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A research on the relationship between suppliers' transaction-specific investments and perceived relational risks: The moderating roles of control mechanisms and relationship phases

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Abstract This study examines the dynamic nature of suppliers' perceived relational risks arising from transaction-specific investments (TSIs) in their relationship with manufacturers, and the moderating effects of contracts and relational norms, during the developmental process of manufacturer-supplier relationship. An empirical study was conducted with data collected from 261 suppliers and manufacturers in the Chinese consumer electronic appliances sector. We found that suppliers' TSIs have a positive effect on their perceived relational risks, and in different phases of a relationship effect varies significantly. Results of the research also show that both contracts and relational norms have negative moderating effects on the relationship between suppliers' TSIs and their perceived relational risks, and moderating effects during are different across various phases of a relationship.

Keywords suppliers' transaction-specific investments, relational risks, phases of a relationship, control mechanisms

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1 Introduction

Along with the increasingly intense competition in today's business environment, there is a considerable trend among enterprises towards replacing simple, arms-length transaction relationships with closely knit long-term partner relationships for recurring business. In a vertical channel system, suppliers in a buyers' market are usually eager to establish steady relationships with their manufacturers. To achieve this objective and seek higher investment returns, suppliers are willing to make transaction-specific investments (TSIs) in their relationships with downstream manufacturers not only on their own initiative but also in response to manufacturers' requirements of improving coordination and enhancing the competitive advantage of the manufacturers' product.

The concept of TSIs was originally put forward in studies of transaction cost theory. The study of TSIs has since expanded into several other academic fields, such as economics, organizational theories, sociology, marketing and game theories. Researchers in these fields have carried out wider and deeper researches into the impacts of TSIs' characteristics, dimensions and control methods. In the marketing field, many studies based on transaction cost theory have indicated that solutions to the transaction difficulties posed by TSIs for suppliers lie in the deployment of appropriate control mechanisms to inhibit opportunistic behaviors or to induce behaviors that promote the continuation of a relationship (Jap and Ganesan, 2000). By making TSIs in their relationships with manufacturers, suppliers can send clear commitment signals that will promote cooperation (Lohtia and Krapfel, 1994). When seeking partners, manufacturers will strongly consider whether suppliers could provide TSIs (Ganesan, 1994). Additionally, given proper use by both sides, TSIs bring ample returns to both sides of the relationship. Therefore, not only can TSIs maintain a relationship but they can also create value for both parties.

Although past literature has provided useful insights for understanding TSIs in channel relationships and the efficacy of various control mechanisms, there are still several gaps that need to be adequately filled in.

First, previous literature paid little attention to the dynamic nature of TSIs. In relationships with manufacturers, suppliers' TSIs do not take place at a single time—they are at a dynamic process. As a relationship deepens, the quantity and type of TSIs will obviously change. Therefore, we can only gain a precise understanding of TSIs, and their impacts on other factors, on the basis of an adequate consideration of TSIs' dynamic nature. Nielson (1996) suggests that further research ought to study TSIs' detailed impacts combined with relationship development (Nielson, 1996). Apart from Nielson's research, few empirical studies have investigated this issue.

Second, several scholars have indicated that a relationship will have distinct behaviors, processes, and orientations in different developmental phases (Dwyer et al., 1987; Ring et al., 1994), and there is a growing recognition that a control mechanism's appropriateness depends on the particular phase of a relationship's life cycle, however, previous empirical studies on the phases of relationship in channel emphasize only the relationship between manufacturers and their downstream channel members but ignore the relationships between manufacturers and their upstream channel members (Jap and Ganesan, 2000). Furthermore, very few studies are concerned with suppliers' TSIs in the Chinese context.

Third, previous literature on channel behaviors offers little insights into relational risks. The concept of relational risks, rooted in the literature of strategic alliance, also plays an important role in partnership development in channel relationships. Thompson (1967) argues that the essence of management is controlling risks and environmental uncertainties. An important factor that hinders the success of decision-making on TSIs' and investment objectives is relational risk. Hence there is both theoretical and practical significance in studying, deeply and in detail, the antecedents of relational risk and its changes in channel behaviors.

To fill in these gaps, this paper focuses on the relationship between suppliers' TSIs and their perceived relational risks. The purposes of this study are, from the perspective of suppliers, (1) to make it clear that during the development of a relationship between a manufacturer and its suppliers, there is an evolution in the suppliers' perceived relational risks from their TSIs, and to examine the effect of different control mechanisms on the perceived relational risks; (2) to discuss how the two different control mechanisms impact the relationship between suppliers' TSIs and their perceived relational risks; and (3) to provide suggestions for suppliers to manage their TSIs so as to decrease the possibility of being exploited.

In the following sections, based on a review of the relevant literature, the conceptual framework and research hypotheses are developed, and the research methodology is described. Analysis and results are presented in Section 5. In the final section, we detail the conclusions and management implications, and provide suggestions for further research.

2 Conceptual framework

A major contribution of transaction cost economics is the identification of the problems that arise when TSIs are involved in an exchange relationship (Weitz and Jap, 1995). Transaction-specific investments, which are tailored to a particular

company or value-chain partner, are highly specific and ongoing investments (Rokkan et al., 2003; Forker, 1997). Resource dependence theory suggests that few organizations are internally self-sufficient with respect to their critical resources (Heide, 1994). Transaction-specific investments can help to form an interdependent relationship between two parties (Williamson, 1975, 1979), and have a bonding effect (Anderson and Weitz, 1992). Thus, TSIs could foster cooperative relationships between firms. Since the value of a TSI is specific to one relationship, they cannot be easily redeployed to other channel relationships (Weitz and Jap, 1995). Transaction-specific investments, which create a switching cost, often bring relational risks.

The concept of relational risks comes from the literature of strategic alliance (Das and Teng, 1996). As in the context of strategic alliance, relational risk is an absolutely unavoidable element in a channel-cooperation relationship. Generally, there are two types of risks, arising from two sources. One is relational risk coming from cooperation among firms, and the other is performance risk arising between firms and their outside environment (Das and Teng, 1996). The term "relational risk" addresses the possibility and the consequences of partners in inter-firm alliances, not fully committing themselves to joint efforts (Ring et al., 1994). In other words, it refers to one party's loss arising from its partner's opportunistic behaviors and seeking of self-interest in their relationship (Das and Teng, 2001). In brief, relational risk is related to whether the cooperation among partners will go smoothly or whether partners will fail to cooperate. Miller (1992) defined risk as an unexpected negative outcome; any kind of loss that comes from cooperative relationships could be defined as relational risk (Miller, 1992).

Williamson believes that the opportunistic behavior of the partner is a main source of relational risks (Williamson, 1983). Economics theory assumes that an enterprise will engage in some harmful self-interested behavior resulting in loss of its partner or their cooperation objective (Gulati, 1995). This kind of guileful, self-interested behavior is opportunism, which involves two main elements: distortion of information and renegeing on explicit or implicit commitments (Jap and Erin, 2003). Parkhe (1993) argues that opportunistic behavior may bring more benefits than abiding by the agreement. Either party in an exchange can engage in opportunism before or during the transaction (Jap and Erin, 2003), but the party making lesser investment is more likely to engage in opportunistic behavior (Gundlach et al., 1995). Resource dependence theory states that TSIs will create asymmetric dependence. Therefore, suppliers' TSIs often provide a manufacturer with a chance to engage in opportunistic behavior (Heide, 1994). Weitz and Jap argue that when a supplier makes TSIs in a relationship with its manufacturer, the supplier is committed to the relationship (Weitz and Jap, 1995). The manufacturer might take advantage of this commitment to obtain profits.

And the supplier would tolerate the manufacturer's opportunistic behaviors while making TSIs because it realizes that discontinuing the relationship will cause a reduction in the value of its TSIs and an increase in its cost (Weitz and Jap, 1995).

Zajac and Cyrus (1993) indicate that the literature of transaction cost economics has paid more attention to the potential cost of TSIs but failed to recognize the potential value created by them (Zajac and Cyrus, 1993). Since another important source of relational risk is the inequity of distributing the increased profits in a relationship, the impartial allocation of the increased profits generated by TSIs becomes a problem. A necessary condition of cooperation between the two parties is that the distribution mechanism must be fair. The sense of equity has a great impact on the cooperation between the two parties. If the TSIs of the two parties were to be asymmetrical, the party which makes lesser TSIs in the relationship would feel less restraint in the relationship and may have an opportunity to extract greater profits by threatening to discontinue the relationship. This phenomenon of asymmetric TSIs between suppliers and their manufacturers can always be found in the channel relationship; therefore, uncertainty in the division of the increased profits may lead to over caution of parties in channels while making TSIs (Helper and Levine, 1992).

Transaction-specific investments under the threat of relational risks need the safeguards of specific control mechanisms. Control mechanisms are any kind of method or mechanism that can be used to control and coordinate members' behaviors in channel relationships (Weitz and Jap, 1995). An appropriate control mechanism can protect partners' interests and maximize the parties' benefits in channel exchange, simultaneously coordinate various activities within organizations, and ultimately help to achieve organization objectives (Lewis, 2003). Control mechanisms have three aspects: setting up standards, monitoring standards, and selecting solutions to be used when parties clearly depart from standards. The main function of these mechanisms is serving the requirements of the organization and redounding to organization's final goals (Bernard, 1988). The control mechanisms investigated may include qualification procedures, authority, bilateral TSIs, contracts, relational norms and monitoring (Jap and Ganesan, 2000). Here we focus our study of control mechanisms on contracts and relational norms, which are frequently involved in channel relationship research.

Contract mechanisms involve an agreement signed by the parties in a relationship on defining their responsibilities and rewards for performing channel activities and clarifying relative solutions to matters expected to arise in the future (Weitz and Jap, 1995; Bozarth et al., 1998). The contractual terms can be worked out either by one party or through a negotiation process involving both parties. Some contracts could be drawn up initially and then modified to meet future

conditions. Agency theory offers a perspective on how such contractual terms should be developed in conditions commonly encountered in channel relationships such as uncertainty, differential information, and risk preferences (Bergen et al., 1992). The established contracts may fail to perform their functions by either one partner receives an uncertain payoff or a third party involved in the relationship.

The term “relational norms mechanism” refers to a shared set of implicit principles or norms that coordinate the activities performed by the parties and govern the relationship (Weitz and Jap, 1995). Relational norms are expectations about behavior that are partially shared by a group of decision makers and directed toward collective or group goals (Jap and Ganesan, 2000). Weitz and Jap believe that relational norms come from past transactions and market reputations, and they usually constitute a firm’s organizational culture (Weitz and Jap, 1995). Following the research of Dwyer and Heide, we include the following concepts into relational norms: solidarity, information exchange, and participation (Dwyer et al., 1987; Heide and George, 1992). Solidarity is a bilateral expectation that behaviors are directed toward relationship maintenance—it would arise as the relationship proceeds. Information exchange is the expectation that the parties will freely and actively provide useful information to each other. Participation refers to the joint expectation that both parties will share decision-making and goal-setting regarding all aspects of the exchange.

Life cycle theory suggests that there is a life cycle in business activities, just as the one in people’s lives. Firms should adopt appropriate solutions in different business life phases according to the requirements of the different stages. Transaction-specific investments, being unique to specific relationships, have both investment and relationship attributes. The investment attribute describes the concern that a supplier has about the return rate and cost callback of its TSIs, which are usually made across several phases. The relationship attribute describes the fact that sometimes the real purpose of a supplier in making TSIs is to enhance ongoing relationships with its manufacturer. Therefore, these two attributes of TSIs are implicitly subject to the influences of the time. Additionally, the life cycle theory also indicates that the different phases of relationships possess distinct behaviors, processes, and orientations; therefore, the appropriateness of a control mechanism depends on the particular phase that the relationship is in. Chiles and McMackin (1996) argue that contracts and relational norms will develop over time, and the empirical studies of Jap and Ganesan (2000) agree that control mechanisms have the attribute of changing with time.

The concept of phases of inter-firm relationships comes from the early research on the life cycle of personal relationship (Palmer, 1995). Early in 1994, Palmer and Bejou (1994) provided empirical evidence for the existence of a buyer-seller relationship life cycle. From that research, the studies in channel behaviors found that the phases of a relationship could reflect the time-dependent and dynamic

characteristics of channel relationship development. Ford (1980) believes that a relationship life cycle can be divided into five phases. Wackman et al. (1987) studied the relationship life cycle in the advertising agent industry and divided it into four phases (Wilson, 1995). Dwyer et al. (1987) suggest a five-phase model that lays foundation for the research on relationship phases, and emphasize for the first time that the development of a channel relationship has clear stage features. Jap and Ganesan (2000) provide another five-phase model that includes the phases of exploration, buildup, maturity, decline, and deterioration. By drawing lessons of relationship life cycle from the literature noted above, we divide the life cycle of a relationship into four distinct phases: exploration, buildup, maturity, and decline.

Based on the foregoing discussion, we present a conceptual framework in Fig. 1. This framework reflects the relationship between suppliers' TSIs and their perceived relational risks, and the moderating effects on the relationship of four relationship phases and two control mechanisms.

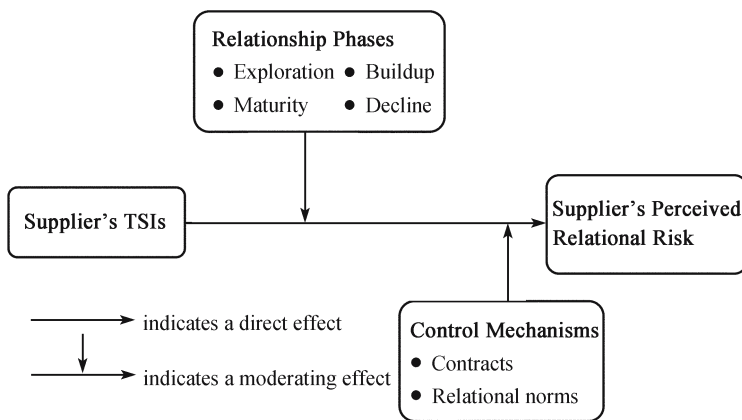


Fig. 1 Conceptual framework

3 Hypotheses

3.1 Suppliers' transaction-specific investments and perceived relational risks

We investigate the relationship between suppliers' TSIs and their perceived relational risks in terms of two sources of relational risks. Economists believe that some opportunism in the transaction is inevitable (Jap and Erin, 2003). When a supplier transfers its control over resources of its TSIs to its exchange partner, it

will more easily suffer from a partner's opportunism (Spekman and Strauss, 1986). Hence, the more the supplier makes TSIs in the relationship with its manufacturer, the more it perceives relationship risks.

On the other hand, the value of suppliers' TSIs decreases rapidly when used outside a specific relationship and are difficult to replace. Therefore, the supplier will recover the cost of its TSIs by depending on the relationship with its manufacturer (Lohtia and Krapfel, 1994), which will increase the suppliers' dependence on their manufacturers and lead the suppliers' into an inequitable situation in the distribution of the increased profits of TSIs in the relationship. Hence, the supplier will perceive increasing relational risks from the possibility of unfair distribution. Based on the above discussion, we propose that

H1: suppliers' TSIs are positively related to its perceived relational risks.

3.2 The moderating effects of relationship phases

Alan (2002) points out that in a market environment, Transaction-specific investments suffer a serious risk of moral hazard and uncertainty regarding the duration of the relationship, which leads us to investigate the moderating effects of phases on the relationship between TSIs and perceived relational risks.

In the exploration phase of a relationship, the supplier and the manufacturer do not understand each other very well, and their relationship is full of uncertainty (Dwyer et al., 1987). In this phase of the relationship, both sides lack trust, and their relationship is very vulnerable. Since TSIs during this phase bring few benefits, the supplier can only recoup very little of the cost of its TSIs. Therefore, if this fragile relationship terminates, it will result in a nearly complete loss of its TSIs (Lohtia and Krapfel, 1994). Also, in the early stages of a relationship, opportunistic behavior may bring more benefits than abiding by the agreement. A manufacturer lacking commitment is inclined to engage in opportunistic behavior (Jap and Erin, 2003).

In the buildup phase of a relationship, the two parties, having completed the exploration phase, have accepted and are satisfied with each other. The relationship is increasingly mature, and the parties have established a certain degree of trust and interdependence (Jap and Ganesan, 2000). The research results of Ring et al. (1992) indicate that the trust between companies could help to decrease the parties' anxiety about opportunistic behavior and to alleviate relational risk. Das and Teng (2001) also posit that goodwill and trust will reduce the perception of relational risk. Also, the socialization process continuously infuses transactions with norms and values, which enable the relationship to persist. Therefore, with increased risk-taking by both parties, the fears of relational risks will decrease (Frazier, 1983).

In the maturity phase of a relationship, both sides are highly satisfied with the value provided by the other side. There are many tangible and intangible assets put into the relationship, and transactions between the two parties take place very frequently. The level of the two parties' interdependence and trust has reached its peak in the developmental process of the relationship (Jap and Ganesan, 2000). At the peak of the relationship, a high degree of satisfaction with the relationship will make the relationship relatively stable. In this case, neither party will engage in opportunistic behavior that might threaten the steady relationship. Therefore, in the maturity phase both sides will perceive a relatively low level of relational risk. In the literature of strategic alliance, Das and Teng (1998) also argue that firms that have been in relationships for a long time will not often suffer from relational risks.

Based on the above discussion, we propose that

H2a: in the exploration phase of a relationship, the positive effect of suppliers' TSIs on their perceived relational risks is strengthened;

H2b: in the buildup phase of a relationship, the positive effect of a suppliers' TSIs on their perceived relational risks is weakened;

H2c: in the maturity phase of a relationship, the positive effect of suppliers' TSIs on their perceived relational risks is weakened.

3.3 The moderating effects of control mechanisms

The literature of transaction cost economics advocates safeguarding TSIs through vertical integration (Williamson, 1985). However, this way of safeguarding TSIs is not always desirable or feasible (Jap and Ganesan, 2000). Hollander (1964) believes that contracts between firms could have an effect similar to that of vertical integration. In the literature of relational contract theory, Heide and John (1992) point out that relational norms could also be used to govern relationships between firms. Therefore, both contracts and relational norms are control mechanisms that could be used to govern organizations' exchanges, minimize opportunistic behavior, and protect TSIs. But their features and efficacies in practice are distinct (Jap and Ganesan, 2000).

Through a process of negotiation, contracts are formally subscribed through the agreement of both sides. They confirm each party's rights, obligations, and matters of concern. The key features of the contract are explicit, immovable, and have force and effect. When contracts specify how a manufacturer will be punished for expropriation of suppliers' TSIs, and how much the suppliers will get from the increased profits, the manufacturers have to take into account the legal and economic consequences of violating a written contract (Jap and Ganesan, 2000). Hence, the believable threat presented by the contract will reduce suppliers' perceived relational risks from their TSIs.

Relational norms, involving solidarity, information exchange, and participation, are common value orientations of the two parties, which have implicit restraints on both sides, and are very flexible and ambiguous. Developing solidarity will shift the focus of a manufacturer's behaviors from self-centered to fostering both sides' common responsibilities and interests, which will help to decrease the possibility of opportunistic behavior by the manufacturer (Rokkan et al., 2003). Information exchange provides both sides with symmetrical information, which makes it difficult for the manufacturers to take illegal advantage of the suppliers' TSIs. Participation enables the supplier to influence the nature of its investments, the sharing of benefits, and the goals of the relationship. Also, empirical study by Noordewier et al. (1990) proves that bilateral norms provide effective control in some uncertain environments. Based on above discussion, we propose that

H3a: the use of contracts weakens the positive relationship between suppliers' TSIs and their perceived relational risks;

H3b: the use of relational norms weakens the positive relationship between suppliers' TSIs and their perceived relational risks.

3.4 The joint moderating effects of the exploration phase and control mechanisms

In the exploration phase of a relationship, the relationship is very fragile because the sides do not understand each other well enough and lack trust and commitment (Dwyer et al., 1987). The party who has made fewer TSIs will tend to engage in opportunistic behavior, which may increase the suppliers' perceived relational risks. During this phase, the use of contracts will reduce the uncertainty of relationship deterioration and partially restrict opportunistic behavior, by specifying how suppliers will recoup the value of their TSIs and how should the relationship be terminated as well as by providing guidelines for an appropriate termination of the process (Wilson, 1995).

In the early stage of a relationship, relational norms are not fully established and do not have enough effect on protecting suppliers' TSIs. Even if the relational norms have been well established, the uncertainties and self-interest of both sides at this stage will decrease the effect of relational norms (Jap and Ganesan, 2000). Hence, we propose that

H4a: in the exploration phase of a relationship, the use of contracts will weaken the positive relationship between suppliers' TSIs and their perceived relational risks.

H4b: in the exploration phase of a relationship, the use of relational norms has no significant effects on the positive relationship between suppliers' TSIs and their perceived relational risks.

3.5 The joint moderating effects of the buildup phase and control mechanisms

In the buildup phase of a relationship, the two parties have received some returns from their relationships and have established a certain degree of trust and interdependence. As time passes, the relationship becomes gradually steadier and steadier. The suppliers who make TSIs in the relationship with their manufacturers usually perceive a lower level of relational risk than in the exploration phase. But in the developmental process of a relationship, both sides will cooperate in more and more fields. The uncertainties in these fields' of cooperation may threaten suppliers' TSIs. Thus, the effects of a contract at this stage are still very notable and their range of control is no longer limited to dealing with issues of the relationship's end, as in the exploration stage, but also provides restraint in many other areas of cooperation.

In this stage of the relationship, the relational norms are being shaped, developed and implemented, and could already be used for control. Although the trust and interdependence between the two parties could make the supplier, who has made TSIs in the relationship with its manufacturer, perceive a relative lower level of relational risk than in the exploration phase, the supplier's TSIs are still threatened by uncertainty as the relationship proceeds. If the supplier only relies on contracts that are explicit and immovable to safeguard its TSIs, this seems to be insufficient. Relational norms, which are flexible, interactive and highly adaptable to environmental uncertainty, could remedy the deficiency of contracts. Therefore, in the buildup phase of a relationship, use of relational norms should offer the greatest protection to suppliers' TSIs making (Jap and Ganesan, 2000). Based on the above discussion, we propose that

H5a: in the buildup phase of a relationship, the use of contracts will weaken the positive relationship between suppliers' TSIs and their perceived relational risks;

H5b: in the buildup phase of a relationship, the use of relational norms will weaken the positive relationship between suppliers' TSIs and their perceived relational risks.

3.6 The joint moderating effects of the maturity phase and control mechanisms

In the maturity phase of a relationship, the two parties of the relationship interact frequently and the transactions between them have become a kind of convention. The trust and interdependence between them reach the highest level of the relationship and, therefore, both sides perceive the lowest level of relational risk. As contracts consist primarily of rules that anticipate future conditions in the relationship, they have only limited influence on manufacturer's opportunistic behavior that emerges in a changing environment.

In contrast, relational norms representing solidarity, information exchange and participation are implicit, flexible, and variable. They are adaptable to changes in the environment and are accumulations of the previous mutual experiences of the two parties in the relationship. Therefore, the use of relational norms can reduce the possibility of a manufacturer's opportunistic behavior in a dramatically changing environment. Jap and Ganesan (2000) suggest that the use of relational norms should offer the greatest protection to suppliers making TSIs in the maturity phase of a relationship (Jap and Ganesan, 2000). Based on the above discussion, we propose that

H6a: in the maturity phase of a relationship, the use of contracts has no significant effects on the positive relationship between suppliers' TSIs and their perceived relational risks;

H6b: in the maturity phase of a relationship, the use of relational norms will weaken the positive relationship between suppliers' TSIs and their perceived relational risks.

These hypotheses represent our main theoretical predictions. In addition to the variables that constitute these hypotheses, we also include measures of conflict and competence as the controlling variables, and consider their effects on the relational risk perceived by the supplier. Stern and Gorman (1969) point out that intra-channel conflict is arising when a channel member perceives the behavior of another to impede the attainment of its goals and effective performance of its instrumental behavior patterns. Although functional conflict produces channel efficiency (Stern and Heskett, 1969), most scholars still argue that dysfunctional conflict can impede the channel's performance and may eventually destroy the channel as a competitive entity (Anderson and Weitz, 1992; Stern and Gorman, 1969; Alderson, 1965). Therefore, when the relationship between a supplier and a manufacturer is threatened with conflict, the supplier will perceive an increasing relational risk. Also, the ability of a firm to develop and manage relations with key suppliers, customers and other organization, and effectively deal with the interactions among these relations, is a core competence of a firm (Thomas et al., 2002). This kind of core competence includes brand influence, marketing capability, product capability, professional technology, research and development (R&D) capability. Core competence has been defined as the resources generated or recombined inside a firm (Banerjee, 2003). Few organizations are internally self-sufficient with respect to their critical resources—they must cooperate with others to gain needed resources. One party will largely depend on the member holding more resources in a cooperative relationship (Heide, 1994). Keith and Steven (1989) have proved the negative relationship between dependence and opportunistic behavior. Opportunistic behavior of the partner is a main source of relational risks (Williamson, 1983). Therefore, a supplier will have more resources

when it possesses more core competence. In this case, a manufacturer will be more dependent on the supplier, which provides the manufacturer less opportunity to engage in opportunistic behavior, and decreases the suppliers' perceived relational risk.

4 Method

4.1 Research setting and data collection

Questionnaires were sent to 350 suppliers randomly selected from a list of 700 suppliers provided by a famous manufacturer of household electrical appliances in China. Each supplier was required to finish two questionnaires according to its relationships with two main manufacturers. Respondents were suppliers' managers who interacted with the manufacturers regularly. They had been involved in buyer-seller relationships for 3.7 years on average and had been working in the supply companies for 6.4 years on average, indicating that the respondents had adequate experience and knowledge of the suppliers' operations. Because the famous manufacturer's suppliers are a majority of the suppliers of the Chinese household electrical appliance industry, the sample we chose adequately represents the total.

We designed a structural survey questionnaire based on the relevant literature. Then we pre-tested some suppliers of household electrical appliances before the formal survey. After modifications to the phrasing and order of some items in the questionnaire, we prepared the final questionnaire. Questionnaires were sent out by mail or were completed in interviews with the respondents to assure the accuracy and response rate of the questionnaires received. Respondents were promised a summary report of the study results. Anderson (1995) noted that there were tremendous difficulties associated with gathering longitudinal data to examine process dynamics across stages. According to his suggestion, we collected the data at one point in time, classified the relationships by different phases of relationship, and used a multi-sample modeling approach to conduct the empirical study. The survey was carried out from February to June of 2004. Three weeks after the initial mailing, all non-respondents were sent the questionnaire again. Of the 700 surveys mailed, 273 were received, of which 261 questionnaires were completed and effective. The response rate was 37%. Responses on some key variables, such as duty time period and firm size, were compared between questionnaires received early and late. This comparison indicated there were no statistically significant differences between early and late respondents, suggesting that there was no non-response bias.

4.2 Measures

4.2.1 Independent variables

Suppliers' TSIs. We followed the TSIs items of Nielson (1996) and covered the extent to which the supplier has made an investment in time, energy, and money specifically to meet its manufacturers' requirement of improving coordination and enhancing their product competitive advantage in an industry. The TSIs include facilities investments dedicated to manufacturer's product line, distribution procedures, and delivered equipment.

4.2.2 Dependent variables

Relational risks: we followed the relational risks definition of Das and Teng (2001), and measured the relational risk's items in terms of possibilities of information stolen, personnel stability, and equity of increased profits.

4.2.3 Moderator variables

Contracts: we developed three items to assess the degree to which the relationship operates under contracts involving formal, written, and detailed operational procedures according to the studies of Jap and Ganesan (2000).

Relational norms: following the relevant literature of Heide and John (1992) and Dwyer and Sejo (1988), we scaled the relational norms items from solidarity, information exchange, and participation.

Relationship phase: our study's descriptions of four relationship phases are based on Dwyer et al.'s (1987) and Frazier's (1983) work. The respondents identified the phase that typified their relationships with their manufacturers on the basis of brief descriptions of the key characteristics of each phase. This measure divides the total responses into 42 responses in the exploration phase, 79 in buildup, 140 in maturity, and 11 in decline.

4.2.4 Control variables

When one party in a relationship perceives that its partner will impede the realization of its objective and function, conflict will take place (Etgar, 1979; El-Ansary and Louis, 1972; Thomas, 1967). Conflict usually has a negative effect on a relationship (Anderson and Weitz, 1992). In a relationship of asymmetrical power, the conflict is not likely to be resolved in a functional way (Weitz and Jap, 1995). Hence, we regard conflict as having an important impact on channel

relationship and select it as a control variable. We develop three scale items of conflict level based on the work of Kumar et al. (1992), and indicate the extent to which a high level of conflict existed in the relationship

The literature of strategic alliance suggests that competence is a type of competitive power to establish, develop, and manage alliance (Lambe et al, 2002). One important reason for forming a channel relationship is that the partner's competences are complementary with each other, which usually leads to valuable cooperative effect. Based on the work of Lambe et al. (2002), we scale the competence items according to the extent to which the application and development of suppliers' specific technology, R&D advantage, and brand influence could be adequately used in a relationship.

Except for the relational phases, all the items are measured using multi-item Likert seven-point scales. The anchors for all items were 1 = strongly disagree to 7 = strongly agree.

5 Results

5.1 Measure validation

After testing the non-response bias, the items whose item-to-total correlations were below 0.4 were dropped. Then the items having high cross-loading were dropped by using exploratory factor analysis. After that, the reliability estimates were computed using Cronbach's alpha coefficient—all values were above 0.8 except relational norms—whose value was above 0.7. These results, which indicated the measures, had high internal consistency after being purified. Table 1 shows the mean, standard deviation, and correlations between all purified variables, and shows good correlations between variables. Finally, we assessed the factor unidimensionality by confirmatory factor analysis. The results show goodness of fit index ($\chi^2 = 111.855$, $df = 48$, $\chi^2/df = 2.331$, $GFI = 0.935$, $RMSEA = 0.068$, $IFI = 0.973$, $TLI = 0.963$, $CFI = 0.973$).

Convergent and discriminant validities were assessed using SPSS 11.5 and AMOS 4.0. The convergent validity was assessed by calculating each variable's factor loading and average variance extracted. From the results showed in Table 2, all the factor loadings were significant with values above 0.7, and average variance extracted was above 60%. For the discriminant validity check, we first selected two factors randomly, and then administered to each pair of factors a chi-square difference test in which a correlation between pairs of factors is freely estimated and set equal to 1—all p values were less than 0.01—which indicated chi-square differences were significant.

Table 1 Correlation matrix of measures

	1.71	2.72	3.73	4.R1	5.R2	6.R3	7.C1	8.C2	9.C3	10.M1	11.N2	12.N3	13.F1	14.F2	15.F3	16.P1	17.P2	18.P3	19.P4	20.P5	21.P6	22.P7	23.P8		
2.72	0.757**	1																							
3.73	0.757**	0.679**	1																						
4.R1	0.216**	0.263**	0.244**	1																					
5.R2	0.206**	0.264**	0.288**	0.856**	1																				
6.R3	0.247**	0.281**	0.289**	0.732**	0.803**	1																			
7.C1	-0.143*	-0.140*	-0.222**	-0.608**	-0.626**	-0.551**	1																		
8.C2	-0.182**	-0.224**	-0.216**	-0.648**	-0.688**	-0.604**	0.809**	1																	
9.C3	-0.132*	-0.198**	-0.177**	-0.680**	-0.727**	-0.651**	0.709**	0.812**	1																
10.M1	0.234**	0.204**	0.276**	-0.086	-0.066	-0.048	-0.045	0.083	0.178**	1															
11.N2	0.404**	0.370**	0.383**	-0.099	-0.099	-0.018	0.029	0.069	0.124*	0.532**	1														
12.N3	0.187**	0.160**	0.131*	-0.188**	-0.216**	-0.214**	0.051	0.094	0.254**	0.447**	0.460**	1													
13.F1	0.171**	0.199**	0.168**	0.433**	0.500**	0.531**	-0.383**	-0.378**	-0.442**	-0.048	0.024	-0.170**	1												
14.F2	0.220**	0.221**	0.182**	0.261**	0.203**	0.300**	-0.208**	-0.218**	-0.237**	-0.060	0.052	-0.090	0.598**	1											
15.F3	0.163**	0.196**	0.186**	0.461**	0.506**	0.476**	-0.412**	-0.516**	-0.506**	-0.089	-0.032	-0.149**	0.665**	0.539**	1										
16.P1	0.234**	0.100	0.197**	-0.237**	-0.295**	-0.259**	0.225**	0.303**	0.412**	0.299**	0.408**	0.372**	-0.161**	-0.008	-0.224**	1									
17.P2	0.306**	0.170**	0.261**	-0.145**	-0.184**	-0.150**	0.180**	0.222**	0.314**	0.261**	0.344**	0.346**	-0.088	0.002	-0.161**	0.729**	1								
18.P3	0.340**	0.232**	0.305**	-0.150**	-0.168**	-0.115*	0.092	0.166**	0.270**	0.366**	0.484**	0.366**	-0.041	0.013	-0.131*	0.698**	0.671**	1							
19.P4	0.304**	0.172**	0.298**	-0.085	-0.124*	-0.066	0.068	0.132*	0.227**	0.232**	0.420**	0.299**	0.025	0.096	-0.085	0.658**	0.614**	0.740**	1						
20.P5	0.247**	0.112*	0.240**	-0.138*	-0.109*	-0.107*	0.050	0.138*	0.225**	0.230**	0.374**	0.270**	-0.008	0.060	-0.102	0.566**	0.585**	0.681**	0.787**	1					
21.P6	0.319**	0.260**	0.344**	0.002	0.026	0.053	-0.009	0.013	0.108*	0.277**	0.416**	0.304**	0.097	0.082	0.018	0.407**	0.420**	0.534**	0.569**	0.595**	1				
22.P7	0.267**	0.165**	0.237**	-0.048	-0.008	-0.045	-0.061	0.064	0.148**	0.385**	0.235**	0.045	-0.011	-0.012	0.413**	0.451**	0.495**	0.518**	0.557**	0.516**	1				
23.P8	0.180**	0.043	0.121*	0.013	0.024	0.008	-0.082	0.017	0.106*	0.298**	0.313**	0.315**	0.081	-0.072	-0.104*	0.518**	0.427**	0.530**	0.509**	0.433**	0.559**	1			

** correlation is significant at the 0.01 level (2-tailed); * correlation is significant at the 0.05 level (2-tailed).

Table 2 Measures of internal consistency of the scale

Scale	Coefficient alpha	Factor loading	Variance extracted (%)
Suppliers' TSIs	0.891		82.067
<i>T1</i> : we have made a substantial investment in personnel dedicated to this supplier's product line.		0.927	
<i>T2</i> : we have contractually dedicated a portion of our plant to producing product only for this customer.		0.895	
<i>T3</i> : we have a significant investment in shipping and distribution equipment tailored to supplying this customer.		0.895	
Suppliers' perceived relational risks	0.921		86.507
<i>R1</i> : in the relationship, our partner may steal our crucial technology and information.		0.928	
<i>R2</i> : in the relationship, our crucial technology and manage staffs are in the risk of loss.		0.955	
<i>R3</i> : in the relationship, our partner likely requires to distribute joint profits breach of contract.		0.907	
Contracts	0.911		85.167
<i>C1</i> : over time we have developed ways of doing things with <i>X</i> that never need to be expressed formally.		0.909	
<i>C2</i> : we are actually bounded by our oral commitments rather than formal agreements without detail obligations of both parties.		0.949	
<i>C3</i> : we have not formal agreement with <i>X</i> but oral commitments.		0.910	
Relational norms	0.732		65.339
<i>N1</i> : it is expected that the parties will provide proprietary information if it can help the other party.		0.820	
<i>N2</i> : we consult <i>X</i> concerning inventory decisions.		0.827	
<i>N3</i> : problems that arise in the course of this relationship are treated by my firm and <i>X</i> as joint rather than individual responsibilities.		0.778	
Conflict	0.818		73.430
<i>F1</i> : we have some disagreements about after service with <i>X</i> now and then.		0.885	
<i>F2</i> : we have some disagreements about product price with <i>X</i> now and then.		0.825	
<i>F3</i> : we have some disagreements about R&D with <i>X</i> now and then.		0.859	
Competence	0.909		61.993
<i>P1</i> : in the relationship, we can use our product know-how adequately.		0.800	
<i>P2</i> : in the relationship, we can use our product capability adequately.		0.784	

(Continued)

Scale	Coefficient alpha	Factor loading	Variance extracted (%)
P3: in the relationship, we can use our advanced facilities adequately.		0.860	
P4: in the relationship, we can use our professional technology adequately.		0.871	
P5: in the relationship, we can use our R&D capability adequately.		0.847	
P6: in the relationship, we can use our good relationship with some research institutes adequately.		0.703	
P7: in the relationship, we can use our sale force adequately.		0.704	
P8: in the relationship, we can use our brand influence adequately.		0.706	
The exploration phase: both firms are discovering and testing the goal compatibility, integrity, and performance of the other, as well as potential obligations, benefits and burdens involved with working together on a long-term basis.			
The buildup phase: both firms are receiving increasing benefits from the relationship, and a level of trust and satisfaction has been developed such that are more willing to become committed to the relationship on a long-term basis.			
The maturity phase: both firms have an on-going, long-term relationship in which both are receiving acceptable levels of satisfaction and benefits form the relationship.			
The decline phase: one or both members have begun to experience dissatisfaction and are contemplating relationship termination, considering alternative manufacturers or customers, and beginning to communicate an intention to end the relationship.			

5.2 Tests of hypotheses

Using SPSS11.5, we tested the hypotheses by estimating the following equations using regression analysis

$$SR = \alpha_0 + \beta_1 TSI + \beta_6 CNFL + \beta_7 COMP + \varepsilon \tag{1}$$

$$SR = \alpha_0 + \beta_1 TSI + \beta_2 CONT + \beta_6 CNFL + \beta_7 COMP + \varepsilon \tag{2}$$

$$SR = \alpha_0 + \beta_1 TSI + \beta_3 NORM + \beta_6 CNFL + \beta_7 COMP + \varepsilon \tag{3}$$

$$SR = \alpha_0 + \beta_1 TSI + \beta_2 CONT + \beta_4 TSI * CONT + \beta_6 CNFL + \beta_7 COMP + \varepsilon \tag{4}$$

$$SR = \alpha_0 + \beta_1 TSI + \beta_3 NORM + \beta_5 TSI * NORM + \beta_6 CNFL + \beta_7 COMP + \varepsilon \tag{5}$$

SR = suppliers' perceived relational risks

TSI = suppliers' transaction-specific investments

CONT = contracts

NORM = relational norms

CNFL = conflict

COMP = competence

The regression models 1–3 are based on raw score data, whereas the other models used for testing interactions analysis are based on mean-centered data. The reason is that mean-centered data could avoid the problem of multicollinearity, which is likely to be more acute in a small sample with homogeneous characteristics in each phase.

Table 3 indicates that nine of the twelve hypotheses are supported. *H1* hypothesizes that suppliers' TSIs are positively related to their perceived relational risks; it is supported by the result (0.253, $p < 0.001$). As hypothesized in three sub-hypotheses from *H2a* to *H2c*, the positive effect of suppliers' TSIs on their perceived relational risks is strengthened in the exploration phase ($0.423 > 0.253$, $p < 0.001$), but weakened in the buildup ($0.214 < 0.253$, $p < 0.1$) and maturity phases ($0.211 < 0.253$, $p < 0.1$). The positive relationship between suppliers' TSIs and perceived risk is reduced as the use of relational norms and contracts increases, so *H3a* (-0.097 , $p < 0.05$) and *H3b* (-0.106 , $p < 0.1$) are supported. As predicted, in the exploration phase of a relationship, the use of relational norms does not moderate the effect of suppliers' TSIs on their perceived relational risks (-0.067 , $p > 0.1$), so *H4b* is supported. The use of contracts weakens the positive relationship between suppliers' TSIs and their perceived relational risk in the buildup phase (-0.192 , $p < 0.05$); *H5a* is supported. In addition, contracts have no significant moderating effect on the positive relationship between suppliers' TSIs and their perceived relational risk in the maturity phase, which offers support to *H6a* (-0.135 , $p > 0.1$).

Unexpectedly, three hypotheses are not supported. *H4a* hypothesized that the use of contracts weakens the positive relationship between suppliers' TSIs and their perceived risk in the exploration phase, but is not supported (0.146 , $p < 0.1$). *H5b* and *H6b* hypothesize that the use of relational norms will weaken the positive relationship between suppliers' TSIs and their perceived risk in the buildup and maturity phase, but neither of them are supported by the results (-0.006 , $p > 0.1$; -0.100 , $p > 0.1$). The reasons for the lack of support of these three hypotheses could be explained as follows.

(1) In the exploration phase of a relationship, suppliers tend to be eager to set up a long-term relationship with their manufacturers; this puts suppliers in a disadvantageous position when negotiating TSI-related contracts with their manufacturers. Therefore, there are few contractual items that favor suppliers, and unfair factors are embedded from the beginning of a relationship. In addition, incomplete contracts usually lead to opportunistic behavior (Ganesan, 1994). These will add to suppliers' perceived relational risks, so *H4a* is not supported.

(2) As shown in Table 1, the reliability and validity of the relational norms are acceptable, but its indexes are much lower than those of the other three

Table 3 Test of hypotheses

Hypotheses	Total sample			Exploration phase			Buildup phase			Maturity phase		
	H1	H3a	H3b	H2a	H4a	H4b	H2b	H5a	H5b	H2c	H6a	H6b
Control variable												
Conflict	0.448***	0.180***	0.437***	0.545***	0.268***	0.557***	0.416***	0.199*	0.395***	0.404***	0.245***	0.400***
Competence	-0.187***	-0.05	-0.116*	0.083	0.129*	0.136	-0.286***	-0.156*	0.154	-0.113	-0.079	-0.098
Independent variable												
TSI	0.253***	0.178***	0.286***	0.423***	0.176*	0.497***	0.214*	0.129	0.278**	0.211**	0.311***	0.225**
Contracts	-0.589***	-0.589***	-0.183***		-0.652***	-0.217*		-0.443***	-0.317***		-0.444***	-0.074
Relational norms												
TSI*contracts		-0.097**			0.146*							
TSI*relational norms			-0.106**			-0.067						
<i>N</i>	261	261	261	42	42	42	79	79	79	140	140	140
<i>F</i>	42.642***	83.575***	28.508***	23.201***	40.912***	14.857***	12.496***	17.079***	10.071***	13.462***	19.163***	8.419***
<i>R</i> ²	0.332	0.621	0.359	0.647	0.850	0.674	0.333	0.539	0.408	0.229	0.417	0.239
Support or not	support	support	support	support	not	support	support	support	not	support	support	not
					support				support			support

Notes: dependent variable: suppliers' perceived relational risk; *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

factors, i.e. suppliers' TSIs, suppliers' perceived relational risks, and contracts. Limited data on relational norms may be the cause of *H5b* and *H6b* not being supported.

6 Discussion

6.1 Theoretical implications

By collecting and analyzing data from the Chinese household electrical appliance industry, this study takes the relationship between suppliers and their manufacturers as the research objective and conducts an empirical study focused on investigating the moderating effects of contracts and relational norms on the relationship between suppliers' TSIs and their perceived relational risks during various phases of a relationship. The results suggest that suppliers' TSIs positively affect their perceived relational risks, and the relationship between suppliers' TSIs and their perceived relational risks will be strengthened or weakened by different control mechanisms in different phases of a relationship.

Our results show that suppliers who make TSIs usually perceive a relatively higher level of relational risk in the exploration phase and a lower level of relational risk in the buildup and maturity phases. The level of perceived relational risk reaches its peak value in the exploration phase (0.423, $p < 0.001$), where it is higher than the average level of perceived relational risks (0.253, $p < 0.001$). The level falls to the lowest value in the maturity phase (0.211, $p < 0.1$), which is similar to the level in the buildup phase (0.214, $p < 0.1$) and lower than the average level of perceived relational risks (0.253, $p < 0.001$). Previous work has ignored research on the dynamic nature of TSIs (Helper and Levine, 1992; Williamson, 1975, 1985, 1991); our study could provide a supplement for this field's research.

Our results indicate that when both contracts and relational norms moderate the relationship between suppliers' TSIs and their perceived relational risks, either of them can weaken the positive relationship between suppliers' TSIs and their perceived relational risks or protect suppliers' TSIs during the relationship. Hollander and Heide suggest that contracts and relational norms, as antecedents, have direct safeguarding effects on TSIs (Heide and George, 1992; Hollander, 1964). Our research is an extension of their work and we find that contracts and relational norms' have safeguarding effects on TSIs by moderating the relationship.

Our study also shows that, during different phases of a relationship, contracts and relational norms have distinct moderating impacts on the relationship between suppliers' TSIs and their perceived relational risks. Jap and Ganesan (2000) have

investigated three control mechanisms' moderating effects on the relationship between retailers' TSIs and their perception of supplier commitment (Jap and Ganesan, 2000). By drawing lessons from their researches, we conduct our study from a different perspective, focus and context. It is an extended research on the basis of past literature.

Additionally, we find that conflict, as a control variable, has a significant positive impact on suppliers' perceived relational risks in all of five regression equations. This indicates that suppliers would often perceive a high level of relational risk in a channel relationship that is filled with conflict. This finding is consistent with most scholars' premises that conflict will corrupt a relationship (Anderson and Weitz, 1992).

6.2 Managerial implications

This research represents an important first step in testing and understanding the relationship between suppliers' TSIs and their perceived relational risks from a dynamic point of view. Transaction-specific investments have both investment and relationship attributes that requires us to consider the time and relationship factors simultaneously in these studies. Our results show that the perception of relational risks of suppliers' making TSIs varied with the development of the relationship, while two distinct control mechanisms, contracts and relational norms, have different moderating effects on the relationship between the suppliers' TSIs and their perceived relational risks during different phases of a relationship. These results suggest that, whether to keep a relationship with a powerful manufacturer or to gain benefits from relationships with its manufacturers, the supplier should take the dynamic point of view and consider which particular phase its relationship is in, when making decisions on TSIs in channel relationship, assessing the relational risks it is facing, and choosing the suitable control mechanisms.

Both contracts and relational norms can weaken the positive relationship between suppliers' TSIs and their perceived relational risks, and have the effect of safeguarding suppliers' TSIs during a relationship. But the moderating effects of both contracts and relational norms are distinct in different phases of relationship. In the exploration phase of a relationship, suppliers who make TSIs in the relationship will face a higher level of relational risk. Since the relational norms may not be fully established in this stage, the suppliers may have to rely on contracts to safeguard their TSIs. In this case, if the contractual terms signed are unfair, this will increase the suppliers' perceived relational risks. During this phase, therefore, the supplier should emphasize acquiring a satisfying contract.

The relational risk levels perceived by suppliers are similar during the buildup and maturity phases, but distinct control mechanisms are needed to decrease

them. During the buildup phase of a relationship, contracts and relational norms not only have negative moderating effects on the positive relationship between suppliers' TSIs and their perceived relational risks, but also are complementary with each other. Consequently, both could be used to reduce the suppliers' perceived relational risks during this stage. During the maturity phase, however, as contracts have limited effects and some of their terms have transformed into implicit relational norms, suppliers should mainly rely on relational norms to safeguard their TSIs. All of this suggests that suppliers should pay more attention to fostering and establishing relational norms at the very beginning of the relationship with their manufacturers.

Our study assumes that the positive relationship between suppliers' TSIs and their perceived relational risks will be strengthened during the decline phase, and that the use of contracts and relational norms will weaken the positive relationship. This result suggests that, at the very beginning of a relationship, suppliers who make TSIs ought to carefully think over the contractual terms governing relationship termination; meanwhile, suppliers should emphasize the establishment and maintenance of the relational norms during the entire relationship process.

Although the samples of our study are selected from the Chinese household electrical appliances sector, the channel relationships between the suppliers and their manufacturers are a common phenomenon in today's globalization context. Therefore, the results and implications of this study are valuable for both Chinese enterprises and overseas multinational corporations. This study can help suppliers to be aware of the relational risks they are facing when they set up and develop long-term relationships with Chinese manufacturers through their TSIs, and provides suppliers with suggestions on how to choose effective control mechanisms to reduce relational risks during the four distinct relationship phases.

6.3 Limitations and further research

There are some limitations in this study, which need to be considered in further studies. First, the items for measuring suppliers' TSIs only include hard TSIs such as "specific facilities." This fails to provide a complete view of suppliers' TSIs. Some soft TSIs such as "people training" should be involved in future research. Second, according to Anderson's (1995) suggestion, we divide our cross-sectional data, instead of longitudinal data, into four sub-samples to conduct our empirical studies on the dynamic stages of a relationship. If the longitudinal data could be used for analysis, it might provide a more accurate conclusion. Third, this study separately investigates the moderating effects of contracts and relational norms on the positive relationship between suppliers' TSIs and their perceived relational

risks. Further research could also examine the joint moderating effects of both contracts and relational norms. Fourth, the data collected in the decline phase were too limited to be used for statistical analysis, which may be attributed to suppliers' hesitation to report on conflicts and dissatisfactions with their manufacturers, so that the samples in the decline phase are limited. This suggests that more researches should be done in the future on the complicated decline phase of a channel relationship.

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