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Effects of suppliers' trust and commitment on customer involvement

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Effects of suppliers' trust and commitment on customer involvement

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1041

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Abstract

Purpose – The purpose of this paper is to investigate the relationships among suppliers' trust and commitment, transaction-specific investment, switching cost, and customer involvement within the context of relational governance mechanism and the social exchange theory.

Design/methodology/approach – The authors use survey data from 214 Chinese manufacturing firms and employ the structural equation model to verify the conceptual model.

Findings – Relational governance benefits customer involvement. Transaction-specific investment mediates the relationship between trust and commitment of suppliers. Switching costs negatively moderate the relationship between suppliers' trust and customer involvement, but positively moderate the relationship between suppliers' commitment and customer involvement.

Research limitations/implications – The authors focus on two key elements of relationship, namely, trust and commitment of suppliers, but neglect other relational factors, such as relational norms and interdependence.

Originality/value – These findings broaden the understanding and present new directions for the implementation of customer involvement from the perspective of relational governance and social exchange theory.

Keywords Commitment, Trust, Customer involvement, Relational governance

Paper type Research paper

1. Introduction

More and more suppliers are considering customers as important sources of information, knowledge, and competence (Alfaro *et al.*, 2004; Helpman, 1992; Im *et al.*, 2003; Shaw, 1992). Hence, in a business-to-business (B2B) environment, involving customers into new product development (NPD) is important for suppliers. First, involving customers aids suppliers in uncovering true latent needs through proactive learning from customers (Deszca *et al.*, 1999; Leonard and Rayport, 1997; Martin and Horne, 1995; Prahalad and Ramaswamy, 2000; Thomke, 2003). Second, involving customers helps suppliers gain competitive advantages over their rivals through lowering product development cost (Fitzsimmons, 1985), saving product development time (Alam, 2002), improving



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productivity, effectiveness, and quality (Lovelock and Young, 1979; Mills *et al.*, 1983; Mills and Morris, 1986; Song and Adams, 1993). Third, customers involved into the product process are more likely to be satisfied with the supplier (Bendapudi and Leone, 2003; Fournier and Mick, 1999; Keiningham *et al.*, 1999). Fourth, involving customers exhibits positive performance effects (Narver and Slater, 1990) and creates continuous superior marketplace performance for suppliers (Deshpande and Farley, 2000; Prahalad and Ramaswamy, 2003).

The importance of involving customers in B2B market has been highlighted by deeper exchange and cooperation between suppliers and customers (Finch, 1999). It becomes particularly significant when suppliers begin to develop new products. As a successful strategy for NPD of suppliers (Brockhoff, 2003), involving customers could enable suppliers to realize in-depth learning of customer needs, which is necessary for successful NPD (Brown and Eisenhardt, 1995; Craig and Hart, 1992; Montoya-Weiss and Calantone, 1994). More importantly, through customer involvement, suppliers gain access to development capabilities and other resources that they lack in-house (Athaide *et al.*, 1996; Ruckert and Walker, 1987) and obtain the assistance from customers for product design, development, testing, and commercialization (Nambisan, 2002).

Although previous studies have suggested involving customers is beneficial to the success of new products of suppliers (Brown and Eisenhardt, 1995; Ruckert and Walker, 1987; Nambisan, 2002), few studies have investigated factors driving suppliers to involve their customers in NPD activities (Lundkvist and Yakhlef, 2004; Svendsen *et al.*, 2011). Governance coordinates cooperation (Steinicke *et al.*, 2012; Teng and Das, 2008), influences value-creation (Dyer and Singh, 1998) and minimizes the risk of opportunism (Hoetker and Mellewigt, 2009). In the existing literature, governance mechanisms are classified into contractual or relational (Hoetker and Mellewigt, 2009; Poppo and Zenger, 2002; Roath *et al.*, 2002). Partnership with customers, governance by suppliers, hard bases for contracts (Lundkvist and Yakhlef, 2004), and customer collaboration are valued over contract negotiation (Cohn, 2005). Thus, relational governance is likely to be a more suitable and effective tool for suppliers to manage customer involvement. Relational governance emphasizes the roles of trust and commitment to coordinate inter-firm relationship. Thus, we consider relational governance should mainly include two dimensions – trust and commitment.

While relational governance exhibits its role in an enduring relationship (Hewett and Bearden, 2001), the continuity of relationship depends on the value (benefits/costs) comparison of the current relationship (Grisaffe and Kumar, 1998). Thus, some certain mechanisms may be in place through which the relationship between relational governance and customer involvement occurs. Understanding these mechanisms may offer managers with a more detailed picture of how suppliers involving customers into NPD effectively. As necessary expenses for suppliers, transaction-specific investment premises on trust (Yu *et al.*, 2006; Reuer *et al.*, 2006), and shows the signal to commitment (Krapfel *et al.*, 1991). Therefore, transaction-specific investment may be an intermediate outcome of suppliers' trust that ultimately leads to suppliers' commitment and customer involvement. By contrast, switching cost yields benefits, like increasing customer loyalty, locking partners in the relationship (Burnham *et al.*, 2003). These benefits may strengthen the effects of relational governance on customer involvement. However, the mediating role of transaction-specific investment and the moderating role of switching cost have been overlooked in previous studies. Moreover, trust and

commitment are regarded as the essential ingredients for successful collaborative relationships (Moorman *et al.*, 1992; Morgan and Hunt, 1994), but Zhao *et al.* (2008) find that instrumental relationship commitment do not significantly influence customer integration, and excessive trust on customers constitutes a barrier to innovation because of short-sight and ignorance of customers (Matsuo, 2006), in turn discourages suppliers to involve customers. The inconsistent findings in the literature suggest the need to identify contingencies that may explain relational governance-customer involvement relationship.

This study addresses three significant research questions missing in previous literature:

- RQ1. How different dimensions of relational governance impact on customer involvement?
- RQ2. What are the roles of transaction-specific investment on the relationships between relational governance and customer involvement?
- RQ3. What are the roles of switching cost on the relationships between relational governance and customer involvement?

This study contributes to existing literature and practices in several ways. First, this study contributes to our understanding on how to facilitate customer involvement by unpacking the relationship between relational governance and customer involvement. Second, this study investigates the mediating effect of transaction-specific investment on the relationship between suppliers' trust and suppliers' commitment, which reveals the indirect effect of suppliers' trust on customer involvement. Third, this study enhances our understanding on the relationship between relational governance and customer involvement through examining the moderating effects of switching cost.

The rest of this study is organized as follows. In Section 2, we review existing literature to develop research hypotheses and build the conceptual model. In Section 3, we describe the research method and measures. The results are presented in Section 4, followed by discussions and contributions in Section 5. Finally, we outline limitations and future research directions in Section 6.

2. Theory background and hypotheses

2.1 Drivers of customer involvement

Involving customers is not only conducive to suppliers' innovation and positively promotes cross-functional integration and NPD process of suppliers (Chien and Chen, 2010), but also helps suppliers speed up the release of new products (Lin *et al.*, 2010). Considering the importance of customer involvement, there is a need to investigate its drivers.

Research on antecedents of customer involvement in NPD is currently in its emerging stage. Customer involvement relates with contextual factors internally and externally (Parker, 2000; Petersen *et al.*, 2005). Externally, Gales and Mansour-Cole (1995) insisted that environmental context may predict customer involvement, while empirical results of Lin and Germain (2004) did not support the hypothesis that technological turbulence would positively influence customer involvement in product development. Internally, these factors derive from strategy and organizational structure, product feature, technology and capability, and relationship. From the side of strategy and organizational structure, Svendsen *et al.* (2011) proposed embodiment of product differentiation and competitor orientation positively affect customer

involvement, which in turn increases relationship profitability. Lin and Germain (2004) found that formalization related positively with customer involvement, whereas decentralization related negatively with it. The relationship between formalization and customer involvement is also found to be stronger in Chinese firms. On the aspect of product feature, product saleability (Wu *et al.*, 2004), product complexity (Lin and Germain, 2004), product innovativeness, and product modularity (Lau, 2011) relate positively to customer involvement. Referring to technology and capability, He *et al.* (2014) found that manufacturing flexibility has a positive effect on customer integration. Innovation capabilities (Ngo and O'Cass, 2013) and organizational capabilities (Sharma *et al.*, 2014) may account for customer participation. Web 2.0 tools (Hoyer *et al.*, 2010; Kohler *et al.*, 2009; Sigala, 2011), such as blogs, forums and virtual communities, and IT systems (Müller and Seuring, 2007) accelerate customer involvement. With regard to relationship, many researchers discuss the effects of power and trust (Wu *et al.*, 2004), dependence (Léger *et al.*, 2006), different supply chain linkages (Müller and Seuring, 2007), and commitment (Svendsen *et al.*, 2011) on customer involvement. Ritter and Walter (2003) considered relationship-specific factors, such as mutual adaptations, mutual trust, mutual commitment, and mutual relationship management, to contribute to customer involvement in NPD. Westh Nicolajsen and Scupola (2011) believed that personal trust is conducive to customer involvement in radical innovations.

Researchers found that strategy and contextual factors from environment, industry, organization, individuals, and products could be potential antecedents to customer involvement. However, still very few attempt to document the causes of customer involvement (Ritter and Walter, 2003). Ritter and Walter (2003) examined the impact of relationship-specific factors, namely, mutual trust, commitment, adaption, and relationship management on customer involvement in NPD. Although their study provides important insights into relationship-specific factors that become significant predictors of customer involvement, some problems remain unsolved. For instance, what is the relationship among relationship-specific factors? Moreover, when the relationship links suppliers with customers, costs and benefits incurred by the relationship should be considered by both parties. The effect of cost and benefit on the relationship is another open question. Our study is based on the study of Ritter and Walter (2003) and combines the theories of trust-commitment and social exchange to develop a theoretical model to solve these questions.

Under competitive B2B market environment, suppliers have realized that they should involve customers in NPD to acquire information, knowledge, techniques, and capacity from customers, but effective control and governance of the involvement with customers remain unclear. Suitable governance could cultivate innovativeness (Bosch-Sijtsema and Postma, 2009; Sivadas and Dwyer, 2000) and success of cooperation (Dilk *et al.*, 2008; Muthusamy and White, 2005). In the context of customer involvement, based on trust and commitment, relational governance is more preferable to contractual governance because relational governance could encourage partners to resist attractive short-term interests, and reduce opportunistic behaviour. Moreover, contractual governance has rather unlikely rules for partners, such as initiative knowledge- and information-sharing, and prompting feedback on problems and comments for improvement of products. Hence, we merely focus on the perspective of relational governance. In addition, suppliers and customers need to consider that whether the relationship should continue through comparing the cost with the benefit, and cost and benefit are brought by relationship. Therefore, we also incorporate cost and benefit factors, i.e., switching cost and transaction-specific investments in our research.

2.2 Theoretical background and hypotheses

Morgan and Hunt (1994) proposed commitment-trust theory, which considers commitment and trust as key factors in the relationship. Both factors facilitate marketers to focus on cooperation to preserve relationship investments, expect long-term benefits of remaining with existing partners instead of attractive short-term alternatives, and believe that partners will not respond to opportunistic behaviours. In other words, cooperation is caused directly by trust and commitment, which are crucial in effective business relationships (Dwyer *et al.*, 1987; Morgan and Hunt, 1994). As essential ingredients of successful collaborative relationships between partners, trust and commitment are embedded in the relationship (Gundlach *et al.*, 1995). Building the relationship between suppliers and customers tends to rely on commitment (Grayson and Ambler, 1999; O'Malley *et al.*, 1997; Söllner, 1999; Skarmas *et al.*, 2002) and trust (Chien and Moutinho, 2000; Hallen *et al.*, 1991). Involvement with customers, which is an important form of cooperative behaviour, attracts wider attention from suppliers in need of NPD. This development enhances the importance of commitment and trust because these factors contribute to the development of successful relationships (Samiee and Walters, 2006). Trust and commitment are essential in building and cementing the relationship of suppliers and customers, i.e., customer involvement in NPD. In a highly uncertain and volatile environment, early integration of customers in NPD and sharing of critical information are important approaches for executing NPD tasks (Wheelwright and Clark, 1992), which rely on trust and commitment from suppliers.

The social exchange theory argues that trust and commitment are essential elements that result in dependence as well as develop and maintain the relationship. Fostering trust and commitment is indispensable for successful marketing relationship (Kingshott, 2006). As an integral feature of successful relationships (Mohr and Spekman, 1994), trust facilitates cooperative behaviour and beneficial relational exchange (Moorman *et al.*, 1992; Morgan and Hunt, 1994) and determines supply chain cooperation (Anderson and Narus, 1984, 1990; Kelle and Akbulut, 2005). Luo (2002) insisted that trust is an underlying condition that results in cooperation. When conceptualized as a determinant of joint performance, trust aids in enhancing cooperation, contributes to reducing transaction costs, improves capability and increases strategic flexibility (Gulati, 1995; Mayer *et al.*, 1995; McAllister, 1995; Smith *et al.*, 1995). As a necessary element of social exchange, trust is conducive for relationship building because it accelerates cooperation.

NPD projects are intrinsically uncertain and have high risks of failure (Cooper, 1979). The situation becomes aggravated when NPD work integrates different organizations, i.e., partnerships and alliances (Doz, 1987; Duysters and Hagedoorn, 1995). Suppliers may be worried that customers divulge know-how to other suppliers and even invest in new ones mainly in anticipation of short-term benefits. Only when suppliers trust their customers can they safely involve them in NPD activities. Otherwise, fear of customers divulging of their technology know-how could lead suppliers to separate their developing activities from customers. Beyond that, supplier trust in customers is exhibited in several ways, such as suppliers believing in the truthfulness of information the customer provides. The belief that customer actions will result in positive responses is likely to stimulate suppliers to better operate and manage customer relationships. In turn, this treatment will facilitate suppliers to involve customers in NPD. Trust improves communication and understanding between suppliers and customers

(Atuahene-Gima and Li, 2002), restraints opportunistic behaviour, decreases risk, and thus boosts suppliers' confidence in future exchange. Thus, we propose:

H1. Suppliers' trust to customer positively affects customer involvement in NPD.

Commitment refers to the willingness of partners to exert effort on the relationship and implies future orientation, which is the desire to build continuous relationship and solve unanticipated problems (Gundlach *et al.*, 1995). Commitment has been recognized as an attitudinal component that indicates an intention towards developing and sustaining a long-term relationship (Anderson and Weitz, 1992). Gundlach *et al.* (1995) and Moorman *et al.* (1992) viewed commitment as an essential ingredient for maintaining successful long-term valued relationships. Commitment connotes that partners look forward to a successful and continuous relationship. In NPD, suppliers commit to customers in hope of fostering and strengthening their collaborative relationships, i.e., building CRMs to facilitate their cooperation and allowing customers to experience new products for the first time. The commitment from suppliers implies the intentions of sharing information and communication, ensures future exchange, and lowers the probability of customers leaving (Zhao *et al.*, 2008). Suppliers with greater commitment to customers more willingly involve customers. Hence, we hypothesize that:

H2. Suppliers' commitment to customers positively affects customer involvement in NPD.

Homans (1961) defined social exchange as the exchange of activities of at least two persons. Activities may be tangible or intangible, and rewarding or costly. Burns (1973) viewed social exchange as mutually rewarding activities. The exchange is not only an exchange of material objects, but also non-material ones (Homans, 1958). In relational exchange, concurrence bilateral costs and rewards exist, and thus, calculation of gains and losses requires emphasis (Dwyer *et al.*, 1987).

The scope of social exchange theory is extended by the investment model (Rusbult, 1980), which predicts the leave/stay behaviour or intentions to maintain relationships and to remain psychologically attached to it. According to the investment model, rewards and costs influence the attraction and satisfaction in a relationship. Satisfaction is the important predictor of the intent of an individual or organization to remain in the relationship (Le and Agnew, 2003; Sprecher, 1988). When partners participate in the relationship, their rewards and costs in the involvement should be considered. To some extent, rewards and costs affect relationships, e.g., customer involvement in NPD. During the process of customer involvement in NPD, the benefits brought by switching cost, like customer loyalty, and customers' low sensitivity to price and satisfaction (Fornell, 1992), correspond to rewards for suppliers while transaction-specific investments in customers or relationship equal to costs for suppliers. Hence, we cannot neglect the role of transaction-specific investment and switching cost in customer involvement by suppliers in NPD.

An ongoing relationship allows firms to employ new flexible cooperation such as alliances, produce mutual benefits or reciprocity and invest in transaction-specific assets. Trust is an integral feature of successful relationships (Mohr and Spekman, 1994), and once a relationship is established, firms believe their customers are honest (Doney and Cannon, 1997), benevolent (Geyskens *et al.*, 1996), and competent (Moorman *et al.*, 1992). Suppliers prefer to provide higher discounts, faster delivery and better service for these trusted customers. When suppliers trust partners, they are willing to invest in their relationship. In other words, trust fosters the willingness to make transaction-specific investments (Yu *et al.*, 2006). Reuer *et al.* (2006) maintained that

suppliers should be more willingly make transaction-specific investments and forge alliances with trusted partners. The more suppliers trust customers, the more they willingly conduct transaction-specific investment to help and serve customers. Once trust is built, suppliers will keep, develop, and deepen this relationship with customers, depending on continuous sustained transaction-specific investment.

Transaction-specific investments imply that suppliers are willing to commit to a long-term relationship. However, termination of this relationship can result in the loss of the value of transaction-specific investments, which will be difficult to re-deploy (Anderson and Weitz, 1992). Krapfel *et al.* (1991) considered transaction-specific investments as signals of credible commitment and reciprocity. Transaction-specific investments, such as investing new material, process, and human resource, serve to raise mutual dependence and reciprocal commitment in a relationship (Heide and Miner, 1992; Parkhe, 1993). Such investments increase the commitment of suppliers to customers. When suppliers invest in sustaining the relationship with customers, this action indicates that suppliers intend to commit to its customers and the relationship.

The higher the amount of trust suppliers have for their customers, the more they will invest in maintaining the relationship with customers. This kind of investment signifies supplier commitment to the long-term relationship. The trust of suppliers to customers may influence the commitment through transaction-specific investment. In the context of NPD characterized by high risk and failure rate, suppliers may worry about loss of the value of transaction-specific investment because of the possibility of customer betrayal. Thus, supplier trust in customers is an essential element and prerequisite. After suppliers consolidate the relationship with customers through transaction-specific investments, the risk of leaking know-how on new products may be reduced, and suppliers can actually make the commitment that the relationship will continue with investment. Thus, we insist that supplier trust affects their commitment indirectly based on the channel of increasing transaction-specific investment. Transaction-specific investment is an effective hub that carries positive effects of supplier trust to their commitment:

H3. Transaction-specific investment mediates the relationship between trust and commitment of suppliers.

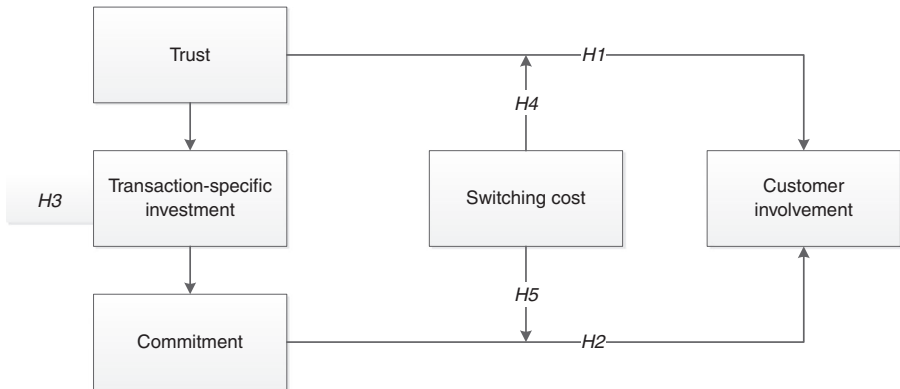
Switching cost locks partners in the relationship. Many researchers propose that switching cost assists firms in building personal ties (Burnham *et al.*, 2003), keeping customers in relationships regardless of their satisfaction (Bansal *et al.*, 2004; Jones *et al.*, 2000), lowering customer sensitivity to prices (Fornell, 1992) and increasing their loyalty (Burnham *et al.*, 2003). Switching cost, including searching, learning, transaction, and opportunity cost, creates ties from suppliers to customers (Burnham *et al.*, 2003), and helps suppliers better understand and predict customer behaviour (Anderson and Sullivan, 1993; Anderson, 1994; Fornell, 1992). These benefits enhance suppliers dependence on customers, and may motivate suppliers to speed up the process of customer involvement. Therefore, switching cost strengthens the positive effects of supplier trust and commitment on customer involvement, and we propose *H4* and *H5*:

H4. Switching cost positively moderates the relationship between supplier trust on customers and customer involvement in NPD.

H5. Switching cost positively moderates the relationship between supplier commitment to customers and customer involvement.

Based on *H1-H5*, we develop the conceptual model shown in Figure 1.

Figure 1.
The conceptual
model



3. Method

3.1 Samples and data collection

The vast territory of China makes data collection from the entire country extremely difficult. To improve sampling representativeness and efficiency, we employ stratified random sampling method and strategically select five provinces or municipalities, namely, Shaanxi, Shandong, Beijing, Guangdong, and Jiangsu for our samples. We consider different levels of size, geographical conditions, and economic diversity. Beijing and Guangdong enjoy a high degree of economic development and marketization. Shandong and Jiangsu reflect average stages of economic development in China, whereas Shaanxi represents a relatively early stage of economic development.

In each of these five areas, we randomly select companies listed under government directories of firms. We identify and select CEO/presidents, vice presidents, directors, or managers of the sample firms as respondents to ensure the collection of reliable data concerning relationships with their customers. After determining appropriate informants and pre-testing, we mailed the questionnaire together with a cover letter. In the cover letter, we described the issue, explained our research objectives, and assured confidentiality. Follow-up phone calls were made to potential respondents who did not return the survey within one month to increase the response rate.

Out of 750 companies, 226 survey questionnaires were returned, whereas 12 were discarded because of excessive missing data. Thus, we obtained 214 usable questionnaires, or a response rate of 28.53 per cent. Table I presents the characteristics of the respondents and shows that the sample firms cover various industries, such as food and beverage, textile and apparel, paper and printing, and so on. More importantly, the firms sell investment goods to their customers. Sales and number of employees varied among the respondents. All sample companies made their decisions independently, and most did not belong to monopolized industries. Although approximately 20 per cent of the sample companies are state- or collectively-owned businesses, these firms are not political and are not influenced by the Communist Party of China in their decisions.

We apply the *t*-test to compare the early and late responses for all variables; results show that non-response bias is not a serious concern in this study because no significant differences are found (Swink and Song, 2007). We conclude that common method bias is not a potential issue based on Harman's one-factor test. Comparing with

Industry	Total (<i>n</i> = 214)
Food and beverage	6 (2.80%)
Textile and apparel	7 (3.27%)
Paper and printing	3 (1.40%)
Chemicals and petrochemicals	11 (5.14%)
Rubber and plastics	3 (1.40%)
Non-metallic mineral products	14 (6.54%)
Smelting and pressing	11 (5.14%)
Metal products	21 (9.81%)
Mechanical and engineering	41 (19.16%)
Electronics and electrical	55 (25.70%)
Instruments and related products	26 (12.15%)
Others	16 (7.48%)
<i>Sales</i>	
< 5	40 (18.69%)
5-9	32 (14.95%)
10-19	12 (5.61%)
20-49	20 (9.35%)
50-99	25 (11.68%)
Over 100	85 (39.72%)
<i>Number of employees</i>	
< 50	25 (11.68%)
50-99	40 (18.69%)
100-299	58 (27.10%)
300-999	40 (18.69%)
1,000-1,999	20 (9.35%)
2,000-4,999	19 (8.88%)
Over 5,000	12 (5.61%)
<i>Ownership</i>	
State-owned and collectively owned business	34 (15.89%)
Privately owned business	129 (60.28%)
Foreign-owned business	51 (23.83%)

Table I.
Profile of
sampled firms

$\chi^2(80) = 200.871$ for CFA model, Harman's one-factor model generates $\chi^2(90) = 2,399.284$. This fit indicates that variables had several distinct factors, thereby suggesting that common method bias is not a serious issue (Podsakoff *et al.*, 2003; Teo and Liu, 2007).

3.2 Measures

By reviewing related literature, we identify suitable indicators to measure constructs. Customer involvement is defined according to the participation of customers in NPD activities, which gives rise to better understanding and forecasting of market demand (Sin *et al.*, 2005). Customer involvement is measured by five items on Lin *et al.* (2010) and Mishra and Shah (2009). Trust refers to the extent to which the firm believes the customer will take positive actions for the company. The measurement of five items is derived from Walter (2003) and Fynes *et al.* (2005). Commitment refers to the intention of the firm to develop, sustain, and invest in a long-term relationship (Anderson and Weitz, 1992; Gundlach *et al.*, 1995), and is measured by six items, which are adapted from Walter (2003) and Hadjikhani and Thilenius (2009). Transaction-specific investment contains tangible and intangible investments in a particular long-term relationship, and we employ measurement

composed of four items from Liu *et al.* (2009). Commitment emphasizes the willingness of partners to exert effort on behalf of the relationship. For instance, manufacturers are willing to invest time and money to develop the relationship with its partners. However, transaction-specific investment highlights concrete action or behaviour to invest in the relationship. For example, manufacturers have made significant investments in training the employees of a customer and tailor-fitting shipping and storage (distribution) facilities for the customer. In sum, commitment refers to emotional or psychological levels, whereas transaction-specific investment relates to behaviour or action. Hence, no overlap between commitment and transaction-specific investment constructs exist.

Covering searching cost, learning cost, transaction cost, and opportunity cost, switching cost are assessed using four items from Yee *et al.* (2010). Moreover, we add two more control variables, namely firm age and size. Respondents were asked to rate each item on a seven-point Likert-type scale anchored at 1 = "totally disagree" and 7 = "totally agree". The measurement items are presented in the Appendix. We adopt iterative modifications to improve key model fit statistics. Items removed after checking modification indices, correlated errors, and loadings are marked with "*".

The initial questionnaire was developed in English, and thus, two researchers proficient in both Chinese and English languages were requested to translate the research tool into Chinese. Another two researchers translated the Chinese version of the questionnaire back into English. We checked the back-translated English version against the original English version to search for discrepancies. We use the Chinese version of the questionnaire for our survey. We followed the suggestions of Christmann (2000) to assess the questionnaire. First, we asked three professors and eight manufacturing managers to review the questionnaire and collect their feedback. Second, after first round modifications, we submitted the questionnaire to a sample of ten randomly selected companies for pre-testing. Finally, we obtained additional modifications to ensure that the questionnaire is intelligible and practicable to China. Furthermore, as the supplier may have many customers, we limited our questions on the relationship between suppliers and their major customers, and requested executives to consider major customers that bought the highest dollar value of their products. Our request was justified based on several reasons. First, major customers are regarded as the most important partner for suppliers and thus are expected to maintain long-term relationships with suppliers to be deeply involved in NPD. Second, the single informant could offer more accurate information for our investigation, they have more familiarity with their customers.

3.3 Validation of measures

Most of the scales in our survey are extracted from existing literature, and thus, content validity is established. Cronbach's α and composite reliability are applied to assess the scale reliability of each construct. Table II shows that Cronbach's α exceeds 0.7 and composite reliability is over 0.6, and thus, each construct indicates good reliability (Fornell and Larcker, 1981).

Exploratory factor analysis (EFA) is conducted to assess unidimensionality. EFA is used with principle component analysis for data reduction and determination of the main constructs measured by each scale. Varimax rotation with Kaiser normalization is used to clarify the factors. The EFA results show that five factors with eigenvalues above or near 1.0 emerged, explaining 92.3 per cent of the total variance. Table III illustrates that each scale had high loading on the construct it was intended to measure, and low loading on the construct it was not intended to measure. This result ensures unidimensionality.

Table II.
Results of
confirmatory
factor analysis

Construct	Item	Factor loading	Cronbach's α	CR	AVE
Commitment (CC)	CC3	0.997	0.982	0.982	0.949
	CC4	0.979			
	CC6	0.944			
Trust (CT)	CT2	0.902	0.922	0.929	0.815
	CT3	0.973			
	CT5	0.827			
	TSI1	0.981			
Transaction-specific investment (TSI)	TSI2	0.981	0.988	0.988	0.966
	TSI3	0.986			
	SC1	0.946			
Switching cost (SC)	SC3	0.945	0.965	0.966	0.903
	SC4	0.960			
	CI1	0.892			
Customer involvement (CI)	CI2	0.888	0.912	0.913	0.778
	CI4	0.865			

		Factor loading				
		Switching cost	Transaction-specific investment	Customer involvement	Commitment	Trust
CI1	0.030		0.224	0.787	0.328	0.262
CI2	0.052		0.211	0.876	0.154	0.248
CI4	0.037		0.279	0.788	0.282	0.224
CC3	0.131		0.365	0.310	0.802	0.298
CC4	0.113		0.342	0.298	0.810	0.300
CC6	0.139		0.297	0.297	0.814	0.304
CT2	0.176		0.313	0.246	0.285	0.769
CT3	0.153		0.330	0.319	0.238	0.799
CT5	0.152		0.171	0.271	0.289	0.791
TSI1	0.170		0.824	0.274	0.303	0.316
TSI2	0.179		0.833	0.262	0.346	0.249
TSI3	0.158		0.833	0.311	0.303	0.269
SC1	0.940		0.149	0.017	0.104	0.124
SC3	0.951		0.123	0.040	0.037	0.114
SC4	0.955		0.071	0.061	0.122	0.105

Table III.
The results of EFA

Convergent validity was evaluated using CFA. Table II presents the AVE values of all constructs, which are all above 0.5. Therefore, convergent validity is achieved. The model fit indices are $\chi^2/df = 2.511$, TLI = 0.966, CFI = 0.974, SRMR = 0.025, and RMSEA = 0.084. The results demonstrate convergent validity and ensure unidimensionality of the scales (Cao and Zhang, 2011). All factor loadings range from 0.827 to 0.997, which exceeded the generally accepted value of 0.60, and all are significant under the condition of $p < 0.001$ (Flynn *et al.*, 2010; Koufteros *et al.*, 2007).

According to the conclusions and recommendations of Farrell (2010), the results of EFA ensure discriminant validity. To test further for discriminant validity, we follow Fornell and Larcker (1981). Table IV shows that the square root of AVE for each construct is greater than the correlation between that construct and other constructs. The results provide sufficient evidence for guaranteeing discriminant validity.

4. Results

We employ structural equation model (SEM) to test our hypotheses and overall research model. Amos8.0 is used to generate SEM estimates. Figure 2 shows the results of SEM. Multiple indices of fit, including $\chi^2/df = 2.435$, TLI = 0.951, CFI = 0.962, SRMR = 0.0612, RMSEA = 0.082, were acceptable (Hu and Bentler, 1999).

Figure 2 shows the empirical results that demonstrate that supplier trust and commitment have positive effects on customer involvement. This result supported *H1* and *H2*. Trust and commitment of suppliers to customers could contribute to building and strengthening relationships with customers for mutual benefit and reciprocity, and in turn, facilitate suppliers to involve customers in NPD. From commitment-trust and social exchange theories, in NPD, trust and commitment are essential conditions that promote cooperation with customers. Relational governance that is based on trust and commitment effectively operates CRM, expedites communication channels, and shortens the distance between suppliers and customers. To a certain extent, risks and uncertainty incurred by inefficient communication in NPD are reduced, consequently, which increases customer involvement.

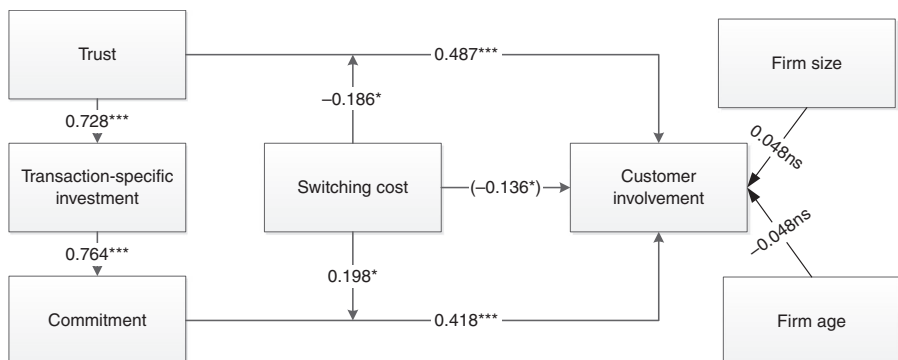
To test the mediating effects of transaction-specific investment, we follow the steps proposed by Baron and Kenny (1986), Judd and Kenny (1981), and James and Brett (1984). Table V provides the results of the test of *H3*. First, we establish the correlation of independent variable (supplier trust) with the dependent variable (supplier commitment).

Table IV.
Variable means,
standard deviations
and correlations

	Mean	SD	CC	CT	TSI	SC	CI
Commitment (CC)	5.070	1.089	0.974				
Trust (CT)	4.871	0.939	0.710***	0.903			
Transaction-specific investment (TSI)	4.413	1.455	0.746***	0.688***	0.983		
Switching cost (SC)	4.017	1.490	0.291***	0.341***	0.340***	0.950	
Customer involvement (CI)	4.698	1.117	0.673***	0.651***	0.641***	0.165*	0.882

Notes: Square root of AVE is on the diagonal. *, ***, Significant at $p < 0.05$, $p < 0.01$ and $p < 0.001$ levels, respectively

Figure 2.
Hypothesized
structure model
results



Notes: ns, non-significant. *, ***, Significant at $p < 0.05$, $p < 0.01$ and $p < 0.001$ levels, respectively

We find that supplier trust is significantly related with supplier commitment. The relationship between independent variable and mediator (transaction-specific investment) is then tested. We find that supplier trust positively influenced transaction-specific investment. Finally, under the control of the mediator, the effects of supplier trust on supplier commitment weakened, but remained significant. These results manifest that transaction-specific investment partly mediate the relationship between supplier trust and supplier commitment. We apply the Sobel, Aroian, and Goodman tests to verify this conclusion further. The significances of the three tests suggest the robustness of our conclusion on mediation effects.

Supplier trust is positively correlated with transaction-specific investment, and transaction-specific investment is significantly correlated with supplier commitment. The higher the trust suppliers have for their customers, the more suppliers will be willing to invest in equipment, production technology, and customer service. Such investment will stabilize the relationship established by trust. In other words, supplier trust becomes a prerequisite for transaction-specific investment. By having trust in their customers, suppliers become willing to invest in promoting performance, providing training, and upgrading logistics facilities for customers. Such investment is regarded as the signal to develop a deeper relationship and supplier commitment to customers. Thus, supplier trust has direct and indirect effects on customer involvement, while supplier commitment has direct effects on customer involvement.

As noted in *H4* and *H5*, the results demonstrate that switching cost negatively moderates the relationship between supplier trust and customer involvement. By contrast, switching cost positively moderates the relationship between supplier commitment and customer involvement. Figure 4 shows that the interaction pattern is consistent with our hypothesis, but Figure 3 does not. Thus, *H4* is rejected, but *H5* is

Independent variable	CT	CT	CT TSI
Dependent variable	CC	TSI	CC
Unstandardized coefficient (SE)	0.823*** (0.056)	1.066*** (0.077)	0.433*** (0.067) 0.366*** (0.043)

Notes: Sobel test: 7.365***; Aroian test: 7.353***; Goodman test: 7.378***. ***Significant at $p < 0.001$ levels

Table V.
The results
of mediation

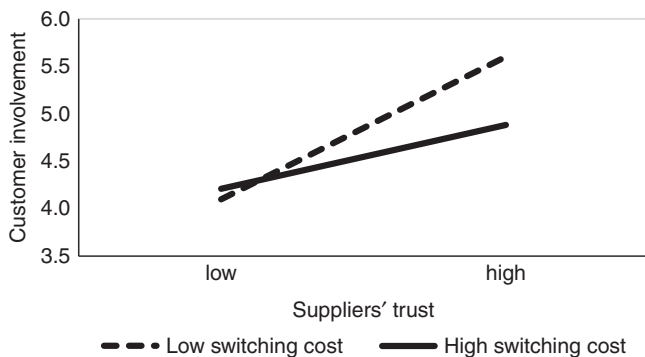


Figure 3.
The moderating
effect of switching
cost on the
relationship between
suppliers' trust
and customer
involvement

supported. Based on the suppliers' benefits incurred by switching cost, we propose that switching cost enhances the relationship between supplier trust/commitment and customer involvement. What is surprising is that the results did not completely support our hypothesis. While switching cost brings benefits for suppliers, such as maintaining ties, lowering sensitivity to price and satisfaction, and increasing loyalty, this type of cost also incurs negative effects. At the early stage of supplier-customer relationship, as trust is built and switching cost is high, antipathy of customers (Jones *et al.*, 2000) makes suppliers believe that customers may cover their true demand, provide false information, and even betray them. Therefore, initiatives of involving customers in NPD are discouraged. However, a stronger relationship between commitment and customer involvement will occur during high switching cost when suppliers realize that customers depend on and are stuck to relationship followed by investment. The steady relationship leads to the reduction of the risk of leakage and ensure the truth of information and demand from customers. Such conditions will eventually render suppliers to enhance customer involvement.

5. Discussions, theoretical contributions, and managerial implications

5.1 Discussions

Our research supports the findings of Feng and Zhao (2014), and Svendsen *et al.* (2011) that trust and commitment of suppliers are important for them to involve customers. Relational governance mechanisms particularly trust and commitment can result in strikingly less opportunistic behaviours and enable long-term cooperation. Trust, which serves as a fundamental asset for long-term relationships, increases willingness to share risks and consolidates partnerships (Cannon *et al.*, 2010; Laureano Paiva *et al.*, 2014; Sahay, 2003). Through sharing of mutual goals and values, commitment prompts partners coordinate and work together to experience increased closer integration (Wu *et al.*, 2004).

In addition to relational governance mechanisms, we also find social exchange factors, such as transaction-specific investment and switching cost, to be helpful in stimulating to suppliers to involve customers. Transaction-specific investment links supplier trust with supplier commitment, and influences customer involvement indirectly. Chang and Chou (2011), Lee and Neale (2012), and Park *et al.* (2014) insisted that high switching cost is positively associated with customer retention, continuance intention, and inattentiveness of alternatives, as well as admit to the "lock-in"

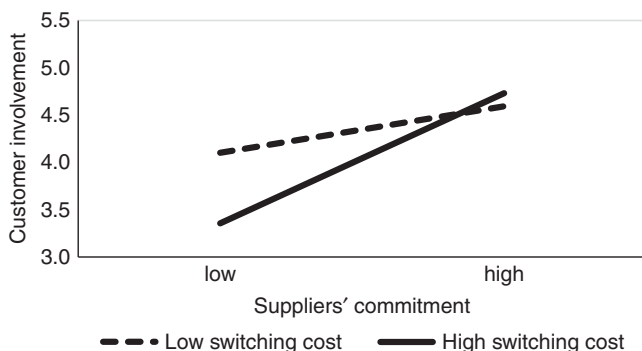


Figure 4.
The moderating effect of switching cost on the relationship between suppliers' commitment and customer involvement

phenomenon caused by switching cost. However, these studies neglect the role and differences in the effects of switching cost that depend on the closeness in relationships.

Lee and Neale (2012) expected that with low-inertia customers, switching cost results in negative word-of-mouth (WOM), whereas high-inertia stemming from customer satisfaction engenders less negative and even positive WOM. Low-inertia customers actively search for and compare deals, whereas high-inertia customers positively contemplate switching (Zeelenberg and Pieters, 2004). This conclusion of Lee and Neale (2012) coincided with our results about the effects of switching cost. Suppliers perceive that customers transform from low-inertia to high-inertia along with the deepening of the relationship. The impact of switching cost on the relationship between relational governance mechanisms and customer involvement also changes. In the early stage of relationship, when switching cost is high, suppliers regard customers as unsettled because they are low-inertia and continuously hunt for better suppliers. This type of customers may not offer suppliers any useful help in NPD, so suppliers do not have enough motivation to involve customers even they trust in customers. Consequently, the effects of supplier trust on customer involvement will weaken. In the later period, suppliers consider that customers have reached high-inertia and indulged in relationships. High switching cost will strengthen the influence of supplier commitment on customer involvement. These findings can offer guidelines to managers in their implementation of strategies for involving customers and improving their understanding of management activities, such as customer involvement.

5.2 Theoretical contributions

Few existing studies have focused on the factors explaining customer involvement in NPD activities (Svendsen *et al.*, 2011). The selection of an appropriate governance mechanism to structure supplier-customer relationship also poses challenges and needs to suppliers (Brown *et al.*, 2000; Cannon *et al.*, 2000). The use of relational governance by suppliers is a more effective tool for coordinating supplier-customer relationship. One of the possible reasons for this effectivity is because relational governance could inspire more enthusiasm and initiative of suppliers. Moreover, the question about whether relationship governance facilitates or impedes customer involvement remains unanswered. Therefore, this study investigates the antecedents of customer involvement in the context of NPD from the perspective of relationship governance and discusses the relationship between relationship governance and customer involvement. We also investigate the relationship among relational governance mechanism, transaction-specific investment, switching cost, and customer involvement within the context of NPD, which is established in trust-commitment and social exchange theories. Hence, our study generates several important theoretical contributions.

First, we discuss the association between relational governance and customer involvement, therefore the research gap that how relational governance affects customer involvement could be filled. As key elements of relationships and social exchanges, supplier's trust and commitment contribute to customer involvement. The study extends current studies on the relationship of relational governance and customer involvement and identifies new factors, namely, supplier trust and commitment, which are important in driving suppliers to involve customer in NPD. In incorporating these relational factors, this study adds greater comprehensiveness and richness to customer involvement literature, enhances understanding of the impact of relational governance on customer involvement, helps resolve the debate about the relationship between relational

governance and customer involvement, and shows new direction and thinking for research on the antecedents of customer involvement.

Second, on the strength of social exchange theory and its extended theory – the investment model, transaction-specific investment from suppliers, and switching cost for customers are incorporated as impact factors for customer involvement. As their influences on customer involvement are indirect, introducing transaction-specific investment as a mediator for the relationship between supplier trust and commitment reveals that transaction-specific investment could bridge trust and commitment and offer another path for the effects of trust on commitment. Transaction-specific investment exhibits partial mediating effect. This conclusion enriches current literature in this area and broadens the findings of previous works that expect trust to directly influence commitment (Aulakh *et al.*, 1996; Medlin *et al.*, 2005; De Ruyter *et al.*, 2001) and cooperative behaviours (Morgan and Hunt, 1994).

Third, switching cost plays an important role in the process of development of “supplier-customer” relationship. Switching cost positively moderates the relationship between supplier commitment and customer involvement, but negatively moderates the relationship between supplier trust and customer involvement. The distinguishing degree of relationship between suppliers and customers and the change of customers inertia perceived by suppliers lead to different roles of switching cost. Although switching cost could help suppliers lock customers in a permanent relationship, such relations may result in the rebellion of customers in some circumstances, and then undermines the benefits of suppliers. In our research, at the beginning, high switching cost induces unstable and unsatisfying relationships, thereby hinders the promotion of customer involvement by supplier trust. After experiencing the benefits from supplier investment, the relationship between suppliers and customers is strengthened. Thus, switching cost becomes the impetus that reinforces the relationship between supplier commitment and customer involvement. The higher switching cost, the stronger the relationship between supplier commitment and customer involvement. In other words, low switching cost signifies a fierce market competition environment. Under such circumstances, supplier trust exhibits prominent effects on customer involvement. By contrast, supplier commitment plays a more prominent role in facilitating customer involvement. This finding deepens our understanding about the relationship between relational governance and customer involvement.

5.3 Managerial implications

Managerial implications, which are linked with our findings and results, are stated as follows. In terms of trust-commitment and social exchange theories, our empirical results show antecedents of customer involvement in NPD from the perspective of relationships. Suppliers could improve to involve customers from two aspects.

First, relational governance mechanism, particularly trust and commitment, could help suppliers improve customer involvement. Therefore, suppliers could facilitate customer involvement directly by the way of ensuring product supply and timely delivery, keeping in touch through mail, calls, SNS, and other social media tools, promptly processing problems, and maintaining relationships.

Second, the indirect effects of transaction-specific investment and switching cost cannot be ignored as well. On the one hand, transaction-specific investment links supplier trust and commitment. Supplier trust affects customer involvement indirectly through transaction-specific investment, which affects customer involvement based on supplier commitment. Thus, suppliers could reinforce various investment activities,

including formulating programmes to promote efficiency and performance for customers, constructing transaction-specific assets for customers, and applying faster and safer logistics system to serve customers, consequently increasing the degree of customer involvement. On the other hand, suppliers should utilize the power of switching cost. In the early stage of relationships, suppliers should not keep and lock customers in a relationship by utilizing the exit barrier of high switching cost. Instead, suppliers should achieve customer involvement through low switching cost. During the mature period of the relationship, suppliers should raise switching cost and produce effects of "locked in" that will eventually enhances the relationship between supplier commitment and customer involvement. Suppliers should adopt targeted strategies to increase customer involvement in NPD during the different stages of the supplier-customer relationship. Low switching cost is more effective for suppliers in the early period, whereas high switching cost is more effective in the later period. The characteristic of "inertia" of customers determines supplier strategy. Low switching cost strategy should be applied to low-inertia customers, while high switching cost strategy should be designed for high-inertia customers.

6. Limitations and future research

This study has several limitations that need to be addressed in future research. First, this study focuses on only two key elements of relationship, namely, trust and commitment of suppliers, to be antecedents of customer involvement. Other relational factors, such as relational norms (Liu *et al.*, 2009), interdependence (Fynes *et al.*, 2005), are not considered. Future research could analyze the effects of these relational factors on customer involvement.

Second, a single key informant is used for collecting data. We emphasize the assertion that a single respondent in our sample could provide useful viewpoints to reflect supplier behaviour based on the strength of their capacity and experience. However, respondent bias may still be a potential problem. In future research, a multiple informant approach could be adopted to enhance the reliability and validity of empirical findings. In our study, survey data are sourced from suppliers only, and although this is not a huge issue (Yee *et al.*, 2010), requesting customers to fill in some parts of a questionnaire, such as the part on switching cost, may be the better option. Additional research efforts should incorporate data from customers. The cross-sectional data used in this study may not be sufficient to explain causal statements derived from empirical findings. Future studies could focus on the ways that antecedents of customer involvement may evolve over time.

Third, all sample manufacturers are located in China. As countries may have various differences, conclusions from a single sample may be difficult to generalize. Future studies that compare developing and developed countries as well as transactional and relational mechanisms of sample firms may enhance our understanding of customer involvement under different cultures, economic levels, and mechanisms.

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Appendix. The measurement items

Commitment (CC): sourced from Walter (2003) and Hadjikhani and Thilenius (2009)

CC1: The relationship that our firm has with this customer is something we are very committed to*.

CC2: It is important to maintain a good relationship with this customer*.

CC3: We are willing to invest time and money to develop the relationship with this partner.

CC4: We expect the relationship with this customer to continue for a long time.

CC5: We are committed to do business with this customer*.
CC6: We would not supply another customer at the expense of this current customer.

Trust (CT): sourced from Walter (2003) and Fynes et al. (2005)

CT1: We are convinced that this customer handles information from us confidentially.*

CT2: We believe the information that this customer provides us.

CT3: When we share our problems with this customer, we know that it will respond with understanding.

CT4: We consider this customer as trustworthy*.

CT5: This customer is genuinely concerned that our business succeeds.

Transaction-specific investment (TSI): sourced from Liu et al. (2009)

TSI1: We have made significant investments in training this customer's employees.

TSI2: We do a lot to help this customer become a more efficient and effective buyer.

TSI3: We specifically designed and developed programmes to enhance this customer's performance.

TSI4: We have made a substantial investment in shipping and storage (distribution) facilities tailored for the customer*.

Switching cost (SC): sourced from Yee et al. (2010)

SC1: Customers have to pay a high cost for searching and evaluating information of alternative product providers before changing product provider.

SC2: Customers have to pay a high cost to learn new product after changing product provider*.

SC3: Customers have to pay a high cost to build new relationships after changing product provider.

SC4: Customers have to pay a high cost for the benefits lost by changing product provider.

Customer involvement (CI): sourced from Lin et al. (2010) and Mishra and Shah (2009)

CI1: We consulted major customer early in the design efforts for the new product.

CI2: We partnered with major customer for developing new product.

CI3: Major customer was an integral part of the design effort for the new product development*.

CI4: Major customer was frequently consulted about the design of the new product.

CI5: We have continuous improvement programmes that include our major customer*.

Note: *deleted item

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