

Achieving relational governance effectiveness: An examination of B2B management practices in Taiwan

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Abstract

This study examines the antecedents of relational governance effectiveness in a country context where the prevalence of Confucian values is expected to create a culturally ingrained preference for relational governance. We also explore whether different management practices are better predictors of relational governance effectiveness under different collaborative inter-firm relationship configurations. Results from an analysis of 182 alliance relationships in Taiwan, a dynamic newly developed economy, reveal that, generally, demonstrating trustworthiness, establishing just and fair procedures, and building effective platforms for connectivity are management practices that are good predictors of relational governance effectiveness. The multi-group analysis provided more nuanced insights. The findings suggest that different inter-firm relationship configurations require different subsets of management practices. Building effective platforms for connectivity is a strong predictor of relational governance effectiveness in equity-based alliances with foreign partners. In equity-based alliances with domestic partners, establishing fair and just procedures is emphasized. In contractual alliances with foreign partners, ensuring contractual clarity and building effective platforms for connectivity are found to be facilitators of relational governance effectiveness. Last, contractual alliances with domestic partners seem to rely on a portfolio of management practices encompassing demonstrating trustworthiness, establishing just and fair procedures, and building effective platforms for connectivity.

Keywords: Trustworthiness, Contractual clarity, Procedural justice, Connectivity, Relational governance effectiveness, Alliance performance

1. Introduction

In this paper, we examine the antecedents of relational governance effectiveness in a country context where the prevalence of Confucian values (Cheung & Chan, 2005) is expected to create a culturally ingrained preference for relational governance. Relational governance can be defined as the establishment of various behavioral routines and management strategies that aim to develop informal self-enforcing safeguards in a collaborative relationship (cf. Sarkar, Aulakh, & Madhok, 2009; Zaheer & Venkatraman, 1995). We define relational governance effectiveness as the extent to which these routines and management strategies achieve the desired collaborative behavior.

In general, the choice of governance mechanisms depends on a number of factors, including the complexity and codifiability of transactions, the nature and quality of partner capabilities (Gereffi, Humphrey, & Sturgeon, 2005), the intended relationship duration (Buckley, Craig, & Mudambi, 2019), the nature and extent of environmental and behavioral uncertainties (Abdi & Aulakh, 2017), as well as the parties' preference for particular governance mechanisms shaped by their national culture (Samaha, Beck, & Palmatier, 2014). In Asia, relationships, and by extension, the effectiveness of relational governance, play a central role in achieving business success (Samaha et al., 2014).

Examples include *guanxi* in China (Lee & Dawes, 2005), *keiretsu* in Japan (Sambharya & Banerji, 2006), and *yongho* in Korea (Horak & Taube, 2016). This prominent cultural logic has implications for the success of collaborative inter-firm relationships (Tsai, 2013). Specifically, firms from these cultures may not be very forthcoming with their knowledge and other types of information

vis-à-vis partners that the firms do not consider as belonging to their in-group (Hutchings & Weir, 2006; Wang & Chen, 2018). Therefore, understanding the management practices that can contribute to the achievement of effective business-to-business (B2B) relational governance in Asian countries is equally important for domestic and foreign partners. To demonstrate this point further, we draw on the concepts of liability of foreignness and liability of outsidership.

Liability of foreignness can be defined as the level of psychic distance between the home and host countries, whereas the liability of outsidership refers to a firm's weak position in a network (cf. Yamin & Kurt, 2018). Foreign partners can be expected to be subject to both types of liabilities, as they are interconnected (Yamin & Kurt, 2018). However, although domestic partners are not subject to the liability of foreignness, they may still need to overcome the liability of network outsidership. Thus, we propose that the type of liabilities a partner is exposed to affects the management practices the partner employs to achieve relational governance effectiveness.

We chose Taiwan as the empirical context due to its strategic importance as a cooperative venture partner for Mainland China (Tsai, 2013), as well as for developed economies. This is evidenced by trade data. Trade between China and Taiwan totaled US\$57.385 billion in imports and US\$91.817 billion in exports in 2019 (Customs Administration, Ministry of Finance)¹. The aggregated import-export figures for Europe and North America show a similar picture with a total of US\$73.217 billion in imports and US\$78.395 billion in exports. High-technology sectors account for most of these

¹ <https://eweb.customs.gov.tw>, accessed May 2020

import-export figures providing an indication of strong collaborations in these sectors (Customs Administration, Ministry of Finance).

Furthermore, Taiwan belongs to the highest category of a more fine-grained emerging market typology proposed by Hoskisson, Wright, Filatotchev, and Peng (2013). Specifically, Taiwan occupies a comparatively advanced position in terms of the country's institutional development as well as infrastructure and factor market development (Bilgili, Kedia, & Bilgili, 2016). The ensuing reduction in environmental and behavioral uncertainty, together with the prominence of Confucian values driving organizational behavior in Taiwanese firms (Lin, 2011; Lin & Ho, 2010), provides an ideal empirical context to examine the antecedents of relational governance effectiveness in collaborative inter-firm relationships. To ensure that cooperative collaboration is the purpose of the inter-firm relationship, we focus on equity-based as well as contractual alliances.

Against this background, we aim to answer two research questions: 1) Which collaborative inter-firm management practices predict relational governance effectiveness? 2) Are different management practices better predictors of relational governance effectiveness under different collaborative inter-firm relationship configurations? To answer the first research question, we use a partial least squares (PLS) path model to determine which management practices predict relational governance effectiveness and in turn, alliance performance. We examine the second research question with a post-hoc multi-group analysis to explore path changes in the base model under different

relationship configurations. In the following sections, we present the theoretical framework, hypotheses, methods, results, and conclusions.

2. Theoretical development and hypotheses

The literature on inter-firm relationships distinguishes between three perspectives on relationship management. The structural perspective propagates the use of complex contracts with a large number of clauses specified in detail as safeguarding devices that alleviate the perceived risk of opportunistic behavior (Fu et al., 2014; Poppo & Zenger, 2002). The main tenet of this perspective is that contracts are coordination mechanisms which simplify decision making and prevent disputes over how to achieve tasks (Pisano, 1990; Reuer & Ariño, 2007). The relational perspective promotes a relational governance strategy in which partners rely on mutual trust to address issues of safeguarding and coordination (Thorgren, Wincent, & Eriksson, 2011). The third perspective promotes the view that contractual and relational mechanisms need not be mutually exclusive; they can be complements or substitutes depending on the micro- and macro-contexts of the inter-firm relationship (Abdi & Aulakh, 2017).

In this paper, we focus on relational governance effectiveness in a country context where local partners can be expected to have a culturally pre-disposed preference for relational governance mechanisms. In the Chinese context, “relationship,” looked at through the lens of *guanxi*, refers to “the notion of a relation-centered and collaborative culture seeking relationship harmony” (Fletcher-Chen,

Al-Husan, & Alhussan, 2017, p.877). Taiwan and China are two major emerging markets whose cultures are deeply rooted in Confucianism (Farh, Tsui, Xin, & Cheng, 1998).

In the remainder of this section, we draw on the *guanxi* literature to identify management practices that, based on Confucian values, are most likely to contribute to relational governance effectiveness and by extension, to alliance performance. Specifically, Lin (2011) identifies three aspects of *guanxi* in the literature. The first aspect is *mianzi*. It refers to the behavior of individuals in line with social expectations, as well as to the respect, dignity, and public image that are the outcomes of one's behavior and achievements in society. The second aspect is reciprocal favor. Its essence is the accord of assistance when needed which will be reciprocated by the other party. The third aspect is affect, which is connected to a long-term orientation with respect to the continuation of the relationship. These individual-level aspects can be extrapolated to the organizational level.

2.1. Demonstrating trustworthiness

Many studies consider trust to be a critical factor in inter-firm relationships (Lumineau, 2017; Oliveira & Lumineau, 2019). In social exchange, trust can be defined as one party's social assessment of another party's benevolence and motivations (Inkpen & Tsang, 2005). According to previous literature, there are two major types of trust: goodwill trust and competence trust (Das & Teng, 2001; Patzelt & Shepherd, 2008). Specifically, goodwill trust is generated by a partner's benevolence, integrity, and good faith. Competence trust is the belief that a partner possesses adequate resources and capabilities to meet cooperative requirements (Jiang, Jiang, Cai, & Liu, 2015, p. 129). The

existence of inter-organizational trust reduces the fear of opportunism (Fulmer & Gelfand, 2012) and contributes to the development of a cooperative culture in alliances.

Extending these definitions of trust to an inter-firm relationship context, the demonstration of trustworthiness can be seen as an important management practice for achieving relational governance effectiveness. More importantly, in a society permeated by Confucian values, such as benevolence, righteousness, harmony, loyalty, and humility (Cheung & Chan, 2005), demonstrating trustworthiness can be seen as leading to mianzi (Lin, 2011). Mianzi is often associated with maintaining face, or put differently, a positive image. In an inter-organizational context, face is lost when business partners—either through their own actions or the actions of their employees—do not meet the requirements that are expected of them due to their social and organizational position (Lee & Dawes, 2005). In the Chinese context, trust enhances exchange relationships among parties in the guanxi network. Therefore, demonstrating trustworthiness in inter-firm relationships is more likely to enable the firm to improve relational governance effectiveness. Thus, we hypothesize that:

H1: Management practices that demonstrate the trustworthiness of business partners are a significant predictor of relational governance effectiveness.

2.2. Ensuring contractual clarity

Abdi and Aulakh (2017) provide empirical evidence that contractual and relational mechanisms can be complements and substitutes depending on the risks to which the inter-firm relationship is exposed. In an environment where formal institutions, such as the rule of law, are well developed (World Bank, 2020), and the national cultural logic favors the development of strong

relationships (Lin, 2011; Tsai, 2013), a complementary relationship between contractual and relational mechanisms can be expected. Drawing up contracts collaboratively enables parties to engage in a process of sensemaking. This is especially beneficial when consciously used as a way to identify potential differences and establish common expectations and understanding (Abdi & Aulakh, 2017; Carson, Madhok, & Wu, 2006; Luo, 2007). A clear understanding of each other's needs and expectations helps preserve business partners' face (Lee & Dawes, 2005). Furthermore, the way contractual negotiations are handled along with the clarity of the defined terms can indicate the partners' value systems and thus, compatibility (cf. Ariño & Ring, 2010). Clearly understanding the needs and preferences of business partners will also aid the process of reciprocal help that forms an important part of guanxi development (Lin, 2011). Therefore, we propose the following hypothesis:

H2: Contractual clarity is a significant predictor of relational governance effectiveness.

2.3. Establishing just and fair procedures

Procedural justice can be defined as the extent to which an alliance's decision-making process and procedures that impact each party's gains and interests are fair, transparent, unbiased, and accordant with contractual specifications (Brockner, 2002; Luo, 2008b, p. 624). Luo (2005, p. 696) indicates that the major areas that require fairness include procedures used in "(1) building and structuring the alliance, (2) organizing and managing the alliance, (3) governing resource sharing, and (4) executing alliance plans and decisions."

Thus, procedural justice provides guidelines for structuring decision-making processes to maximize perceptions of fairness. It enhances individual cognitive confidence in the decision-making process and builds feelings of belonging and loyalty (Engelseth & Felzensztein, 2012). Furthermore, procedural justice is valuable because it allows individuals to voice their views in the decision-making process, promoting active bilateral communication (Luo, 2005). The function of fair procedures is symbolic, emphasizing reciprocity and mutual respect, and thus, helps strengthen a firm's relationship with its partner organization (Qian, Yang, & Li, 2016). Procedural fairness nourishes an alliance partner's commitment to joint efforts and strengthens their loyalty to the organization (Johnson, Korsgaard, & Sapienza, 2002).

Procedural justice also contributes to goal alignment among alliance members and consolidates positive inter-party interests. The premise of justice theories is that fair treatment is important to people and a major determinant of their reactions to decisions (Zolkiewski & Feng, 2012). Even when a particular decision is unfavorable to alliance members at a particular time, if the parties demonstrate reciprocity and affect (Lin, 2011), they will feel that their interests are protected in the long run. Fair treatment creates cooperative value by removing fears of exploitation and by demonstrating respect for the rights and dignity of the other party (Luo, 2008a). Thus, procedural justice enhances relational governance effectiveness. Therefore, we propose:

H3: Procedural justice is a significant predictor of a firm's relational governance effectiveness.

2.4. Building platforms for connectivity

Personal ties or social bonds lie at the heart of guanxi. Lee and Dawes (2005) empirically demonstrate the importance of business interactions for creating inter-party trust and ultimately, long-term orientation within an inter-organizational relationship. However, a manager's comfort zone has been shown to shape the extent of collaborative openness in an inter-firm relationship (Jensen & Petersen, 2013). Therefore, investing in building platforms for connectivity can significantly expand the comfort zones of the parties and thus, contribute positively to relational governance effectiveness (cf. Sinkovics, Choksy, Sinkovics, & Mudambi, 2019). Connectivity refers to the collection of communication and interaction mechanisms and relational structures that aim to support the back-and-forth flow of ideas, experiences, and know-how between two organizations (Cano-Kollmann et al., 2016; Sinkovics et al., 2019). Although communication and interaction by virtual means can be effective to bridge geographic distances, to exchange tacit and proprietary knowledge, they must be embedded in strong ties (Bouncken & Barwinski, 2020; Sinkovics et al., 2019). Therefore, connectivity mechanisms based on physical co-location, even if they are temporary, must be part of the connectivity repertoire to strengthen inter-party ties and by extension, relational governance effectiveness (cf. Cano-Kollmann et al., 2016). Based on the arguments above, we propose the following hypothesis:

H4: Connectivity is a significant predictor of relational governance effectiveness.

2.5. Relational governance effectiveness and alliance performance

As outlined in the introduction, we differentiate between the concepts relational governance and the effectiveness of relational governance mechanisms. Relational governance refers to a collection of management techniques and behavioral routines aimed at developing informal self-enforcing safeguards in a collaborative relationship (cf. Sarkar et al., 2009; Zaheer & Venkatraman, 1995). Relational governance effectiveness encompasses the extent to which these routines and management strategies achieve the desired collaborative behavior. Specifically, the targeted collaborative behavior is characterized by mutual influence, open communication, joint problem solving, and the aspiration to create benefits for both parties (Jap, 2001; Wang, Dou, Zhu, & Zhou, 2015).

In East Asia, building high-quality collaborative relationships is culturally embedded, and an essential theme of business strategy (Chen & Miller, 2011). In inter-firm relationships, relational governance effectiveness is important for collaborative satisfaction and leads to better efficacy in alliance execution. Thus, a high level of relational governance effectiveness is expected to allow firms to develop mutual understanding and joint problem solving, which, in turn, result in desirable collaborative outcomes (Bstieler & Hemmert, 2015). Therefore, we propose:

H5: Relational governance effectiveness is a significant predictor of alliance performance.

3. Method

3.1. Data collection and sample

We used a questionnaire survey to collect data. The questionnaire was originally developed in English and then translated into Chinese. We applied the back-translation approach (Mullen, 1995) to ensure concept equivalence. The sample frame was generated from sources such as the China Credit Information Services, a reputable Taiwanese credit-rating company, and the Top 1000 Manufacturing List in Taiwan. These databases include general company information, such as the contact point, address, number of employees, and industry category. We obtained the sampling frame based on three main criteria. First, we chose cooperative relationships in alliances in Taiwan at the firm-to-firm level as the unit of analysis. In Taiwan, domestic and foreign firms collaborate through alliances for resource synergies. Second, the partnerships investigated in this study needed to reveal strong collaborative relationships connecting resource flow and a link between firms (Parkhe, 1991). Third, most of the sample firms were technology manufacturers with more than US\$3 million in capital.

The final sampling list comprised 521 firms. The key informants were the firms' managers, directors, or senior supervisors who were familiar with the firms' alliance management. The respondents were asked to choose one of the most significant alliances within the previous five years. Of the 194 questionnaires returned, 3 responses contained incomplete data, and 9 respondents were not qualified. Therefore, 182 questionnaires had complete data usable for analysis, yielding an effective response rate of 34.93% (182/521). Of the 182 responding firms, 47.06% had equity-based alliances,

and 52.94% had contractual-based alliances. Regarding alliance partners' nationality, 40.66% were alliances with domestic partners, and the remaining 59.34% were alliances with foreign partners.

Table 1 displays the sample characteristics.

Insert Table 1 about here

3.2. Measures

All variables were measured using multi-item scales and a seven-point response format. All measurement items were developed based on previous studies. *Trustworthiness* was measured using four items adapted from Luo (2008b) and Perry, Sengupta, and Krapfel (2004). The items were (1) abiding by agreement, (2) level of confidence in each other's contribution, (3) absence of opportunism, (4) keeping promises, and (5) honoring commitment. *Contractual clarity* was defined as "the degree to which different aspects of the relationship and relevant issues are specified in the form of written agreements and the extent to which exchange partners rely upon these written agreements" (Abdi & Aulakh, 2017, p. 785). Contractual clarity was measured with a three-item scale adapted from Geringer and Hebert (1989) and Luo (2008b): (1) contract terms on joint monitoring, (2) contract terms on cooperation governance, and (3) contract terms on directing and governing. *Procedural justice* was defined as the extent to which the dynamics of the decision process are judged to be fair (Johnson et al., 2002; Luo, 2008b). We developed a four-item scale to measure procedural justice, which was adapted from Luo (2008b) and Johnson et al. (2002). The measurement items focused on

procedural fairness were the following: (1) planning, organizing, and managing alliance activities, (2) sharing knowledge or resources, (3) administering and monitoring strategic decisions, and (4) making strategic decisions.

We adapted a three-item scale for *connectivity* from Kale and Singh (2007). The measurement items consisted of a “collective review” to assess progress and performance, a joint meeting for alliance management experience learning, and a joint forum for information exchange. *Relational governance effectiveness* was defined as the extent to which the firm in an alliance is able to cultivate desired collaborative behavior (Walter, Auer, & Ritter, 2006). Adapted from Medlin, Aurifeille, and Quester (2005) and Walter, Auer, and Ritter (2006), the five-item scale comprised joint solving of conflicts, building good personal relationships, putting oneself in the partner’s position, solving problems that benefit the relationship as a whole, and being jointly responsible for problems.

Managerial assessments of alliance performance have gained acceptance in alliance research (Jiang et al., 2015; Walter, Kellermanns, & Lechner, 2012). In this study, we developed a four-item scale adapted from Kale, Dyer, and Singh (2002) and Krishnan, Martin, and Noorderhaven (2006). The measurement items reflected (1) the extent to which the firm was satisfied with the financial performance of the alliance, (2) the extent to which the firm was satisfied with the overall performance of its alliance, (3) the extent to which the firm perceived its alliance partner to be satisfied with the financial performance of the alliance, and (4) the extent to which the firm perceived the alliance partner to be satisfied with the overall performance of the alliance.

In addition to the main constructs in the conceptual framework, other variables may influence alliance performance. In this study, we included the following three control variables: *Firm size* was measured by the number of employees, *firm age* was measured by the number of years since the firm's founding, and *industry-specific effects* were controlled for using dummy variables representing engagement in different industries.

3.3. *Non-response bias and common method bias*

To evaluate non-response bias, we followed Armstrong and Overton (1977) in evaluating non-response by looking at differences between early and late response. We divided the respondents into two groups according to their response time (the early 75% of the entire response samples in the first group and the later 25% of respondents in the second group). Then, we used t-tests to compare the sample means of the first wave of respondents with the second wave of respondents using demographic variables, such as the number of employees and sales revenue. No significant differences were detected. We ran additional t-tests on the key constructs in the model, such as contractual clarity and procedural justice. The results specified no statistically significant differences between these two groups regarding the major variables. Therefore, non-response bias was not a serious problem in this study.

To further assess non-response bias from non-respondents, we identified 20 non-respondents and called them to find out why they had not responded (see Jean, Sinkovics, & Cavusgil, 2010). In

most cases, the major reasons for non-response had to do with worries about time pressure and confidentiality issues.

As all measures were collected from the same questionnaire answered by a single respondent, there was a potential problem with common method bias (Villena, Choi, & Revilla, 2019). Following Podsakoff, MacKenzie, and Podsakoff (2012), we carefully designed the measures to attain clarity and arranged the questions in the appropriate order to reduce bias in the answers. To encourage responses to the questions, we allowed the respondents to answer anonymously.

We further applied three ex-post statistical approaches to assess the possibility of common method bias. First, we conducted Harman's one-factor test by following Podsakoff and Organ's (1986) approach. The principal component factor analysis produced four factors with eigenvalues greater than 1, accounting for 74.41% of the variance. If there was common method bias in the data, one major factor should have emerged from the factor analysis. The results indicated that the first factor accounted for only 25.47% of the covariance.

Second, we correlated objective performance data with subjective performance data in the same variable to evaluate common method bias (Robson, Katsikeas, & Bello, 2008). The respondents reported their firms' sales growth on the questionnaire. We collected objective information about sales growth from the Taiwan Economic Journal (TEJ) database for 53 of the sample firms and compared this information with the data in the survey. The results showed a statistically significant and positive correlation coefficient of 0.789 ($p < 0.01$).

Third, we followed the rigorous analytical procedure suggested by Liang et al. (2007) and Williams et al. (2003). We added a method factor that included all indicators of the principal constructs in the model. The square values of the principal constructs' factor loadings were defined as the percent of indicator variance caused by the substantive construct, and the square values of the method factor loadings were defined as the percent of indicator variance caused by the method (Liang et al., 2007, p. 87). We compared each indicator's variance caused by the principal construct and by the method factor. Most method factor loadings were not statistically significant. Therefore, the results indicated only a minor threat of common method bias.

4. Analysis and Results

To evaluate the model and conduct multi-group analysis (MGA), we applied the partial least squares structural equation modeling (PLS-SEM) method by using the statistical software SmartPLS3 (Ringle, Wende, & Becker, 2015). PLS is a composite-based approach to SEM, and this method places no restrictions on the co-variances between the same construct indicators. Instead, it forms composites as linear combinations of their respective indicators (Henseler et al., 2014; Sarstedt et al., 2016).

PLS is considered a powerful and very suitable approach for examining prediction research models for exploring and advancing theory development (Richter, Sinkovics, Ringle, & Schlägel, 2016). In this paper, the aim is not to confirm or reject a theory, that is, to determine how well a proposed theoretical model can estimate the covariance matrix for a sample data set. Instead, we determine how well the independent variables explain the variance in the dependent variables (Hair,

Hult, Ringle, & Sarstedt, 2017). The hypothesized relationships under different combinations of alliance nationalities and alliance forms in MGA have not previously been studied. Our aim is predicting and explaining the target variables, that is, relational governance effectiveness and alliance performance (Rigdon, 2012), which supports the “soft-modelling” approach that we adopt (Richter et al., 2016; Wold, 1980). Furthermore, PLS has the advantage of imposing fewer requirements on sample size to achieve acceptable statistical power (Reinartz, Haenlein, & Henseler, 2009), which proves advantageous for MGA.

We conducted an MGA in post-hoc analysis by inspecting different combinations of alliance nationalities (domestic/foreign) and alliance forms (equity/contractual), which resulted in subgroups of 34, 40, 43, and 65 observations. We reverted to the requirement of a minimum sample size based on a statistical power of 80% (Hair et al., 2017, p.26). With the maximum number of independent variables in structural model being four, a significance level of 10%, and a minimum R^2 of 0.25, all of the subgroups in this study fulfilled the acceptable sample size of 34.

4.1. Assessment of measurement model

The evaluation of the measurement model includes the assessment of its reliability and validity with respect to the posited underlying constructs. We first examined the *internal consistency reliability* of the constructs and used Cronbach’s α and composite reliabilities to check the internal consistency of the measurement model. An inspection of Cronbach’s alpha for the constructs in the full model and all the subgroups revealed that all of the coefficients were greater than 0.70 (ranging

from 0.710 to 0.971), which indicated acceptable reliability (Fornell & Larcker, 1981). We further examined composite reliability. All values ranged from 0.840 to 0.979, reaching the acceptable threshold of 0.70.

Fornell and Larcker (1981) suggest that *convergent validity* can be judged based on the significance of the factor loading and shared variance. As shown in

Table 2, except for three items in model A (domestic and equity alliance group), which were marginally lower than 0.7, all other items showed outer loadings above the critical value of 0.7. However, all measurement items fulfilled the minimum cut-off criterion of 0.5 (Henseler, Ringle, & Sinkovics, 2009). The average variance extracted (AVE) for the constructs in the full model and all subgroups was greater than the cut-off criterion of 0.5 (Henseler et al., 2009). Therefore, convergent validity was considered acceptable.

To assess discriminant validity, we first followed Fornell and Larcker's (1981) approach to compare the average variance extracted and the variance shared between the constructs. Table 3 shows the correlation coefficients in the off-diagonal elements of the matrix and the square roots of the AVE values calculated for each construct along the diagonal. To ensure adequate discriminant validity of a construct, its diagonal element should be greater than the off-diagonal elements in the corresponding rows and columns. All the constructs in the full model and subgroups fulfilled this criterion. Second, we examined the heterotrait–monotrait (HTMT) ratio of correlations to evaluate discriminant validity with a more stringent measure. This new approach has been indicated to be a better criterion than the

Fornell-Larcker one (Henseler, Ringle, & Sarstedt, 2015). The results showed that all HTMT values were lower than the threshold value of 0.85. We further ran the bootstrapping procedure to calculate 95% bias-corrected and accelerated confidence intervals to evaluate whether the HTMT values were statistically significantly different from 1 (Hair et al., 2017). All HTMT confidence intervals did not include 1, indicating that all constructs had achieved acceptable discriminant validity.

Insert Table 2 and Table 3 here

4.2. Assessment of the structural model

Having satisfied the requirements for the measurement model, we then tested the structural model. We started by checking collinearity between the constructs. All the variance inflation factor (VIF) values in all models were smaller than the threshold of 5, demonstrating that collinearity was not a potential problem. The predictive power of a PLS model is determined by R^2 scores. The R^2 values of alliance performance were between 0.127 and 0.476 (see Table 4), which was above the acceptable level of 0.1 (Falk & Miller, 1992). The R^2 value of relational governance effectiveness was between 0.557 and 0.732 (in the full model and models A to D), which could be considered moderate to high levels (Cohen, 1988; Ringle, Sarstedt, & Straub, 2012). The criteria for acceptable R^2 depend on the research context; for example, an R^2 value of 0.2 is considered high in disciplines such as consumer behavior and marketing (Hair, Ringle, & Sarstedt, 2011).

In addition to R^2 , we examined the effect size (f^2) to evaluate the impact of an independent latent variable on a dependent latent variable (Chin, 2010). The f^2 values of 0.02, 0.15, and 0.35 denote small, medium, or large effects, respectively (Cohen, 1988). As can be seen specifically for relational governance effectiveness on alliance performance in the various models, the effect sizes ranged from medium to big.

We also examined the Stone-Geisser's Q^2 value to evaluate the path model's predictive relevance by using the blindfolding procedure for a specified omission distance 8. The Q^2 values in all models were larger than 0, indicating the model's predictive accuracy regarding each endogenous construct (Hair et al., 2017). Table 4 shows the R^2 , f^2 , and the Q^2 values of the structural model.

Insert Table 4 here

4.3. Results for the full model

To answer the first research question related to which collaborative inter-firm management practices predict relational governance effectiveness, we examined the hypothesized relationships in the model. We applied the bootstrapping technique (5000 resamples) in PLS-SEM to obtain the t -values to evaluate the path coefficients' significance (Henseler et al., 2009). We found that trustworthiness has a statistically significant impact on relational governance effectiveness ($\gamma = 0.153$, $t = 2.038$, $p < 0.05$); H1 is supported. However, the relationship between contractual clarity and relational governance effectiveness (H2) is not supported ($\gamma = 0.143$, $t = 1.409$, $p > 0.05$). Procedural

justice is positively associated with relational governance effectiveness ($\gamma = 0.330$, $t = 3.750$, $p < 0.01$). Thus, H3 is supported. The path coefficient from connectivity to relational governance effectiveness was 0.363 ($t = 6.604$, $p < 0.01$); H4 is supported. Last, H5 is also supported ($\beta = 0.451$, $t = 6.560$, $p < 0.01$) indicating that relational governance effectiveness contributes to alliance performance. We further examined the effects of the control variables on the outcome variable. The results show that there are no statistically significant paths from all control variables to alliance performance in the full model. To assess model fit, we performed a test of the composite-based standardized root mean square residual (SRMR), which is considered the only approximate model-fit criterion in PLS (Stone, 1974; Williams et al., 2003). The SRMR was 0.062, which was under the threshold of 0.08. The results for the full model are displayed in Table 5 and Figure 1.

Insert Table 5 and Figure 1 here

4.4. Post-hoc analysis

To answer the second research question whether different management practices are better predictors of relational governance effectiveness under different collaborative inter-firm relationship configurations, we conducted a post-hoc analysis. The aim was to examine path changes in the base model across collaboration configurations. This allows us to theorize about management practices in different inter-firm relationship scenarios. We divided the sample along two dimensions: 1) the nationality of the alliance partner and 2) the type of alliance (equity versus contractual). Previous

studies show that alliance partner nationality may influence the nature of the alliance relationship and by extension, the performance of the alliance (e.g. Li, Tian, & Wan, 2015; Sirmon & Lane, 2004).

Mixed findings from studies on the impact of cultural distance on alliance performance (cf. Pesch & Bouncken, 2017) call for an exploration of management practices contributing to relational governance effectiveness and in turn, alliance performance in alliances with domestic versus foreign partners.

A number of studies have examined different influences of the choice of the organizational form of alliances (Kwok, Sharma, Gaur, & Ueno, 2019; Reuer & Devarakonda, 2016). Following previous studies (Colombo, 2003; Lojacono, Misani, & Tallman, 2017), in this study we divided alliance forms into equity-based and contractual alliances. Equity-based alliances depend on sophisticated mechanisms involving considerable relation-specific investments to reduce the threat of opportunistic behaviors (Hsiao, Chen, Lin, & Kuo, 2017). Contractual alliances rely on control mechanisms with more flexibility associated with less relation-specific investments and inter-firm integration (Colombo, 2003; Pesch & Bouncken, 2017). Therefore, it can be expected that different management practices may be relevant in equity-based and contractual relationships to achieve relational governance effectiveness.

We carried out an MGA by separating the full sample into four groups under different combinations of alliance nationalities (domestic/foreign) and alliance form (equity/contractual), which resulted in subgroups of 34, 40, 43, and 65 observations. We reverted to the commonly used level of

statistical power of 80% (Hair et al., 2017). With the maximum number of arrows pointing at a construct (i.e., the number of independent variables) being four, we need 34 observations to reach statistical power of 80% for detecting R^2 values of at least 0.25 (with a 10% probability of error). The sample size in the subgroups was acceptable. The MGA results are summarized in Table 5, and a graphic overview is also shown in Figure 2.

As expected, compared to the full model different management practices predicted relational governance effectiveness under different inter-firm relationship configurations. In the domestic/equity scenario (scenario A in Figure 2), procedural justice is a statistically significant predictor of relational governance effectiveness. In comparison, in the foreign/equity relationship scenario, only connectivity significantly predicts relational governance effectiveness (scenario C in Figure 2). In the domestic/contractual scenario, trustworthiness, procedural justice, and connectivity predict relational governance effectiveness (scenario B in Figure 2). In contrast, in the foreign/contractual scenario, contractual clarity and connectivity are statistically significant predictors of relational governance effectiveness (scenario D in Figure 2). Relational governance effectiveness is a statistically significant predictor of alliance performance in all four scenarios. However, the f^2 values in Table 5 show that the effect of relational governance effectiveness on alliance performance is strongest for firms in contractual relationships with domestic partners ($RG-AP f^2_A = 0.244$; $f^2_B = 0.598$; $f^2_C = 0.188$; $f^2_D = 0.142$).

Insert Figure 2 here

5. Discussion

5.1. Research implications

In this paper, we examined which of four identified management practices predict relational governance effectiveness, and in turn, alliance performance, in a country context where a managerial preference for relational governance as opposed to formal governance mechanisms is expected. We also explored whether different management practices are better predictors of relational governance effectiveness in different collaborative inter-firm relationship configurations.

The analysis of the full model revealed that demonstrating trustworthiness, establishing just and fair procedures, and building platforms for connectivity are management practices that positively contribute to relational governance effectiveness. However, a closer look at the effect sizes (see Table 4) identifies building platforms for connectivity as the strongest overall predictor of relational governance effectiveness. This is in line with a growing body of literature emphasizing the importance of connectivity in B2B relationships (Cano-Kollmann et al., 2016; Lorenzen & Mudambi, 2013; Mudambi, Mudambi, Mukherjee, & Scalera, 2017; Sinkovics et al., 2019; Törnroos, Halinen, & Medlin, 2017).

However, well-functioning platforms for connectivity may be more important under certain conditions than others. To this end, the multi-group analysis provides more nuanced insights. The effect of building platforms for connectivity on relational governance effectiveness across all four

scenarios is strongest in scenario C, representing equity-based alliances with foreign partners ($f^2_A = 0.068$; $f^2_B = 0.546$; $f^2_C = 0.822$; $f^2_D = 0.137$). In this scenario, the other three management practices do not have a significant impact. An awareness of existing psychic distance between partners can lead firms to invest more resources in overcoming this liability of foreignness (cf. O'Grady & Lane, 1996; Yamin & Sinkovics, 2006). Although an equity-based relationship may help reduce the foreign partner's liability of foreignness through a large degree of inter-firm integration, this relationship will not automatically reduce the partner's liability of outsidership (cf. Yamin & Kurt, 2018). To develop insidership status, foreign partner managers must develop guanxi with domestic partner firm managers. Effective platforms for connectivity are an important facilitator for interactions that are necessary to achieve this (Lin, 2011).

However, equity-based alliances are not always the preferred form of collaboration (cf. Das & Teng, 2000). Scenario D represents contractual alliances with foreign partners. In this scenario, building platforms for connectivity is used in combination with ensuring contractual clarity. In this configuration, there is a lower level of integration between the two parties (Pesch & Bouncken, 2017), but at the same time, the foreign partner still has to reduce their liability of foreignness as well as their liability of outsidership (Yamin & Kurt, 2018). Drawing up contracts collaboratively to ensure that potential misunderstandings and differences of opinion are caught and addressed early in the process (Abdi & Aulakh, 2017; Carson et al., 2006; Luo, 2007) can help ultimately reduce psychic distance (Pesch & Bouncken, 2017; Yamin & Kurt, 2018; Yamin & Sinkovics, 2006). This clarity about

mutual expectations creates a good foundation for relationship building that can be leveraged through effective platforms for connectivity. This, in turn, is expected to reduce the foreign partner's liability of outsidership (Yamin & Kurt, 2018).

Scenarios A and B depict inter-firm relational configurations with domestic partners. Under these conditions, the liability of foreignness is of no concern. However, the domestic partner may still suffer from the liability of network outsidership (cf. Lin, Huang, Lin, & Hsu, 2012). In scenario A, the establishment of just and fair procedures is the sole contributor to relational governance effectiveness. Contrary to expectations, building platforms for connectivity does not have a significant impact. A possible explanation is that the increased integration through the equity relationship together with the shared cultural background sufficiently mitigates the liability of outsidership (cf. Lin et al., 2012; Yamin & Kurt, 2018). In other words, there may not be an added need for facilitated business relationship development.

Scenario B depicts contractual alliances with domestic partners. In this configuration, building effective platforms for connectivity is a strong predictor for relational governance effectiveness. In addition, demonstrating trustworthiness and establishing just and fair procedures also form part of the portfolio of relevant management practices. In this scenario, the mitigating impact of inter-firm integration through equity is absent. At the same time, the existing cultural proximity can be expected to amplify the two parties' shared preference for, as well as reliance on, relational governance to optimize alliance performance.

5.2. Managerial implications

This study clearly indicates that relational governance effectiveness plays an important role in enhancing alliance performance in a country context permeated by Confucian values. The empirical results offer guidance for domestic and foreign partners regarding which management practices are good predictors of relational governance effectiveness. Specifically, foreign partners in contractual alliance relationships with Taiwanese firms are well advised to ensure contractual clarity when drawing up agreements. Foreign partners are also advised to invest in effective platforms for connectivity. This latter management strategy is also recommended to foreign partners in equity relationships with Taiwanese firms. Domestic parties in equity-based alliance relationships must ensure that both parties perceive the procedures as just and fair. Last, domestic partners bound together by contractual alliances are advised to invest in a portfolio of management practices encompassing demonstrating trustworthiness, establishing just and fair procedures, and building effective platforms for connectivity.

5.3. Limitations and future directions for research

The limitations of this study are as follows. First, we collected data on the perspectives of both partners on an alliance using a single-side survey of Taiwanese partners only. Geringer and Hebert (1991, p. 256) find a significant and positive correlation between a focal partner's satisfaction with alliance performance and the other partner's perception of this focal partner's satisfaction. However,

to obtain more balanced perspectives future studies might examine the dyadic perspectives in the alliance.

Second, procedural justice research is usually scrutinized from a one-sided perspective. Nevertheless, according to Luo's (2005) research results, shared procedural justice and unilaterally perceived procedural justice might have different degrees of influence on relative performance. For cooperation aimed at collective achievements in alliances, shared procedural justice is important to improve joint operations. If justice perceptions are not common to all parties, conflicts may arise as one party is likely to feel unfairly treated (Luo, 2005). Further research is needed to examine partners' different perspectives of procedural justice in the alliance. In addition, we examined only one type of fairness, procedural justice. Future studies may investigate the possible influences of other types of justice in inter-organizational relationships, such as interpersonal or informational fairness (Jean, Chiou, & Sinkovics, 2016) .

Third, connectivity involves two forms, the organization-based pipelines and individual-based personal relationships that often arise within communities of practice, networks, or global diasporas (Andersson, Dasí, Mudambi, & Pedersen, 2016, p. 154; Lorenzen & Mudambi, 2013). This study focused on connectivity at the organizational level. Future researchers may wish to incorporate personal relationships in their examinations, which would enable studying connectivity as a multilevel construct (Andersson et al., 2016).

Finally, the data were cross-sectional because all the variables were measured at the same time. Approximating longitudinal measurements, however difficult to implement, would likely provide more insights into the evolving roles of contractual and relational governances at the different stages of the life cycle of inter-organizational relationships in alliances.

6. References

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7. Figures and Tables

Figure 1

Diagram of hypothesized relationships and PLS-SEM results

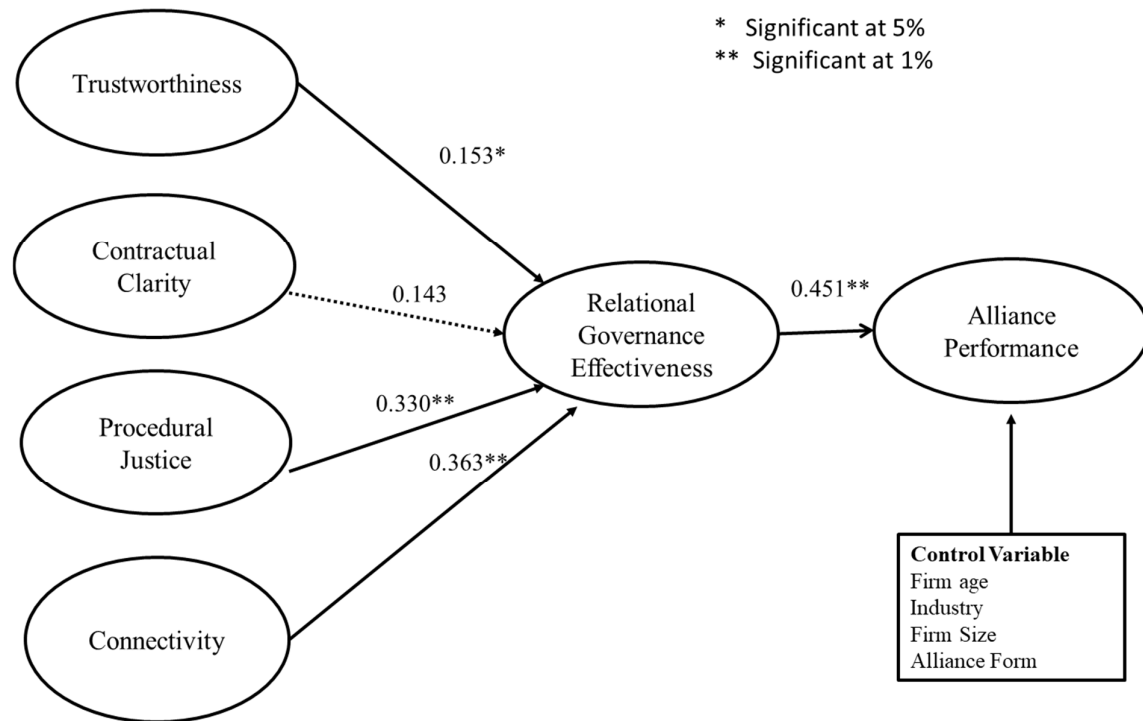


Table 1

Descriptive information

Firm Age	Percentage	Firm Size	Percentage
Less than 5 years	2.20%	Less than 50 employees	12.64%
5-15 years	30.77%	50-100 employees	12.09%
15-25 years	28.02%	100-500 employees	29.12%
25-35 years	17.03%	500-1000 employees	10.44%
35-45 years	10.99%	1000-2000 employees	14.29%
45-55 years	6.04%	2000-3000 employees	3.85%
More than 55 years	4.95%	3000-5000 employees	5.49%
		More than 5000 employees	12.09%
Industry	Percentage	Alliance Form	Percentage
Semiconductor	10.44%	equity-based	42.86%
Computer	23.08%	contract-based	57.14%
Communications	6.04%		
Precise Equipment	5.49%	Sales Revenue	Percentage
Photo Electronics	8.79%	Less than 100 millions (US\$3.3 million)	9.34%
Biotechnology	8.79%	100-500 millions	21.43%
Manufacturing	20.88%	500 millions to 1 billion	8.79%
Others	16.48%	1-5 billions	21.43%
		5-10 billions	10.44%
Capital	Percentage	10-30 billions	9.34%
Less than 100 millions	5.49%	More than 30billions (US\$1.7 billion)	19.23%
100-500 millions	8.79%	Nationality	Percentage
500millions-1 billion	3.30%	Domestic	40.66%
1-5 billions	30.77%	International	59.34%
5-10 billions	14.84%		
10-30 billions	16.48%		
More than 30 billions	20.33%		

Table 2

Constructs and associated items

<i>Items</i>	<i>Full model</i>			<i>Model A (Do/Equi)</i>			<i>Model B (Do/Contr)</i>			<i>Model C (For/Equil)</i>			<i>Model D (For/Contr)</i>		
	<i>Mean</i>	<i>SD</i>	<i>OL</i>	<i>Mean</i>	<i>SD</i>	<i>OL</i>	<i>Mean</i>	<i>SD</i>	<i>OL</i>	<i>Mean</i>	<i>SD</i>	<i>OL</i>	<i>Mean</i>	<i>SD</i>	<i>OL</i>
<i>Trustworthiness (TR)</i>	CA=0.923 CR=0.942 AVE=0.766			CA=0.938 CR=0.954 AVE=0.809			CA=0.953 CR=0.964 AVE=0.842			CA=0.897 CR=0.924 AVE=0.711			CA=0.877 CR=0.910 AVE=0.669		
Both parties always rely on each other to abide by and carry out alliance agreements.	5.62	1.01	0.865	5.44	1.08	0.959	5.40	1.19	0.860	5.74	0.88	0.787	5.77	0.92	0.849
Both parties have a high confidence level of each other's commitment and contribution.	5.57	1.11	0.929	5.41	1.28	0.954	5.23	1.25	0.962	5.74	1.09	0.952	5.74	0.89	0.816
The partner firm never uses opportunities that arise to profit for itself at our expense.	5.33	1.25	0.770	5.24	1.44	0.676	5.10	1.39	0.875	5.37	1.25	0.745	5.49	1.05	0.745
Our alliance partner usually keeps the promises they make to our firm.	5.40	1.02	0.889	5.26	1.14	0.931	5.1	1.15	0.948	5.60	1.00	0.831	5.51	0.83	0.812
Generally, my firm trusts our partner.	5.66	0.99	0.915	5.47	1.19	0.942	5.40	1.19	0.940	5.77	0.97	0.886	5.85	0.69	0.864
<i>Contractual clarity (CC)</i>	CA=0.916 CR=0.947 AVE=0.856			CA=0.945 CR=0.965 AVE=0.902			CA=0.938 CR=0.960 AVE=0.889			CA=0.891 CR=0.933 AVE=0.822			CA=0.881 CR=0.927 AVE=0.808		
Whenever the alliance contract needs alternation or renewal, both parties always work together on all related terms and clauses, and jointly monitor contract enforcement thereafter.	5.42	1.01	0.906	5.15	1.13	0.931	5.25	1.08	0.943	5.51	1.00	0.856	5.62	0.88	0.877
Contract terms on interparty cooperation, sharing, and exchange are	5.41	1.07	0.939	5.29	1.17	0.984	5.00	1.34	0.936	5.63	0.90	0.919	5.57	0.87	0.919

clearly defined and well executed by both parties.																
Contract terms on directing, monitoring, and governing the alliance's major activities are clearly defined and well executed by both parties.	5.40	0.99	0.931	5.26	1.05	0.933	5.20	1.27	0.948	5.49	0.94	0.943	5.52	0.77	0.900	
<i>Procedure justice(PJ)</i>	CA=0.916 CR=0.947 AVE=0.856			CA=0.945 CR=0.965 AVE=0.902			CA=0.938 CR=0.960 AVE=0.899			CA=0.891 CR=0.933 AVE=0.822			CA=0.881 CR=0.927 AVE=0.808			
The procedures used by two parties in planning, organizing, and managing alliance activities (i.e., strategic planning, autonomy allocation, and routine management) are fair.	5.27	1.08	0.878	4.76	1.33	0.852	5.10	1.13	0.931	5.58	0.88	0.833	5.45	0.92	0.883	
The procedures used to govern knowledge or resources sharing between two parties (i.e., knowledge transfer, innovation development, and resource contribution) are fair.	5.09	1.20	0.853	4.85	1.21	0.877	4.98	1.17	0.934	5.40	1.09	0.883	5.08	1.25	0.760	
The implementation of strategic decisions is administered and monitored fairly by both parties.	5.27	1.07	0.866	5.03	1.11	0.698	5.15	1.21	0.941	5.44	1.03	0.939	5.35	0.98	0.851	
Overall, the procedures used for making strategic decisions were fair.	5.32	1.04	0.936	5.09	1.08	0.942	5.17	1.24	0.950	5.40	1.05	0.966	5.49	0.83	0.911	
<i>Connectivity (CONN)</i>	CA=0.837 CR=0.903 AVE=0.756			CA=0.710 CR=0.840 AVE=0.639			CA=0.906 CR=0.941 AVE=0.842			CA=0.885 CR=0.928 AVE=0.812			CA=0.823 CR=0.895 AVE=0.741			
Company management conducts a 'collective review' to assess the progress and performance of its strategic alliances.	5.18	1.15	0.808	5.12	1.12	0.683	5.07	0.99	0.879	5.33	1.41	0.877	5.17	1.10	0.793	
Alliance managers participate in forums such as committees or task forces to take stock of their alliance management experience and practices.	5.47	1.00	0.907	5.44	1.05	0.855	5.20	1.11	0.939	5.74	0.82	0.918	5.48	0.99	0.918	
Company managers participate in forums such as meetings, seminars, or retreats to exchange alliance-related information, experiences, war stories, etc.	5.53	0.95	0.890	5.32	1.04	0.848	5.33	0.89	0.933	5.81	0.96	0.908	5.57	0.90	0.867	

Relational governance effectiveness (RG)	CA=0.875 CR=0.909 AVE=0.666			CA=0.875 CR=0.907 AVE=0.662			CA=0.861 CR=0.899 AVE=0.643			CA=0.869 CR=0.905 AVE=0.656			CA=0.888 CR=0.918 AVE=0.692		
The partners engage in joint problem solving while resolving conflicts.	5.62	0.97	0.790	5.53	0.99	0.861	5.43	1.04	0.715	5.84	0.97	0.715	5.65	0.91	0.843
We have the ability to build good personal relationships with business partners.	5.76	0.87	0.807	5.62	0.78	0.900	5.53	0.99	0.814	6.02	0.74	0.779	5.82	0.90	0.774
We can put ourselves in our partners' position.	5.50	0.97	0.849	5.18	1.09	0.818	5.28	0.99	0.853	5.74	0.88	0.863	5.65	0.89	0.855
Our firm prefers to work out solutions to problems that benefit the relationship as a whole, and not only the individual parties.	5.52	1.06	0.825	5.21	1.25	0.700	5.55	0.93	0.882	5.63	1.07	0.862	5.60	1.01	0.851
In our firm's past relationships, the parties have treated problems as joint rather than individual responsibilities.	5.69	0.98	0.808	5.38	1.21	0.775	5.58	0.90	0.731	5.86	0.94	0.822	5.80	0.91	0.833
Alliance Performance (AP)	CA=0.958 CR=0.969 AVE=0.887			CA=0.964 CR=0.973 AVE=0.899			CA=0.947 CR=0.962 AVE=0.863			CA=0.971 CR=0.979 AVE=0.920			CA=0.934 CR=0.952 AVE=0.831		
Our firm is satisfied with the financial performance of the collaboration.	4.85	1.4	0.941	4.65	1.15	0.933	4.43	1.15	0.941	5.12	1.37	0.947	5.03	0.88	0.904
Our firm is satisfied with the overall performance of the collaboration.	4.99	1.13	0.935	4.82	1.19	0.952	4.60	1.17	0.893	5.16	1.36	0.963	5.22	0.82	0.919
Our alliance partner firm seems to be satisfied with the financial performance of the collaboration.	4.92	1.18	0.941	4.71	1.12	0.935	4.63	1.10	0.942	5.19	1.47	0.960	5.05	1.02	0.907
Our alliance partner firm seems to be satisfied with the overall performance of the collaboration.	5.04	1.14	0.950	4.74	1.14	0.971	4.68	1.10	0.939	5.28	1.33	0.966	5.28	0.96	0.915

Note: Mean=mean value; SD=standard deviation; OL=outer loading; CR=composite reliability; AVE=average variance extracted). Model A=Domestic (Do)/Equity (Equi), Model B= Domestic (Do)/Contractual (Contr), Model C=Foreign (For)/Equity (Equi), Model D= Foreign (For)/Contractual (Contr). Recommended criteria for reflective measurement model: Loadings (OL) > 0.70, AVE > 0.50, Cronbach's alpha 0.60-0.90, CR 0.60-0.90.

Table 3

Discriminant validity assessment results (HTMT.85 criterion)

		AP	CC	CONN	TRUST	PG	RG
AP	Model full	0.942					
	Model A	0.948					
	Model B	0.929					
	Model C	0.959					
	Model D	0.911					
CC	Model full	0.622	0.925				
	Model A	0.614	0.950				
	Model B	0.746	0.943				
	Model C	0.614	0.907				
	Model D	0.496	0.899				
CONN	Model full	0.394	0.425	0.869			
	Model A	0.432	0.408	0.799			
	Model B	0.230	0.362	0.918			
	Model C	0.403	0.266	0.901			
	Model D	0.462	0.607	0.861			
TR	Model full	0.625	0.779	0.324	0.875		
	Model A	0.585	0.775	0.358	0.899		
	Model B	0.731	0.782	0.220	0.918		
	Model C	0.651	0.762	0.257	0.843		
	Model D	0.504	0.774	0.460	0.818		
PG	Model full	0.573	0.721	0.393	0.712	0.884	
	Model A	0.404	0.551	0.159	0.709	0.847	
	Model B	0.821	0.806	0.422	0.675	0.939	
	Model C	0.650	0.786	0.219	0.735	0.906	
	Model D	0.376	0.721	0.631	0.733	0.853	
RG	Model full	0.450	0.654	0.603	0.617	0.685	0.816
	Model A	0.421	0.597	0.370	0.618	0.673	0.814
	Model B	0.628	0.633	0.635	0.636	0.742	0.802
	Model C	0.460	0.611	0.666	0.552	0.591	0.810
	Model D	0.353	0.774	0.667	0.689	0.694	0.832

Note: Diagonal terms are square root of the average variance extracted. Off-diagonal terms are the correlation of latent constructs. The diagonal term must be greater than any of the elements in the row or the column corresponding to that number.

Table 4Coefficient of determination (R^2), effect sizes f^2 and Stone-Geisser Q^2 of predictive relevance

		R^2	f^2 (effect size) on...		Stone Geisser
			AP	RG	Q^2
AP	Model full	0.216			0.179
	Model A	0.233			0.180
	Model B	0.476			0.314
	Model C	0.265			0.215
	Model D	0.127			0.069
RG	Model full	0.633	<i>0.259</i>		0.398
	Model A	0.557	<i>0.244</i>		0.314
	Model B	0.732	0.598		0.385
	Model C	0.677	<i>0.188</i>		0.390
	Model D	0.686	0.142		
TR	Model full			0.022	
	Model A			0.000	
	Model B			<i>0.204</i>	
	Model C			0.003	
	Model D			0.036	
CC	Model full			0.018	
	Model A			0.045	
	Model B			0.031	
	Model C			0.069	
	Model D			0.147	
PJ	Model full			0.123	
	Model A			<i>0.283</i>	
	Model B			<i>0.249</i>	
	Model C			0.069	
	Model D			0.011	
CONN	Model full			<i>0.288</i>	
	Model A			0.068	
	Model B			0.546	
	Model C			0.822	
	Model D			0.137	

Note: f^2 values of 0.02, 0.15 and 0.35 are considered small, medium and large at the structural level. We indicate this in normal font (small), italics (medium) and bold (large).

Table 5

Results of the structural model testing

<i>Rel</i>	<i>Model</i>	<i>Path coefficient</i>	<i>t values</i>	<i>CIS (95% bias-corrected)</i>	<i>p values</i>	<i>Sig</i>
TR -> RG	Model full	0.153	2.038	[0.002, 0.300]	0.042	yes
	Model A	0.010	0.045	[-0.466, 0.462]	0.964	no
	Model B	0.382	2.313	[0.079, 0.739]	0.021	yes
	Model C	0.051	0.418	[-0.243, 0.270]	0.676	no
	Model D	0.186	1.220	[-0.140, 0.445]	0.223	no
CC -> RG	Model full	0.143	1.409	[-0.061, 0.329]	0.159	no
	Model A	0.230	0.766	[-0.544, 0.670]	0.443	no
	Model B	-0.185	0.820	[-0.639, 0.222]	0.412	no
	Model C	0.227	1.313	[-0.075, 0.618]	0.189	no
	Model D	0.386	2.542	[0.128, 0.739]	0.011	yes
PJ -> RG	Model full	0.330	3.750	[0.159, 0.511]	0.000	yes
	Model A	0.508	2.363	[0.161, 1.073]	0.018	yes
	Model B	0.453	2.621	[0.115, 0.764]	0.009	yes
	Model C	0.257	1.597	[-0.048, 0.592]	0.110	no
	Model D	0.101	0.665	[-0.176, 0.423]	0.506	no
CONN -> RG	Model full	0.363	6.604	[0.249, 0.466]	0.000	yes
	Model A	0.192	1.274	[-0.255, 0.414]	0.203	no
	Model B	0.426	4.588	[0.217, 0.585]	0.000	yes
	Model C	0.537	5.515	[0.327, 0.709]	0.000	yes
	Model D	0.283	2.040	[0.066, 0.605]	0.041	yes
RG -> AP	Model full	0.451	6.560	[0.299, 0.570]	0.000	yes
	Model A	0.437	2.035	[-0.541, 0.692]	0.042	yes
	Model B	0.584	4.362	[0.260, 0.783]	0.000	yes
	Model C	0.394	2.949	[0.063, 0.606]	0.003	yes
	Model D	0.363	3.229	[0.109, 0.553]	0.001	yes
Control Variable						
Firm Age	Model full	0.006	0.082	[-0.126, 0.140]	0.935	no
	Model A	0.044	0.251	[-0.264, 0.412]	0.802	no

	Model B	-0.283	2.494	[-0.126, 0.140]	0.013	yes
	Model C	0.227	1.253	[-0.138, 0.554]	0.210	no
	Model D	0.030	0.240	[-0.205, 0.277]	0.810	no
Firm Size	Model full	0.109	1.507	[-0.030, 0.249]	0.132	no
	Model A	0.149	0.798	[-0.201, 0.513]	0.425	no
	Model B	0.111	1.151	[-0.078, 0.300]	0.250	no
	Model C	0.065	0.434	[-0.244, 0.299]	0.664	no
	Model D	0.029	0.208	[-0.126, 0.140]	0.835	no
Industry	Model full	-0.027	0.363	[-0.173, 0.120]	0.717	no
	Model A	0.218	0.977	[-0.234, 0.630]	0.329	no
	Model B	-0.136	1.182	[-0.362, 0.096]	0.237	no
	Model C	-0.094	0.473	[-0.473, 0.297]	0.636	no
	Model D	-0.043	0.354	[-0.271, 0.202]	0.723	no

Note: Rel=(path) relationships, CIS=95% (bias-corrected) confidence intervals, Sig=significant at 5% level (yes/no), SRMR=standardized root-mean square residual measure of model fit

Figure 2

Graphical summary of findings

