difficult for the OEM and the supplier to negotiate contracts. Specifically, we expect that the exchange partners will spend more time and effort forging complex, detailed contracts that protect them from unfavorable environmental changes. Stated more formally, and consistent with a second core premise of TCE, we expect to find support for the following hypothesis:

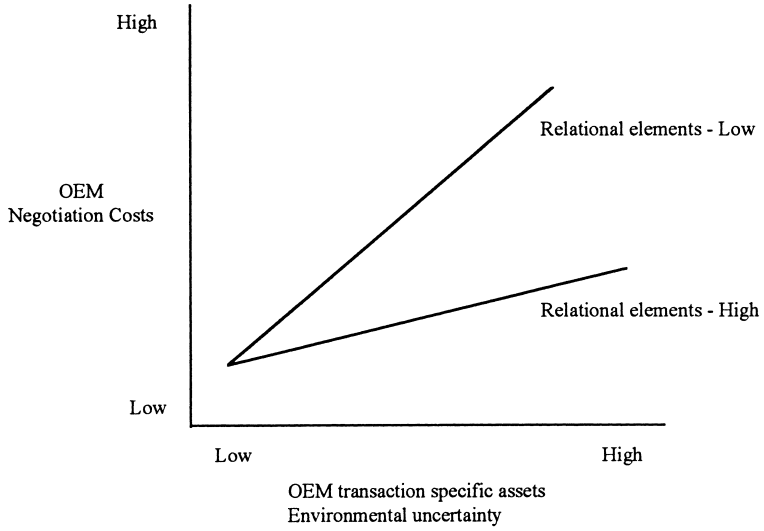

Fig. 2. Moderating impact of relational elements.

Hypothesis 2. *In the absence of relational norms, environmental uncertainty is positively related to OEM negotiation costs.*

2.4. Relational factors

The potential beneficial effect of relational norms has been recognized for some time. Research conducted by Noordeweir et al., (1990); Walker and Poppo (1991); Heide and John (1992), 1990, among others, suggests that as the three relational norms of *collaboration*, *continuity expectations*, and *communication strategies* become more prevalent, we will observe the following three behaviors:

co-operation will replace competition as the norm
opportunistic behavior will decline
relationship adaptability will increase.

Hence, we expect all the relational elements to moderate, and more specifically to reduce, the hypothesized positive relationship between *OEM transaction specific assets* and *environmental uncertainty* on *OEM negotiation costs*. Fig. 2 depicts the general hypothesized effect. An examination of each of the individual relational norms included in our model shows this link more clearly.

Collaboration. As enunciated by Heide and John (1992), collaboration refers to the willingness of the OEM and supplier to work together to create a positive exchange relationship and improve alliance performance. Collaborative actions can act to enhance the OEM–supplier relationship as a whole and curtail opportunistic behaviors. For example, joint planning and forecasting can allow both the OEM and the supplier to participate in determining each's roles and responsibilities and foster mutually beneficial expectations. Similarly, as Schuler, 1979 argues, bilateral efforts to share information on production requirements, future design changes and the like implies a more open and complete disclosure

of relevant information and fosters interfirm trust and cooperation. Thus, a high level of OEM-supplier *collaboration* provides a context which can improve performance. Furthermore, as Goldberg and Erickson (1987) argue, collaborative behaviors suggest a willingness of the exchange partners to focus on actions designed to enhance the relationship as a whole and discourage self-serving behaviors. Thus, the transactors are likely more willing to adapt to environmental changes by adjusting the terms of their contract. Thus, the time and effort the OEM spends negotiating detailed upfront contracts that cover a wide range of contingencies is reduced. These considerations suggest

Hypothesis 3a. *Investments in OEM transaction specific assets by an OEM increases OEM negotiation costs more when collaboration is low than when collaboration is high.*

Hypothesis 3b. *Environmental uncertainty increases OEM negotiation costs more when collaboration is low than when collaboration is high.*

Continuity expectations. According to Dwyer et al. (1987), *continuity expectations* concern the extent to which the OEM and the supplier expect the relationship to continue for the foreseeable future. Expectations of a long-term supply relationship can encourage cooperation by providing the opportunity for one alliance partner to retaliate if the other behaved opportunistically (Axelrod, 1984). Specifically, opportunistic behavior by one party in one period can be matched by opportunistic behavior by the other partner in the next. Similarly, cooperation can be met with cooperation. Following this logic, researchers such as Rappaport and Chammah (1965); Parke (1993) have found that while noncooperative behavior has been found to be the dominant strategy for discrete exchanges, the expectations of reciprocity encourage partners to cooperate in ongoing exchanges. In addition, Parke argues that when exchange partners expect a long-term relationship, they are increasingly willing to incur short term disadvantages since they are more confident that future opportunities to recoup their concessions will exist. Hence, *continuity expectations* may reduce the likelihood of opportunistic behavior, increase OEM-supplier flexibility, and lower negotiation costs. We hypothesize the following:

Hypothesis 4a. *Investments in OEM transaction specific assets by an OEM increase OEM negotiation costs more when continuity expectations are low than when continuity expectations are high.*

Hypothesis 4b. *Environmental uncertainty increases OEM negotiation costs more when continuity expectations are low than when continuity expectations are high.*

Communication strategy. Communication strategy refers to the type of communications the OEM and the supplier use in their bargaining sessions to try to influence the negotiations. The relationship between communication strategies and firm behavior has received considerable attention in the marketing channels literature. The approach adopted by Frazier et al. (1989); Frazier and Rody (1991) groups these strategies into either coercive or noncoercive communications. Negotiators using coercive communications attempt to achieve their desired goals by applying direct pressure with adverse consequences of noncompliance stressed. Examples of coercive communications include using threats or legalistic pleas, in which one party argues that compliance is required by the formal contract terms. When one firm attempts to coerce another in order to gain a more favorable negotiation

outcome, that firm is likely to be viewed by its alliance partner as exploitative rather than accommodative, and retaliatory behavior often results. Coercive communications promote opportunistic behaviors such as deliberately altering information, making promises that are never delivered, and outright lying — all of which lead to interfirm conflict (Frazier and Rody, 1991). Furthermore, coercion causes negotiators to become more rigid in their views, making adaptation to uncertainty more difficult (Cadotte and Stern, 1979).

In contrast, according to Boyle et al. (1992), noncoercive strategies attempt to persuade rather than demand. Noncoercive communications center on beliefs about business issues and involve little direct pressure. Examples include simple requests or recommendations, in which one party stresses the benefits the other party will receive by complying. Noncoercive negotiation strategies promote flexibility and accommodation and encourage the OEM and the supplier to work together to resolve problems (Frazier and Rody, 1991). Cooperation, rather than competition, becomes more prevalent, and the association moves from one in which the primary focus is on individual goals to one where joint interests become increasingly important.

The above arguments suggest that the type of negotiation communication used may significantly impact *OEM negotiation costs*. Although either coercive or noncoercive communications could be examined, in keeping with our position that relational elements act to moderate the impact of transaction specific assets and uncertainty, we focus on the 'good' type of communications. Specifically, we argue that the negotiators' use of noncoercive strategies reduces the likelihood of opportunism and improves the alliance partners' adaptive capabilities. Thus, we hypothesize the following:

Hypothesis 5a. *Investments in OEM transaction specific assets by an OEM increases OEM negotiation costs more when the use of noncoercive communications is low than when the use of noncoercive communications is high.*

Hypothesis 5b. *Environmental uncertainty increases OEM negotiation costs more when the use of noncoercive communications is low than when the use of noncoercive communications is high.*

2.5. Control variable

In addition to the above variables, one additional construct is included in our model, *negotiation importance*. Although not derived from the focal theories, it is potentially an important predictor of our dependent variable.

Negotiation importance refers to the extent to which the contract negotiation can impact OEM performance. Spekman (1988) points out that suppliers providing components which have a relatively large impact on the OEM's product cost or quality warrant more attention than other relationships. We argue that one of the ways in which this level of attention manifests itself is in the effort an OEM expends in its negotiations. More specifically, when the potential impact of a supply contract negotiation is large, we expect the OEM to devote more human and technical resources to insuring that the contract is appropriately structured than when the potential impact is small. Thus, we hypothesize the following:

Hypothesis 6. *Negotiation importance increases OEM negotiation costs.*

3. Research method and data

3.1. Sample and data collection

This study focused on the OEM's perspective of its relationship with one self-selected supplier. Since the individuals most responsible for managing suppliers are located in the OEMs purchasing function (Bhote, 1989), purchasing agents have frequently been used as a source of information by researchers examining interorganizational buying behavior (e.g., Perdue et al., 1986; Rubin and Carter, 1990). Consistent with this approach, surveys were sent to a random sample of 1400 purchasing managers and senior buyers from a national mailing list of purchasing agents. These individuals were located in OEMs in the SIC codes 35, 36, 37 and 38 (industrial and machining equipment, electronic and electrical machinery, computer equipment, and transportation machinery). Four hundred and and fifteen responses were received. After eliminating surveys with incomplete information and those in which the respondent indicated they had insufficient knowledge, the final sample size was 393.

Respondents were asked to select one major external component supplier that would serve as the referent in answering survey questions. Since we are interested in negotiation costs, we instructed respondents to only select suppliers with whom they negotiate periodic adjustments to their original agreement after the existing contract was signed. These include contracts such as a Fixed Price with Periodic Adjustment contracts (e.g., price redetermination) or incentive contracts (in which targets are periodically renegotiated). Similar to Crocker and Masten (1991), we limited respondents to report on less precise contracts in which parties defer decisions about price, quantity, and the like until well into the contract term, at which time specific terms are negotiated. Thus, we attempted to limit our respondents to reporting on supply relationships that were governed by relational contracts, as defined by Macneil (1978); Crocker and Masten (1991); Crocker and Reynolds (1993), among others.

Attempts were made to gather responses from multiple informants within the OEM. However, pre-survey field interviews with purchasing managers revealed that unless problems arise, only one individual interacts closely with a single supplier on an ongoing basis. In addition, even where multiple informants may have existed, purchasing managers expressed reluctance to commit more than one respondent to answer the survey. Consequently, we relied on data from a single informant in the OEM.

Although reliance on key informants is recognized as a limitation, we sought to insure that the informant possessed sufficient knowledge of negotiations with the focal supplier. This increases the reliability and validity of reports in several ways. First, only individuals with at least 2 years negotiation experience were asked to complete the survey. Second, only suppliers in which the respondent was either (a) the sole negotiator, or (b) the leader of the negotiation team were to be chosen. Finally, as suggested by Kumar et al. (1993), we formally assessed informant competency through survey items measuring the respondent's knowledge of the supplier that was reported on, and the extent of the respondent's involvement in negotiations with the supplier. Only respondents reporting a four or above (1–5 scale with 5 representing the highest knowledge and involvement) on both dimensions were retained for the final

sample (mean scores for respondent's knowledge and involvement were 4.5 and 4.7, respectively).

Respondents were asked to complete the survey in regards to all negotiations they have had with their chosen supplier over the preceding 2 years. This event window was chosen for two reasons. First, as indicated by Dobler et al. (1990), since contract negotiations usually occur at least annually, the 2 year horizon is long enough to reduce the likelihood that survey results are unduly influenced by one aberrant bargaining session. Second, pre-survey interviews indicated that informants would be able to accurately report on all negotiations over that period.

As suggested by Armstrong and Overton (1977) we compare early with late respondents to assess non-response bias. A series of *t*-tests were run to test for differences on the construct measures and various demographic variables. The only significant difference ($p < 0.05$) was a tendency for early respondents to be smaller than later respondents.

3.2. Measures

When constructing our measures, we examined factor loadings of the individual items and item-to-total correlations in order to determine which of the individual items were meaningfully correlated with the overall factors. Using the cut-off suggested by Pedhazur and Schmelkin, 1991, only those items with loadings above 0.5 were included in the final scale. The content validity of each multi-item measure was also considered in deciding whether to drop a particular item. Through this process, measures retained for analysis exhibited favorable reliability as well convergent and discriminant validity (Churchill, 1979). We evaluate the reliability of the respective measures using the internal consistency approach of Pedhazur and Schmelkin (1991). Internal-consistency reliability estimates were assessed through Cronbach's alpha. Although there is some disagreement about what constitutes acceptable levels of reliability, Nunally (1978) suggests that alpha coefficients of near 0.70 or above constitutes an 'acceptable' level of reliability. Sample survey items are shown in Appendix A.

OEM negotiation costs. Seven questionnaire items were used to measure *OEM negotiation costs*. These items describe the following three dimensions as developed by Kutschker (1985); Anderson and Narus (1990): (a) the amount of preparation time for the negotiation (b) the amount of time spent in actual negotiation and the number of bargaining sessions, and (c) the amount of conflict in the relationship. These dimensions were recorded on 5-point Likert scales ranging from 1, 'strongly disagree' to 5, 'strongly agree.' Factor analysis revealed that these items represented a unidimensional construct. Consequently, the unweighted individual item scores were summed to create our dependent variable. Cronbach alpha for this scale was 0.77.

OEM transaction specific assets. Ten items were used to describe the OEM's physical, human and temporal specificity. Responses were recorded on a 5-point Likert scale. Two factors were extracted from the data on the basis of a scree test of factor Eigenvalues. Similar to Anderson (1985), factor one consisted of seven items assessing physical assets, and personnel, knowledge and training that are specialized to the focal supplier. The coefficient alpha of this scale was 0.80. Factor two contained three items that attempted to measure temporal specificity. This scale exhibited poor reliability (alpha = 0.50) and was dropped

from further consideration. Thus, our measure of *OEM asset specificity* is represented by a seven item measure of OEM physical and human specificity.

Environmental uncertainty. This scale measures price and volume uncertainty. Specifically, it describes the OEM's inability to estimate prices for the focal supplier's product and its difficulty in forecasting expected demand. Six items were formed into a composite measure of *environmental uncertainty* (alpha = 0.81). These items are based on scales developed by Noordeweir et al. (1990); Miller (1993).

Collaboration. We constructed a measure of OEM-supplier *collaboration* from 12 items describing the following: OEM and supplier efforts to share information, the extent to which the alliance partners make efforts to assist one another, the amount of joint planning and problem solving and the extent to which the parties share the responsibility for maintaining the relationship. These survey items were adapted from scales used by Kaufmann and Stern (1988); Noordeweir et al. (1990); Heide and John (1992); Mohr and Spekman, (1994). The alpha coefficient for this measure is 0.86.

Continuity expectations. This scale was measured in the manner of Heide and Miner (1992) by three items assessing the extent to which the alliance partners expect the present relationship to continue for the foreseeable future. Cronbach alpha for this scale was 0.83.

Noncoercive communications. To measure *noncoercive communications*, a three item scale was developed measuring one specific type of noncoercive communications, *recommendations* (alpha = 0.84). *Recommendations* are negotiation communications that emphasize the benefits one party would receive by complying with the other's request. As indicated by Boyle et al. (1992), recommended courses of action by one firm that are aimed at increasing the other's success emphasize the former's commitment to the relationship and are expected to simplify negotiations.

Negotiation importance. This scale was measured by the following three items: (1) the potential impact of the contract negotiation on OEM performance and (2) the impact of the supplier's component on OEM end product quality, and (3) the log of the total dollar purchases from the supplier. It is based on scales used by Dant and Schul (1992); Heide and Miner (1992). The alpha coefficient for this scale was 0.67.

3.3. Analysis

The core model we use is derived from hierarchical regression analysis as described by Pedhazur and Schmelkin (1991). Before testing the significance of the individual interaction terms in our model, it is important to assess the overall impact of the group of moderators. Unless these moderators as a group contribute significantly to the model's predictive power, any observed relationship for individual terms in a set of data may be simply due to random fluctuations (Cohen, 1978; Arnold, 1982; Pedhazur, 1982). Hierarchical regression allows us to test the notion that, when examined as a group, the relational interaction variables significantly increase the predictability of the overall regression model.

We began by regressing *OEM negotiation costs* on only the direct effects of the variables of interest. The model with only linear direct effects takes the following form

$$OEM \text{ Negotiation costs} = \beta_0 + \beta_1 \text{ OEM transaction specific assests}$$
$$+\beta_2 \text{ environmental uncertainty} + \beta_3 \text{ collaboration} + \beta_4 \text{ continuity expectations}$$
$$+\beta_5 \text{ recommendations} + \beta_6 \text{ negotiation importance} + \varepsilon$$

The R^2 of this reduced model was 0.359. We then estimated a full model that included both the direct and interaction terms. Specifically, the relational elements of interest here, *collaboration*, *continuity expectations* and *recommendations*, were entered both as a direct effect and in multiplicative terms with the *OEM transaction specific assets* and *environmental uncertainty* variables. Despite the expected nonsignificant direct effects of the relational variables, Cohen and Cohen (1975) indicate that partialling the direct effect from the product term is essential when testing for interaction effects. The R^2 of the full model was 0.416. The significant change in R^2 between the full and reduced model ($F = 5.41$, $p < 0.001$) provides support for the claim that the three relational moderators act to significantly influence OEM negotiation costs. Thus, the full model will be used to test our hypotheses.

We are also concerned about the possibility of spurious results due to endogeneity and sample selection in our model. Endogeneity of governance could result in the following type of problem. Suppose a supplier is a particularly difficult party to work with and this is for reasons that are independent of the relationship under investigation. Then negotiation costs would be high with this supplier, and it would be unlikely that relational norms such as collaboration, etc., would be successful with this supplier. As a result, it might appear that relational norms, when present, are negatively related to negotiation costs, but this would not be due to the governance conditions causing lower negotiation costs. To address this concern, we have estimated a two stage recursive model in which relational governance is first estimated as a function of asset specificity, uncertainty and dependency characteristics of the supplier (Kennedy, 1987: 137). This predicted governance is therefore only a function of known characteristics of the exchange. It therefore removes the endogeneity issue whereby unobserved characteristics cause both governance conditions and negotiation costs. These predicted governance variables are then used as direct effects and as interactive effects in the second stage of the model in which negotiation costs are estimated.

Another concern is that there could be sample selection bias. In this case, it is important to distinguish between governance characteristics that match the underlying conditions of specific assets and uncertainty in contrast to those that do not have the expected match. Without controlling for mistakes in governance conditions, a choice of the firm, one might not be estimating the true relationship between correct governance choices and performance. To address this we estimate a two-stage switching regression model, similar to one estimated in Masten et al. (1991); Masten (1993). In this model, the relational governance variables are dichotomized at the mean value. A probit estimation is then used in the first stage. In the second stage, negotiation costs are estimated as a function of asset specificity, uncertainty, and importance in combination with the inverse mill's ratio, lambda, from the first equation as suggested by Maddala (1983). The inverse mill's ratio is a correction for the presence of selection bias in the sample.

In order to estimate the two stage models, we need to get a good instrument for relational governance in the first stage in order to represent its effects in the second stage. To estimate relational governance we use some exogenous variables that are currently in the negotiation

cost equation: OEM specific assets, environmental uncertainty and negotiation importance. We also add several variables. These variables are Depend1, Depend2 and Import1. These represent the dependence of the OEM on the supplier or the importance of the supplier — all exogenous variables identifying the presence of asset specific characteristics of the exchange. They are defined as follows:

Depend1 The extent to which the OEM would experience negative financial repercussions if its relationship with the supplier ended.

Depend2 An overall assessment by the OEM of how dependent it is on the supplier.

Import1 The percentage of the end value of the OEM's product that is accounted for by the supplier's component.

A separate OLS equation is used to estimate an instrument for the following relational governance variables: (1) Collaboration, (2) Continuity Expectations and Noncoercive communication. The general form for the first stage estimation for each type of Relational Governance is thus

$$\begin{aligned}\text{Relational governance} = {} & \text{Constant} + \text{OEM specific assets} \\ & + \text{Environmental uncertainty} + \text{Negotiation importance} \\ & + \text{Depend1} + \text{Depend2} + \text{Import1}\end{aligned}$$

4. Results

These instruments, or predicted variables, are then used as the variables representing each form of relational governance in the second, negotiation cost equation.

Table 1 gives means, standard deviations and correlations for the study variables. The regression assumptions were tested for normality of the residuals and for outliers. The maximum variance inflation factor between any two variables in the model was 1.43. This statistic is well below the guideline of 10 which Neter et al. (1990) suggests as indicative of a multicollinearity problem.

We estimate two models in addition to the hierarchical regression to investigate the robustness of results: a recursive model and a switching regression model. The results with the recursive model, designed to address the endogeneity of governance variables, are very similar to the original model (See comparison in Table 2). This occurs even though the R^2 for the first stage of this analysis, which is an estimate of relational governance

Table 1
Descriptive statistics and correlations

Variables	Means	SD	1	2	3	4	5	6
1. OEM negotiation cost	18.53	4.99	0.30***					
2. OEM specific assets	15.07	5.52	0.48***	0.28***				
3. Environmental uncertainty	15.38	3.38	−0.15**	0.11*	0.02			
4. Collaboration	47.40	7.11	−0.27***	0.01	−0.15	0.44***		
5. Continuity expectations	13.13	2.03	−0.16***	0.11*	0.13**	0.23***	0.20***	
6. Noncoercive comm.	6.35	2.27	0.10*	0.19***	0.07**	0.25***	0.25***	0.21***
7. Negotiation importance	8.75	1.28						

Table 2
Results of hierarchical regression analysis: effects on OEM negotiation costs

Variable	Regression analysis on TOTCOST	Recursive regression on TOTCOST (using predicted values of governance variables)
	β	β
Constant	17.261*** (0.001)	48.24*** (0.001)
OEM specific assets — ASSETS	0.154*** (0.001)	3.37** (0.01)
Environmental Uncertainty UNCERT	0.453*** (0.001)	2.18** (0.01)
Collaboration COLLAB	−0.065** (0.03)	−0.69* (0.05)
Continuity expectations CONT	−0.598*** (0.001)	−0.41** (0.01)
Noncoercive communication RECOMEND	−0.188** (0.04)	−0.25* (05)
Negotiation importance IMPORT	1.088*** (0.001)	1.72*** (0.001)
COLLAB × ASSETS	−0.043** (0.03)	−0.04** (0.01)
COLLAB × UNCERT	0.002 (0.77)	−0.016 (0.58)
CONTINUE × ASSETS	−0.067** (0.004)	−.49* (0.04)
CONTINUE × UNCERT	−0.038 (0.32)	−0.06 (0.43)
RECOMEND × ASSETS	−0.033* (0.05)	−0.08 (0.29)
RECOMEND × UNCERT	0.022 (0.89)	−0.05 (0.66)
Adjusted R^2	0.416	0.32

variables Collaboration, Continuity Expectations, and Noncoercive communications, is in the range of 0.25–0.11 (Table 3). We also estimate negotiation cost as a function of each relational governance variable separately, including its interactions with asset specificity and uncertainty. This allows us to compare the continuous versions of the models and the models which correct for selection bias (Table 3).

We estimate the switching regression model to correct for sample selection bias even though by changing our continuous governance variables to dichotomous governance variables we are losing some information. From these models (Table 4), one can see that the inverse mill's ratio is not significant. It has a very high standard error, coincident with the constant term, which indicates it is essentially a proxy for the constant term. A graphical presentation of the inverse mill's ratio also confirms that it is co-linear with the constant term. It would seem that on this basis, one could drop the inverse mill's ratio correction.

In the switching regression model, the asset specificity and uncertainty variables, while having very similar sign, are less significant than in the uncorrected OLS reported for the same samples (Table 4). We do these switching regression models in the context of each governance variable separately because splitting each governance variable at its mean results in a different sample. Following Masten et al. (1991), we also compare these estimates to the similar estimation without the switching regression but on the same sample. We do not find much evidence that the correction for sample selection changes our results.

Since our original model is based on continuous variables we prefer to discuss the original model, and the endogeneity two-stage recursive correction for that model in our findings. Results of the hierarchical regression analysis are shown in Table 2, as are the recursive findings. Since the recursive findings are the same as the OLS model, with the exception of one coefficient that is no longer significant in the recursive model, we discuss the findings for the OLS model, and point out this one exception as a limitation.

Table 3
Recursive models compared to OLS models

Variable	Regression on TOTCOST		Regression on COLLAB	
	Recursive model	OLS model	OLS model	
	β	β	Variable	β
Constant	25.59**** (0.001)	17.72**** (0.001)	constant	21.07**** (0.001)
COLLAB	−0.43**** (0.001)	−0.12*** (0.002)	ASSETS	0.57 (0.17)
COLLAB × ASSETS	−0.002**** (0.001)	−0.008* (0.07)	UNCERT	0.12 (0.25)
COLLAB × UNCERT	0.01**** (0.001)	0.006 (0.48)	IMPORT	0.36** (0.05)
IMPORT	1.22**** (0.001)	1.54**** (0.001)	DEPEND1 (new)	1.68**** (0.001)
			DEPEND2 (new)	0.33** (0.03)
			IMPORT1 (new)	0.53* (0.07)
Adjusted R^2	0.32	0.13	adjusted R^2	0.24
			Regression on CONT	
Constant	23.51**** (0.001)	22.65**** (0.001)	Constant	8.03**** (0.001)
CONT	−1.33**** (0.001)	−0.81**** (0.001)	ASSETS	0.04 (0.35)
CONT × ASSETS	−0.008*** (0.002)	−0.06*** (0.009)	UNCERT	0.09**** (0.001)
CONT × UNCERT	−0.04**** (1.10)	−0.03 (0.51)	IMPORT	0.06 (0.21)
IMPORT	1.10**** (0.001)	1.54**** (0.001)	DEPEND1 (new)	0.11**** (001)
			DEPEND2 (new)	0.07 (0.04)
			IMPORT1 (new)	0.20*** (0.005)
Adjusted R^2	0.30	0.21	adjusted R^2	1.25
			Regression on RECMEND	
Constant	1.56 (045)	13.13**** (0.001)	constant	12.58**** (0.001)
RECMEND	−0.32 (021)	−0.18* (0.07)	ASSETS	0.002 (0.61)
RECMEND × ASSETS	−0.02**** (0.001)	−0.03* (0.08)	UNCERT	−0.07 (0.06)
RECMEND × UNCERT	−0.09**** (0.001)	−0.04 (021)	IMPORT	0.34* (0.10)
IMPORT	1.79**** (0.001)	1.37**** (0.001)	DEPEND1 (new)	0.16** (0.04)
			DEPEND2 (new)	0.04** (0.03)
			IMPORT1 (new)	0.17*** (0.005)
Adjusted R^2	0.35	0.11	adjusted R^2	0.11

*$P \leq 0.001$; **: $P \leq 0.05$; ***: $P \leq 0.01$; ****: $P \leq 0.001$.

As expected, OEM investments in specialized assets is significant (0.01) and in the expected direction, confirming the positive relationship between *OEM transaction specific assets*and *OEM negotiation costs*.

Hypothesis 2 examines whether an OEM's negotiation costs are related to *environmental uncertainty*. The positive relationship between *environmental uncertainty* and *OEM negotiation costs* is highly significant (0.001). It suggests that, as expected, higher levels of *environmental uncertainty* increase the difficulty the OEM experiences in negotiating supply contracts.

We investigate the ability of each of the three relational elements to moderate the impact of *OEM transaction specific assets* and *environmental uncertainty* on *OEM negotiation costs* in Hypotheses 3a, 3b, 4a, 4b, 5a, 5b. Overall, the regression analysis indicates that the addition of these interaction terms has a statistically significant (0.001) joint effect on

Table 4
Tests for selection bias

Variable	Sample with Collab = 0 ($N = 169$)		Sample with CONT = 0 ($N = 136$)		Sample with RECMEND = 0 ($N = 218$)	
	Corrected OLS	Uncorrected OLS	Corrected OLS	Uncorrected OLS	Corrected OLS	Uncorrected OLS
	β	β	β	β	β	β
Constant	9.42 (0.94)	5.13**** (0.001)	30.91 (0.88)	4.27**** (0.001)	40.00 (0.69)	5.67**** (0.001)
Assets	0.86 (0.93)	0.13** (0.020)	0.04 (0.97)	0.26**** (0.001)	0.04 (0.92)	0.58**** (0.001)
Uncertain	0.08 (0.99)	0.56**** (0.001)	1.85 (0.81)	0.49**** (0.001)	−0.29 (0.91)	0.53**** (0.001)
Import	1.27 (0.93)	1.89**** (0.001)	0.24 (0.97)	1.58**** (0.001)	3.01 (0.81)	0.93**** (0.001)
Lambda	11.44 (0.94)		−24.58 (0.86)		42.21 (0.74)	
Adjusted R^2	0.320	0.320	0.39	0.39	0.28	0.27
	Sample with Collab = 1 (N =181)		Sample with CONT = 1 (N = 214)		Sample with RECMEND = 1 ($N = 218$)	
	Corrected OLS	Uncorrected OLS	Corrected OLS	Uncorrected OLS	Corrected OLS	Uncorrected OLS
Constant	5.89 (0.89)	4.51*** (0.002)	5.41 (0.34)	5.73**** (0.001)	9.85 (0.91)	3.90*** (0.002)
Assets	0.31 (0.92)	0.11** (0.03)	0.06 (0.71)	0.05 (0.25)	0.27 (0.87)	0.21**** (0.001)
Uncertain	0.77 (0.75)	0.51**** (0.001)	0.39 (0.69)	0.45**** (0.001)	3.66 (0.91)	0.49**** (0.001)
Import	0.45 (0.91)	0.71*** (0.003)	0.92 (0.34)	0.87**** (0.001)	19.93 (0.91)	1.49*** (0.004)
Lambda	−6.62 (0.90)		1.27 (0.95)		−124.84 (0.91)	
Adjusted R^2	0.310	0.310	0.23	0.23	0.32	0.32
	Prohibit model of COLLAB	OLS model of COLLAB	Prohibit model of CONT	OLS model of CONT	Prohibit model of RECMEND	OLS model of RECMEND
Constant	1.56 (0.001)	21.07**** (0.001)	0.88**** (0.001)	8.03**** (0.001)	1.65**** (0.001)	12.58**** (0.001)
Assets	0.001 (0.77)	0.57 (0.17)	0.004 (0.54)	0.04 (0.35)	0.002 (0.69)	0.002 (0.61)
Uncertain	0.010 (0.20)	0.12 (0.25)	−0.03**** (0.001)	0.09**** (0.001)	−0.002* (0.05)	−0.07* (0.06)
Import	0.023 (0.36)	0.36** (0.05)	0.14 (0.46)	0.06 (0.21)	0.05* (0.08)	0.34* (0.10)
Depend1	0.11*** (0.01)	1.68**** (0.001)	0.02** (0.02)	0.11**** (0.001)	0.03 (0.11)	0.16** (0.04)
Depend2	0.018 (0.11)	0.33** (0.03)	0.013 (0.21)	0.07 (0.04)	0.008* (0.07)	0.04** (0.03)
Import1	0.69** (0.02)	0.53* (0.07)	0.86*** (0.01)	0.20*** (0.005)	0.04** (0.04)	0.17*** (0.005)
Adjusted R^2	0.21	0.24	0.20	0.25	0.06	0.11

*$P \leq 0.10$; **: $P \leq 0.05$; ***: $P \leq 0.01$; ****: $P \leq 0.001$.

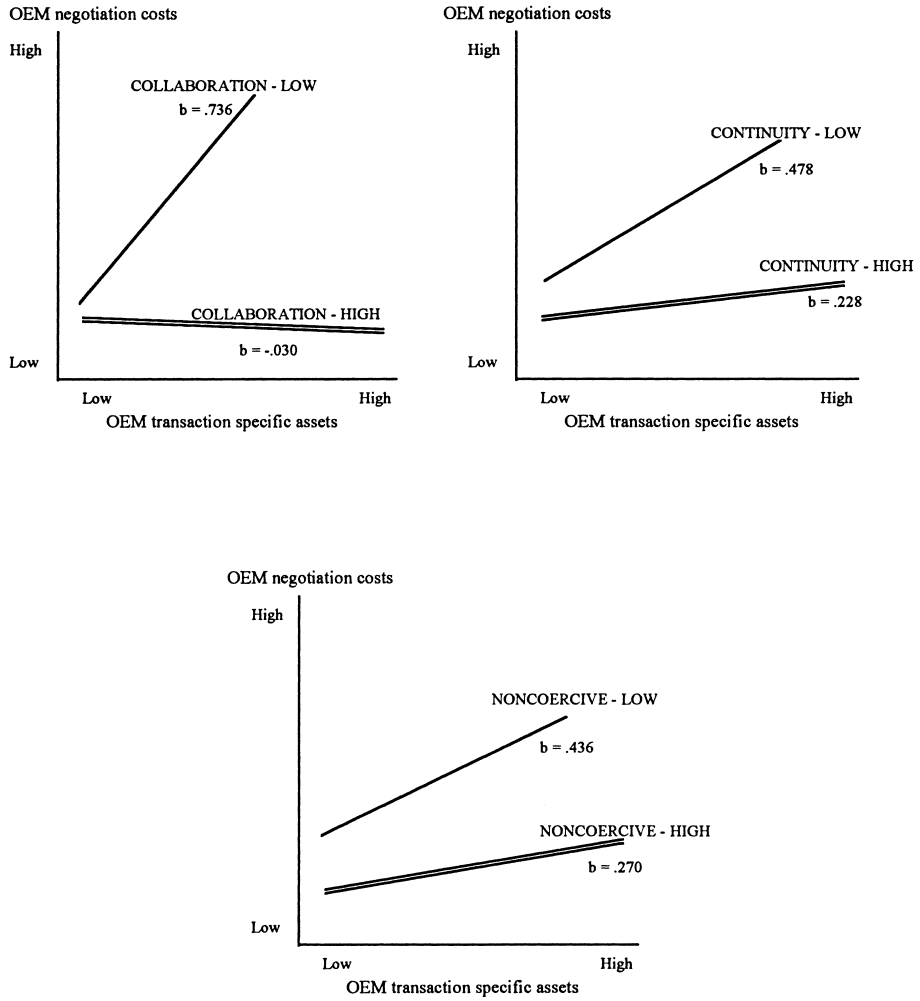

Fig. 3. OEM negotiation costs as a function of OEM specific assets are relational elements.

OEM negotiation costs. Within this group, all three relational elements, i.e., *collaboration* (0.001), *continuity expectations* (0.001) and *noncoercive communications* (0.05) negatively interacts with OEM specific assets. Thus, our findings provide strong support for Hypotheses 3a, 4a and 5a. The only example of a changed result from the recursive estimation is that *noncoercive communications* when interacted with OEM specific assets, is no longer significant in this model and so there is no support for Hypothesis 5a. The form of each of these interactions is shown in Fig. 3. Since this research evaluates a bilinear interaction, the nature of the relationship is revealed by calculating the slope of *OEM negotiation costs* on *OEM transaction specific assets* at high and low levels of each of the respective moderator variables. As suggested by Cohen and Cohen (1975), high and low values for the moderators are set at one standard deviation above and below each variable's mean.

The influence of relational elements on *environmental uncertainty* is investigated in Hypotheses 3b, 4b and 5b. Although the beta coefficients are in the expected direction on two of the three product terms, none of these are significant. Therefore, our findings provide no support for Hypotheses 3b, 4b and 5b.

It should also be noted that even though no formal hypotheses are presented for the direct effects of relational elements on *OEM negotiation costs*, the beta coefficients for these direct effects are not without information. Specifically, *collaboration*, *continuity expectations*, and *noncoercive communications* are all found to have strong, negative direct effects on *OEM negotiation costs*. These findings provide substantial evidence that, in addition to any moderating effects they may have, the relational elements also play a direct role in reducing *OEM negotiation costs*.

Hypothesis 6 asserts that the more important a negotiation in terms of its potential impact on end-product quality and OEM profitability the more costs an OEM would be willing to incur in the negotiations. Hence, a positive relationship is hypothesized. This hypothesis is strongly supported (0.001).

5. Discussion

This study makes a valuable contribution by focusing directly on the moderation of traditional transaction cost arguments by the presence of relational norms. It empirically validates that these relational norms reduce *OEM negotiation costs*. The results reinforce and extend previous transaction cost research to incorporate cooperative forms of exchange in two ways: (1) it directly examines the costs of conducting exchange in a collaborative strategic alliance (rather than on the decision to make or buy as an unobserved reflection of those costs), and (2) it shows that these costs are reduced when relational norms are present.

First, in support of the traditional TCE research, we find that both *OEM asset specificity* and *environmental uncertainty* directly increase the cost of conducting interfirm exchange. While this finding is clearly consistent with previous TCE research examining vertical integration decisions (e.g., Monteverde and Teece, 1982; Masten, 1984; Anderson, 1985), those studies only assumed that cost increases led to the decision to make rather than buy a component. By showing that these established constructs directly increase *OEM negotiation costs* in the expected way, we identify the intermediate mechanism prior to the make or buy decision. In addition, this establishes a benchmark that is consistent with previous research, which we can then use to investigate the effect of relational norms on *OEM negotiation costs*.

Second, the study finds that all the relational norms, i.e., *collaboration*, *continuity expectations*, and *noncoercive communications*, effectively reduced the impact of *OEM asset specificity* on *OEM negotiation costs*. This finding supports the argument made by others such as Macneil (1980); Ring and Van de Ven (1992) that these behaviors, based on the assumption of trust and cooperation, play a significant role in the maintenance of purchasing alliances. Our findings extend those of Heide and John (1992). While they found links between relational norms and buyer control, our findings show empirical support for the link between similar relational norms and negotiation costs. Without this extension of Heide and John (1992), one would not know whether relational elements impact the costs of conducting exchange, as is hypothesized in the TCE framework.

Our results also illustrate that simply adopting an appropriate governance structure may not necessarily minimize bargaining costs, but that these costs are dependent on the behavioral aspects of the relationship as well. Specifically, our results reveal that OEM negotiation costs differ across dyads as a result of the relational norms that are present, even though all relationships we examine are governed by similar relational contracts. Thus, our findings are supportive of those by Zaheer and Venkatraman (1995) among others, who argue that investigations of governance include both a structural and a process view.

The beneficial effect of relational norms does not extend to reducing *OEM negotiation costs* stemming from *environmental uncertainty*. One possible explanation for this non-significant finding may be that the *environmental uncertainty* faced by firms in this study is too low to allow relational norms to moderate its influence. This rationale is consistent with the Noordeweir et al. (1990) study which finds beneficial effects of relational norms at high levels of uncertainty, but not at low levels.

It is also interesting to note that all of the relational norms were found to have negative direct effects in addition to their moderating effects (Table 2). Thus, the benefit of relational norms is not necessarily limited to a moderating role but rather acts independently to increase cooperation and adaptability and lowers the cost of coordinating exchange.

The positive relationship between *negotiation importance* and *OEM negotiation costs* confirms the expectation that OEMs place more emphasis on managing important suppliers than they do on managing important suppliers.

6. Conclusions

These findings respond to Hill (1990) call for more research directed at understanding long term cooperative relationships between independent firms. Like previous contributions to research on relational norms within the TCE framework, this study focuses on outcomes which are antecedent to choices such as make or buy decisions. It uses the negotiation costs incurred by OEMs as its outcome variable rather than intermediate outcomes such as buyer control (Heide and John, 1992), because there is a closer correspondence between this construct and transaction costs as defined by Williamson (1985). It extends the research of Noordeweir et al. (1990) by including both the primary dimensions of uncertainty and specific assets as dimensions which are moderated by relational norms. It, thus, captures a broader set of the means by which relational norms can influence transaction costs. It also examines these in a statistical context which controls for endgoneity through our recursive estimation procedure.

Our validated model reveals the richness of these collaborative relationships and emphasizes the need to accommodate complexity among factors in future discussions. Unlike theoretical discussions or experimental studies where factors are considered independently of each other, we find numerous significant relationships among the exogenous variables. Hence, in addition to its contribution to the respective TCE and relational exchange theories, this research illustrates the merit of the call by Hansen and Wernerfelt (1989); Zaheer and Venkatraman (1995) to use a multitheoretical approach to create a more comprehensive conceptualization of interorganizational relationships.

Our research also responds to calls (e.g., Smith et al., 1995; Zaheer and Venkatraman, 1995) for more research that examines the outcomes of cooperation. Here, cooperation, in

the form of collaboration between the OEM and the supplier, has a clear and positive impact on one important dimension of OEM-supplier performance, i.e., the costs of coordinating activities across the dyad.

While the findings of our study provide valuable insights, several future research directions are apparent. For instance, TCE argues that relational governance emerges as a safeguard for a firm's investment in transaction specific assets (Williamson, 1985). Though the findings of this study are generally supportive of this argument, it is plausible that a reverse sequence of events is operating and that the existence of a close relationship is an antecedent to asset specific investments. However, the cross-sectional nature of our study makes it difficult to ascertain which interpretation most accurately reflects the actual process of investment and relationship development. Even structural equation models of cross-sectional data cannot unambiguously sort out the temporal sequence. Ultimately, as suggested by Keith et al. (1990), issues such as these are best studied using longitudinal data.

While our study highlighted the role played by relational norms in reducing costs, an interesting question remains. How robust is the beneficial influence of these behavioral norms? For example, in the case of asset specificity, even though relational elements are found to moderate the impact of these assets on costs, their ability to moderate these costs is based on OEM and supplier expectations of a long term relationship — the shadow of the future (Hill, 1990). In contrast, if the exchange occurred within the same firm, it would be moderated by the force of organizational authority (Dow, 1987). As pointed out by Walker and Poppo (1991), increases in asset specificity raise the potential gain from opportunistic behavior. At some point, the benefit from behaving opportunistically may cause basic OEM-supplier incompatibilities to arise, thereby putting pressure on relational contracting practices and perhaps restricting their ability to continue to deter self-serving behaviors. This path of inquiry highlights at least three interesting research questions: (1) what is the level of asset specificity and/or environmental uncertainty at which relational elements can no longer function as an effective governance mechanism?; (2) other than relational norms, what mechanisms exist that can be used to discourage opportunistic behavior and encourage a productive interfirm exchange?; and (3) rather than focusing exclusively on internal relational elements such as the ones considered here, how effective are external factors suggested by Anderson and Weitz (1989), such as reputation effects, in deterring opportunistic behavior?

The positive correlation between *OEM asset specificity* and *environmental uncertainty* also raises interesting questions. Specifically, anecdotal evidence suggests that uncertainties stemming from increased competition, shorter product life cycles, and greater technological complexity are leading OEMs to align themselves more closely with their chosen suppliers (Clark, 1989; Helper, 1991). To facilitate these closer ties, OEMs can make specialized investments such as production technologies, joint R&D activities and the like. Thus, *environmental uncertainty* may sometimes actually be the catalyst driving OEM specific asset investments.

Future research would also benefit from collecting data from both the buyer and supplier perspectives, rather than focusing solely on one side of the dyad as was done in this research. While steps were taken to attempt to minimize this problem, it is conceivable that different results may have been obtained if the supplier's perspective had also been integrated into our analysis.

Appendix A. Sample survey items

A.1. Dependent variable

OEM negotiation costsThe following items are recorded on a 1 (strongly disagree) to 5 (strongly agree) Likert scale.

On average, negotiations with this supplier require extensive preparation time.

It does not usually require very much negotiation time to reach agreement with this supplier on contract terms. (Reverse-coded)

On average negotiations with this supplier require numerous separate bargaining sessions.

It is difficult to reach agreement with this supplier on negotiation items.

The parties involved in the negotiation between our firm and this supplier become agitated with each other.

A.2. Independent variables

OEM transaction specific assets (1–5 Likert scale)

We have made significant investments in tooling and equipment dedicated to this supplier

Qualifying this supplier has involved substantial commitments of time and money

The supplier's product requires technical skills that are unique to this supplier

Environmental uncertainty (1–5 Likert scale)

Price estimates for this supplier's product are difficult to predict

The market for the end product that uses this supplier's component is highly volatile

It is difficult to estimate the expected volumes for the supplier's component

Collaboration (1–5 Likert scale)

We share proprietary information with this supplier

We participate in joint goal setting and forecasting with this supplier

This supplier does not seek our advice or counsel (reverse-coded)

Continuity (1–5 Likert scale)

Both our firm and this supplier expect our relationship to last a long time

Noncoercive communications/recommendations (1–5 Likert scale)

Negotiations with this supplier stress the benefits each party will receive by accepting the other's terms

When negotiating with this supplier, we make it clear how the requests we make will benefit its business

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