The Influence of Prior Ties on Trust in Contract Enforcement in the Construction Industry: Moderating Role of the Shadow of the Future

Yuting Chen[1]; Yongqiang Chen[2]; Zhaojun Liu [3]; Hongjiang Yao[4]

Abstract: This paper explores the effect of prior ties on trust in contract enforcement after contractual breaches, which is underdeveloped in the existing literature, from a multi-functional perspective. In this research, both goodwill-based and competence-based trust have been distinguished to explore their mediating effects on the influence of prior ties on contract enforcement; two diverse functions of contracts, controlling and coordination, have been differentiated. This study also examines the moderating effects of the shadow of the future on these functions. Using data gathered from a paper-based survey of 195 Chinese general parties in the construction industry, we posit that prior ties between contracting parties will improve the level of both goodwill-based and competence-based trust between them, so negatively influencing the severity of contract enforcement. Furthermore, the inhibiting effects of competence-based trust on the severity of coordination contract enforcement will be strengthened under the circumstances of a higher likelihood of continued cooperation. This study offers a deep and nuanced understanding of contract enforcement.

Keywords: Contractual breach; Contract enforcement; Prior ties; Trust; Shadow of the future

[1] Postgraduate, College of Management and Economics, Tianjin University, Tianjin 300072, P.R. China. Email: cyt111@foxmail.com
[2] Professor, College of Management and Economics, Tianjin University, Tianjin 300072, P.R. China. Email: symbolpmc@vip.sina.com
[3] Postgraduate, College of Management and Economics, Tianjin University, Tianjin 300072, P.R. China. Email: tju_lzj199374@126.com
[4] Postgraduate, College of Management and Economics, Tianjin University, Tianjin 300072, P.R. China (corresponding author). Email: yhjtgif@163.com

Introduction

Contracts are well understood for their important role as a substitution for relational governance (Adler, 2001, Ghoshal and Moran, 1995, Gulati, 1995), or as constituting relational governance completely (Liu, Luo and Liu, 2009, Luo, 2002, Poppo and Zenger, 2002, Ryall and Sampson, 2009). However, contracts can never play their designed roles unless fulfillments are made by all contracting parties. Due to a lack of awareness of obligation, insufficient resources, honest attempts to react to unforeseen circumstances, or purposed opportunism (Antia and Frazier, 2001), contracting parties may breach contracts. Thus, violation happens no matter how well contracts are designed (Williamson, 1996), especially in the construction industry, which has a high level of uncertainty (Winch, 1989). However, contract breach enforcement is underdeveloped in the existing literature (Johnson and Sohi, 2016).

Contract enforcement, which can be regarded as one part of the governance mechanism, should be aligned with transaction features in a discriminating way so that transaction costs can be reduced (Mooi and Gilliland, 2013). Contract enforcement is not just a binary decision, and a continuum of enforcement severity should be determined as a response to violation of contractual obligations (Antia and Frazier, 2001). Antecedents of contract enforcement have been identified in previous studies (Antia and Frazier, 2001, Gilliland and Bello, 2002, Mooi and Gilliland, 2013). It is not clear, however, how contract play in enforcement.

Nuanced studies that distinguish the different functions of contracts help to shed light on contract governance mechanisms and contract structure. Similarly, the authors propose that violations of different contract terms with diverse functions are influenced by prior ties and trust to varying degrees. Due to different resources of trust in the construction industry, this study distinguishes between goodwill-based and competence-based trust. This research explores the following research questions:

RQ1: How do prior ties influence the severity of contract enforcement?

RQ2: Do prior ties influence the severity of contract enforcement by impacting the level of trust between transaction parties?

RQ3: How does the concept of shadow of the future moderate the relationship between trust and the severity of contract enforcement?

Great importance should be attached to the examination of the first research question because contract breaches are common in the construction industry. Thus, it is high time to explore contract enforcement that often leads to zero-sum outcomes (Anne, 2000). Since not all transaction parties have prior ties, the second research question is necessary to understand contract enforcement in the absence of prior ties. Finally, the moderating effect

explored in the third question can clarify when these effects occur.

To examine these research questions, the authors collected data in China and 195 valid paper-based questionnaires were selected as our sample. Both mediation and moderation effects have been examined by a combination of structural equation modeling and regression analysis.

Generally, this study contributes to the existing literature in the following three ways: Firstly, this study provides a deep and nuanced understanding of contract enforcement. To the best of our knowledge, this study is the first to examine a continuum of enforcement severity from a multi-functional perspective. Distinction between goodwill-based and competence-based trust also provides a subtler understanding of contract enforcement than previously achieved. Secondly, this study paints a detailed picture of how prior ties influence the severity of contract enforcement and whether the same outcomes can be achieved in the absence of prior ties. By precisely identifying the mechanism of how trust inhibits the negative side of transactions, this research provides a complementary view of how trust benefits cooperation. Thirdly, we clarify the boundary conditions of when these effects occur by examining moderating effects. Overall, this study addresses some of the deficiencies in previous researches thus reinforcing the theoretical and empirical foundation of the literature on contract enforcement.

In the following sections, this paper first provides an overview of the literature related to the research questions. Next, hypotheses are formulated based on theoretical foundations. Research methods, discussion of the results and the implications of this study are then introduced. Finally, the authors conclude this study and provide suggestions for further research.

Theoretical background

Literature of contract breach enforcement

Bounded-rationality and the pursuit of self-interest are two core assumptions in Transaction Cost Theory (Williamson, 1996). Therefore, decisions about whether to breach a contract or not are dominated by considerations of costs and benefits (Guo and Jolly, 2008). In addition to this, contract breach may also happen because of negligence, changes in environmental conditions (Johnson and Sohi, 2011), lack of awareness of the obligation, or insufficient resources to fulfil the obligation. Therefore, not all violations are opportunism (Antia and Frazier, 2001).

Johnson and Sohi (2016) classified four broad areas in the current literature on contracts: (a) contracts as governance mechanisms, (b) contract structure, (c) contract breach enforcement, and (d) contract renegotiation. The area of contract breach enforcement is underdeveloped compared to the other three areas (Mooi and

77 Gilliland, 2013). Contract enforcement can be considered in two ways, including the means ensuring that
78 contract terms can be complied with, such as setting pre-conditions, like sound institutional environments,
79 politics and law for example, for efficient exchanges (Aboal, Noya and Rius, 2014, BenitoArrunada, 2001, Guo
80 and Jolly, 2008, Radygin and Entov, 2003, Weber, 2015), and the corrective actions that are aimed at remedying
81 the situation after contract breach (Antia and Fisher, 2006, Antia and Frazier, 2001, Mooi and Gilliland, 2013,
82 Stoyanova, 2009, Suzor, 2012). In the literature on corrective actions, on which this article focuses, researchers
83 have discussed the antecedents of contract enforcement (Antia and Fisher, 2006, Gilliland and Bello, 2002, Jin,
84 Tangpong, Hung and Johns, 2013), the different types of contract enforcement (Noorderhaven, 1992, Stoyanova,
85 2009, Suzor, 2012, Weber, 2015), and the consequences of contract enforcement (Mooi and Gilliland, 2013).
86 However, the role of contracts in enforcement is still underdeveloped.

87 Most literatures related to contract enforcement treated the contract as a whole and analyzed the enforcement
88 decision afterwards (Ellingsen and Kristiansen, 2011, Guo and Jolly, 2008). Only a few studies broke contracts
89 down into different provisions. Antia and Frazier (2001) identified four provisions in franchise contracts that are
90 commonly violated. With the belief that different components of contracts generate diverse likelihoods of
91 enforcement, Mooi and Gilliland (2013) described four components in contracts: relational safeguards,
92 transaction safeguards, service and warranties and product and price. Their study found that these different
93 components of contracts have various influences on enforcement. In addition, nuanced studies that distinguish
94 different functions of contracts help to solve the puzzles in both contract governance and contract structure
95 (Malhotra, 2009, Malhotra and Lumineau, 2011, Weber and Mayer, 2011, Weber, Mayer and Macher, 2011),
96 and it's reasonable to assume that they would aid in understanding contract enforcement since enforcement is
97 also an important governance (Williamson, 1996). To the best of our knowledge, no attempt has been made to
98 understand contract enforcement from a multi-functional perspective, in which contracts serve
99 controlling/safeguarding and coordinating functions.

100 With the assistance of computers, Parkhe (1993) developed a checklist of eight provisions to safeguard
101 transactions. Based on this study, scholars classified these eights provisions into different categories from a
102 multi-functional perspective. The first three provisions contribute to the coordination function of contracts,
103 while the last five provisions serve to safeguard the transaction (Reuer and Ariño, 2007). Construction industry
104 contracts differ to those in other industries because construction projects are amongst the most complex of all
105 production undertakings (Winch, 1989). Based on the study of Song, Bij and Weggeman (2006), Zhang, Fu,
106 Gao and Zheng (2016) generated four specific contract controlling provisions and six coordination provisions.

As mentioned above, the definition of enforcement in this study is a corrective action aimed at remedying problems, adopted from the studies of Antia and Fisher (2006) and Mooi and Gilliland (2013), which refer to the severity of one party's response to another party's violation of a contract obligation (Antia and Frazier, 2001). After violation of one party, the other party should choose distinct contract enforcement to make up their losses. Researchers have identified these contract enforcements as including arbitration, litigation and termination (Arruñada, 2001, Wang, 2009). However, to the best of our knowledge, no attempt has been made to understand the severity of contract enforcement after violation in the construction industry, which is frequent due to the sub-goal-seeking of different stakeholders in construction projects (Walker, 2015).

Trust

Generally speaking, the literature on trust is covered by a broad spread of disciplines including psychology, sociology, economics and organizational science (Guo, Lu and Song, 2013). The definition of trust varies a lot across these disciplines. Researchers in each discipline attach importance to different facets and levels of trust. Economists define trust as "implicit contracting", in which one party in a transaction can make sure that the other party in a transaction does what is promised. While sociologists treat trust as a set of expectations shared by all those involved in a transaction (Zucker, 1986). After reviewing different definitions from various disciplines, Rousseau, Sitkin, Burt and Camerer (1998) assert that "Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions of behavior of another". There are two important parts to this conceptualization of trust: "expectancy" and "behavior" (Singh and Sirdeshmukh, 2000). The absence of a precise definition doesn't prevent researchers from understanding the organizational issues associated with trust (Bigley and Pearce, 1998). Thus, this article borrows from Nooteboom (1996) and distinguishes goodwill-based trust and competence-based trust as referring to the belief about the other party's intention to perform in a trust-worthy manner and the ability to complete tasks as promised as separate issues.

It is generally agreed that having prior ties accumulates trust between exchange partners and facilitates governance and coordination (Valdés-Llaneza and García-Canal, 2015). According to Cook and Emerson (1978), the term *prior ties* refers to the history of a particular relationship. Studies related to prior ties generally center around Social Exchange Theory which complements Transaction Cost Theory. Besides trust, learning has also been studied, and these two elements are proposed to be positively influenced by successful prior ties between the same exchange partners (Chen and Bharadwaj, 2009).

However, the influence of prior ties via trust and learning on contract governance is contradictory. Some have

argued that prior ties generate trust thus diminishing the need to craft highly specific contracts (Gulati, 1995), while some have demonstrated that prior ties help exchange parties learn about the other party's business process and culture, and improves their ability to foresee contingency, thus increasing the specification of contracts (Mayer and Argyres, 2004, Poppo and Zenger, 2002). Hence, more works are needed to understand how prior ties and trust influence contract governance and enforcement.

Transactions with known parties are common in the construction industry, probably due to market size, and the need for professional techniques or dedicated devices. Continued cooperation exists in both relationships between owner and contractor and between contractor and subcontractor.

Hypothesis development

Prior ties and Trust

Both Social Exchange Theory and Transaction Cost Theory predict that trust can be built over time through experience with known parties, though the logic and the dimensions of trust that are analyzed in these theories differ (Lioukas, 2015). According to Social Exchange Theory, goodwill-based trust accumulates with repeated exchange experiences. Prior ties help to determine if and to what extent the other party can be trusted (Robinson, 1996). The more frequently parties transact, the less likely they would lose control of the subsequent transaction because of the shared norms of equity and the built reciprocity; opportunism can be avoided under uncertain circumstances (Ven, 1992). In addition, information a party receives from a party with which it shares a history is regarded as more reliable than that from parties with which it has no prior ties (Normann, 1971). The behaviors of the other party can be predicted based on trust built over time through repeated transactions (Gulati, 1995), for these parties would not behave in a self-interested manner in view of friendship and emotional attachments (Mcallister, 1995, Robson, Katsikeas and Bello, 2008). These studies demonstrated that prior ties enhance goodwill-based trust. Compared with the detailed analysis of goodwill-based trust in Social Exchange Theory, competence-based trust that reflects confidence in the other party's ability to accomplish certain tasks has not been well explored (Connelly, Miller and Devers, 2012, Ven, 1992).

Transaction Cost Theory complements this dimension. Studies that integrated learning and knowledge-based perspectives with Transaction Cost Theory demonstrated that prior ties help to understand a partner's ability to accomplish tasks (Lioukas, 2015, Mayer and Argyres, 2004). Repeated transactions help exchange parties to understand each other's reputation and competence to achieve the desired goals (Laan, Voordijk, Noorderhaven and Dewulf, 2012, Valdés-Llaneza and García-Canal, 2015). Besides capabilities, skills, culture and management systems are also understood from prior interactions (Zollo, Reuer and Singh, 2002). In addition to

competence-based trust, the literature based on Transaction Cost Theory, learning and a knowledge-based perspective also posited that goodwill-based trust can be built up through repeated transactions. The partner's incentive can be comprehended (Mayer and Argyres, 2004) and the goodwill-based trust of the other party through an accumulation of cooperation could help to reduce transaction costs (Friedman, 1991, Ven, 1994).

Projects, which differ between organizations, are characterized by finite time spans and this may complicate the development of trust and thus lead to the underdevelopment of issues related to how prior ties influence trust in a project setting (Buvik and Rolfsen, 2015, Laan, Voordijk, Noorderhaven and Dewulf, 2012). In a longitudinal study, Webber (2008) explored the evolution of multidimensional trust and showed that prior ties help to develop trust. Construction, as a prime example of a project-based industry, may help to clarify the mechanism of how prior ties influence trust in a project setting. In a qualitative study at the construction team level, Buvik and Rolfsen (2015) concluded that the influence of prior ties on trust development in the project team is significant both in the early establishment and development stages; built beliefs and norms could facilitate their feelings of unity, and open communication with clear information sharing and problem-solving mechanisms also improve their competence to collaborate. Thus, we developed the following hypotheses:

H1a. Prior ties are positively associated with goodwill-based trust.

H1b. Prior ties are positively associated with competence-based trust.

Trust and Contract Enforcement

Contract literature based on Transaction Cost Theory emphasizes the controlling/safeguarding function of the contract to safeguard investments and property rights and to diminish moral hazards in the transactions. These controlling provisions are designed to improve incentives to prevent the occurrence of opportunism (Eckhard and Mellewigt, 2006). Thus, if one party breaches the controlling provisions, the other party in the transaction may treat it as opportunistic behavior. Goodwill-based trust, which refers to the belief of the other party's intention to perform in a trust-worthy manner (Robinson, 1996), creates norms of equity and reciprocity between transaction parties (Ven, 1992) and this could reduce one party's belief of the other party's incentive to be opportunistic. Because of the friendship and emotional attachments in this dimension of trust (Mcallister, 1995, Robson, Katsikeas and Bello, 2008), one party may choose to regard the information offered by the other party as reliable (Normann, 1971), and thus regard any violation of a contract as unintentional. In other words, the likelihood of opportunism may not decline but the other party's perception of it could be diminished in the presence of goodwill-based trust.

In addition to the controlling function, which deals with relational risk of a transaction, contracts also have a

coordination function to mitigate the performance risk present in all transactions (Eckhard and Mellewigt, 2006). Expected outcomes may not be achieved due to high complexity, uncertainty or lack of competence to confront challenges. Competence-based trust, which derives from the belief of the other party's ability to complete tasks as promised (Nooteboom, 1996), can not only facilitate the exchange of information, but also improve satisfaction with the working relationship (Guo, Lu and Song, 2013, Pinto, Slevin and English, 2009). In addition, competence-based trust increases the likelihood of continued collaboration after a conflict has arisen (Malhotra and Lumineau, 2011). After a breach of coordination provision, a transaction party with a high level of confidence in the other party's ability to complete tasks might still trust the other party and take cooperative action, thus mitigating the severity of contract enforcement. Hence, we developed the following hypotheses:

H2a. Goodwill-based trust is negatively associated with severe contract enforcement.

H2b. Competence-based trust is negatively associated with severe contract enforcement.

Prior ties and Controlling Contract Enforcement

The authors expect that prior ties, by improving the level of goodwill-based trust, should diminish the severity of contract enforcement after a breach of controlling provision. Based on an empirical study in China, Luo (2002) found that prior ties could nurture cooperation and mitigate opportunism more than complete contracts could. In addition, findings of Poppo, Zhou and Rhu (2008) suggested that prior ties could help to generate trust in an indirect way; prior ties help transaction parties to learn each other's ability to perform satisfactorily thus equity and justice could be perceived. Goodwill-based trust, which derives from one party's belief of the other party's intention to perform in a trust-worthy manner, would generate cooperation and decrease the perception of opportunism (Lui and Ngo, 2004). Since enforcement is treated as non-cooperative and results in a zero-sum outcome (Anne, 2000), we propose that prior ties would reduce the severity of contract enforcement. Thus, we developed the following hypotheses:

H3a. Prior ties are negatively associated with severe contract enforcement.

H3b. Goodwill-based trust mitigates the inhibiting effect of prior ties on severity of controlling contract enforcement.

Prior ties and Coordination Contract Enforcement

Prior ties, by increasing competence-based trust, will decrease the severity of contract enforcement after a breach of coordination provision. Prior ties can help transaction parties to be clear about each other's ability, and experience can clarify the procedure and responsibilities of each party. With the belief of the other party's ability to complete the assigned works, a transaction party would pay more attention to the evaluation of the

final work rather than the procedure (Connelly, Crook, Combs, Ketchen and Aguinis, 2015, Das and Teng, 1996, Das and Teng, 1996). Compared with controlling provisions, which focus on negative facets of a transaction and their subsequent enforcement measures, coordination provisions emphasize the positive facets of a transaction (Eckhard and Mellewigt, 2006). Thus, even if one party breaches coordination provision, which deals with the performance risk of a transaction, the other party, with a high level of competence-based trust accumulated from prior ties, would tolerate the violation and evaluate the transaction in terms of the final project. Hence we developed the following hypotheses:

H4a: Prior ties are negatively associated with severe coordination contract enforcement.

H4b: Competence-based trust mediates the inhibiting effect of prior ties on severity of coordination contract enforcement.

Moderating role of the shadow of the future

In the construction industry, continued collaboration exists in both relationships between owner and contractor and between contractor and sub-contractor. The likelihood of continued collaboration may enhance the effect of trust on inhibiting the severity of contract enforcement. Actions can be affected by the expectations of reciprocity and mutual cooperation. Such a situation is treated as repeated game in game theory, where benefits are expected in the future. However, the working relationship might be ruined and the likelihood of continued collaboration would decrease after a severe contract enforcement, which is often treated as non-cooperative behavior (Anne, 2000). Furthermore, the shadow of the future can also improve the level of trust between the transaction parties (Poppo, Zhou and Rhu, 2008); if one party has trust in the other party, no matter on what this trust is based, this party is more likely to display cooperative behavior for the expected benefits under a high likelihood of continued cooperation. As a result, parties are more likely to tolerate a violation of contract thus the severity of contract enforcement can be mitigated. Hence, we developed the following hypotheses:

H5a: The negative influence of goodwill-based trust on the severity of controlling contract enforcement will be strengthened when the partners have a higher likelihood of continued cooperation.

H5b: The negative influence of competence-based trust on the severity of coordination contract enforcement will be strengthened when partners have a higher likelihood of continued cooperation.

Research Methodology

Sampling and data collection procedures

This research used a questionnaire survey to test the proposed hypotheses and all the data was collected from

Chinese project professionals who have experienced contract violation in their construction projects. All of them were asked to complete the questionnaires based on their most impressive experience of contract violation.

In order to reduce the issue of common method variance (CMV), which is common when using surveys (Podsakoff and Organ, 1986), we took the advice from (Podsakoff and Mackenzie, 2003) and informed all of the respondents that this questionnaire would be used only for academic purposes and all the responses would be confidential. In addition, an exploratory factor analysis (EFA) with Harman's one-factor was conducted to test for this problem. The result showed that the cumulative contribution rate of the five latent variables was 71.558%, and each of them contributed less than 40%. Thus, neither single factor emerged, nor could one factor explain most of the variation, which indicates that CMV is not a significant disturbance in this study.

400 paper-based questionnaires were distributed during construction project training programs and the respondents come from different companies with diverse backgrounds. 265 questionnaires were collected, with a response rate of 60.5%. Finally, 195 valid questionnaires were selected as our sample after filtering out records with missing data, outliers, and non-manager responses, representing a valid response rate of 54.3%.

Measurement development

With reference to previous studies, the authors developed the items to measure variables in this survey. In order to make questions suitable for the construction industry, the authors made modifications and refinement. Since the related literature is all in English, the authors translated the questionnaire into Chinese and two Chinese-speaking researchers reviewed the second version. All the items in this research were measured with the 7-point Likert scale, which ranges from 1 (strongly disagree) to 7 (strongly agree).

Dependent variable: Severity of Contract Enforcement

In the studies carried out before Antia and Frazier (2001), contract enforcement was measured by a binary variable, which is classified as enforcement/not enforcement (Bergen, Heide and Dutta, 1998, Dutta, Bergen and John, 1994). Antia and Frazier (2001) were the first to measure contract enforcement as a continuum in terms of severity. Though Antia and Fisher (2006) also broadened the conceptualization of enforcement into severity, certainty, and speed, severity is fundamental to the definition of contract enforcement (Gibbs, 1975). Considering the research methodology in our study is questionnaire based on empirical experience rather than the scenario studies where experimenters are manipulated to make decisions, we adopted the measuring method from Antia and Frazier (2001) in this study. Though four areas of provisions were selected in the study of Antia and Frazier (2001), they dealt with franchise contracts rather than construction project contracts. In order to adjust the questionnaire for the construction industry, we used as reference the study of Zhang, Fu, Gao and

Zheng (2016) and Quanji, Zhang and Wang (2016) to develop items to measure the severity of contract enforcement in the construction industry from a multi-functional perspective. Since some provisions in their study could not be violated, the authors made adjustments based on the study of Mooi and Gilliland (2013). Finally, as can be seen in **Table 1**, four items were used to measure the severity of controlling contract enforcement and five items were used to measure the coordination contract enforcement.

Independent variable: Prior Ties

Considering that it's hard for respondents to recall precise times of collaboration in the construction industry, the authors measured prior ties based on the study of Reuer and Ariño (2007) and supplemented this binary variable with reflective questions to measure how often they had prior ties before this project. *Very often*, *Often*, and *Seldom* are recorded with 3, 2, 1 scores respectively.

Mediating variable: Trust

Based on the studies of Jiang, Li, Gao, Bao and Jiang (2013) and Zhang, Fu, Gao and Zheng (2016), this study uses the existing items to measure goodwill-based trust and competence-based trust. Both of these studies were completed in the Chinese context thus the applicability of items could be assured. As shown in **Table 1**, five items were used for measurement of goodwill-based trust and four items were used for that of competence-based trust.

Moderating variable: Shadow of the future

Similar to the study of Parkhe (1993), this study uses the 7-point Likert scale to measure the perceived likelihood of continued collaboration by the four items shown in **Table 1**.

Control variables

Based on previous studies related to contract enforcement decisions, this study controlled five variables including *transaction type*, *relationship type*, *difficulty to verify contract violation*, *cost of resolution*, and *feasibility of legal enforcement*. Four types of transaction were analyzed: *owner to contractor*, *contractor to owner*, *contractor to subcontractor* and *subcontractor to contractor*. The dominant role in these contracts may differ across these diverse transaction types thus influencing enforcement decisions. In addition, relationship types including *exchange party within the same company*, *independent Chinese company* and *independent foreign company*, reflect different social interaction (Zhou and Cai, 2003) between exchange parties thus impacting on the severity of enforcement. Both *difficulty to verify contract violation* and *cost of resolution* were measured by the 7-point Likert scale based on the study of Antia and Frazier (2001). *Feasibility of legal enforcement* was also added since legal institutions are proposed to influence enforcement decisions (Zhou and

Poppo, 2010).

Results

Construct validity and reliability

In order to explore the internal consistency and reliability of the scales, Cronbach's alpha value of multiple-item scales were calculated. As shown in **Table 1**, the Cronbach's alpha value of each scale ranged from 0.840 to 0.940 and were all above the 0.7 benchmark, indicating that the level of consistency and reliability was sufficient in this study (Nunnally and Bernstein, 1994).

Confirmatory factor analysis (CFA) was employed to explore internal structure validity, convergent validity and discriminant validity. The results showed $\chi^2/df = 1.866$; $p<0.001$; GFI＝0.846; AGFI=0.805; CFI＝0.936; IFI=0.937; TLI= 0.926; NFI=0.874; RMSEA＝0.067, which indicated that the model had a satisfactory fit to the data.

Construct reliability (CR) and average variance extracted (AVE) were calculated to explore the convergent validity. As shown in **Table 1**, the CR values for constructs are all above the 0.7 benchmark, and the AVE values of each construct are all above the 0.5 benchmark, which indicates that measurements of those constructs have good convergent validity. Each square root of AVE value was compared with the off-diagonal correlation coefficient by the authors to access the discriminant validity. As shown in **Table 2**, the square root value of AVE of each construct is higher than the off-diagonal correlation coefficient. Thus, discriminant validity is confirmed.

Hypotheses analysis

The authors first conducted a correlation analysis to test the hypotheses. The data central processing method was employed to reduce the influence of multicollinearity interference, and the variance inflation factors (VIFs) were calculated (Kerlinger, 1973). The values of VIFs ranged from 1.123 to 1.383, which is less than the 10 benchmark proposed by Neter, Wasserman and Kutner (1974). Thus, multicollinearity is not a significant problem for this model. Correlation analysis was first employed to explore whether these variables relate to each other. Their correlations were assessed twice, with prior ties as a binary variable and a numerical variable in the presence of trust. As shown in **Table 3**, the correlation coefficients of this model are all less than 0.6 so satisfying the requirement of hierarchical regress analysis (Kerlinger and Pedhazur, 1974). The results in the model with the binary variable show that prior ties are positively related to goodwill-based trust and competence-based trust, and negatively related to severity of controlling enforcement and coordination enforcement, which supports H1a, H1b, H3a and H4a. The results in the model with a numerical variable show

that prior ties are positively related to goodwill-based trust and negatively related to severity of controlling enforcement. Thus, further analysis is necessary.

Linear regression was conducted after correlation analysis. The regression equation is $Y_i=b_0+b_j\times X_j\left(i=1,2,3,4;\ j=1,2,3,4,5,6,7,8\right)$ in which Y_i represents severity of controlling enforcement, severity of coordination enforcement, goodwill-based trust and competence-based trust respectively, and X_j represents prior ties, transaction type, relationship type, difficulty to verify contract violation, cost of resolution, and feasibility of legal enforcement. Three dummy variables were developed in this study. As shown in Model 2 in **Table 4**, prior ties are significantly negatively related to severity of controlling enforcement (β=-0.226, $p<0.01$), thus H3a is supported. The results in Model 5, shown in **Table 4,** show that prior ties are negatively associated with severity of coordination enforcement with significance (β=-0.210, $p<0.01$), which supports H4a. The results in Model 8 and Model 10, shown in **Table 4,** show that both goodwill-based trust and competence-based trust are positively influenced by prior ties with significance (β= 0.548, $p<0.001$; β=0.526, $p<0.001$;), which supports H1a and H1b.

When there was prior cooperation, we also conducted linear regression under the numerical measurement of prior ties. As shown in **Table 5**, the results show that prior ties significantly mitigate the severity of controlling enforcement (β=-0.211, $p<0.05$) and improves goodwill-based trust (β= 0.338, $p< 0.01$), thus furtherer supporting H3a and H1a.

A combination of structural equation modelling and hierarchical regression analysis was used because the model in this research contains both a mediating and moderating test. In order to explore the mediating effect of two dimensions of trust, Bootstrapping in AMOS was used in this research. The relationship between the two dimensions of trust and severity of contract enforcement were detected before exploration of the mediation effect. As shown in **Table 4**, goodwill-based trust significantly reduces the severity of controlling contract enforcement (β=-0.562, $p<0.001$) and competence-based trust significantly mitigates the severity of coordination enforcement (β=-0.457, $p<0.001$), which supports H2a and H2b. Thus the pre-conditions of mediation effect exploration were satisfied.

The SEM model is illustrated in **Fig.1**. The results are shown in **Table 6** and lead to the conclusion that the effect of prior ties on severity of controlling contract enforcement is partially mediated by the level of goodwill-based trust and the effect of prior ties on severity of coordination contract enforcement is fully mediated by the level of competence-based trust, which supports H3b and H4b.

In further analysis, the authors consider the consequence in the presence of prior ties. As shown in **Table 7**,

the empirical results lead to the conclusion that the influence of prior ties on the severity of controlling contract enforcement is partially mediated by the level of goodwill-based trust, which further supports H3b.

In order to explore the moderating effect of the shadow of the future, this research applied hierarchical multiple regression. The results show that the interaction of the shadow of the future with goodwill-based trust ($p=0.210$) is insignificant, which does not support Hypotheses 5a. The interaction between competence-based trust and the shadow of the future ($\beta=0.278$, $p<0.01$), indicates that a higher likelihood of continued cooperation will strengthen the negative relationship between competence-based trust and the severity of coordination contract enforcement. Thus, Hypotheses 5b is supported by the results.

Simple slope tests were conducted to get more insight into the interaction effect of prior ties and trust. Following the procedure of (Toothaker, 1994), we split the shadow of the future into two groups: A low (one standard deviation below the mean) group and a high (one standard deviation above the mean) group. The effect of prior ties on severity of coordination contract enforcement was estimated for the low and high group. **Fig.2** indicates that when the likelihood of continued cooperation is high, prior ties have a stronger negative impact on severity of coordination contract enforcement ($\beta=-0.450$, $p< 0.001$) than when it is low ($\beta=-0.321$, $p<0.01$).

Discussion

Consistent with previous studies (Buvik and Rolfsen, 2015, Gulati, 1995), the findings of this study reinforce the view that prior ties could promote trust between transaction parties. Specifically, prior ties, by helping project members to understand each other's motives (Buvik and Rolfsen, 2015), to predict when self-interested behavior may occur (Lioukas, 2015) and to establish expectations of each other's behavior (Maurer, 2010), improve both goodwill-based and competence-based trust. This explains why owners/contractor prefer to cooperate with the original contractors/sub-contractor in construction projects, which often involve huge investment and high levels of uncertainty (Winch, 1989). In addition, the marginal effect of prior ties on trust reduces as cooperation between parties continues.

Previous studies demonstrate that trust between transaction parties could generate cooperation (Ven, 1992, Zhang, Wan, Jia and Gu, 2009), which focuses on the positive side of a transaction. However, with the empirical evidence supporting hypotheses 2a and 2b, this study focuses on how trust inhibits the non-cooperative side of a transaction. Consistent with the study of Zhang, Fu, Gao and Zheng (2016), trust is relied upon by transaction parties to address disputes. After a breach of contract, transaction parties try to avoid severe contract enforcement, which often has a zero-sum outcome (Anne, 2000), to protect the existing relationship. The empirical results explain how prior ties reduce the severity of contract enforcement via two dimensions of trust,

which complements the antecedents of severity of contract enforcement in the study of Antia and Frazier (2001). Prior ties, by improving goodwill-based trust and competence-based trust, reduce the severity of both control and coordination contract enforcement. *Guanxi*, unique to Chinese culture might be helpful in explaining this phenomenon. In addition to this, the institutional environment in China might be another reason. Considering the inadequate law enforcement in China (Cao, 2014), legal sanctions might not be enforced even after a judgment has been announced. Thus, rather than taking the risk of ruining the established relationship, transaction parties would try to find other ways to handle the other party's breach of contract.

The results of this study demonstrate that the shadow of the future would strengthen the negative influence of competence-based trust on severity of coordination contract enforcement. The principle of reciprocity (Gouldner, 1960) might contribute to this phenomenon. Expecting the other party to do the same in the future, one party might show the other party leniency even when contract provisions have been violated in the present transaction. Inconsistent with our hypothesis, the shadow of the future has no moderation effect on the influence of competence-based trust on the severity of controlling contract enforcement. The dominant effect of goodwill-based trust over competence-based trust on continued cooperation after dispute (Malhotra and Lumineau, 2011) may help to explain this phenomenon. Goodwill-based trust, compared to competence-based trust, has a wider limitation of domains, making it difficult to repair (Kim, Dirks, Cooper and Ferrin, 2006). Thus, transaction parties still severely enforce controlling contracts even when the likelihood of continued cooperation is high. According to these results, we posit that though the termination of a relationship is certain to occur sooner or later (Parkhe, 1993), when this would happen should be made uncertain so that severe contract enforcement could be avoided and cooperative relationship could be protected.

Conclusions and implications

According to the results of this study, the authors posit that prior ties can mitigate the severity of controlling and coordination contract enforcement after violations by improving goodwill-based and competence-based trust. In addition, the shadow of the future between transaction parties can enhance the negative influence of competence-based trust on coordination contract enforcement. When the likelihood of continued cooperation is high, a transaction party would reduce the severity of contract enforcement to gain the probable benefits in the future.

This study provides a deeper understanding of contract enforcement and enhances the ability of transaction parties in construction projects to resolve contract violations. Theoretically, this study complements the literature related to contracts, especially in the little-understood area of contract enforcement after contractual

breach (Mooi and Gilliland, 2013). This study enriches the current literature related to the antecedent of contract enforcement (Antia and Fisher, 2006, Gilliland and Bello, 2002, Jin, Tangpong, Hung and Johns, 2013). The empirical results show that prior ties and two dimensions of trust influence the severity of contract enforcement.

Secondly, this study offers a nuanced explanation of how prior ties influence the severity of contract enforcement. Two dimensions of trust have been distinguished in this study. The empirical results reinforce the findings of other studies (Buvik and Rolfsen, 2015, Gulati, 1995) that prior ties would increase the level of both goodwill-based and competence-based trust between transaction parties with a decreasing marginal increment. This distinction of trust provides a nuanced understanding thus a clearer route of function could be revealed. Complementing previous studies, which focused on the function of trust on improving cooperation in transactions (Ven, 1992, Zhang, Wan, Jia and Gu, 2009), this study extends the literature of this field by demonstrating that trust can also inhibit the negative side of transactions thus protecting transactional relationships. To the best of our knowledge, this study is the first one to differentiate contract enforcement from a multi-functional perspective, which is prevalent in studies of contract structure (Eckhard and Mellewigt, 2006, Schepker, Oh, Martynov and Poppo, 2013). This distinction provides new insight into issues surrounding contract enforcement.

Thirdly, this study also offers an explanation of how the effects of two dimensions of trust on the severity of contract enforcement are influenced by different levels of the shadow of the future. The findings demonstrate that the inhibiting effects of competence-based trust on the severity of coordination contract enforcement can be strengthened under a higher level of the shadow of the future. Both the principle of reciprocity (Gouldner, 1960) and the unique Chinese institutional environment can explain these findings. Thus, this study also clarifies the boundary conditions of its findings about the relationship between trust and the severity of contract enforcement.

This research can also inform managerial practice. Owners and contractors can benefit from the conclusions in this study by understanding the importance of prior ties, accumulation of trust and the promise of continued cooperation in the future. Not only could two dimensions of trust be built through prior ties, but also the likelihood of trust being rebuilt after a violation of contract is higher in the future. However, a trade-off has to be made by owners between decreasing marginal benefits from prior ties for trust and significant improvement of trust with new cooperative contractors. In addition, It's wise for owners to obfuscate the termination of the relationship even if it's certain to happen sooner or later for the shadow of the future can be used to manipulate the severity of contract enforcement after violation. To summarize, this study offers a comprehensive

understanding related to contract enforcement after contractual breaches, which are common in the construction industry.

Limitations and future research

Although this study is helpful to construction project management both in theory and practice, our study is subject to several limitations. First, this study explores the shadow of the future, which focuses on future projects, thus the contract enforcement in one project is treated as static. Contract governance is dynamic during a project (Reuer and Ariño, 2002), especially in construction projects that often have long lifespans. Hence, longitudinal data of contract enforcement during the lifecycle of a project is needed to test the dynamic effect. Second, this study relied on the data gathered in China where the institutional environment and culture are unique and these elements may influence decisions over contract enforcement. Thus, further research should be conducted across different countries and cultures to reach a more general understanding. Third, this study focuses on the severity of contract enforcement rather than how the violations of contracts are resolved, which deserves more attention in future studies. Fourth, the shadow of the future is the only moderator explored in this study. However, more plausible factors, such as institutional environment and the degree of bilateral lock-in, should be taken into consideration in the future.

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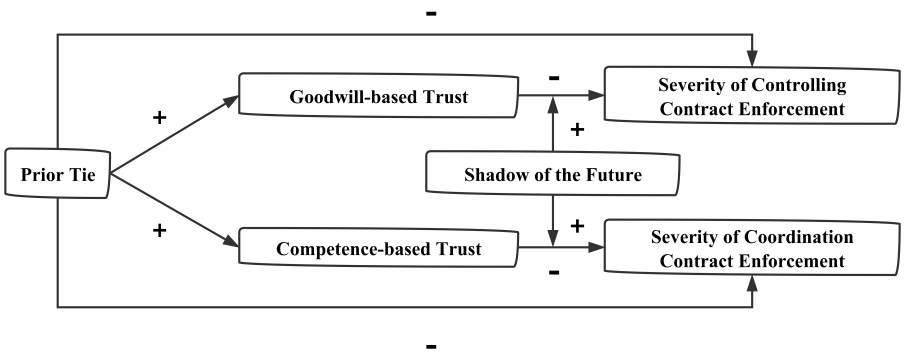

Fig. 1. Theoretical Framework

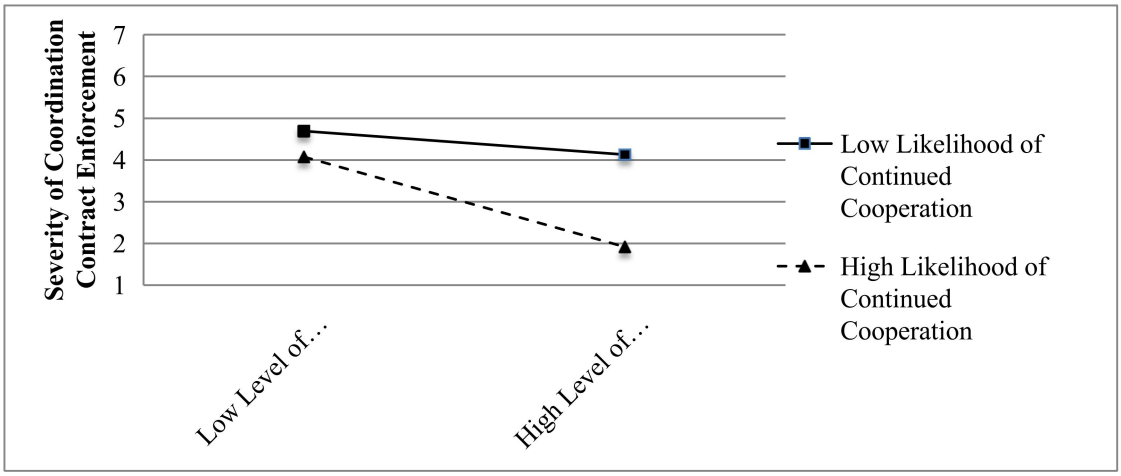

Fig. 2. Graphical representation of moderation effects

Table 1. Results of confirmatory factor analysis

Constructs and scale items	SFL
Goodwill-based Trust (Cronbach's α=0.879; CR=0.890; AVE=0.621)	
1. Our partner is very honest	0.870
2. Our partner can keep its promises all the time.	0.849
3. Our partner is trustworthy.	0.779
4. Our partner makes decision for our sake.	0.751
5. Our partner will help us when we are in trouble.	0.675
Competence-based Trust (Cronbach's α=0.882; CR=; 0.872; AVE=0.631)	
1. Our partner has a good reputation in the industry	0.811
2. We do not suspect our partner's capabilities according to its reputation and qualification.	0.811
3. Our partner shows very professional knowledge in the process of cooperation.	0.764
4. We feel very confident about skills, personnel, and capital of our partner to perform its job.	0.790
Severity of Controlling Contract Enforcement (Cronbach's α=0.840; CR=0.859; AVE=0.611)	
1. Our response to the other party's self-interest seeking behavior with deception or guile was very severe.	0.899
2. Our response to the other party's violation of provisions about insurance and guarantee was very severe.	0.899
3. Our response to the other party's violation of provisions about payment was very severe.	0.662
4. Our response to the other party's violation of provisions about quality of project, materials and equipment	0.623

was very severe.	
Severity of Coordination Contract Enforcement (Cronbach's α=0.878; CR=0.885; AVE=0.606)	
1. Our response to the other party's violation of provisions about scope of works was severe.	0.825
2. Our response to the other party's violation of provisions about technical specifications was severe.	0.749
3. Our response to the other party's violation of provisions about communication procedure was severe.	0.737
4. Our response to the other party's violation of provisions about procedure of report and information submission was severe.	0.724
5. Our response to the other party's misunderstanding of contract was severe.	0.850
Shadow of the future (Cronbach's α=0.940; CR=0.955; AVE=0.843)	
1. Relations of long cooperation are expected between us.	0.895
2. It's inevitable to continue cooperation between us.	0.913
3. We will continue to sign contracts with the other party in the future.	0.933
4. Relationship between us will be sustained.	0.931
χ^2/df	1.866
GFI	0.846
AGFI	0.805
CFI	0.936
IFI	0.937
TLI	0.926
NFI	0.874
RMSEA	0.067

Table 2. Descriptive statistics and Pearson correlation matrix

Variables	Mean	S.D.	1	2	3	4	5
1. Severity of Controlling Contract Enforcement	4.639	1.489	**0.781**				
2. Severity of Coordination Contract Enforcement	4.642	1.299	.407	**0.779**			
3. Goodwill-based Trust	3.583	1.233	-.584	-.125	**0.788**		
4. Competence-based Trust	3.595	1.254	-.059	-.501	.083	**0.794**	
5. Shadow of the future	5.306	1.559	-.213	-.077	.345	.212	**0.918**

Note: The bold numbers in the diagonal row are square roots of AVE

Table 3 Results of Correlation analysis

	Prior Tie	
	Binary Variable	Strength of Prior Tie (When prior tie exists)
Goodwill-based Trust	0.581**	0.373**
Competence-based Trust	0.540**	-0.109
Severity of Controlling Enforcement	-0.292**	-0.283**
Severity of Coordination Enforcement	-0.259**	-0.166

Note: N=195
*Significance level: p<0.1;
**Significance level: p<0.05;
***Significance level: p<0.01.

687

688 **Table 4.** Results of empirical model (Prior Tie as a binary variable)

Variables	SoCon Model 1	SoCon Model 2	SoCoo Model 3	SoCoo Model 4	SoCoo Model 5	Goodwill Model 6	Goodwill Model 7	Goodwill Model 8	Competence Model 9	Competence Model 10
Prior Tie		-.226**			-.210**			.548***		.526***
Goodwill-based Trust			-.562***			-.087				
Competence-based Trust			.019			-.457***				
Relationship type	-.132	-.070	-.052	-.236**	-.179*	-.115	.149	.000	.236***	.093
Difficulty to verify violation	-.142	-.112	.019	.053	.081	.090	.287***	.214**	.025	-.044
Cost of resolution	.116	.114	.016	.022	.020	.016	-.177*	-.171**	.020	.026
Feasibility of legal enforcement	.091	.067	.062	.101	.078	.079	-.053	.007	-.038	.020
Owner to Contractor	.090	.065	.056	.143	.119	.083	-.066	-.005	-.118	-.060
Contractor to Subcontractor	.097	.087	.098	.132	.123	.067	-.002	.020	-.140	-.119
Subcontractor to Contractor	-.096	-.090	-.057	.101	.106	.069	.066	.052	-.081	-.094
R^2	.098	.143	.371	.078	.117	.283	.133	.397	.064	.307
ΔR^2	.064	.105	.340	.043	.078	.248	.100	.371	.029	.277
F	2.875	3.845	12.050	2.241	3.051	8.059	4.068	15.253	1.812	10.255

689 Note: N=195
690 SoCon=Severity of Controlling Contract Enforcement
691 SoCoo=Severity of Coordination Contract Enforcement
692 *Significance level: p<0.1;
693 **Significance level: p<0.05;
694 ***Significance level: p<0.01.

695

696 **Table 5.** Results of empirical model (Prior Tie as a numerical variable in presence of prior tie)

Variables	SoCon Model 1	SoCon Model 2	SoCoo Model 3	SoCoo Model 4	Goodwill Model 5	Goodwill Model 6	Competence Model 7	Competence Model 8
Prior Tie		-.211*		-.077		.338**		-.180
Relationship type	-.176	-.116	-.267*	-.246	.148	.051	-.016	.035
Difficulty to verify violation	-.129	-.094	.011	.023	.281*	.225*	.089	.119
Cost of resolution	.222*	.203	.098	.091	-.211	-.182	-.129	-.144
Feasibility of legal enforcement	.088	.068	.208*	.201	.127	.159	-.058	-.075

Owner to Contractor	.012	-.012	.114	.031	.093	.100	-.174	-.166
Contractor to Subcontractor	.240*	-.051	.198	-.160	-.066	.025	-.116	.009
Subcontractor to Contractor	.040	-.202*	.160	.120	-.007	-.031	-.019	-.124
R^2	.139	.177	.123	.128	.165	.262	.063	.090
ΔR^2	.072	.103	.054	.049	.100	.195	-.010	.009
F	2.068	2.386	1.798	1.628	2.535	3.945	0.861	1.105

Note: N=99

SoCon=Severity of Controlling Contract Enforcement

SoCoo=Severity of Coordination Contract Enforcement

*Significance level: p<0.1;

**Significance level: p<0.05;

***Significance level: p<0.01.

Table 6 Results of SEM (Prior Tie as a binary variable)

	Estimate	S.E.	C.R.	P
GOO<---PRI	.647	.154	4.193	***
COM<---PRI	.640	.129	4.961	***
CON<---GOO	-.297	.121	-2.442	.015
COO<---COM	-.621	.118	-5.274	***
CON<---PRI	-.706	.245	-2.878	.004
COO<---PRI	-.272	.182	-1.491	.136

Note: N=195

***Significance level: p<0.01.

Table 7 Results of SEM (Prior Tie as a numerical variable in presence of prior tie)

	Estimate	S.E.	C.R.	P
GOO<---PRI	.647	.154	4.192	***
CON<---GOO	.640	.129	4.966	***
CON<---PRI	-.300	.121	-2.474	.013

Note: N=99

***Significance level: p<0.01.