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Formal governance mechanisms, relational governance mechanisms, and transaction-specific investments in supplier–manufacturer relationships

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Abstract

This study addresses the question of how to design governance mechanisms so that local suppliers are encouraged to make transaction-specific investments in foreign manufacturing firms. Suppliers' transaction-specific investments can increase the efficiency of production for foreign manufacturing firms operating in a host country. However, it can be difficult to induce suppliers to make specialized investments, because of the numerous hazards associated with such investments. Basing its conclusions on the results of a survey of Taiwanese firms using Chinese suppliers, this study examines the effectiveness of both formal governance mechanisms (i.e., contractual agreements and financial commitments) and relational governance mechanisms (i.e., calculative and benevolent trust) in inducing suppliers to make specialized investments. We find that both formal governance and relational governance mechanisms affect suppliers' tendencies to make specialized investments. Additionally, we find that calculative trust acts as a moderating factor in the relationship between formal governance mechanisms and transaction-specific investments.

Keywords: Formal governance mechanisms; Relational governance mechanisms; Transaction-specific investments; Supplier–manufacturer relationships

1. Introduction

Manufacturing firms making foreign direct investments cannot simply enter a foreign country and commence the effortless exercise of their proprietary advantages (Buckley & Casson, 1976). Rather, to enhance their ability to compete, they must work at the complex and sometimes delicate task of establishing cooperative relationships with suppliers in host countries (Dyer, 1996). When local suppliers make transaction-specific investments in manufacturing firms—showing their willingness to cooperate with these firms—the overall efficiency of production is improved.

Transaction-specific investments are those investments intended to support a specific manufacturer—supplier relationship. For example, a supplier might invest in specialized tools or equipment to produce customized or idiosyncratic components for a manufacturing firm. However, transaction-specific investments are not without cost for suppliers; that is, transforming these investments into other relationships of similar value can be tricky. If a manufacturing firm chose to terminate such a cooperative relationship, a supplier could very well incur an irrevocable loss, owing to the difficulty of recouping the loss of its investments. The purpose of this study is to explore the factors which induce a supplier to make transaction-specific investments, thus satisfying the needs of the relevant manufacturing firm.

In most transaction cost economics (TCE) research (i.e. Williamson, 1985), the characteristics of transaction-specific investments have been examined in light of their impact on governance mechanisms; that is, transaction-specific invest-

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ments are treated as an exogenous variable (e.g., Heide & John, 1990; Joskow, 1987). The major proposition, along this line, is that manufacturing firms are asked to offer contracts to safeguard suppliers' specialized investments. When contracts cannot provide the necessary safeguards, manufacturing firms are forced to engage in vertical integration to mitigate suppliers' lock-in hazards. In practice, however, given that transaction-specific investments are necessary, many transactions exist outside the realm of vertical integration or contracts (Bensaou & Anderson, 1999). Bensaou and Anderson (1999) postulated that one possible reason for this is that relationships based on trust lessen the chance that vertical integration will be used to protect transaction-specific investments. An ongoing relationship generally fosters trust and enables partners to adopt more flexible models of cooperation (such as alliances), create value together (that is, mutual benefits or reciprocity), and, eventually, induce suppliers to make transaction-specific investments.

Over the last decade, researchers have begun to examine the impact of governance mechanisms on the value-creation initiatives of exchange partners (Claro, Hagelaar, & Omta, 2003; Zajac & Olsen, 1993). However, the conditions that enable transaction-specific investments have received less attention. Recently, Bensaou and Anderson (1999) argued that architectural interdependence, complexity, the thinness of the supplier market, and the scope of a relationship all influence automakers to make specialized investments in suppliers. Following this line of research, this study took suppliers as the sample body from which to further explore whether formal or relational governance mechanisms induce suppliers to make transaction-specific investments.

According to the TCE perspective, the numerous hazards to suppliers require the drawing up of explicit legal contracts or an agreement upon specific financial recourse (Williamson, 1985). As a demonstration of goodwill, as well as to reduce the exchange hazards faced by suppliers, manufacturing firms may, as a matter of course, need to provide contracts or financial commitments to suppliers. However, the TCE seems to overemphasize the use of explicit contractual safeguards in potentially hazardous exchange settings (Dyer & Singh, 1998; Poppo & Zenger, 2002).

The relational perspective offers a different, less explicit set of governance mechanisms, such as trust, to persuade suppliers to more willingly make transaction-specific investments. Relational governance in this study refers to interfirm exchanges that include significant relationship-specific assets, combined with a high level of interorganizational trust (Zaheer & Venkatraman, 1995). Indeed, the presence of trust has been described as an important antecedent to interfirm cooperation (Smith, Carroll, & Ashford, 1995).

It remains unclear, however, what sort of a trade-off exists between relational governance mechanisms (such as trust) and formal governance mechanisms (such as contracts and financial commitments). Some researchers have examined whether relational governance functions as a substitute for complex, explicit contracts (Bradach & Eccles, 1989; Dyer & Singh, 1998). To our knowledge, few researchers have explored the relationship between relational governance mechanisms and formal governance mechanisms by examining the specialized investments made by suppliers in their foreign-manufacturer clients. We hope to shed some light on the subject.

A particular institutional environment may encourage or impede the building of relational ties between trading partners (North, 1990). Chinese society has functioned as a highly relational network of clans since the sixth century BC, and therefore provides a context appropriate for the examination of the impact of trust on transactions (Park & Luo, 2001). Because China is currently the world's largest recipient of foreign direct investment (FDI), we have chosen to examine the impact of formal and relational governance mechanisms on Chinese suppliers' making specialized investments in foreign (i.e. Taiwanese) manufacturing firms. In any part of the world, however, we believe it is critical to understand how to construct governance mechanisms that will improve cooperation between foreign and local firms.

The purpose of this study is to provide insight into how suppliers might be induced to make specialized investments in manufacturing firms. In this vein, we offer several contributions to the governance-mechanism literature. First, we take the transaction-specific investment as an endogenous variable and then examine whether formal governance mechanisms and relational governance mechanisms induce a supplier's transaction-specific investment. Second, we evaluate the substitutive relationship between formal governance mechanisms and relational governance mechanisms on transaction-specific investments made by manufacturing firms. Third, we adopt a specific measurement for specialized investments [i.e., "molds," as defined by Random House's Webster's College Dictionary (2000) as a hollow form for giving a particular shape to something in a molten or plastic state], thereby reducing ambiguity related to the question of whether or not specialized investments may have alternative uses. Fourth, this study focuses in particular on firms operating in China, allowing the observation of the special institutional context effect. Finally, we provide some suggestions for foreign manufacturing firms to help them create cooperative relationships with local suppliers in China.

2. Literature review

2.1. Transaction cost economics perspective

To protect themselves against various hazards of exchange, cooperative partners may employ a variety of

governance mechanisms. The basic assumptions of TCE are that cooperative partners may be characterized as having bounded rationality and may sometimes display opportunistic behavior, and that the principal attributes of transactions are asset specificity, uncertainty, and frequency (Williamson, 1985). Because of these exchange characteristics, as well as generalizable assumptions about human nature, manufacturing firms need to design particular governance mechanisms to protect suppliers' specialized investments. Thus, governance mechanisms may help to achieve a win-win situation for both manufacturing firms and suppliers.

To mitigate the risks to suppliers related to manufacturers' opportunistic behavior, as well as other unforeseeable eventualities, the TCE suggests that manufacturing firms must craft legal contracts or create formal structures allowing suppliers financial recourse. Exchange partners tend to be more confident about cooperative activities when they feel that they have an adequate level of control over the actions of their partners.

Contracts explicitly stipulate courses of action to be taken in the event of unforeseeable situations, and provide safeguards for minimizing losses arising from the inherent hazards of exchange faced by suppliers (Williamson, 1985). For example, suppliers may require a guaranteed volume or a pre-determined price before making a specialized investment. When levels of uncertainty or asset specificity become too high, suppliers will require manufacturing firms to provide assurance (i.e., in the form of a legal contract), so as to mitigate the hazards related to unforeseeable scenarios (Williamson, 1985).

Some transaction cost theorists have argued that financial commitments[3] acting to pre-empt manufacturing firms' opportunistic behavior can be regarded as a kind of relational mechanism (Williamson, 1985). However, financial commitments are maintained by economic weapons such as hostages and (formal) credible commitments designed to eliminate opportunistic behavior (Zaheer & Venkatraman, 1995). This perspective on relational governance (i.e., by such means as financial commitments) is quite different from that which holds relational methods of governance to be supported by non-economic factors, such as trust (i.e., Zaheer & Venkatraman, 1995). Accordingly, we treat both financial commitments and contracts as formal governance mechanisms. Suppliers may demand that manufacturing firms make some sort of financial commitments to them, in order to assure that similar behavior will occur in exchange, on their behalf. By increasing their "ex-ante" insurance, suppliers may feel assured that manufacturing firms will not terminate relationships on the basis of their own short-term self-interests.

[3] "Financial hostage" has been used by Williamson's (1985) to explain the equity participation. For this study "financial commitments" is adopted to refer to any types of commitments of financial resources.

2.2. Relational perspective

Although contracts and financial commitments are viewed as the primary means for safeguarding transactions, the implications of relational governance have been discussed by researchers from various fields. Relational governance in this study makes reference to Macneil's (1980) argument that any relational exchange relies heavily on social components—most frequently, trust. Sociologists have also demonstrated the embedded role that trust and other forms of social relationships play in economic transactions (Granovetter, 1985). This study defines relational governance as interfirm exchanges which include significant relationship-specific assets, combined with a high level of interorganizational trust (Zaheer & Venkatraman, 1995).

Relational governance mechanisms (such as trust) are regarded as a means to enhance transaction-specific investments associated with less monitoring and bargaining (Barney & Hansen, 1994). Holm, Eriksson, and Johanson (1996) argued that increased levels of understanding in a relationship will increase the overall commitment-level of the relationship. The existence of trust between two partners can help to facilitate joint planning and problem solving (Claro et al., 2003), and can help to create a stable and committed relationship.

Trust is frequently considered to be the positive expectations one party has about another party's intentions. That is, trust is one party's confidence in another's goodwill (Zaheer & Venkatraman, 1995). In keeping with the literature, "trust", in this study, is made up of two components: calculative trust, the rational component of trust, and benevolent trust, the emotional side of trust (Doney & Cannon, 1997). Calculative trust is preceded by the calculative process: an organization calculates the costs and/or rewards of cheating (or not) in a particular transaction. When one partner can deliver in the manner that it has promised, demonstrates the ability to continue the exchange relationship, or seems capable of generating some benefit for another partner in the future, another partner may be more willing to continue to make exchanges and to stay in the relationship.

By "benevolent trust," we mean the belief that cooperation creates a situation of mutual goodwill, and that partners will not take unexpected (non-cooperative) actions against one another (Cullen, Johnson, & Sakano, 2000). Thus, "benevolent trust" with regards to manufacturing firms refers to the belief of suppliers that manufacturers will consider the supplier's interests or welfare. The longer the duration of the relationship and its associated assistance-giving routines, the greater and deeper the consequent benevolent trust (Dyer & Chu, 2000).

2.3. Relational governance and formal contracts as substitutes

Relational governance mechanisms—signaling to suppliers that manufacturing firms can be trusted and that

specialized investments are likely to be protected—can result in the creation of fewer formal contracts. Besides, relational governance methods (and their associated expectations of future mutually beneficial exchanges) may serve to reduce the hazards of exchange entailed by formal contracts. Ring and Van de Ven (1994) argued that there is a substitutive relationship between formal contracts and trust in situations of interfirm cooperation.

Since the existence of trust may reduce transaction costs and lessen the need to monitor or safeguard exchange hazards, formal contracts may, beneficially, be replaced by trust (Dyer & Singh, 1998). Similarly, Dyer and Singh (1998) suggested that the marginal costs associated with formal safeguards are typically higher than those associated with informal safeguards, because formal contractual safeguards typically involve capital outlays for equity or other types of collateral (i.e. bonds). In other words, with their low transaction costs, relational governance mechanisms (such as trust) may act as highly effective substitutes for formal governance mechanisms (such as contracts).

3. Research hypotheses

3.1. Formal governance mechanisms

Williamson (1985) suggested that appropriate contracts and financial commitments may mitigate the adversarial relationship between cooperative partners. In this study, we define contracts and financial commitments as formal governance mechanisms. Foreign manufacturing firms, especially those operating in host countries, are encouraged to use formal governance mechanisms to protect suppliers' specialized investments, owing to the need for asset specificity and conditions of uncertainty. Thus, contracts and financial commitments, which stipulate conditions of mutual obligations, may serve to increase a supplier's willingness to make specialized investments for manufacturing firms.

H1. Foreign manufacturing firms' formal governance mechanisms (such as contracts and financial commitments) are positively related to the transaction-specific investments made by local suppliers.

3.2. Relational governance mechanisms

3.2.1. Calculative trust

Calculative trust occurs at both a dyadic level and a network level. At the dyadic level, suppliers' trust emerges after continuous, repeated exchanges, creating the belief that manufacturing firms will not switch partners (perhaps opportunistically) in the future (Heide & Miner, 1992). Forward-looking expectations will fortify and enhance cooperation, because of the promise of future beneficial interactions. Expectations of continuity may be said to be analogous to the behavioral commitments found in cross-border partnerships. As the time over which mutual benefits are realized lengthens, suppliers may become more willing to make transaction-specific investments for manufacturing firms.

At the network level, indirectly connected relationships affect directly connected relationships (Anderson, Hakansson, & Johanson, 1994). The perceived influence of partners' relationships with third parties on the focal supplier–manufacturer relationship will affect suppliers' decisions. Examining international partnerships, Holm et al. (1996) argued that business network connections have a positive effect on the level and number of commitments made by partners. For example, a manufacturing firm might introduce other customers to its suppliers, or might find a promising buyer to support its business.

In sum, expectations of future exchange derived from dyadic and network relationships will facilitate cooperation in the present. Therefore, calculative trust, which may be called the rational element of relational governance, enhances suppliers' willingness to make transaction-specific investments.

H2. Foreign manufacturing firms' calculative trust is positively related to the transaction-specific investments made by local suppliers.

3.2.2. Benevolent trust

Trust emerges through social interactions between exchange partners (Granovetter, 1985); benevolent trust takes time to develop. Cooperation through long term interactions helps to develop mutual understanding. Moreover, as the duration of interactions between partners increases, cooperative norms may be developed, and social sanctions may become more efficacious (Dyer & Chu, 2000). Similarly, Sohn (1994) suggested that in-depth social knowledge increases coordination between transacting parties by making a potential partner's behavior both understandable and predictable. After dealing with buyers for a longer period of time, suppliers will have greater confidence in making specialized investments, owing to their knowledge of buyers' reputation and intent.

Although the length of the relationship may not be exactly represented as benevolent trust, it is fair to take the length of the relationship as a proxy for the development—time of benevolent trust. That is, with the increasing length of cooperation, exchange partners are more likely to trust one another and to develop specialized methods of communication. A supplier may acknowledge that a long term relationship can be regarded as a relational safeguard, because the manufacturing firm would hesitate to jeopardize it (Bensaou & Anderson, 1999). Further, Child and Möllering (2003) argued that although it takes time to understand that an organization is untrustworthy, this does not change the fact that the development of trust requires time. Particularly in China, foreign manufacturing firms

cannot rely on the institutional system (i.e. local laws) but rather, must take care to individually invest in manufacturer–supplier relationships (Child & Möllering, 2003). Therefore, in the Chinese context, it is entirely correct to consider the effect of the length of the relationship.

H3. The length of the relationship between local suppliers and foreign manufacturing firms is positively related to the transaction-specific investments made by the suppliers.

In addition to the length of the relationship, a manufacturing firm needs to actively behave in such a way as to influence suppliers' beliefs about the firm's trustworthiness. As Schurr and Ozanne (1985) argued, a buyer's pre-exchange beliefs about a seller's trustworthiness positively influence buyer–seller communications and a buyer's concession-making processes (interaction). Even if a seller adopts tough bargaining tactics (such as high initial requests and making only small concessions), when a buyer trusts the seller, the buyer tends to be more willing to make concessions, and to be more agreeable during negotiations. Therefore, it is important that sellers take special care to effectively convey signals of benevolent trust.

In order to operationalize benevolent trust, we derived "assistance-giving routines" by interviewing executives and through a review of the literature (see Dyer & Chu, 2000). Aiding suppliers with their production problems (such as solving suppliers' technical problems, helping suppliers reduce manufacturing costs, and helping suppliers to improve inventory management) generates benevolent signals, thereby enhancing suppliers' goodwill toward manufacturers. Dyer and Chu (2000) suggested that the offering of free assistance may persuade suppliers that the donor does not have opportunistic intentions.

Notably, due to their newness and foreignness (or liabilities of foreignness), foreign manufacturing firms very much need to build a reputation of benevolent trust among local suppliers. Intimate communication and direct offers of assistance to local suppliers are some of the most effective ways to demonstrate a willingness to increase interdependence with local suppliers, rather than take advantage of them. Correspondingly, if benevolent behavior is made routine, it becomes possible to generate trust and to induce suppliers to respond with reciprocal behaviors.

H4. Assistance-giving routines made by foreign manufacturing firms are positively related to the transaction-specific investments made by local suppliers.

3.3. The relationship between formal and relational governance mechanisms

The enforcement of legal property rights and adherence to contracts may vary greatly in different countries (Zhang, Cavusgil, & Roath, 2003). Compared with other industrialized countries, the institutional context in China, permitting both the inconsistent and arbitrary enforcement of the law, appears to be a major source of uncertainty for organizations (Child & Tse, 2001). For example, although China's central government has ostensibly adopted a policy of decentralization since 1979, the central government can still arbitrarily change the policies made by local governments. Additionally, interpretation of the law varies greatly among localities, according to local knowledge and disposition. As indicated by the factors listed above, transaction costs are increased in institutional environments in which business contracts are not effectively enforced.

Moreover, the inconsistent implementation of the law and the ambiguity of property rights in China make the use of relational governance mechanisms even more critical for businesses (Child & Tse, 2001; Park & Luo, 2001). Due to institutional underdevelopment, it costs more to institute mechanisms of formal governance capable of thwarting manufacturers' ill intentions; thus, manufacturing firms are, of necessity, encouraged to adopt methods of relational governance. As Coleman (1990) argued, the rule of reciprocity in relationships inhibits opportunistic behaviors, thereby preserving social capital within the existing network. In addition, trust may play a more important role in facilitating economic transactions when suppliers place less emphasis on formal governance mechanisms.

Griffith (2002) argued that Western companies that demonstrate superior performance in China tend to be those that have built close trusting relationships with their Chinese partners. In situations of such significant cultural difference, a manufacturer's exhibition of trust demonstrates not only its awareness, but also its willingness to accept—or at least understand—the supplier's position (Zhang et al., 2003). *Guanxi* represents a powerful, guiding force for an organization's behavior[4]. Indeed, forces as strong as *guanxi* make possible the adoption of relational governance mechanisms in lieu of formal governance mechanisms, when asking suppliers to make specialized investments.

We agree that contracts and financial commitments can provide protection against self-interested or unethical behavior. Additionally, we suggest that trust can generate a relational rent, and, consequently, may moderate the positive effect of formal governance mechanisms on transaction-specific investments. Trust may reduce both ex ante and ex post opportunism (Zaheer & Venkatraman, 1995), and may mitigate the need for formal contracts, which are costly to write and monitor. Calculative trust and benevolent trust may facilitate stronger relationships, and may lessen the number and depth of conflicts between suppliers and manufacturing firms. Thus, the existence of calculative trust, the length of a relationship, and the routine giving of

[4] Guanxi is a cultural characteristic that has strong implications for interpersonal and interorganizational dynamics in Chinese society. It is an intricate and pervasive relational network that contains implicit mutual obligations, assurances, reciprocal, and understanding (Park & Luo, 2001), and has greater meaning than any legal framework (Styles & Ambler, 2003).

assistance may act as substitutes for formal governance mechanisms and may moderate the relationship between formal governance mechanisms (such as contracts and financial commitments) and the specialized investments made by suppliers.

H5. The positive relationship between formal governance mechanisms (such as contracts and financial commitments) and transaction-specific investments made by local suppliers is reduced as a manufacturing firm's level of calculative trust grows higher.

H6. The positive relationship between formal governance mechanisms (such as contracts and financial commitments) and transaction-specific investments made by local suppliers is reduced when the length of a relationship between local suppliers and manufacturing firms is longer.

H7. The positive relationship between formal governance mechanisms (such as contracts and financial commitments) and transaction-specific investments made by local suppliers is reduced when manufacturing firms regularly offer assistance.

The proposed conceptual model is provided in Fig. 1.

4. Methodology

4.1. Survey procedure and samples

The data collection for testing the hypotheses occurred in three stages. In the first stage, the questionnaire derived from the literature was pre-tested with two executives managing production operations in China, as well as with one executive from a supplier in China. Some items in the questionnaire were revised or modified in accordance with their suggestions.

In the second stage, introductory phone calls to the presidents of the members of the Association of Ningbo's Taiwanese Enterprises were made to secure support for the study. FDI from Asian countries (including investments from Taiwan, Hong Kong and Macao) accounted for 56% of the total foreign investment in Ningbo City of Zhejiang (Statistics Information from Ningbo's website, 2003). Ningbo is one of the cities in China preferred by Taiwanese investors. Among the 1436 firms investing in Ningbo, 280 were from Taiwan.

This study sacrificed some degree of external validity by contacting firms which matched the focal variables (Cook & Campbell, 1979), and through the introduction of the executives participating in the pretest to other firms. Six Taiwanese manufacturing firms expressed their willingness to cooperate. The six manufacturing firms belong to the machinery and equipment manufacturing industry, textile machinery industry, wood machinery industry, electrical and electronic machinery industry, and toy industry. In these industries, suppliers' transaction-specific investments are important to manufacturers' development of new products.

In the third stage, and in accordance with the recommendations to use the most knowledgeable informants (Kumar, Stern, & Anderson, 1993), we asked the purchasing managers in these six Taiwanese firms to identify the suppliers who had made transaction-specific investments in them. The questionnaires were then sent to Chinese suppliers, and managers in charge of day-to-day operations were asked to answer the questionnaires.

We assessed the perceptions of Chinese suppliers only. Each Chinese supplier could answer up to six questionnaires (i.e., with regards to six foreign firms operating in China among their total customer population). In total, 50 Chinese suppliers answered 93 copies of the questionnaire. Twenty-seven (17%) responses were unusable due to missing data on the transaction-specific variable, leaving 77 (83%) usable responses. Additionally, none of the suppliers had equity ties to their customers. Following Armstrong and Overton's (1977) procedure for testing response bias, no significant differences ($P>0.05$) were found between early and late

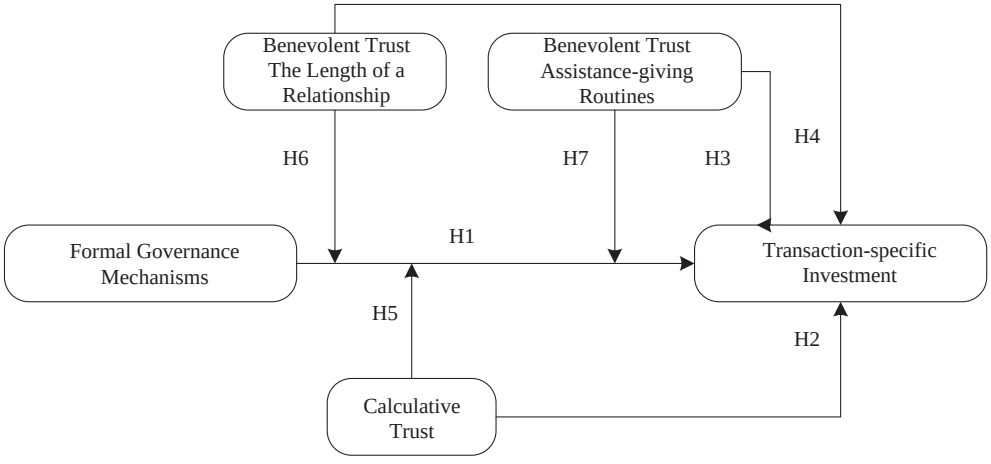

Fig. 1. Conceptual model.

respondents on any of our constructs, nor with regards to other variables, such as the number of employees. Thus, non-response bias did not appear to be a problem.

Additionally, although the questionnaires were answered by key informants, we faced, potentially, the problem of common method variance (Campbell & Fiske, 1959). When self-reported data on two or more variables are collected from the same source at one time, correlations among them may be systematically contaminated by any defect in that source (Parkhe, 1993). Harman's single-factor test (1967) argued that if a substantial amount of common method variance exists in data, a single factor will emerge from the factor analysis when all of the variables are entered together, or a general factor that accounts for most of the variance will result. After we performed factor analysis on items related to the three independent constructs, and extracted three factors with eigenvalues greater than one, it appeared that this study did not have serious problems of common method variance. Regarding the potential bias associated with the fact that some respondents (Chinese suppliers) answered more than one questionnaire: we felt that, owing to the wide variations of the values of independent variables among the questionnaires from the same source, such bias would not emerge as a major issue.

4.2. Measures

Specific items for measurement were generated from literature and interviews. Managers were used as expert judges to assess the face validity of the selected items. Final measures were based on the results of exploratory factor analyses and an assessment of the confirmatory factor analysis (CFA).

Transaction-specific investment (TSI): To avoid the possibility of redeployment, which can muddy specificity, we focused on asset specificity associated with specialized investments in physical assets (i.e., Celly, Spekman, & Kamauff, 1999). In this study, we used molds made especially by suppliers for manufacturing firms. Although Williamson (1989) identified five types of asset specificity—namely, site asset specificity, physical asset specificity, human asset specificity, dedicated asset specificity, and brand name capital—measuring 'asset specificity' has proven to be extremely difficult, causing most studies to use subjective measures (Dyer, 1996; Masten, 1984; Parkhe, 1993). One such difficulty is determining whether or not an investment may be redeployed to an alternative recipient (the nature of asset specificity). While a supplier makes idiosyncratic investments (e.g., human asset investment) originally for a specific transaction, these investments can probably be used in other transactions, after a period of time (i.e., through learning) or can even eventually become general investments. Although this study also follows earlier studies in making subjective evaluations, it can be easily determined whether or not a mold can be used in alternate transactions. That is, specialized investments are defined by physical assets that are not redeployable to alternative uses (Williamson, 1985). Thus, a supplier's transaction-specific investment is assessed according to whether or not a mold made for a manufacturing firm can be used to serve other clients. The coding is as follows: '1' means that 'the mold is specific to one manufacturing firm'; '2' means that 'the mold can serve a few manufacturing firms'; '3' means that 'the mold can serve many manufacturing firms'.

Formal governance mechanism (FG): formal governance mechanisms are measured as the mean of four responses, including contracts and financial commitments (Williamson, 1985), each on a 7-point Likert scale. The items used to assess the degree to which the governance mechanisms are used with suppliers are: (1) the manufacturing firm needs to guarantee the purchasing quantity (FG1) ; (2) the manufacturing firm needs to guarantee the purchasing price (FG2) ; (3) the manufacturing firm needs to pay part of the investment in the molds (FG3) ; and (4) the manufacturing firm pays for the mold investment beforehand and the supplier will reimburse the investments to the manufacturing firm only once the purchase-quantity has reached a certain level (FG4).

Calculative trust (CT): Calculative trust is measured as the mean of following three items, as suggested by Holm et al. (1996) and Dyer and Chu (2000): (1) the manufacturing firms will continue to do business with the supplier (CT1); (2) the manufacturing firm has a big buyer to support his business (CT2); (3) the manufacturing firm can introduce other customers to the supplier (CT3). A 7-point Likert scale, ranging from '1' (strongly disagree) to '7' (strongly agree) was used to measure responses.

Benevolent trust (the length of a relationship) (LR): The length of a relationship is measured by the number of years that the supplier and the manufacturing firm have been working with one another. *Benevolent trust (assistance-giving routines)* (AR): Assistance-giving routines are operationalized by finding the mean of the following 3 items, as suggested by Dyer and Chu (2000): (1) the extent to which the manufacturing firm provides assistance in solving the supplier's technical problems (AR1) ; (2) the extent to which the manufacturing firm provides assistance in helping the supplier reduce manufacturing costs (AR2) ; and (3) the extent to which the manufacturing firm provides assistance to help the supplier improve inventory management (AR3). A 7-point Likert scale, ranging from '1' (strongly disagree) to '7' (strongly agree) was used.

Control variables: In order to extract possible confounding effects, this paper identified 5 control variables. A 7-point Likert scale, ranging from '1' (strongly disagree) to '7' (strongly agree) is used for the following variables:

(1) *Technological change* is measured according to the statement, "the rate of technological change is dramatic in the manufacturing firm's industry." Technological uncertainty is often the result of high rates of technical change and the constant risk of obsolescence

Table 1
Final measurement model

		Standardized factor loading	*t*-value
Formal governance mechanism	FG1	0.82	10.44*
	FG2	0.82	9.08*
	FG3	0.47	5.54*
	FG4	0.58	7.84*
Calculative trust	CT1	0.71	3.54*
	CT2	0.46	2.88*
	CT3	0.31	2.06*
Assistance-giving routines	AR1	0.93	9.38*
	AR2	0.88	8.69*
	AR3	0.57	5.21*

* Indicating significant level at 0.05.

(Quinn & Hilmer, 1994). It may be that the higher the level of such uncertainty, the less willing suppliers are to make specialized investments.

(2) *Multiple customers* is measured according to the statement, "in addition to this manufacturing firm, the supplier still deals with many other manufacturing firms." A supplier with a cupboard full of alternate buyers would be less willing to make transaction-specific investments.

(3) *Possibility of finding new customers* is measured according to the statement, "we (the supplier) can easily find other new customers." The reason is similar to that given above: as it becomes easier for a supplier to find other customers, the supplier will likely be less willing to make transaction-specific investments.

(4) *Possibility of finding new suppliers* is measured according to the statement, "the manufacturing firm can easily find new suppliers." When a supplier's customer can easily find other customers, the supplier will be more inclined to make transaction-specific investments to keep his customer.

Additionally, we measure the *firm size* of the supplier. The larger the supplier (in terms of the number of employees), the less likely it is that that firm will make transaction-specific investments. The coding is as follows: '1' for 'below 100 employees', '2' for '100–300 employees', '3' for '300–500 employees' and '4' for 'above 500 employees.' There were 31 observed firms coded '1', 29 observed firms coded '2', 8 observations coded '3', and 9 observations coded '4'. Thus, most of the respondents were small- and medium-sized firms.

An exploratory factor analysis (EFA) (using Varimax rotation) showed that the underlying patterns related to these items were condensed into three multi-item factors, namely *formal governance mechanisms* (loadings were 0.85, 0.82, 0.71, 0.67, respectively), *calculative trust* (loadings were 0.73, 0.61, 0.78, respectively), and *assistance-giving routines* (loadings were 0.90, 0.86, 0.76, respectively) with eigenvalues greater than one, which together accounted for 63.1 percent of the variance in the data.

After EFA, a confirmatory factor analysis (CFA) was used to examine the adequacy of the measurement model (Jöreskog & Dag, 1989). The results show that the model reaches a reasonable goodness of fit for formal governance mechanisms with $\chi^2_{(2)}$=3.97 (P>.05), GFI=0.97, and NFI=0.96. The results for exogenous variables (relational governance mechanisms, including calculative trust and assistance-giving routines) also achieve a moderate level of goodness of fit with $\chi^2_{(8)}$=10.95 (P>.05), GFI=0.96, and NFI=0.92. An examination of the individual item loading was both large and significant (see Table 1). These results provide evidence for the convergent validity of each of the measures. The descriptive statistics and correlation coefficients are shown in Table 2.

5. Results and discussion

Hierarchical regression analysis is used to investigate whether formal governance mechanisms influence transaction-specific investments, and whether relational governance mechanisms influences transaction-specific investments (Table 3). After removing multicollinearity

Table 2
Descriptive statistics and person correlation matrix (N=77)

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1. Transaction-specific investment	2.81	0.49	1.00									
2. Formal governance mechanism	3.49	1.94	0.36**	1.00								
3. Calculative trust	4.57	1.45	0.30**	0.10	1.00							
4. The length of a relationship	4.74	2.70	−0.18	−0.05	0.19	1.00						
5. Assistance-giving routines	4.45	1.88	0.27*	0.11	0.24*	0.09	1.00					
6. Technological change	4.55	1.91	0.09	0.07	0.46**	0.13	0.19	1.00				
7. Multiple customers	6.62	0.99	0.17	−0.01	0.14	0.12	0.00	0.06	1.00			
8. Finding new customers	5.28	1.70	0.07	0.10	−0.12	−0.11	−0.34**	−0.30**	0.32**	1.00		
9. Finding new suppliers	4.34	2.12	0.02	−0.02	−0.05	0.11	−0.29*	0.14	0.09	0.31**	1.00	
10. Firm size	2.06	1.40	−0.01	−0.19	−0.17	0.06	0.09	−0.11	0.10	−0.13	-0.28*	1.00

* Significant at 0.10.
** Significant at 0.05.

Table 3
Hierarchical regression analysis for transaction-specific investments

	Transaction-specific investments		
	Model 1	Model 2	Model 3
Control variables			
Technological change	0.10(0.44)[a]	−0.10(0.42)	−0.12(0.33)
Multiple customers	0.15(0.23)	0.14(0.23)	0.09(0.42)
Finding new customers	0.06(0.70)	0.02(0.88)	−0.03(0.85)
Finding new supplier	−0.04(0.79)	0.16(0.17)	0.19(0.10)
Firm size	−0.02(0.88)	0.11(0.31)	0.09(0.40)
Independent variables			
Formal governance mechanisms (FG)		0.31(0.00)**	0.39(0.00)**
Calculative trust (CT)		0.31(0.01)**	0.29(0.02)*
The length of a relationship (LR)		−0.27(0.01)**	−0.18(0.08)
Assistance-giving routines (AR)		0.25(0.03)*	0.23(0.036)*
Interaction			
FG * CT			−0.31(0.00)**
FG * LR			0.21(0.07)
FG * AR			−0.17(0.12)
F-value	0.57	3.77**	4.34**
R^2	0.04	0.37	0.45
Adjusted R^2	−0.03	0.25	0.35
Δ Adjusted R^2		0.28	0.10
Hierarchical F-value		7.52**	4.33**

[a] Standardized regression coefficients (β).
* Indicating significant at 0.05.
** Indicating significant at 0.01.

between independent variables, a hierarchical regression analyses was performed[5]. In the first hierarchical regression model, only control variables such as technological change, multiple suppliers, and size, are included. In the second regression model, the formal governance mechanisms, calculative trust, the length of a relationship, and assistance-giving routines are added to the model. The interaction variables are added to the third model.

Model 1, which tests for control variables, is not significant at the α=0.05 level. The control variables are obviously insufficient to justify their inclusion. When governance mechanisms are included in the model, the F-values of Model 2 increase significantly. As shown in Table 3, the regression model is significant at the 0.01 level, and the adjusted R^2 is 0.25. When interaction variables are added, the model is significantly improved, as indicated by Model 3 in Table 3.

In Model 2 and Model 3, the formal governance mechanisms, calculative trust and assistance-giving routines are positively related to transaction-specific investments, and thus strongly support H1, H2 and H4. Surprisingly, the impact of the length of a relationship on transaction-specific investments appears in Model 2 to be negative, and is not significant in Model 3. One reason is that long relationships alone do not necessarily guarantee a long-term orientation. Though relationships might endure, there is no automatic, correspondent rise in long-term orientation, explicit and/or normative contracting, or relational behavior (Lusch & Brown, 1996: 33). This suggests that attitudes and perspectives toward the long term are much more important than the mere fact of a long-standing relationship (Lusch & Brown, 1996: 33). Another reason for these results may be that foreign manufacturing firms do not ask local suppliers to make completely new molds for mature products. In this case, local suppliers would only need to modify existing molds, which might be used for a number of manufacturing firms.

This finding supports that the contention that calculative trust has a negative effect on the relationship between formal governance mechanisms and transaction-specific investments (β= −0.31, P<0.01). Fig. 2 reveals a steeper (more positive) slope for the relationship between formal governance mechanisms and transaction-specific investments when calculative trust is low, and a less steep slope when calculative trust is high. The figure also shows that for low levels of formal governance mechanisms, calculative trust creates a high degree of transaction-specific investments. Therefore, H5 is supported. Surprisingly, the interactive effect between formal governance mechanisms and assistance-giving routines is not significantly correlated with transaction-specific investments. Likewise, there is no interactive effect between formal governance mechanisms and the length of a relationship on transaction-specific investments. Hypothesis 6 and 7 are not supported. This may, at least in part, have to do with liabilities of foreignness (Zaheer, 1995). Although foreign manufacturing firms may have assisted in production, local suppliers may not be comfortable with these firms, owing to concerns about continuing to do business with them in the future.

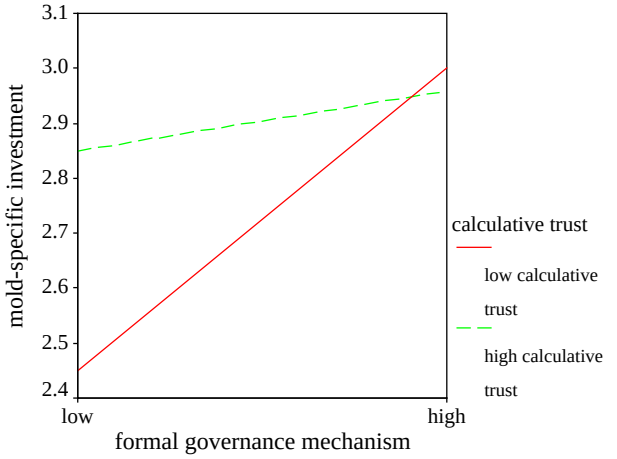

Fig. 2. Formal governance mechanisms and mold-specific investments by calculative trust.

[5] The multicollinearity was removed by computing Z-value for each independent variable ($Z(x_i)$=(x_I—mean of x_i)/S.D.(x_i)) and using these Z-values on the regression models (Luo, 2002).

Likewise, the length of a relationship does not guarantee a positive attitude between local suppliers and foreign firms. Thus, neither assistance-giving routines nor the length of a relationship have a significant moderating effect on the relationship between formal governance mechanisms and transaction-specific investments. In conclusion, we may say that—with regards to interaction effects—H5 is accepted, but H6 and H7 are rejected.

6. Conclusion and limitations

6.1. Conclusion

The issue of crafting governance mechanisms capable of inducing suppliers to make specialized investments in manufacturing firms is one that can create competitive advantages for manufacturing firms. This study's major findings demonstrate that both the relational perspective and the transaction cost economics perspective explain the behaviors of suppliers in making transaction-specific investments. The interaction of these two perspectives, as a phenomenon unto itself, also serves to provide some explanation.

Our findings indicate that formal governance mechanisms, calculative trust, and assistance-giving routines drive transaction-specific investments made by local suppliers in foreign manufacturing firms. Calculative trust also moderates the relationship between formal governance mechanisms and transaction-specific investments. As manufacturing firms build up more calculative trust, local suppliers reduce their dependence on formal governance mechanisms. However, the length of a relationship has no (positively) significant effect on transaction-specific investments, and drives no moderating effect on the relationship between formal governance mechanisms and transaction-specific investments. It may be that the mere existence of a long-term relationship does not facilitate qualified inter-organizational attitudes (Pillai & Sharma, 2003). For example, these manufacturers may reduce the number of their suppliers during the mature phase of their product-cycle, leaning toward market transactions (Pillai & Sharma, 2003). Therefore, the length of a relationship does not guarantee that manufacturing firms will treat suppliers better.

While assistance-giving routine has a directly positive effect on transaction-specific investments, it does not have a negative moderation effect on the relationship between formal governance mechanisms and specialized investments. Due to the liabilities of foreignness, the assistance-giving routines may not be powerful enough to act as a full substitute for formal governance mechanisms.

These findings provide two insights which might induce a supplier to make transaction-specific investments on behalf of manufacturing firms. First, not only are formal governance mechanisms critical to the protection of suppliers' specialized investments, but calculative trust and assistance-giving routines can induce suppliers to make transaction-specific investments. The formal governance mechanisms (i.e., contract and financial commitments) dominate supplier–manufacturer relationships. However, foreign manufacturing firms can also build up benevolent trust through assistance-giving routines, so as to shape the context of reciprocal exchange and facilitate a supplier's specialized investments. When cooperative partners are not familiar with one another, they will incur additional governance set-up costs in the form of a legal contract. Both parties may monitor the other's opportunistic behaviors, and may not be willing to work to create value (Dyer, 1997). However, once trust and reciprocal commitments have been established, they will put more effort toward facilitating exchange efficiency.

Second, calculative trust may act as a substitute for formal governance mechanisms. This implies that when a Taiwanese manufacturing firm (or any foreign firm) can provide some positive signals to show "forward-looking expectations", it may reduce the necessity of formal governance mechanisms and, correspondingly, reduce transaction costs. Especially in China, due to the ambiguity of property right, the higher cost of implementing formal governance mechanism facilitates manufacturing firms to adopt relational governance mechanisms. The information provided by the business network, indicated by "whether a supplier agreed that the manufacturing firm can introduce other customers to the supplier," appears to support the relational governance arguments as they apply to the suppliers (Claro et al., 2003). The results are, in large part, consistent with our interviews with executives. Executives at the suppliers in question expressed that Taiwanese manufacturing firms tend to be more reliable in their exchange behaviors. These Taiwanese manufacturing firms were more willing to introduce them to other Taiwanese manufacturing firms, and thus, local suppliers were more willing to make specialized investments on behalf of these Taiwanese firms. Given these conditions, Chinese suppliers may prefer to do business with Taiwanese manufacturing firms.

6.2. Managerial implications

Given that the level of foreign direct investment is burgeoning, foreign manufacturing firms are increasingly engaging in production activities in host countries. Many manufacturing firms have, not surprisingly, faced challenges in as they work to build collaborative relationships with their local suppliers (Doney & Cannon, 1997). One of the central issues is that of how to cooperate with local suppliers so as to create mutually beneficial relationships. In China, formal governance mechanisms are necessary to facilitate cooperation between foreign manufacturing firms and local suppliers. Additionally, trust, both benevolent and calculative in nature, can also lead suppliers to make transaction-

specific investments. As argued by Dyer (1996), transaction-specific investments may be highly effective tools in speeding up the development of new products and increasing their quality. When foreign manufacturing firms show that the relationship has some future (i.e., the relationship isn't a "one-shot deal"), the resultant calculative trust may lessen the usage of formal governance mechanisms in transaction-specific investments.

6.3. Limitations and suggestions for future research

The implications of this study should be evaluated in light of the following limitations; along these lines, we also suggest some directions for future research. First, although relational governance mechanisms can induce suppliers to make transaction-specific investments, the application boundary of our findings has some limitations. For instance, the size of transaction-specific investments may influence the adoption of different types of governance mechanisms. In addition, if the size of transaction-specific investments is too high or too low, a manufacturing firm may use formal governance mechanisms; if the size of transaction-specific investments is in the mid-range, relational governance mechanisms may make more sense. Accordingly, it may be useful to examine the effect that the size of transaction-specific investments has on the choice of governance mechanisms.

Second, although the tests of the models yield a number of results consistent with our hypotheses, the samples examined were all located in coastal cities in China, thus limiting the extension and applications of our results. Suppliers in coastal cities should have more opportunities to cooperate with foreign manufacturing firms, and thus should be more familiar with joint actions with their clients. Correspondingly, it may be useful to study suppliers located in other regions of China, as suppliers in coastal and inland cities may exhibit different behaviors in dealing with foreign firms. (The latter may experience fewer international business dealings.) Third, most of our samples were small, privately-owned firms. Due to their limited resources, small suppliers may rely more heavily on relational governance than would large firms. Small firms simply do not have the resources to use the legal system when conflicts arise; nor do they have enough power to ask foreign manufacturing firms to make financial commitments beforehand. Therefore, relational governance may play an extra-important role for them. Large firms and government-owned firms may exhibit different behaviors in their supplier-foreign manufacturing firm relationships. Fourth, this study is a cross-sectional model; thus relational dynamism is ignored. Our cross-sectional design limits our ability to rule out alternative causal inferences. It is also conceivable that the causality is the reverse of that which we suggested. The proof of the causality of this relationship requires a longitudinal research design. Furthermore, an investigation of the differences in various relational stages on transaction-specific investment decisions may be a worthy endeavor (Jap & Ganesan, 2000; Pillai & Sharma, 2003).

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