



The effectiveness of relational and contractual governance in new product development collaborations: Evidence from Korea



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ABSTRACT

This study provides deeper insights into the management of new product development (NPD) collaborations and a better understanding of the ways that companies in East Asia govern these relationships to acquire external knowledge while achieving collaboration satisfaction. Looking through the lens of the relational view, we disentangle the effects of relational and contractual governance on collaborations outcomes. An analysis of survey data from 119 NPD collaborations in South Korea reveals that the strength of prior business ties between partners enhances relational governance and indirectly contributes to knowledge acquisition and collaboration satisfaction. Contractual governance does affect collaboration outcomes, but the impact is weaker than relational governance. The positive returns on collaboration satisfaction are diminishing when both governance mechanisms are applied simultaneously. The findings further suggest that managers engaged in NPD collaborations in East Asia should invest more in relational governance while maintaining a moderate level of contractual safeguards to enhance collaboration outcomes.

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1. Introduction

New product development (NPD) collaboration is an attractive innovation mode for many firms. NPD collaboration is defined as a close interorganizational exchange relationship between two firms involved in the conception, testing, production or marketing of a new product. NPD collaboration offers multiple potential benefits such as the exploitation of market opportunities for firms that lack the necessary skills and technical expertise, a reduction of development cost and time-to-market (Littler et al., 1995), and new knowledge creation and innovation (Lawson et al., 2009). However, such collaboration implies extensive coordination cost as collaborating firms face the risk of free-riding, opportunism, or potential misappropriation of technological knowledge and strategic know-how (Littler et al., 1995; Bstieler, 2006). The creation and transfer of knowledge is a major objective of NPD collaborations. These relationships are exposed to a higher degree of uncertainty and exchange hazards than other types of interorganizational relationships such as channel relationships between buyers and suppliers, and licensing and outsourcing arrangements. In NPD collaborations, there is a mutual transfer of

technological knowledge and know-how between partners. However, incentives to prevent misappropriation are relatively weak (Dutta and Weiss, 1997). In addition to proprietary nature, information exchange in partnerships includes strategic and tacit know-how acquired through learning-by-doing that may augment a firm's competitiveness (Bstieler, 2006). How to effectively govern these types of relationships is a major concern for innovative companies.

Companies have two types of general governance mechanisms. The first mechanism applies contractual safeguards (contractual governance). The second mechanism relies on working closely with a collaboration partner (relational governance). While the relevance of these two mechanisms is widely acknowledged (e.g., Poppo and Zenger, 2002; Ferguson et al., 2005), two important research questions emerge for their effective application. First, do these two mechanisms work as complements or substitutes? Second, what is their relative importance in enhancing positive outcomes? A third related question pertains to the role of exchange history between collaborating companies when engaging in NPD collaborations (Rindfleisch and Moorman, 2001). How is the strength of prior business ties related to the usage of the two governance mechanisms? These three research questions have gained importance in a business-to-business context beyond general buyer-supplier relationships outside the Western world.

In contrast to the governance of inter-firm relationships in supply chains and distribution channels, previous studies paid less

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attention on how firms should employ governance mechanisms to facilitate knowledge acquisition and satisfaction in collaborative NPD (Rindfleisch and Moorman, 2001; Lawson et al., 2009). Given the potential uncertainty and hazards that come with such collaborations, how to effectively utilize governance mechanisms deserves more research attention. The extant research on the governance of NPD collaborations is predominantly based on studies in Western countries and asserts that both contractual and relational governance are important for achieving positive outcomes (Mayer and Argyres, 2004; Ryall and Sampson, 2009; Lawson et al., 2009). These studies suggest that contractual and relational governance complement each other in NPD collaborations because they can be effectively combined to reduce transaction costs (Mayer and Argyres, 2004) or curb opportunism (Faems et al., 2008). The exchange history between collaboration partners is sparsely considered as an antecedent of governance mechanisms. A major focus of Western research is the need to control collaboration hazards in the presence of high asset specificity and uncertainty in NPD collaborations (Mayer and Argyres, 2004; Faems et al., 2008).

While this research has generated important insights into the joint effects of governance mechanisms in Western industrialized countries, the effective governance of NPD collaborations in other regions is less understood (Cetindamar et al., 2009). The largest increase in research and development (R&D) expenditures in recent years comes from East Asia (OECD, 2013) and firms in this region increasingly use NPD collaborations (Lin et al., 2009; Chen et al., 2011; Kang and Park, 2012). Thus, the appropriate utilization of governance mechanisms in East Asian NPD collaborations is of significant interest. However, there is a void of research on the joint effects of these types of governance in collaborative NPD in East Asia. Due to the prominence of social relationships in East Asia (Gu et al., 2008), how these mechanisms act jointly is of great interest. There is reason to believe that the governance of NPD collaborations in East Asia is guided by principles different from Western countries because inter-firm collaborations are focused primarily on relationship building instead of transaction cost minimization (Chen, 2001; Chen and Miller, 2011; Gupta, 2011). This suggests that a different theoretical lens should be considered when studying NPD collaborations in this region. Therefore, we introduce a perspective that is more reflective of the cultural context and traditions of thought, and we examine the governance of NPD collaborations through the lens of the ‘relational view’. While Dyer and Singh (1998) have proposed the relational view as a broad concept for enhancing a firm’s competitive advantage through investment in interorganizational relationships, Chen and Miller (2011) suggest a more nuanced perspective in relationship building grounded in the cultural context and thought traditions prevalent in East Asia.

Hierarchies and complex webs of personal and business obligations may influence how managers span organizational boundaries for collaboration in China and other countries with similar cultural orientations (Gu et al., 2008), including South Korea (henceforth, Korea). However, emerging regulations and their enforcement may diminish the importance of socially embedded practices (Peng, 2003). As a consequence, it is important to advance our understanding of idiosyncratic practices and the interplay between contractual and relational governance that facilitate successful NPD collaboration in this region. There is a culturally embedded reluctance of trusting external parties, which poses significant challenges for interorganizational collaboration (Huff and Kelley, 2003). The dynamism of the economic environment in East Asia amplifies the volatility and uncertainty for effective governance (Hitt et al., 2003).

In this study, we contribute to the literature on NPD collaborations by introducing a new perspective on the governance of

these collaborations (the relational view) and by examining the outcomes of mixed forms of governance in Korea, which is considered a major representative East Asian country (Li, 2002). Specifically, we disentangle how the strength of prior business ties between collaboration partners affects contractual and relational governance mechanisms, shed light on the relative importance of contractual and relational governance mechanisms for knowledge acquisition and collaboration satisfaction, and elaborate on the complementary versus substitutive effects of contractual and relational governance.

The results of this study indicate that prior business ties play an important role in determining the governance and outcomes of NPD collaborations in East Asia. Furthermore, relational governance facilitates positive outcomes more than contractual governance, while the effectiveness of contractual and relational governance in enhancing collaboration satisfaction diminishes when both mechanisms are emphasized simultaneously. These findings are in contrast with results based on a Western context, which report complementary effects of these governance mechanisms. The governance of NPD collaborations in East Asia appears to work differently from those in the West. Thus, future studies of collaboration governance should take into account cultural context and regional traditions of thought.

2. Framework and hypotheses

2.1. The transactional view of NPD collaborations

The current research on governance in Western NPD collaborations demonstrates the importance of contractual governance (Mayer and Argyres, 2004; Ryall and Sampson, 2009) and relational governance (Bosch-Sijtsema and Postma, 2009; Lawson et al., 2009) for enhancing the outcomes of NPD collaborations, including knowledge acquisition and collaboration satisfaction (e.g., Poppo and Zenger, 2002). Knowledge acquisition is defined as the degree of information acquired via collaboration that extends a firm’s knowledge base about user needs, new product development, and production and manufacturing processes, and is a major objective in NPD collaborations (Rindfleisch and Moorman, 2001; Lawson et al., 2009). Partners pool their resources to ‘test the water’ for longer-term collaboration. Higher levels of satisfaction will have positive consequences for future collaboration. Collaboration satisfaction is a positive affective state resulting from the cumulative appraisal of all aspects in a working relationship over its duration (Jap, 2001).

In addition, Western NPD collaboration research tends to suggest that contractual and relational governance mechanisms mostly work as complements rather than substitutes to achieve positive outcomes in NPD collaborations. For example, Mayer and Argyres (2004) found that in sequential software development collaborations, contractual details increase over time and the process of writing these contractual specifications in response to ongoing problems enhances mutual communication and trust formation. Similarly, Faems et al. (2008) observed that contractual specifications and trust formation co-evolve in R&D alliances. In a study on technology development collaborations, Ryall and Sampson (2009) found that formal contracts and relational enforcement mechanisms work together as complements. Lawson et al. (2009) reported that in manufacturer-supplier NPD collaborations, formal managerial tools enhance knowledge sharing through informal socialization mechanisms. These findings are similar to the studies for other types of knowledge-intensive collaborations such as close information technology (IT) and R&D outsourcing relationships (Poppo and Zenger, 2002; Blomqvist et al., 2005; Carson et al., 2006), and strategic alliances (Reuer and Ariño, 2007).

Overall, Western research on the governance of NPD collaborations is built strongly on transaction cost theory, which emphasizes individual economic choices and the need to control partners' behavior under high asset specificity and uncertainty (Williamson, 1985). According to this transactional view, the complementary utilization of contractual and relational governance mechanisms in NPD collaborations and other knowledge-intensive collaboration is regarded as a result of high asset specificity and uncertainty, which necessitate both contractual and relational mechanisms to control transaction costs and limit collaboration hazards (Poppo and Zenger, 2002; Mayer and Argyres, 2004; Faems et al., 2008). The focus on transaction cost minimization assumes that collaboration partners are primarily seeking individual gains and contractual and relational governance are useful means to curb opportunistic behavior (Wuyts and Geyskens, 2005). Transactions are complete in themselves (Gupta, 2011), and collaboration satisfaction matters only to the extent that expectations of continuity help reduce future transaction cost (Heide and Miner, 1992).

2.2. *The relational view of NPD collaborations*

The 'transactional view' may not hold in East Asia where different ways of thinking and social practices are prevalent (Chen and Miller, 2011). In East Asia, relationship building is culturally embedded and a central element of business strategy (Chen, 2001). The 'relational view' strongly considers social relationships and relational norms. While this view has some common roots with Western concepts such as social exchange theory (Cropanzano and Mitchell, 2005) or relational exchange theory (Macneil, 1980), the 'relational view' goes beyond these concepts by referring to East Asian thought traditions and emphasizing the establishment of high quality relationships, which do not have a clearly defined end as a central goal of human interaction (Chen and Miller, 2011). Consequently, the exchange history between collaboration partners has high importance and collaboration satisfaction is strongly emphasized.

The essence of collaboration satisfaction is a belief in the integrity and reliability of the other party. This belief is reflected in the satisfaction with collaboration outcomes and the principal view that fairly shared returns need to be accomplished before any collaboration partner reaps individual rewards (Chen, 2001). Given the efforts put toward collaboration satisfaction, opportunistic behavior is not an important concern once a high quality relationship is established. The quality of the relationship has central importance for the common cause and relational mechanisms are crucial to create and maintain collaboration satisfaction (Hitt et al., 2002). Contractual safeguards serve to create a mutual understanding on what to do in the future and mark the beginning of an ongoing process to deliver mutual gains (Chen, 2001) much like a Memorandum of Understanding. Thus, contractual safeguards are regarded less important than relational governance for achieving positive outcomes. One could argue that when firms execute NPD collaborations in Western cultures, they also would prefer relational over contractual governance. However, empirical evidence does not support this notion.

Thus, how do various governance mechanisms relate to outcomes of NPD collaborations in an East Asian country? We delineate the role of exchange history between collaboration partners (prior business ties) and governance mechanisms (contractual safeguards and shared governance) on NPD collaboration outcomes. The strength of prior business ties is defined as the degree of closeness between collaboration partners through past interactions (Granovetter, 1973; Marsden and Campbell, 1984). Prior business ties indicate the extent of shared experiences and are an important base for further relationship building.

Partners rely on contractual or relational governance to acquire knowledge and increase the quality of their relationship during NPD collaborations. For contractual governance, we use the construct of contractual safeguards defined as the contractual framework that creates mutual expectations and obligations in a specified reciprocal exchange (Macneil, 1978). In a dynamic environment of NPD collaboration in East Asia, these obligations and expectations are expected to change according to the needs of partners as the collaboration progresses (Chen, 2001).

We use the construct of shared governance for relational governance between collaboration partners. Shared governance is defined as the process in which collaboration parties engage in coordinated and complementary actions for cultivating and maintaining a collaborative relationship (Heide, 1994). While some studies have examined trust as a relational governance mechanism (e.g., Zaheer and Venkatraman, 1995; Poppo and Zenger, 2002), shared governance directly captures the cooperative actions of collaboration partners and reflects the preference for joint progress to achieve mutual goals. These goals are best achieved when everyone works cooperatively and considerately (Chen and Miller, 2011). Similarly, Ferguson et al. (2005) examined relational norms as a proxy for relational governance, but concluded that the interaction between collaboration partners needs to be more strongly reflected when examining relational governance. Shared governance epitomizes the social interaction needed to promote joint problem solving and facilitate the transfer of tacit knowledge. Since the knowledge underlying exchange in collaborative NPD is often difficult to articulate or transfer, shared governance is a critical mechanism facilitating the acquisition of novel and useful knowledge, and ultimately, collaboration satisfaction. Through shared governance and problem solving, collaboration partners develop mutual values and objectives, which promote a better understanding of each other and result in an environment that facilitates collaborative exchange (Heide, 1994; Bstieler and Hemmert, 2010).

In general, attention to relational considerations in East Asia is more conducive for enhancing collaboration outcomes than contractual governance. Relational practices embrace harmony and integration and mitigate the hazards associated with inter-organizational collaboration (Chen and Miller, 2011). While firms in East Asia extensively rely on contractual safeguards in collaboration with parties with whom no social relationships exist, referring to or relying on contractual safeguards results in a loss of face once relational governance is established (Reeder, 1987). Therefore, we expect that shared governance is more important for collaboration outcomes than contractual safeguards and we also expect a substitution effect between contractual safeguards and shared governance. From a managerial perspective, a substitution effect suggests that investing in either shared governance or contractual safeguards can increase collaboration outcomes, but a simultaneous investment could produce diminishing returns. A substitution effect also implies that managers may be able to effectively reduce investments in one of the governance mechanisms.

The conceptual framework is summarized in Fig. 1. In the following section, we propose hypotheses on the relationship of prior business ties, contractual safeguards, and shared governance with collaboration outcomes (knowledge acquisition and collaboration satisfaction), including the relative importance and substitution effect of contractual safeguards and shared governance.

2.3. *Strength of prior business ties*

Repeated interaction among the same actors constitutes the basis for relational governance (Macneil, 1978). A history of exchange promotes emotional attachments and relationship-specific

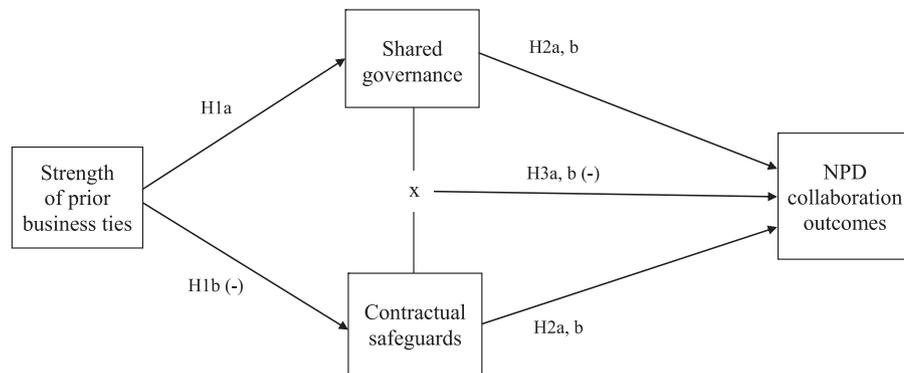


Fig. 1. Conceptual model of governance and outcomes of NPD collaborations (“x” denotes interaction).

norms (van Wijk et al., 2008) and encourages collaboration partners to engage in joint problem solving and shared governance (Uzzi, 1997). Strong prior business ties tend to support close cooperation under uncertainty and help to acquire complementary knowledge and skills (Vanhaverbeke et al., 2012) and facilitate collaboration satisfaction (Bstieler, 2006). In East Asia, individuals tend to build dense personal networks of ties, which they strongly rely on in their social and professional lives (Chen and Chen, 2004; Horak, 2014). Firms capitalize on the ties of their managers as a form of social capital to establish closer business relationships. From a cultural perspective, the strong ties in East Asia appear to be an outcome of Confucian traditions that emphasize the creation and maintenance of harmonious social relations (Yum, 1988; Chen, 2001).

In East Asia, the emphasis on business ties plays a critical role in interorganizational collaboration because these affiliations imply certain standards of behavior. Social ties in Korea are often based on kinship, common regional or school backgrounds, or joint membership in a business community (Horak, 2014), which may open doors or facilitate information access and knowledge acquisition. Company ties established in the past are an important basis for further relationship building and the creation of goodwill. This goodwill strengthens the positive relationship between tie strength and shared governance in NPD collaborations.

However, we also expect a negative relationship between the strength of prior business ties and contractual safeguards. In contrast to research in the West where in repeat technology alliances detailed contracts are emphasized regardless of developed ties (Ryall and Sampson, 2009), collaboration partners in East Asia are perceived to need minimal formal contractual stipulations with strongly connected collaboration partners (Boisot and Child, 1996). In fact, trying to overemphasize contractual provisions is detrimental for the development or maintenance of a long-term relationship (Li et al., 2010b). Therefore, we propose the following:

Hypothesis 1. The strength of prior business ties is (a) positively related to shared governance and (b) negatively related to contractual safeguards in Korean NPD collaborations.

Without presenting formal hypotheses, we further expect prior business ties to be positively related to knowledge acquisition and collaboration satisfaction. Although there is some debate about the effects of strong ties for knowledge acquisition in general (Granovetter, 1973; Krackhardt, 1992), one would expect stronger prior ties to be pivotal in East Asia for sharing tacit or sensitive information (Chen, 2001; Yang, 2006). Strong business ties play a prominent role in facilitating localized knowledge flows between firms in this region (Li et al., 2010a). Moreover, past interactions correlate with the quality of relationships and collaboration partners attribute higher value to relationships that have been maintained over an extended time period (Nguyen, 2005).

2.4. Relative importance of contractual safeguards and shared governance

In the East Asian relational view, signing a contract marks a commitment to work together and the beginning of an ongoing process rather than an end in itself (Chen, 2001). One of the primary objectives of this commitment is to cement the foundation for a long-term relationship and to establish initial mutual trust and goodwill (Reeder, 1987). Formulating and agreeing on mutual principles and obligations through contractual specifications can lay the groundwork for relationship building and trust formation, particularly in the dynamic business environment of East Asia (Luo, 2002; Hemmert et al., 2014). When partners commit to principles of how to work together, they create a collaboration spirit (Chen, 2001). Such a spirit of commitment to take on specific roles or responsibilities and work towards a common cause increases the satisfaction with the collaboration and helps create an atmosphere of open communication, thereby facilitating the exchange of relevant and important knowledge between partners.

Shared governance serves as a crucial mechanism to establish and maintain collaboration satisfaction in interorganizational collaboration in East Asia. Shared governance is viewed as a bonding mechanism that enhances relationship quality through the sharing and integration of information and the breeding of positive expectations about how to further develop the relationship (Nguyen and Rose, 2009). Establishing a close relationship is particularly challenging in collectivistic East Asian societies where the distinction between in-group and out-group tends to be sharp (Huff and Kelley, 2003). Many firms have strong, structured, and hierarchical corporate cultures, which enhance internal efficiency but at the same time make it difficult to work with outsiders. Aligning actions between collaboration partners helps to alleviate these concerns and overcome interorganizational barriers. Shared planning, adjustment, coordination, and evaluation efforts help to resolve potential disagreements and gain a better mutual understanding about the partner's goals and attitudes. Collaboration partners need to create a common group identity in order to feel at ease about sharing knowledge with the partner firm's representatives (Yang, 2006). This kind of interactive relationship is particularly important in NPD collaborations for advancing mutual benefits as opposed to individual gains (Chen and Miller, 2011).

Even though we assume that both contractual safeguards and shared governance positively affect collaboration outcomes, we expect shared governance to be relatively stronger for knowledge acquisition and collaboration satisfaction than contractual safeguards. East Asian collaboration partners generally perceive exchange that is based on frequent interaction as having higher quality than contract-based collaboration, which offers limited personal communication (Chen and Miller, 2011). In bilaterally governed collaborations, relational norms develop over time

through socialization processes in which the partners understand and endorse each other's expectations (Heide and John 1992). These shared norms facilitate in-group status and are positively related to a more open exchange of information that enables partners to learn from each other and absorb knowledge effectively (Bstieler and Hemmert, 2010).

Conversely, when collaboration is mostly governed contractually, partners tend to be perceived as out-groups (Li et al., 2010b). The mutual exchange of information and knowledge transfer is mostly limited to contents that are directly related to contractual obligations. In contrast, shared governance allows partners to deepen their mutual understanding and adjust to each other's needs, thereby contributing more to relationship satisfaction than contractual safeguards.

Hypothesis 2. The positive relation of shared governance with (a) knowledge acquisition and (b) collaboration satisfaction is stronger than that of contractual safeguards in Korean NPD collaborations.

2.5. Substitution effect of contractual safeguards and shared governance

An increasing number of recent studies on Western practices find a complementary relationship between relational and contractual governance in augmenting NPD collaboration outcomes (e.g., Faems et al., 2008; Ryall and Sampson, 2009). Contractual safeguards can enhance expectations that the collaboration partner will behave cooperatively and therefore make shared governance activities more effective in acquiring knowledge and contributing to the success of NPD collaborations. Relational norms complement contractual safeguards, particularly in NPD collaborations exposed to multiple collaboration hazards (Macneil, 1978).

In East Asia, the two governance mechanisms tend to be applied differently. There is no clear separation between business and social relationships in East Asian business cultures (Paik and Tung, 1999). Greater social interaction affords a better mutual understanding, stimulates information and resource flows, and provides more opportunities to enhance bonding. Social bonding is a means for managers to develop and maintain closer business relations. When shared governance is applied to cultivate a relationship, contractual governance has minimal positive effect on collaboration outcomes. To the contrary, referring to a contract in cultures where relationships are the predominant way of conducting business may send a negative signal to the partner. In this context, overemphasizing or enforcing detailed contractual provisions can negatively affect the chances to acquire knowledge from the collaboration partner and is generally counterproductive for the maintenance of a relationship (Li et al., 2010b).

Conversely, when East Asian firms have few mutual relational obligations with a collaboration partner, they will strongly emphasize contractual governance to protect their interests without losing face. In such cases where the terms of collaboration are oriented toward the short-term and performance expectations are limited and well specified (Hui et al., 2004), there is no expectation of advancing the relationship. Efforts to apply shared governance may also be viewed negatively as interference by the partner.

When substitution is present, a simultaneous emphasis on both governance mechanisms produces diminishing returns. Our rationale is that an emphasis on contractual safeguards may indicate a lack of trust or may conflict with shared governance, thus reducing the positive effect of shared governance on collaboration outcomes. In contrast, relational governance may also reduce the positive effect of contractual governance on outcomes by

encouraging partners to less strictly follow up on the transgressions of contractual stipulations to avoid tarnishing the collaboration or the embedded social network (Ferguson et al., 2005; Li et al., 2010a; Li et al., 2010b).

Both governance mechanisms are indispensable in NPD collaborations, but we expect that the positive relation of contractual safeguards and shared governance on NPD collaboration outcomes will be diminished in East Asia when both mechanisms are emphasized simultaneously. Therefore, contractual and relational governance will be substitutes rather than complements for their effect on NPD collaboration outcomes.

Hypothesis 3. The simultaneous emphasis of contractual safeguards and shared governance reduces their otherwise positive relationship with collaboration outcomes such that as shared governance (contractual safeguards) increases, the relation between contractual safeguards (shared governance) and (a) knowledge acquisition and (b) collaboration satisfaction diminishes.

Finally, without presenting a formal hypothesis, we assume a positive link between knowledge acquisition and collaboration satisfaction because knowledge acquisition has important implications for organizational value creation and innovativeness. Acquiring knowledge contributes to the development of organizational capabilities. Firms that are able to learn about customer needs, new technologies, and processes stand a better chance of developing new products for emerging needs (van Wijk et al., 2008).

3. The empirical study

3.1. Data collection and sample

The Korean machinery and electronics industries provided the empirical context for this study. We surveyed firms with 50 or more employees as smaller firms in these industries rarely have R&D departments or conduct NPD collaborations. The initial sampling frame consisted of 541 machinery and 835 electronics firms from the 'Korean Machinery Directory' and the 'Electronics Industry Directory'. The sample was 'purified' after phone contact. We eliminated firms unrelated to manufacturing, did not exist, could not be reached, did not develop any new products, or did not have any recent NPD collaborations. As a result of this process, 165 machinery and 147 electronics firms with NPD collaborations remained.

We selected a key informant in each firm (John and Reve, 1982) who was intimately involved in the collaboration effort. Typically, the key informant was a NPD project manager and often the head of the engineering or NPD group. We carefully instructed informants over the phone about the survey content and asked them to respond to the most recent NPD collaboration with an external partner firm outside the same business group. Then, we distributed and collected the responses via email attachment. The survey instrument was translated from English to Korean and then back translated to English by separate English and Korean native language speakers to secure semantic identity of the survey items and contents. In total, we received 126 responses (61 machinery and 65 electronics firms), which is 40.3% of the firm population with NPD collaborations. We discarded seven responses with excessive missing data, resulting in a final sample of 119 collaborations.

The sample includes a wide range of sub-classifications within the machinery and electronics industries, which represents the overall composition of these two industries. Most of the

Table 1
Correlations and descriptive statistics of key variables.

	1	2	3	4	5	6	7	8	9	10
1 Product newness	(.79)									
2 Partner type	-.06									
3 Partner location	-.11	.01								
4 Industry	.05	.08	.13							
5 Firm size	-.05	-.14	.14	.02						
6 Strength of prior business ties	.30***	.11	.02	.08	-.08	(.74)				
7 Contractual safeguards	-.08	-.02	.07	-.12	-.04	.09	(.84)			
8 Shared governance	.20*	-.09	.00	-.11	.05	.23*	.23*	(.84)		
9 Knowledge acquisition	.31***	.05	.00	-.08	-.07	.26**	.15	.51***	(.83)	
10 Collaboration satisfaction	.22*	-.04	.04	.02	-.03	.51***	.29***	.66***	.62***	(.82)
Minimum	0.00	0.00	0.00	0.00	3.22	1.00	0.00	0.25	3.00	2.00
Maximum	10.00	1.00	1.00	1.00	10.13	10.00	10.00	10.00	10.00	9.60
Mean	6.54	0.53	0.24	0.49	5.15	6.84	6.61	6.90	6.83	6.88
SD	2.26	0.50	0.43	0.52	1.24	1.80	2.50	2.02	1.65	1.59

$n=119$; Numbers on the diagonal are AVE square roots.

* $p < 0.05$ (two-tailed).

** $p < 0.01$.

*** $p < 0.001$.

participating firms are small to medium-sized with a median of 140 employees and annual sales of 25.1 billion Korean Won (roughly equivalent to \$20 m). The median R&D intensity is 5% and the export intensity is 30%. The majority of the collaborations were conducted with customer firms (53%), followed by supplier firms (24%), and other (mostly venture) firms (23%). 76% of the collaboration partners are domestic firms.

3.2. Measurement

The refinement of the measures began with a pretest version of the survey among potential key informants accompanied by field interviews. These pretesting activities helped fine-tune the survey instrument, particularly the meaning of some survey items written in Korean.

Most variables are measured with multiple items and based on 11-point Likert-type scales. The measures reflect the focal manufacturer's perception of the collaborative relationship (see Appendix for survey items and reliability measures).

Dependent variables: *Knowledge acquisition* is adapted from Lynn et al. (1999) and measures with four items the extent that the focal company gained new insights into new product development, production and manufacturing processes, and the understanding of user needs through the collaboration. *Collaboration satisfaction* measures the satisfaction and continuity expectations of the focal company. Based on prior research (Saxton, 1997; Jap, 2001), we measure with five items the extent that the NPD collaboration achieved its objectives, provided a good return on time and efforts invested, was productive, resulted in fair outcomes, and raised continuity expectations.

Independent variables: *Strength of prior business ties* relates to the collaboration history and the degree of mutual closeness between collaboration partners. In East Asia, ties are both organization-specific and person-specific (Chen, 2001). Based on prior research (Marsden and Campbell, 1984; Bstieler, 2006), we use a three-item scale measuring the stability of the collaboration, the closeness of the business relationship, and the closeness of relations with partner firm employees. *Contractual safeguards* gauge the formalization of the initial agreement to engage in collaboration. We drew on prior research (Lusch and Brown, 1996) and adapted three items from the 'contracting over roles' construct that assesses the extent that the roles, responsibilities, and performance obligations of each partner were clearly defined at the beginning of the NPD collaboration. *Shared governance* captures the degree to which collaboration partners share

efforts and decisions to progress towards a mutual goal. We adopted four items from prior research (Heide and John, 1992; Heide and Miner, 1992). These items refer to joint project planning, progress evaluation, project adjustments, and shared responsibility for the collaboration project.

Control variables: *Product newness* measures the novelty of the co-developed product, including its newness to the firm, newness to the market, and whether the product was based on a technological breakthrough. The Cronbach's alpha for this scale is .72. We also control for the *type of partner* (1=customer partner; 0=otherwise), *location of the partner* (0=domestic; 1=international), *industry* (0=machinery industry; 1=electronics industry), and the *size of the focal firm*, which is measured by the natural logarithm for the number of employees.

We compared the number of employees from responding and non-responding firms and found no significant differences ($p > .10$). Furthermore, there were no significant differences between early and late respondents regarding the dependent variables and the duration of the NPD projects ($p > .10$), indicating there is no serious non-response bias.

The composite reliabilities for all constructs are $> .70$. The average variance extracted (AVE) exceeds .50 in all cases. Furthermore, the square roots of the average variance extracted for each construct all exceed the correlations between these and other variables (Table 1). Thus, the scales have satisfactory convergent and discriminant validity (Fornell and Larcker, 1981).

We employed a number of methodological and statistical remedies as suggested by Podsakoff et al. (2003) to control for common method variance. First, the survey was divided into two parts, which were distributed separately to prevent the application of implicit theories by the respondents. The first part contained the independent variables and the second part, distributed three weeks later, included the dependent variables. Second, normative wording such as 'performance' was avoided in the questionnaire to control for social desirability effects. Finally, we checked post hoc for social desirability bias (Lindell and Whitney, 2001) using a marker variable for project success ('Overall, was the project a success or not?'). This marker variable is theoretically unrelated and statistically not correlated to the governance mechanisms included in this study. None of the significant correlations between the independent and dependent variables became insignificant or changed notably when controlled for this variable. Based on these analyses, we conclude that common method variance is not a serious problem.

Table 2
PLS path coefficients.

	Contractual safeguards	Shared governance	Knowledge acquisition	Collaboration satisfaction
<i>Main effects</i>				
Strength of prior business ties	.14 (1.54)	.18 (1.82)*	.12 (1.56)	.36 (5.48)***
Contractual safeguards			.04 (0.76)	.13 (2.05)*
Shared governance			.41 (5.11)***	.36 (5.25)***
Knowledge acquisition				.35 (5.15)***
<i>Interaction effect</i>				
Contractual safeguards x Shared governance			-.06 (0.55)	-.12 (1.81)*
<i>Controls</i>				
Product newness	-.11 (1.33)	.23 (2.35)*	.21 (2.30)*	-.09 (1.22)
Partner type	-.04 (0.64)	-.09 (1.20)	.08 (1.28)	-.06 (1.53)
Partner location	.08 (1.12)	.04 (0.66)	.02 (0.42)	.02 (0.60)
Industry	-.14 (1.68)*	-.13 (1.69)*	-.04 (0.75)	.06 (1.39)
Firm size	-.05 (0.76)	.05 (0.82)	-.05 (0.89)	-.02 (0.53)
R^2	.05	.13	.35	.70

$n=119$; Numbers in parentheses are t -values.

* $p < 0.05$ (one-tailed).

*** $p < 0.001$.

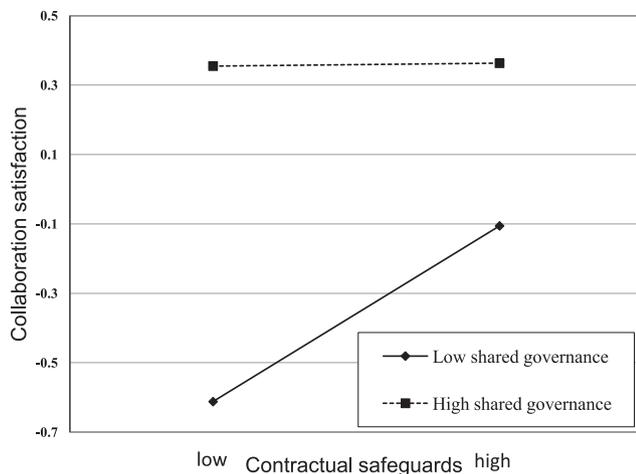


Fig. 2. Interaction plot of contractual safeguards and shared governance on collaboration satisfaction.

3.3. Results

Table 1 provides a summary of the descriptive statistics. To test for multi-collinearity, we calculated the variance inflation factors. None of these factors are higher than 2, suggesting that multi-collinearity is not a serious concern.

We estimated the measurement and the structural models simultaneously with partial least squares (PLS) estimation using Smart PLS 2.0 (Ringle et al., 2005). This structural equation modeling approach allows the simultaneous estimation of measurement and path coefficients for relatively complex models and modest sample sizes (Hair et al., 2012b). As PLS is a distribution-free estimation method, we performed bootstrapping resampling estimation with 5,000 samples. Table 2 shows the results of the structural model estimations. We considered the one-tailed significance of statistical associations at the 5% level because PLS tends to underestimate the strength of paths in structural models (Reinartz et al., 2009).

The strength of prior business ties is positively related to shared governance ($\beta=.18$; $p < .05$), lending support to Hypothesis 1a. However, business tie strength is not associated with contractual safeguards ($\beta=.14$; $p > .05$). Thus, Hypotheses 1b is not supported. Furthermore, the strength of prior business ties is not related to knowledge acquisition ($\beta=.12$; $p > .05$), but positively related to

collaboration satisfaction ($\beta=.36$; $p < .001$). Contractual safeguards are positively related to collaboration satisfaction ($\beta=.13$; $p < .05$), but not to knowledge acquisition ($\beta=.04$; $p > .05$). Shared governance is positively associated with knowledge acquisition ($\beta=.41$; $p < .001$) and collaboration satisfaction ($\beta=.36$; $p < .001$).

We tested Hypotheses 2a and 2b by conducting a relative weight test (Johnson, 2004). We found that shared governance is more strongly related than contractual safeguards to knowledge acquisition ($p < .001$) and collaboration satisfaction ($p < .001$). Thus, Hypotheses 2a and 2b are supported.

The interaction term of contractual safeguards and shared governance is negatively related to collaboration satisfaction ($\beta=-.12$; $p < .05$), but not related to knowledge acquisition ($\beta=-.06$; $p > .05$). Therefore, Hypothesis 3b is supported, but Hypothesis 3a is not supported. The significant and negative interaction supports our prediction that as shared governance increases, the relation of contractual safeguards with collaboration satisfaction diminishes (and also that as contractual safeguards increase, the effect of shared governance decreases). To enhance interpretation, we plot the relationship between contractual safeguards and collaboration satisfaction for high and low levels of shared governance in Fig. 2. The graph shows that an increase of contractual safeguards contributes to collaboration satisfaction under low levels of shared governance, whereas no such increase in collaboration satisfaction occurs under high levels of shared governance. The graph also illustrates the more important role of shared governance in enhancing collaboration satisfaction, as a high level of collaboration satisfaction is only achieved under high levels of shared governance.

Finally, knowledge acquisition is positively related to collaboration satisfaction ($\beta=.35$; $p < .001$). For the control variables, product newness is positively related to shared governance ($\beta=.23$; $p < .05$) and knowledge acquisition ($\beta=.21$; $p < .05$), and the electronic industry dummy is negatively related to contractual safeguards ($\beta=-.14$; $p < .05$) and shared governance ($\beta=-.13$; $p < .05$).

The overall model fit can be assessed by the R^2 , which reflects the combined predictive power of all independent variables (Hair et al., 2012a). As shown in Table 2, 35% of the variance of knowledge acquisition and 70% of the variance of collaboration satisfaction is explained by the independent variables, indicating a satisfactory overall fit of the path model.

Table 3 shows the direct and total effects of all relationships in the PLS path model. All but two associations between independent

Table 3
Direct and total effects in the PLS path model.

Dependent variable	Contractual safeguards		Shared governance		Knowledge acquisition		Collaboration satisfaction	
	Direct effect	Total effect	Direct effect	Total effect	Direct effect	Total effect	Direct effect	Total effect
Strength of prior business ties	.14 (1.54)	.14 (1.54)	.18* (1.82)	.18* (1.82)	.12 (1.56)	.20* (2.03)	.36*** (5.48)	.52*** (6.91)
Contractual safeguards					.04 (0.76)	.04 (0.73)	.13* (2.05)	.14* (2.05)
Shared governance					.41*** (5.11)	.41*** (5.11)	.36*** (5.25)	.51*** (7.33)
Knowledge acquisition							.35*** (5.15)	.35*** (5.15)

$n = 119$.

* $p < 0.05$ (one-tailed).

*** $p < 0.001$.

and dependent variables are significant. Overall, contractual safeguards show the weakest relationship with the dependent variables (knowledge acquisition and collaboration satisfaction).

4. Discussion

In this paper, we examine how various governance mechanisms facilitate the outcomes of NPD collaborations in East Asia. Some argue that when institutional and economic structures change, the reliance on relational governance fades as institutions improve (Peng, 2003), while others claim that relational mechanisms still affect interorganizational collaboration above and beyond contractual governance (Gu et al., 2008). The motivation is to better understand the interplay of governance mechanisms in a NPD context. The empirical results indicate that some mechanisms play a more important role for collaboration outcomes than others, and overall, the ‘relational view’ appears to facilitate the understanding of the governance of East Asian NPD collaborations.

The first finding sheds light on the ways the strength of prior business ties influences the governance of NPD collaborations in East Asia. Strong business ties are positively related to shared governance. However, the strength of prior business ties exhibits neither negative nor positive association with contractual safeguards. The absence of a negative link between the strength of prior business ties and contractual safeguards is surprising in an East Asian context. Further research regarding this point is warranted.

Furthermore, we find a strong positive association of the strength of prior business ties with collaboration satisfaction, but not with knowledge acquisition. The observation that the strength of prior business ties is not directly related to knowledge acquisition contrasts with the results of Western countries, which found a positive relationship between strong ties and knowledge acquisition in alliances (e.g., Rindfleisch and Moorman, 2001; Lane et al., 2001). One possible reason for the absence of a direct link is the general nature of social networks in Korea, which are often based on kinship, alumni ties or regional ties, rather than shared professional interests (Horak, 2014). Such social ties may help create high quality relationships, but are not necessarily related to specific knowledge acquisition in NPD collaborations. However, tie strength indirectly supports knowledge acquisition through shared governance (Table 3), underlying the overall important role of the exchange history for collaboration outcomes.

The second key finding sheds light on the relevance of contractual and relational governance mechanisms on knowledge acquisition and collaboration satisfaction. The results suggest that the outcomes of NPD collaborations in East Asia are more strongly related to relational than contractual governance. Shared governance is strongly related to knowledge acquisition and collaboration satisfaction. In contrast, contractual safeguards are related to collaboration satisfaction, but not associated with knowledge

acquisition. Furthermore, shared governance is more strongly associated with knowledge acquisition and collaboration satisfaction than contractual safeguards. Firms may feel more secure collaborating when a contractual commitment governs their collaboration. However, contractual safeguards have only a modest impact on collaboration satisfaction. Given the mutual belief that the collaborative relationship will endure over time, partners may perceive less need to rely on detailed contractual safeguards as otherwise might be the case (Gupta, 2011). Thus, contracts in NPD collaborations may be an effective insurance against ‘worst case’ scenarios, but overall play a lesser role for collaboration outcomes.

In contrast, shared governance plays a central role for acquiring important knowledge and enhancing collaboration satisfaction. This result is in line with research that frequent interaction and joint decision-making is crucial for managers in East Asia to feel comfortable working together, share important information freely, and establish high collaboration satisfaction (Yang, 2006; Nguyen and Rose, 2009). The prominence of shared governance illustrates the relevance of the ‘relational view’ in knowledge intensive NPD collaborations in East Asia. Whereas contractual safeguards are found to play an important role in supply chain and distribution channel collaborations (Zhou et al., 2008; Li et al., 2010a), they appear to be less relevant in NPD collaborations.

The third key finding elaborates on the complementary versus substitutive effects of contractual and relational governance. We find a significant and negative collective effect of contractual and relational governance on collaboration satisfaction and a non-significant and negative collective effect on knowledge acquisition. This result partially supports the relational view and suggests a substitution effect of contractual and relational governance. The substitution effect attenuates the otherwise positive effect of contractual safeguards. Together, contractual safeguards and shared governance are less effective to achieve higher collaboration satisfaction.

Although we find support for a substitution effect of contractual governance and shared governance on collaboration outcomes, we also note a complementary independent effect. Specifically, contractual safeguards increase collaboration satisfaction independent of the effect of shared governance (and vice versa). Thus, the empirical findings suggest a substitutive effect, but also independent complementary effects.

The results are in contrast to various studies in the U.S., which found contractual and relational governance to act as complementary mechanisms (Poppo and Zenger, 2002) and repeat technology alliances contracts to include more detailed provisions for various contingencies, not less due to relational mechanisms (Mayer and Argyres, 2004; Ryall and Sampson, 2009). The findings suggest that formal contracts and relational governance do not mutually support each other in enhancing the outcomes of NPD collaborations in East Asia. In the ‘relational view’, there appears less need to combine contractual and relational governance in order to control collaboration hazards as suggested by Poppo and

Zenger (2002) and others. In contrast, collaboration partners in East Asia may feel ill at ease when applying contractual and relational governance simultaneously.

Overall, the study indicates that strong prior business ties and shared governance are crucial for achieving positive outcomes in NPD collaborations in an East Asian economy, whereas contractual governance plays a relatively modest role. This preference for relational governance in collaborative relationships is not restricted to Korea, but also found in other East Asian countries. For example, personal relationships are strongly emphasized in business networks in China (Gu et al., 2008).

In summary, the study findings support the notion that despite the strengthening of formal rules and institutions in East Asia, relational governance continues to be more effective for managing NPD collaborations than contractual governance. The results are clearly different from those of research on NPD collaborations in Western countries (e.g., Mayer and Argyres, 2004; Faems et al., 2008; Ryall and Sampson, 2009) and highlight the context specificity of governance mechanism effectiveness in such arrangements. Specifically, whereas the ‘transactional view’ appears instrumental for understanding the governance of NPD collaborations in Western countries, the findings suggest that the ‘relational view’ might be more helpful in capturing the essence of such collaborations in East Asian countries. While this study is built on data from Korea, other countries in this region have similar cultural orientations (Hofstede et al., 2010) and thought traditions. To illustrate, House et al. (2004) identified a cluster of culturally similar East Asian countries, including Japan, Korea, China, Taiwan, Hong Kong and Singapore, which they labeled ‘Confucian Asia’. Therefore, similar results may be expected for NPD collaborations in other East Asian countries.

5. Managerial implications

Understanding the influence of relational versus contractual governance mechanisms on interorganizational collaboration and outcomes is a central issue when conducting business in East Asia. From the viewpoint of managers who are considering pursuing NPD collaborations in East Asian countries, the results of this study suggest that priority should be given to maximize the quality of the relationship with collaboration partners. This requires patience and open-mindedness when collaborating with East Asian counterparts and the willingness to accept the culture. In contrast, contractual safeguards clarify obligations and expectations, which can be useful to prevent or reduce opportunistic behavior by less known partners. However, contractual safeguards are not as effective as shared governance when aiming for successful collaboration outcomes.

A key managerial implication for Western managers is to recognize that if they apply their Western mindsets and practices to the Far East without incorporating Eastern values into their management systems, it is unlikely they will be fully embraced by their counterparts. Western companies pursuing NPD collaborations in East Asia without existing business ties are perceived as outsiders that will be confronted by Asian counterparts that emphasize contractual safeguards in business dealings (Paik and Tung, 1999). While some Western managers may prefer contractual governance when conducting business in East Asia or elsewhere, such contractual governance is not the preferred way of conducting business in East Asia, even though it is applied to outsiders. Hence, the innate function of contractual safeguards in East Asia is to initiate a relationship with a commitment and terms open to change rather than an end in itself.

Given the inherent aversion to contractual governance in East Asia, Western managers should de-emphasize rule-based

governance in favor of actively investing in relational governance. Whereas establishing trust with external partners generally tends to be challenging in economies with collectivistic and high power distance cultures, trust building in such cultures can be facilitated by a collaboration history between partners, reputation of the partner, or through the introduction of a partner by a third party (Doney et al., 1998). Eventually, the Western partner may be able to shed the role of the outsider if the relationship proves to be stable and reciprocal.

A third key implication is the substitution effect of contractual and relational governance on how collaboration satisfaction can be achieved in these relationships. Both contractual safeguards and shared governance have their roles in enhancing positive outcomes in NPD collaborations, and managers could rely on either government mechanisms, depending on the collaboration history. When collaboration partners do not know each other well, contractual governance can be a good starting point to signal mutual commitment and create trust. If prior ties are in place, the collaborators should emphasize joint planning and coordination, and decision-making because such relational governance is more effective in East Asia for achieving positive outcomes. However, managers should be aware that a simultaneous investment in contractual and relational governance diminishes their otherwise positive effects on collaboration satisfaction.

6. Limitations and future research directions

This study has a number of limitations. First, the results are built on information obtained from one side of the NPD collaboration. While we initially sought to collect dyadic data, we eventually had to limit the observations to one side due to the sensitive nature of NPD collaborations and the reluctance of participating companies to reveal information about their partners. Thus, we offer the view of the focal manufacturer as a starting point to understand the effects of governance mechanisms on collaboration outcomes in an East Asian economy.

Second, a single key informant provided the data. A careful selection of informants in conjunction with the use of internally consistent multi-item scales can provide reliable and valid data (John and Reve, 1982). We also employed various methodological and statistical tools to control for common method variance. The results of these tests indicate that the potential for such bias may be limited, though it cannot be strictly ruled out.

Third, the study is built on data collected in one East Asian country. Korea is widely regarded as a representative East Asian country. However, some caution is needed when applying the findings to East Asia as a whole.

Finally, this cross-sectional study does not capture the relational dynamics in interorganizational collaboration in a longitudinal design.

Given these limitations, case-based research of NPD collaborations appears valuable to verify and complement the results of this study. Likewise, additional studies on NPD collaborations in various East Asian countries are desirable to replicate this research and to confirm how the governance of NPD collaborations differs from those in the extensively researched Western countries. In particular, further study of the complementary or substitution effects of contractual and relational governance in such collaborations appears worthwhile. Furthermore, studying collaborations using dyadic data from companies in East Asia and their international partners is another promising area for future research.

Table A1
Multiple item measures.

Constructs	Factor loading (t value)
Strength of prior business ties ($\alpha=.62$; composite reliability (CR)=.80; average variance extracted (AVE) =.57)	
Prior to this collaboration,	
...the history of our relationship with this partner was (0=volatile ...10=stable)	.77 (8.27)
...our business relationship with this partner was (0=very loose...10=very close)	.76 (8.81)
...personal relationships between employees of our and the partner company were (0=non-existent...10=very close)	.73 (7.05)
Contractual safeguards ($\alpha=.79$; CR=.88; AVE=.71)	
At the beginning of this collaboration, the handling of the following issues was 0=not clearly spelled out...10=clearly spelled out in writing:	
The roles of the partners	.88 (13.68)
The responsibilities of the partners	.89 (17.56)
Expectations as regards the performance obligations of each partner	.75 (7.05)
Shared governance ($\alpha=.86$; CR=.91; AVE=.71)	
In this collaboration... (0=strongly disagree...10=strongly agree; same for all items below)	
We jointly planned how this project should be run	.78 (10.79)
Adjustments to project specific agreements were mutually agreed upon	.85 (21.06)
We shared responsibility to make sure that the relationship was mutually rewarding	.86 (26.30)
We jointly re-evaluated the progress of our working relationship throughout the project	.88 (38.36)
Knowledge acquisition ($\alpha=.85$; CR=.90; AVE=.69)	
Through this collaboration ...	
We gained a lot of insights about key tasks involved in the production process	.87 (27.60)
We learned a lot about how to develop new products	.80 (19.75)
We acquired a lot of information about new manufacturing processes	.82 (18.78)
We learned a lot about end-users' product needs	.84 (22.52)
Collaboration satisfaction ($\alpha=.88$; CR=.91; AVE=.68)	
In this collaboration we achieved our objectives	.87 (33.13)
In this collaboration it was beneficial to invest the time and efforts	.91 (40.84)
The relationship with the partner was productive	.84 (15.48)
This collaboration motivated us to do more new projects with this partner	.82 (15.90)
Our outcomes and benefits throughout this collaboration were fair compared to what the partner company gained from it	.65 (8.47)

7. Conclusions

The governance of NPD collaborations is a major concern for innovating companies. This study examines the interplay between contractual and relational governance in NPD collaborations and extends the understanding of how these mechanisms jointly affect collaboration outcomes. The relational view appears to provide an appropriate theoretical lens when studying the governance of NPD collaborations in East Asia. Gupta (2011) notes that it is inevitable East Asian philosophies and governance practices will play a very influential role and it is critical for scholars to begin discussions for what the nature of this influence is likely to be. In this study, we attempted to follow this thought. The study suggests that instead of applying Western-based transactional theories in non-Western regions, the governance of NPD collaborations should be studied based on concepts that are grounded in cultural context and reflective of regional traditions of thought.

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Appendix

See Table A1.

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