

THE CONTINGENT EFFECTS OF ASSET SPECIFICITY, CONTRACT SPECIFICITY, AND TRUST ON OFFSHORE RELATIONSHIP PERFORMANCE

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ABSTRACT

Drawing on the perspectives of interfirm governance mechanisms, we develop a contingency theoretical framework that examines how contract specificity and trust interact with local suppliers' physical asset specificity and human asset specificity in shaping the relationship performance of offshore cooperation between local suppliers and global buyers. The empirical data for hypothesis testing were collected from a survey of 162 dyads composed of Chinese local suppliers and international buyers. The empirical results reveal an inverted U-shaped relationship between physical asset specificity and relationship performance, and this inverted U-shaped relationship is stronger when the level of contract specificity is higher. There is a linear and positive relationship between human asset specificity and relationship performance, and this relationship becomes stronger when the level of trust between the local supplier and international buyer is higher.

Keywords: Asset specificity; Contract specificity; Trust; Local suppliers; International buyers; Relationship performance.

1. Introduction

Firms in developed countries have increasingly outsourced their value-added activities from local suppliers in emerging countries in the form of offshore buyer–supplier cooperation. The success of this offshore buyer–supplier cooperation may depend on how well the relationship between the two partners goes (Bertrand & Mol, 2013). Among the various factors that explain relationship performance in offshore cooperation, asset specificity – nonredeployable specific investments that are dedicated to such relationships (Hoetker & Mellewig, 2009) – has been identified as a primary determinant by prior studies (De Vita & Tekaya, 2015; Wu, Chen, Chen, & Tung, 2016). However, whether asset specificity facilitates or hinders relationship performance remains inconclusive in the literature. Some scholars postulate that such investments can lose at least part of their value if the transactional relationship was terminated because this type of investment is often designed for a particular transaction and shifting it to other businesses is difficult (Williamson, 1991), in turn hindering relationship performance (Liu, Liu, & Li, 2014). Another strand of literature argues that asset specificity signals the

desire to invest in an enduring relationship (Lui, Luo, & Liu, 2009), which can improve partners' trust and satisfaction (Dyer, 1996), thereby leading to behavior-enhanced relationship performance (Lin, Huang, Lin, & Hsu, 2012). Accordingly, further examination of the effect of unilateral specific investment on relationship performance in offshore cooperation represents an important research agenda that should shed some light on the prior controversial findings on the topic.

Furthermore, the transaction cost theory-related literature has documented that the term *asset specificity* means 'many different things to different people,' and this literature calls for a more comprehensive scale of the construct's multidimensional nature (David & Han, 2004; Williamson, 1985). On the one hand, an asset can be physically specific (i.e., physical asset specificity, PAS), referring to tangible investment assets such as tools, equipment and machinery. On the other hand, it can be human relational specific (i.e., human asset specificity, HAS), referring to intangible investment assets such as organizational investments related to customizing workflows, professional training, and learning to serve international buyers (Zaheer & Venkatraman, 1995). In addition, the impacts of PAS and HAS on relationship performance may vary in an emerging country such as China. However, prior studies were exclusively concerned with the estimation of a single, albeit composite, asset specificity, with a focus on outsourcing cooperation in domestic settings in developed countries (De Vita, Tekaya, & Wang, 2010), neglecting the significance of the differences in cultures, institutions and bargaining positions between local suppliers in developing countries and international buyers in developed countries in cross-border exchanges (Zhou & Xu, 2012). Consequently, in terms of the management of PAS and HAS to enhance relationship performance in a cross-border context, we lack a clear understanding of the strategic significance of such management for local suppliers in emerging developing countries.

The interfirm governance literature suggests that safeguarding partners' asset specificity investments and maintaining an effective business relationship in such interfirm cooperation require effective governance mechanisms (Yang, Zhao, Yeung, & Liu, 2016). Thus, firms in partnerships and dealing with cross-border transactions need to employ appropriate governance mechanisms, namely, formal and informal interfirm mechanisms, to avoid transactional uncertainties and risks of opportunism (Xie, Liang, & Zhou, 2014). Formal interfirm governance mechanism-related studies, usually building on transaction cost economics, emphasize the role of formal control, such as contract specificity, to regulate cooperation (Poppo & Zenger, 2002). At the same time, transaction cost economics also stresses the importance of informal interfirm governance mechanisms, such as norms and enduring relationships, whereby the role of more relational governance mechanisms, such as trust and social interactions, must be taken into account (Shahzad, Ali, Takala, Helo, & Zaefarian, 2018). Different governance mechanisms are required for different transaction objectives in governing offshore cooperation relationships (Hoetker & Mellewigt, 2009); hence, it is important to understand specifically how contract specificity and trust shape the effects of PAS and HAS on the performance of the relationship.

This study makes three major contributions to the body of literature on interfirm relationship performance. First, it identifies and empirically examines the two distinctive dimensions of asset specificity, PAS and HAS, and evaluates the differentiated impacts of PAS and HAS on the relationship performance embedded in offshore cooperation. Second, while

previous studies limited their attention to the linear effects of asset specificity, our study discovers a nonlinear impact of PAS on relationship performance by examining how formal and informal interfirm governance mechanisms affect the relationship performance of offshore cooperation when interacting with different types of asset specificities. Third, this study extends the outsourcing-related relationship performance literature on formal and informal control mechanisms by exploring how contract specificity and trust influence the relationships between relationship performance and PAS and HAS, respectively.

2. Theoretical foundations

2.1 Asset specificity investment and interfirm governance mechanisms

Asset specificity refers to “durable investments that are undertaken in support of particular transactions” (Williamson, 1985; p.55). Once sunk, these investments cannot be redeployed (or can be deployed only at a high productivity discount) to alternative interorganizational relationships if the cooperative relationship was destined to terminate (Dyer, 1996). Such investments can be tangible (e.g., physical materials such as tools, equipment and machinery) or intangible (e.g., knowledge-specific assets such as the learning and training of personnel) (David & Han, 2004). In offshore cooperative businesses, local suppliers’ main tasks are often to process and assemble products according to the requirements of international buyers, such that their roles are competence exploiting, either as local implementers or as assemblers (Lin et al., 2012). To enhance the production efficiency and thus improve the effectiveness of the offshore cooperation, local suppliers make these idiosyncratic investments in both tangible and intangible assets for the offshore cooperation (Kang, Mahoney, & Tan, 2009; Jean, 2014). In this study, we focus our examinations on the PAS and HAS that are invested by local suppliers and that are uniquely dedicated to a particular offshore cooperation.

Managing both PAS and HAS investments requires the use of adequate interfirm governance mechanisms to safeguard the process to effectively overcome the challenges in achieving a viable and fruitful balance of interests and power between partners (Nooteboom, 1999). According to transaction cost economics studies, formal interfirm governance mechanisms refer to “depersonalized exchanges, a reliance on financial parameters, and the drafting and implementation of formal contracts” (Ferguson, Paulin, & Bergeron, 2005; p. 217). In line with the logic of relation exchange theory, informal governance is normally considered, including social-based mechanisms that enhance information sharing, open communication and cooperation, which are based on trust (Ryall & Sampson, 2009; Wang & Tanaka, 2011). Since different governance mechanisms are required for different transaction objectives in governing offshore cooperation relationships (Hoetker & Mellewigt, 2009), it is important to understand how contract specificity and trust may shape the effects of PAS and HAS on the performance of the relationship (Xie, Liang, & Zhou, 2016; Shahzad, Ali, Takala, Helo, & Zaefarian, 2018). Considering interfirm governance mechanisms, the relationship between asset specificity and relationship performance is subject to two interpretations. The formal interfirm governance literature emphasizes the role of formal control, such as contract specificity, which provides a protective mechanism for safeguarding specific assets against opportunism by specifying each party's rights, duties, and responsibilities (Fryxell, Dooley, & Vryza, 2002). Informal interfirm governance studies underscore the importance of trust by providing a "mini-society with a vast array of norms" (Williamson, 1985; p.71) that behave and function as a social lubricant for

steering partners' behaviors in reducing transaction costs and fostering effective exchanges (Poppo, Zhou, & Ryu, 2008).

2.2. Theoretical framework

A well-performing relationship between partners in an offshore cooperation occurs when both the local supplier and the international buyer are satisfied with the relationship's effectiveness and efficiency (Jean, Sinkovics, & Kim, 2014). PAS and HAS provide better offshore manufacturing capabilities by improving offshore cooperation efficiency and helping local suppliers coordinate their production processes with their international buyers (Kang, Mahoney, & Tan, 2009; De Vita, Tekaya, & Wang, 2010). Thus, both PAS and HAS can be considered important antecedents to relationship performance in such a context. The adoption of formal interfirm governance mechanisms such as contract specificity and informal interfirm governance mechanisms such as trust helps safeguard suppliers' asset specificity and shapes various features of offshore cooperation, including interpartner knowledge-sharing efficiency and trustworthy relationship building (Dyer & Hatch, 2006), thus possibly having a significant influence on the relationship between asset specificity and relationship performance. Therefore, we incorporate these two different types of interfirm governance mechanisms to specifically examine how contract specificity and trust interact with PAS and HAS, respectively, in shaping the relationship between both PAS and HAS and relationship performance in a cross-national context. In line with the logic discussed above, we develop a contingency theoretical framework that postulates two broad propositions: 1. Physical asset specificity and human asset specificity affect relationship performance, and contract specificity and trust moderate the effects of physical asset specificity and human asset specificity, respectively, on relationship performance. Our theoretical framework is presented in Fig. 1.

Insert Fig. 1 about here

2.3. Hypotheses

2.3.1. Physical asset specificity and relationship performance

In offshore cooperation, PAS can be considered to reflect a positive desire on the part of the local supplier to build a long-term cooperative relationship with the international buyer and thus to help cultivate a bilateral expectation between them (Wu et al., 2016). When both parties share a bilateral expectation, the local supplier has more opportunities to acquire valuable knowledge from the international buyer, who, in turn, is willing to spend more time articulating its know-how, which improves cooperation performance in the offshore cooperative partnership (Mooi & Frambach, 2012). PAS may also help enhance local suppliers' production capacity, which may help increase process efficiency and effectiveness, in turn increasing the international buyer's satisfaction in working with local suppliers (Wagner & Bode, 2014). This may encourage the international buyer to invest more in the cooperative business, and consequently, the relationship between the partners can be improved (Kang et al., 2009). Furthermore, PAS improves the supplier's motivation for joint decision making with the international buyer since joint decision making allows the supplier to influence the decisions of the international buyer in a manner that is favorable to the supplier (Lin et al., 2012). It also allows suppliers to identify opportunities to improve their deployment of PAS (Dyer & Singh,

1998), which may result in stronger buyer–supplier relationship continuity, effectively enhancing the efficiency of the offshore cooperation.

However, these positive effects may begin to decline and even become negative when PAS reaches an exceedingly high level for two primary reasons. First, higher PAS increases the likelihood of hold-ups within the offshore relationship (Dyer & Hatch, 2006), causing the supplier to suffer from making unnecessary obligations to serve the international buyer (Villena, Choi, & Revilla, 2016). Additional responsibilities that require continuous investments of time and effort will deplete local suppliers' limited resources and decrease their motivation to acquire additional information and knowledge. Furthermore, the international buyer may exploit its powerful position to obtain more profits from the offshore cooperation (Bertrand & Mol, 2013), severely hindering the efficiency of the offshore cooperation and damaging relationship performance. Second, when a local supplier's PAS is higher, its responsiveness to both the international buyer's changing requirements and the product portfolio might decrease since PAS is generally designed for the initially best employment purposes (Klein, Crawford, & Alchian, 1978). In response to the international buyer's ever-changing needs, more efforts need to be mobilized to develop mutual understanding and cooperative norms, including managing both products and the appropriate use of assets (Narayanan, Narasimhan, & Schoenherr, 2015). Due to these difficulties in developing new products and managing existing products at higher levels of PAS, relationship performance may deteriorate. Thus, we hypothesize the following:

Hypothesis 1. There is an inverted U-shaped relationship between physical asset specificity and relationship performance.

The investment of HAS by local suppliers may signal their commitment to developing an enduring relationship, which may help increase international buyers' trust and cultivate positive cooperative behaviors leading to an enhanced relationship (Lui et al., 2009). In addition, HAS can enhance the efficiency of offshore cooperation through employee training and the recruitment of additional staff for the sole purpose of serving the international buyer (Kang et al., 2009), contributing to improving the relationship between partners. Moreover, the significant differences in cultures and institutions between the host and home countries of the partners can make it difficult for the partners to reach a mutual understanding and resolve conflicts by legal means (Choi & Contractor, 2016). The knowledge-specific assets spent serving a particular international buyer can increase the likelihood of a better understanding and enhanced communication efficiency between the partners, which may help the international buyer value the potential benefits associated with the offshore cooperation with the local supplier (Cavusgil, Deligonul, & Zhang, 2004). As a result, the international buyer may be more likely to exchange its resources with the local supplier and reinforce reciprocal knowledge transfer, leading to improved relationship performance.

However, the positive effects of HAS may decline or even become negative when the level of HAS is too high for several reasons. First, HAS can also lead to problems such as a lock-in situation, a narrower product portfolio and risks of opportunism when its level becomes excessively high (Williamson, 1991). Second, although HAS helps improve suppliers' services for specific international buyers, exceedingly high investments in such assets may lead to the

path dependence of knowledge accumulation and learning, causing the environment to be an ecological field that is suitable for self-existence but that is not conducive to the survival of other technologies (Kogut & Zander, 1992). As a result, a large quantity of knowledge accumulated by a supplier to serve a particular international buyer may impede its effective learning of other knowledge, severely limiting its openness to information. Thus, we hypothesize the following:

Hypothesis 2. There is an inverted U-shaped relationship between human asset specificity and relationship performance.

2.3.2 The moderating effect of interfirm governance mechanisms

The relationship between asset specificity and relationship performance may be context specific to the types of interfirm governance mechanisms employed. The formal interfirm governance literature emphasizes the role of contract specificity, which relies on contractual agreements to safeguard asset specificity and to regulate relationships (Hoetker & Mellewigt, 2009). Informal interfirm governance studies underline the important role of trust, which focuses on the reliability, creditability, and benevolence of a partner (Jia, 2013). Since different governance mechanisms are required for different transaction objectives in interfirm relationships (Wand, Zhang, & Jiang, 2018), the effects of PAS and HAS on relationship performance may vary with the level of contract specificity and trust.

Contract specificity is expected to strengthen the positive effect of asset specificity (i.e., PAS and HAS) when asset specificity is at a lower level. The international buyer might not want to share valuable knowledge with the local supplier due to concerns over the leakage of core knowledge when the local supplier's asset specificity is low to moderate (Cannon & Perreault Jr, 1999). Detailed contractual provisions specify procedures for offshore cooperation and ensure resource exchange through scrutiny and penalty mechanisms by a third party (Hoetker & Mellewigt, 2009). This formal mechanism can reduce the risks associated with knowledge transfer in an offshore cooperation relationship when the supplier's asset specificity is at a low or moderate level (Wuyts & Geyskens, 2005), which fosters the international buyer's confidence in knowledge sharing, thus improving the positive effects of PAS and HAS on the relationship between the partners.

Offshore cooperation often suffers from a misunderstanding of the information needs and resource obligations of the partners, which may negatively affect the effectiveness of the suppliers' asset specificity (Li et al., 2010). By providing detailed rules stipulating the content, roles and purpose of the supplier's asset specificity, contract specificity may decrease this ambiguity related to suppliers' asset specificity (Cavusgil et al., 2004). In addition, it provides evaluation criteria for international buyers to accurately investigate and evaluate suppliers' asset specificity, thus causing the value of such investments to be more easily recognized by international buyers (Choi & Contractor, 2016). This helps partners recognize the potential value of asset-specific investments, ensuring the smooth operation of the offshore cooperation (Doh, 2005) and improving the positive effects of the local supplier's asset specificity on relationship performance for the offshore cooperation.

However, under certain circumstances, contract specificity coupled with high levels of asset specificity may be detrimental to relationship performance. The reason is that the detailed

contract may limit the supplier's autonomy by stipulating the tasks, duties and rights *ex ante* (Wuyts & Geyskens, 2005), which may increase the severity of the potential lock-in situation. Because an offshore cooperation is an adaptive process, partners can suffer the myopia of focusing on codified information without flexibly adapting to market changes outside of these standard contractual procedures and policies (Zhou et al., 2014). In addition, detailed contracts rely on regulatory or legal authorities to impose sanctions (Cavusgil et al., 2004), which conflicts with the principles of trust building and may undermine the mutual understanding between the partners (Lin et al., 2012). In such a situation, it is more difficult for the local supplier to adequately manage the use of overinvested asset specificity to meet the international buyer's changing requirements. Therefore, contract specificity may enhance the negative effects of asset specificity on the product portfolio and relationship performance. Thus, we hypothesize the following:

Hypothesis 3a. The inverted U-shaped effect of physical asset specificity on relationship performance is stronger (deeper) when contract specificity is at a high level, and vice versa.

Hypothesis 3b. The inverted U-shaped effect of human asset specificity on relationship performance is stronger (deeper) when contract specificity is at a high level, and vice versa.

It is plausible to expect trust to strengthen the positive effect of asset specificity on the local supplier's relationship performance from two perspectives. First, trust breeds a shared identity, similar values and common goals between partners, and hence, it helps build a foundation for efficient offshore cooperation through asset specificity (Dyer & Singh, 1998). This informal interfirm governance mechanism fosters the exchange partners' confidence in the offshore cooperation and helps improve the quality of communication between the partners, further enhancing the positive impacts of asset specificity on relationship performance (Kano, 2017; Mooi & Frambach, 2012).

Second, by stressing self-regulation and positive self-motivation, trust may lead to a win-win environment that encourages partners to maximize their mutual interests by minimizing opportunistic behaviors (Zhou, Zhang, Zhuang & Zhou, 2015). In such a situation, local suppliers are encouraged to invest more in asset specificity (i.e., PAS and HAS), enhancing the suppliers' ability to provide better specialized agency services for specific international buyers. International buyers will also increase their willingness to share key technologies and knowledge with suppliers (Fryxell et al., 2002), thus enhancing the positive effect of asset specificity on relationship performance.

However, trust can also become counterproductive to the relationship between asset specificity and relationship performance after it reaches a certain level. The reason is that high levels of trust imply strong norms and ingrained routines such that the interaction between the partners becomes rigid or stuck in patterns (Lin et al., 2012), strengthening the lock-in situation of the local supplier incurred by overinvested asset specificity. Additionally, trust is represented by credibility and mutuality, which may reflect the same or similar values, ideas, and attitudes between partners (Heide & John, 1992). When the local supplier shares the same values as its international buyer, it is more likely to become complacent in the existing offshore partnership

without qualifying shared knowledge from the international buyer (Poppo et al., 2014). Such complacency may restrain local suppliers from challenging international buyers' positions, hindering their expansive understanding of problems and retarding the development of new ideas. As discussed in H1 and H2, high levels of both PAS and HAS may incur problems such as a narrower scope of product and technology diversity. Trust may further narrow this scope and damage the relationship's performance (Wang et al., 2017). Thus, we hypothesize the following:

Hypothesis 4a. The inverted U-shaped effect of physical asset specificity on relationship performance is stronger (steeper) when the trust level is high.

Hypothesis 4b. The inverted U-shaped effect of human asset specificity on relationship performance is stronger (steeper) when the trust level is high.

4. Results

4.1 Hypothesis testing findings

Table 3 presents the results of the standardized regression estimates. The independent variables and moderators were mean-centered prior to the formation of the interaction terms. Table 2 shows that none of the correlation coefficients is greater than 0.5, the threshold value provided by Churchill (1991). All of the variance inflation factors (VIFs) are well below the recommended cutoff point of 10 (see Table 3), suggesting the nonexistence of significant multicollinearity between the variables (Neter, Wasserman, & Kutner, 1985).

Insert Table 3 about here

Hypothesis 1 predicts an inverted U-shaped relationship between PAS and relationship performance. Model 2 indicates that PAS is positively correlated with relationship performance ($\beta = .447, p < .001$), whereas their quadratic terms exhibit a significant negative relation ($\beta = -.228, p < .05$). To depict the curvilinear relationship, we calculated the simple slopes of the curvilinear relationship at low and high levels (i.e., one standard deviation below/above the mean) for PAS in Fig. 2 based on Cohen et al. (2003). The results show that PAS exerts a positive effect on relationship performance when it is low ($\beta = .73, p < .01$) but a negative effect when it is high ($\beta = -.36, p < .05$). Therefore, Hypothesis 1 is supported.

Hypothesis 2 predicts an inverted U-shaped relationship between HAS and relationship performance. Model 3 indicates that PAS is positively correlated with relationship performance ($\beta = .537, p < .001$), whereas their quadratic terms exhibit a nonsignificant positive relation ($\beta = .103, p > .10$). Therefore, Hypothesis 2 is not statistically supported.

Insert Fig. 2 and Fig. 3 about here

Hypothesis 3a predicts that contract specificity strengthens the inverted U-shaped relationship between PAS and relationship performance. Model 4 indicates a positive effect of the first-order interaction between PAS and contract specificity ($\beta = .262, p < .01$), whereas the effect of the second-order interaction between the squared PAS and contract specificity is

negative ($\beta = -.250, p < .01$). Fig. 3 shows that when PAS is low (left side of the dotted line), it exerts a stronger positive effect on relationship performance (steeper slope) at high levels of contract specificity. However, when PAS is high (right side of the dotted line), relationship performance declines faster as PAS increases when contract specificity is high. Therefore, Hypothesis 3a is supported.

Hypothesis 3b predicts that contract specificity strengthens the inverted U-shaped relationship between HAS and relationship performance. Model 5 indicates that the effects of both the first-order interaction between HAS and contract specificity ($\beta = .113, p > .10$) and the second-order interaction between the squared HAS and contract specificity are nonsignificant ($\beta = .094, p > .10$). Therefore, Hypothesis 3b is not statistically supported.

Hypothesis 4a predicts that trust strengthens the inverted U-shaped relationship between PAS and relationship performance. Model 6 indicates that the effects of both the first-order interaction between PAS and trust ($\beta = .093, p > .10$) and the second-order interaction between the squared PAS and trust are nonsignificant ($\beta = -.055, p > .10$). Therefore, Hypothesis 4a is not statistically supported.

Hypothesis 4b predicts that trust strengthens the inverted U-shaped relationship between HAS and relationship performance. Model 7 indicates a positive effect of the first-order interaction between HAS and trust ($\beta = .514, p < .001$), whereas the effect of the second-order interaction between the squared HAS and trust is nonsignificant ($\beta = -.108, p > .10$). Hypothesis 4b is partially supported. Fig. 4 shows that HAS exerts a linearly negative effect on relationship performance when the trust level is low ($\beta = -.14, p < .05$) but a linearly positive effect when trust in the offshore cooperation is at a higher level ($\beta = .31, p < .01$). Thus, trust is proven to strengthen the positive effect of HAS on relationship performance.

Insert Fig. 4 and Table 4 about here

4.2 Robustness check

We use alternative measures as our explanatory variables to test the robustness of the results. The measures of relationship performance are assessed using international buyers' satisfaction with offshore cooperation, which may be different from local suppliers' assessments. To address this concern about asymmetry, we use an alternative measure of relationship performance adapted from Selnes and Sallis (2003) that reflects the assessment of relationship performance in offshore cooperation from local suppliers' perspectives. It asks local supplier managers to assess the extent to which the offshore cooperation relationship led to firm improvements in terms of (1) sales growth, (2) market share, (3) profitability, (4) product quality and (5) the rate of introducing new products to the market (CR = 0.88). We use a sample of 229 local suppliers to test our model; the results are presented in Table 4. The use of this alternative measure generates similar results, which provides additional support for our results.

4.3 Endogeneity

Since interfirm governance mechanisms (i.e., contract specificity and trust) are chosen to manage problems that arise due to specific investments, contract specificity and trust may be endogenous to PAS and HAS. Following prior studies (Garen, 1988; Mooi & Ghosh, 2010),

this paper adopts whole residual analysis to correct for selection bias. We obtain the residual of contract specificity from Equation 1 (η) and the residual of trust from Equation 2 (μ), and we use these residuals as additional regressors in Equation 3 after incorporating all the independent variables, moderators and control variables to test our hypotheses. Specifically, the residuals and the interaction terms ($\eta * CS$, $\eta * trust$, $\mu * CS$ and $\mu * trust$), along with the selection variables (i.e., CS and trust) and key exogenous variables (i.e., independent variables and control variables) are used as regressors in the analysis to implement the Garen procedure. We used FGLS to estimate the performance equation (Equation 3), where x is a vector of other determinants of relationship performance.

$$CS = \beta_0 + \beta_1 * PAS + \beta_2 * HAS + \beta_3 * x + \eta \quad (1)$$

$$Trust = \beta_0 + \beta_1 * PAS + \beta_2 * HAS + \beta_3 * x + \mu \quad (2)$$

$$\begin{aligned} Relationship\ performance = & \beta_0 + \beta_1 * \eta + \beta_2 * \mu + \beta_3 * \eta * CS + \beta_4 * \eta * Trust \\ & + \beta_5 * \mu * CS + \beta_6 * \mu * Trust + \beta_7 * x_3 + \varepsilon \end{aligned} \quad (3)$$

As shown in Table 5, the parameter estimates for the residuals in all five models are highly significant ($p < .01$), indicating that contract specificity and trust are endogenous in our setting¹. The results are similar to the findings from the OLS model (i.e., Table 3 and Table 4), suggesting that our empirical results are robust when we control for the endogenous variables.

Insert Table 5 about here

5. Discussion

5.1. Contributions

In line with key findings, this study endeavors to make three major contributions. First, unlike De Vita et al. (2010), who showed that both PAS and HAS enhanced relationship performance in domestic settings, our study highlights the differentiated impacts of suppliers' PAS and HAS on offshore cooperation by revealing a curvilinear effect of PAS and a linearly positive effect of HAS on relationship performance in international settings. These results provide insights into the ways in which different dimensions of suppliers' asset specificity (PAS and HAS) differently influence relationship performance in the context of cross-national settings. More importantly, these results echo both Williamson and Riordan's (1985) and David and Han's (2004) calls for a comprehensive measure of the construct's multidimensional nature by showing that it is more meaningful to differentiate the effect of various types of asset specificity on relationship performance than to examine the whole effect of the total amount of asset specificity.

¹ Model 1 in Table 5 shows that the impact of the interaction between PAS and contract specificity on relationship performance is positive ($\beta = .27, p < .01$) but that the impact of the interaction between PAS² and contract specificity on relationship performance is negative ($\beta = -.24, p < .01$). However, the impacts of the interaction between HAS and contract specificity and the interaction between HAS² and contract specificity on relationship performance are insignificant (Model 2 in Table 5: $\beta = -.03, p > .10$; $\beta = .02, p > .10$). Similarly, Model 4 in Table 5 shows that the impact of the interaction between HAS and trust on relationship performance is positive ($\beta = .35, p < .01$) and that the impact of the interaction between HAS² and trust on relationship performance is nonsignificant ($\beta = .02, p > .10$). Model 3 in Table 5 shows that the impact of the interaction between PAS and trust and the impact of the interaction between PAS² and trust on relationship performance are nonsignificant ($\beta = .13, p > .10$; $\beta = .11, p > .010$).

Second, our findings illustrate why local suppliers should always be cautious about the degree of PAS. Thus, the findings shed light on the debate over the influence of asset specificity on firms' performance (Liu et al., 2014; Lin et al., 2017; Lui et al., 2009). Importantly, the existing literature has mostly addressed this question by adopting a single theoretical framework that focuses on either the merits or the weaknesses of AS, which may lead to contradictory findings depending on the empirical setting and specific context. By contrast, our strategy relies on a more integrative perspective and suggests that to make sense of this conundrum, the merits and weaknesses of AS must be reconciled instead of adopting a contrasting approach.

Third, the empirical results highlight the importance of an appropriate combination between asset specificity and the attributes of the interfirm governance mechanisms (contract specificity vs. trust) in strengthening offshore cooperation, thus resulting in improved relationship performance. Existing interfirm governance studies argue that the cultural and institutional differences between different countries impede the coordination effect of contracts; thus, trust plays a more important role in coordinating interfirm exchanges in cross-border transactions (Jean, 2014). However, our results show that trust is not an effective mechanism to enhance the positive effect of PAS on relationship performance. Rather, contract specificity is more effective in safeguarding local suppliers' PAS and improving the positive impact on relationship performance.

5.2. Managerial implications

The results of this study reveal three key implications for managers. First, local suppliers should recognize that different dimensions of asset specificity have heterogeneous effects on relationship performance in offshore cooperation. It is advisable that more attention should be paid to the downsides and risks associated with PAS and that PAS should be maintained at an optimal level. By contrast, local suppliers need to accumulate HAS by constantly increasing their investments in employee training and learning to continually enhance long-term relationship performance.

Second, local supplier managers need to better realize the importance of properly aligning interfirm governance mechanisms across different dimensions of asset specificity in offshore cooperative relationships. The modeling results suggest that proper combinations between asset specificity and interfirm governance mechanisms will contribute to effectively coordinating offshore cooperation. Thus, local supplier managers should consider adopting appropriate interfirm governance mechanisms that are relevant to different dimensions of asset specificity in an integrative manner.

Third, with regard to contract specificity, it is imperative for managers to realize that it is beneficial for local suppliers to maintain a moderate degree of PAS to achieve outstanding relationship performance in the presence of detailed binding contracts. In contrast, when PAS is already at a high level, detailed provisions should be avoided because the formal governance mechanism will strengthen the negative effect of PAS on relationship performance. By comparison, the benefit of enhanced relationship performance through the interaction between HAS and trust can be derived continually regardless of the level of HAS.

5.3. Limitations and future research directions

This study also has at least two major limitations. First, while, in this study, we decomposed asset specificity into two subdimensions to explore their impacts on relationship performance in offshore cooperation exchanges, other underlying dimensions of asset specificity, such as site asset specificity and procedural asset specificity, identified by Williamson (1991) and De Vita et al. (2010), should be examined in future research. In addition, it would be interesting to investigate whether PAS is more contractible than HAS or whether the contracting hazards are higher for HAS than for PAS. Second, apart from the direct effects of PAS and HAS, there may exist strong interaction effects between the two types of asset specificities, and they should be examined in future research.

Some of the hypotheses were not statistically supported, and we provide some speculations for further investigations. We predicted an inverted U-shaped relationship between HAS and relationship performance, but a positively linear relationship was revealed. The reason may be that when local suppliers invest in personnel training and learn to serve international buyers, the accumulation of specific knowledge helps local suppliers master new skills more quickly and successfully than other firms without this type of investment (Wang, et al., 2018).

We also predicted that contract specificity may strengthen the inverted U-shaped relationship between HAS and relationship performance, but this prediction was not statistically supported. HAS manifests as intangible assets that tend to be embedded in the routines and culture of the local supplier (Hoetker & Mellewigt, 2009). This makes it difficult for HAS to be clearly described, evaluated, and written into the contract as a specific provision (Dyer & Singh, 1998). Thus, lacking concrete criteria as a reference point, contract specificity may become relatively ineffective for safeguarding local suppliers' HAS.

The statistical results did not support our proposition that trust strengthens the inverted U-shaped relationship between PAS and relationship performance. The reason may be that the establishment of trust-based governance mechanisms requires capital- and time-intensive investments, which are often costly activities (Lin et al., 2012); thus, trust building with international buyers becomes less relevant for coordinating PAS when the more efficient contractual governance mechanism is available.

6. Conclusion

In this study, we examined the effects of PAS and HAS on the performance of offshore buyer–local supplier relationships in China and the moderating effects of contract specificity and trust on the relationships between them based on a dataset collected from a sample of 162 dyads composed of local suppliers and international buyers. Our results reveal an inverted U-shaped relationship between PAS and relationship performance and a positively linear relationship between HAS and relationship performance. Contract specificity is found to positively moderate the linkage between PAS and relationship performance, whereas a higher level of trust is shown to enhance HAS's contribution to improved relationship performance. Therefore, local suppliers engaging in offshore business cooperations are required to meticulously design their specific capital and human asset investment strategies coupled with relevant governance mechanisms such as contracts and trust vis-à-vis international buyers in light of continually improving relationship performance while minimizing the risks of lock-in in the longer term.

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Fig.1. Conceptual framework

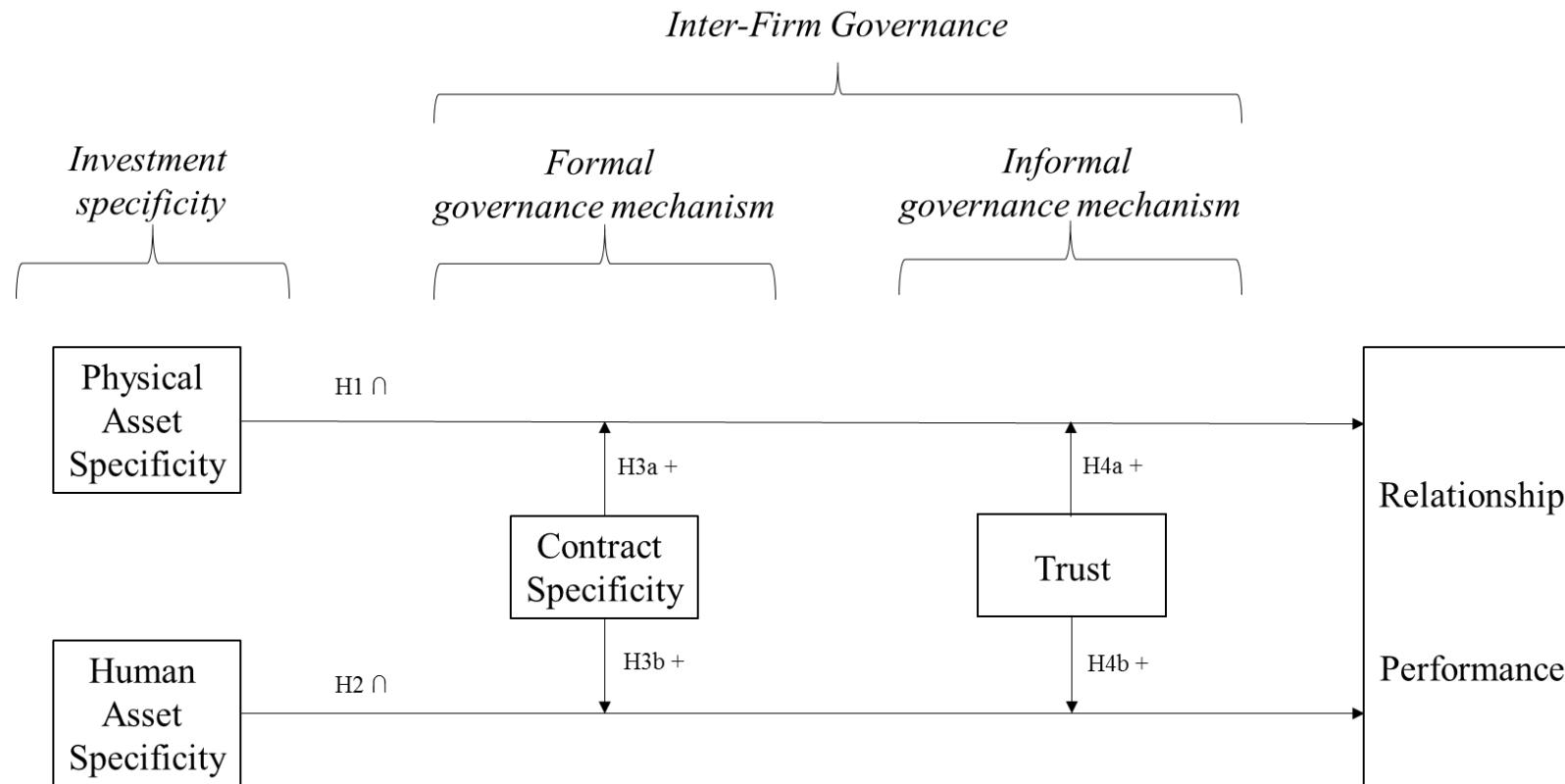


Fig.2. Relationship between physical asset specificity and relationship performance

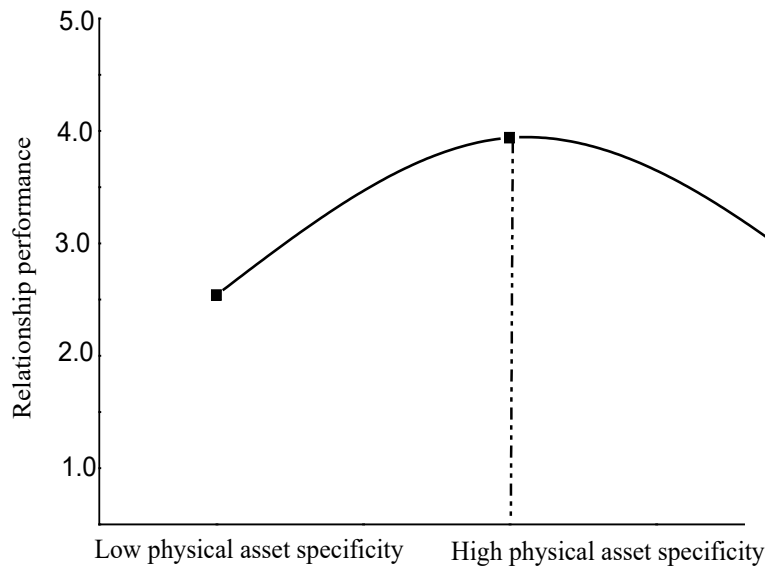


Fig.3. Moderating effect of contract specificity on the relationship between PAS and relationship performance

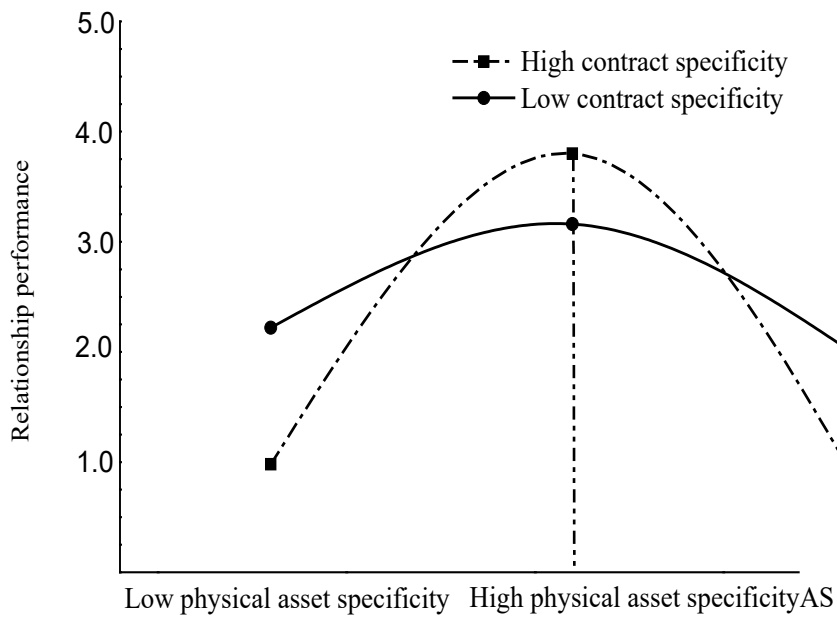


Fig.4. Moderating effect of trust on the relationship between HAS and relationship performance

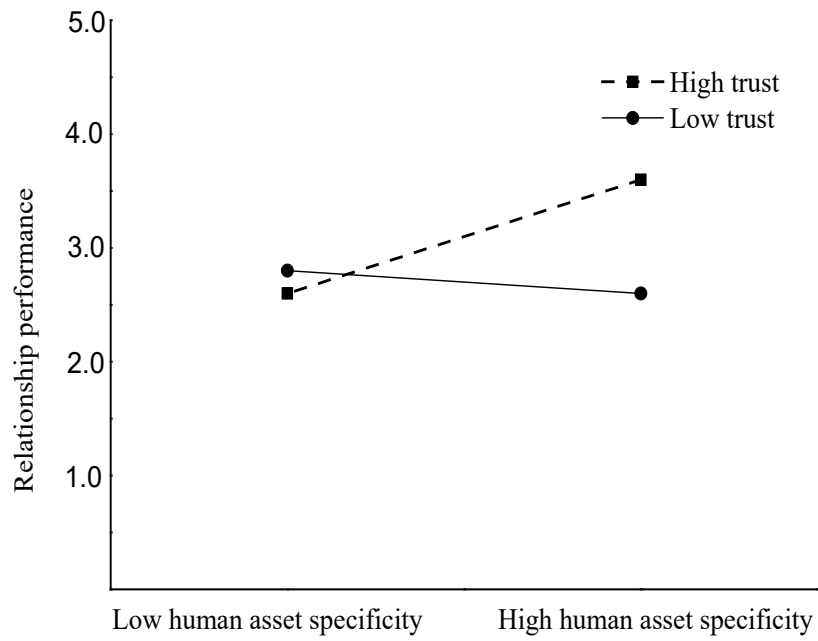


Table 1. Measurement properties

Variables and Items	factor loading	alpha	CR	AVE
<i>Physical asset specificity (Anderson and Weitz, 1992; De Vita et al., 2010)</i>				
PAS1: We have expanded our production capacity in the hope of a long-term relationship with this international buyer.	.86***	.88	.89	.66
PAS2: We have made a substantial investment in facilities dedicated to this international buyer.	.84***			
PAS3: We have made a substantial investment in customized machinery, tools, etc., which are dedicated to this international buyer.	.86***			
PAS4: If we stopped cooperation with this international buyer, we would have a lot of trouble redeploying our facilities presently serving this international buyer.	.70***			
<i>Human asset specificity (Heide and John, 1992; De vita et al., 2010)</i>				
HAS1: We have recruited additional staff for the sole purpose of serving this international buyer.	.76***	.86	.86	.61
HAS2: We have made a substantial investment in employee training for the purpose of serving this international buyer.	.84***			
HAS3: We have made employee training that is specifically tailored to the cooperation with this international buyer.	.80***			
HAS4: If we stopped cooperation with this international buyer, we would have a lot of trouble redeploying our employees presently serving this international buyer.	.71***			
<i>Contract specificity (Cannon and Perreault, 1999; Wuyts and Geyskens, 2005)</i>				
CON1: Our relationship with this international buyer is governed primarily by written contracts.	.82***	.89	.90	.65
CON2: We have precisely stated the enforceability of the contract and legal liability of the two companies in our contract.	.77***			
CON3: We have precisely stated the duties and rights in our contract.	.86***			
CON4: We have precisely stated the method/process of contract modification (renegotiation) in our contract.	.80***			
CON5: We resolve disagreements by referring back to the contract in the cooperation with this international buyer.	.75***			

Note: $\chi^2/d f = 1.21$, NFI = .90, CFI = .98, IFI = .98, TLI = .98, RMSEA = .036; *p < .05, **p < .01, ***p < .001.

Table 1. Measurement properties(Continued)

Variables and Items	factor loading	alpha	CR	AVE
<i>Trust (Doney and cannon,1997; Yli-Renko et al.,2001)</i>				
TRU1: The international buyer fully trusts our production ability.	.78***	.88	.88	.61
TRU2: As far as key issues are concerned, the international buyer is always honest with us.	.90***			
TRU3: The international buyer and our company feel indebted to our collaborating.	.74***			
TRU4: The international buyer is genuinely concerned about whether our business succeeds.	.77***			
TRU5: When making important decisions, our international buyer considers our welfare as well as its own.	.71***			
<i>Relationship performance (Cavusgil, and Calantone,2004;Selnes and. Sallis,2003)</i>				
RP1: We are very satisfied with the quality of the service received in terms of consistency, timeless and accuracy.	.79***	.90	.91	.62
RP2: We are very satisfied with this supplier's responsiveness to problems or queries.	.74***			
RP3: We are very satisfied with the overall benefits obtained from outsourcing this function.	.84***			
RP4: Overall, the objectives set by our company in relation to the outsourcing project have been met.	.83***			
RP5: The service level received from this supplier has exceeded our company's expectations.	.78***			
RP6: Outsourcing the function of reference has allowed our company to concentrate own resources on core activities.	.72***			

Note: $\chi^2/d f = 1.21$, NFI = .90, CFI = .98, IFI = .98, TLI =.98, RMSEA = .036; *p < .05, **p < .01, ***p < .001.

Table 2. Descriptive statistics and correlations (n = 162)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Supplier age	-													
2. Supplier size	.09	-												
3. Industry type	.08	.08	-											
4. OCT	.21**	.02	.10	-										
5. Eastern Region	-.04	-.02	.09	.01	-									
6. Western Region	.16*	-.03	-.04	.08	.09	-								
7. North America	.04	.06	.07	.08	.03	-.06	-							
8. Europe	-.02	-.08	-.01	-.02	.09	-.01	.02	-						
9. Oceania	-.004	-.09	-.05	-.10	-.05	.17*	-.05	-.05	-					
10.PAS	.13	-.01	.07	-.01	.03	-.04	.14 [†]	.15 [†]	.02	.81				
11.HAS	.06	.04	-.07	.09	.01	.01	.15 [†]	.10	-.08	.34***	.78			
12.RP	.11	-.07	.11	.12	.15 [†]	.05	.09	.08	.02	.36***	.43***	.81		
13.CS	.13 [†]	.08	.01	-.04	.15 [†]	-.07	.03	.08	-.02	.20*	.07	.19*	.79	
14.Trust	-.04	-.06	-.10	-.02	-.02	.06	-.04	.06	.03	.23**	.34***	.16*	.20*	.85
Mean	14.45	2.85	.019	7.72	.28	.19	.29	.31	.01	2.84	2.60	3.21	3.35	3.00
S.D.	9.18	.77	.039	4.63	.45	.39	.46	.46	.08	0.73	0.64	.55	.64	.61

Note: [†]p < .10, *p < .05, **p < .01, ***p < .001. The data on the diagonal (in bold font) is the square root of AVE of the construct.

Offshore cooperation tenure (OCT); Physical asset specificity (PAS); Human asset specificity (HAS); Relationship performance (RP); Contract specificity (CS).

Using the data collected from local suppliers for the independent variables and moderators, and using the data collected from international buyers for the dependent variable.

Table 3. The results of regression analysis (n=162)

Variables	Relationship performance							
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
<i>Control variables</i>								
Supplier age	.050	.065	.084	.116	.093	.073	.092	.052
Supplier size	.109	.088	-.016	.058	-.039	.044	-.034	.029
Industry type	.075	.072	.102	.079	.091	.085	.115	.059
Offshore cooperation tenure	.145†	.149*	.147*	.101	.125†	.031	.125†	.086
Eastern Region	.162*	.151*	.101	.131†	.109	.099	.065	.101
Western Region	.019	.017	-.089	.046	-.072	-.043	-.092	-.060
North America	.055	-.051	.001	-.077	.030	-.026	.014	.004
Europe	.063	-.016	-.049	-.015	-.034	-.010	-.049	.010
Oceania	.043	.018	.092	.016	.113	.099	.088	.111
<i>Independent variables</i>								
Physical asset specificity(PAS)		.447***		.412***		.463***		.354***
PAS ²		-.228*		-.210*		-.280***		-.153*
Human asset specificity (HAS)			.537***		.578***		.487**	.314***
HAS ²			.103		.006		.107	.056
<i>Moderator</i>								
Contract specificity				.050				
Trust					.122			.014
						.109	.061	.086
<i>Interaction</i>								
Contract specificity* PAS				.262**				.190*
Contract specificity* PAS ²				-.250**				-.180*

Note: †p<.10, *p<.05, **p<.01, ***p<.001. Table entries are standardized regression coefficients (β).

Using the data collected from local suppliers for the independent variables and moderators, and using the data collected from international buyers for the dependent variable.

Table 3. The results of regression analysis (n=162) (Continued)

Variables	Relationship performance							
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
Contract specificity* HAS					.113			.110
Contract specificity* HAS ²					.094			.034
Trust * PAS						.093		.106
Trust * PAS ²						-.055		-.057
Trust * HAS							.514***	.412***
Trust * HAS ²							-.108	-.077
Model fit								
R ²	.091	.330	.325	.432	.383	.396	.351	.546
Adj-R ²	.043	.281	.276	.378	.325	.338	.289	.422
F-value	1.810*	6.725***	6.569***	7.975***	6.527***	6.875***	5.676***	7.106***
Largest VIF	1.080	1.080	1.905	1.143	2.513	1.736	2.588	2.618

Note: (1) Table entries are standardized regression coefficients (β). †p<.10, *p<.05, **p<.01, ***p<.001. (2) Using the data collected from local suppliers for the independent variables and moderators, and using the data collected from international buyers for the dependent variable.

Table 4. Robustness test (n=229)

Variables	Relationship performance							
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
<i>Control variables</i>								
Supplier age	.037	-.017	.096	-.020	.113†	.110†	.130	.090
Supplier size	.106	.106	-.057	.106	-.095	.000	-.073	-.013
Industry type	.094	.045	.124	.042	.099	.092	.143*	.065
Offshore cooperation tenure	.118	.108	.101	.108	.054	.000	.066	-.034
Eastern Region	.145*	.143*	.068	.134*	-.069	-.059	-.083	-.032
Western Region	-.015	.040	.015	.046	.012	.058	.002	.011
North America	-.020	-.057	-.003	-.077	.021	-.021	.016	-.018
Europe	.055	.022	-.001	-.015	.004	.026	-.007	.031
Oceania	.031	.009	.066	.016	.091	.101†	.058	.104
<i>Independent variables</i>								
Physical asset specificity(PAS)		.361***		.347***		.490***		.350***
PAS ²		-.158*		-.155*		-.270***		-.211**
Human asset specificity (HAS)			.339***		.546***		.456***	.302***
HAS ²			.027		.059		.072	.019
<i>Moderator</i>								
Contract specificity				.009	.118			.004
Trust						.121	.062	.112
<i>Interaction</i>								
Contract specificity* PAS				.164*				.212**
Contract specificity* PAS ²				-.149*				-.182*

Note: †p<.10, *p<.05, **p<.01, ***p<.001. Table entries are standardized regression coefficients (β).
Using the data collected from local suppliers for the independent variables, moderators and dependent variable.

Table 4. Robustness test (n=229) (Continued)

Variables	Relationship performance							
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
Contract specificity* HAS					.102			-.023
Contract specificity* HAS ²					.078			.121
Trust * PAS						-.020		-.022
Trust * PAS ²						-.055		-.051
Trust * HAS							.519***	.483***
Trust * HAS ²							-.098	-.101
Model fit								
R ²	.104	.244	.263	.276	.360	.409	.349	.552
Adj-R ²	.051	.189	.209	.207	.311	.370	.307	.402
F-value	1.970†	4.324***	4.857***	4.402***	8.606***	10.558***	8.202***	10.990***
Largest VIF	1.101	1.080	1.373	1.143	2.321	1.828	2.588	2.864

Note: †p<.10, *p<.05, **p<.01, ***p<.001. Table entries are standardized regression coefficients (β).

Using the data collected from local suppliers for the independent variables, moderators and dependent variable.

Table 5. The results of regression analysis for endogeneity test (n=162)

Variables	Relationship performance				
	Model1	Model2	Model3	Model4	Model5
Control variables					
Supplier age	.07	-.09	-.07	-.03	-.08
Supplier size	-.01	.06	.09	.05	-.02
Industry type	.02	.08	.01	.06	-.01
Offshore cooperation tenure	.13	.07	.15	.10	.07
Eastern Region	.05	.02	.01	.03	.09
Western Region	.06	.10	.12	.13	.01
North America	.02	.01	.02	.02	-.01
Europe	.03	.02	-.01	-.02	-.03
Oceania	.02	.07	-.01	.06	.03
η_1	.25*	.28			.33*
η_2			.28*	.24*	.41*
η_1 * Contract specificity	-.21	-.30*			-.18
η_1 * Trust					-.23*
η_2 * Contract specificity					-.01
η_2 * Trust			-.15	-.18	-.29*
Independent variables					
Physical asset specificity(PAS)	.43***		.35***		.23**
PAS ²	-.21**		.23*		-.17*
Human asset specificity (HAS)		.46		.31**	.31***
HAS ²		-.03		.12	.01
Moderators					
Contract specificity	.03	.11			.09
Trust			.09	.06***	-.04
Interactions					
Contract specificity* PAS	.27***				.21
Contract specificity* PAS ²	-.24***				-.18
Contract specificity* HAS		-.03			-.04
Contract specificity* HAS ²		.02			.02
Trust * PAS			.13		.11
Trust * PAS ²			.11		-.07
Trust * HAS				-.35	.21
Trust * HAS ²				.02	-.01
Model fit					
Adj-R ²	.39	.23	.33	.34	.53
F-value	7.36***	4.07***	6.02***	6.06***	7.28***
Largest VIF	3.70	4.02	2.93	2.97	5.79

Note: †p<.10, *p<.05, **p<.01, ***p<.001. Table entries are standardized regression coefficients (β). Using the data collected from local suppliers for the independent variables and moderators, and using the data collected from international buyers for the dependent variable.