Roles of Contractual Safeguarding and Social Embeddedness in Promoting Contractor’s Cooperation Behavior in Construction Projects

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Abstract: Although cooperative behavior has been divided into in-role behavior and extra-role behavior in existing literature, investigation into the antecedents of these two types of behavior are still insufficient in the field of inter-organizational transactions. This research develops a conceptual model involving cooperative behavior motivated by contractual governance from an economic perspective, and relationship concern from a social perspective. Based on 202 questionnaires completed by Chinese companies involved in the construction industry, we discover that contractual safeguarding can promote in-role behavior but does not affect extra-role behavior; while anticipated interaction positively affects both in-role and extra-role behavior. This research verifies the differential effects of contractual safeguarding and anticipated interaction on different types of cooperative behaviour, and offer suggestions for promotion of the contractor's cooperative behavior in the construction industry.

Keywords: Contractor’s cooperative behavior, contractual safeguarding, anticipated interaction, prior tie

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1 INTRODUCTION

In the construction industry, cooperation between owners and contractors is the basis for the success of a project (Phua and Rowlinson 2004). However, since information and trust is always insufficient (Asgari et al. 2013), and partners only have partially overlapping goals in most cases (Das and Teng 1996), this industry is always “beset by disputes” (Brooker and Lavers 1997). Now it is not an automatic or simple thing to achieve cooperation (Malhotra and Lumineau 2011), and as such, practitioners hope to realize effective mechanisms to promote cooperation. The formal contract is essential for cooperative relationship as it could provide definite and compulsory provisions. Organizations use contractual arrangements to limit potential opportunism and reduce uncertainty of partners’ behavior (Williamson 1985). Nonetheless, due to the incompleteness of contracts, all the cooperative behavior cannot be achieved by the means of contract, especially for the tacit cooperative behavior. Therefore, non-contractual relations also play an important role in business (Macaulay 1963).

The cooperation issue has always caught researchers’ attention in the field of inter-organizational transactions. Numerous researchers have discussed the effects of contractual governance and relational governance on partners’ cooperative behavior. However, cooperation is not a general concept. Katz (1964) implied two dimensions of cooperative behavior, including role performance (i.e. in-role behavior) and innovative and spontaneous behavior (i.e. extra-role behavior). Nonetheless, most studies of extra-role behavior were focused on organizational citizenship behavior at the individual level, while a minority discriminated between in-role behavior and extra-role behavior at the transaction level. For example, the game theory literature with respect to the shadow of the future suggested that anticipated open-ended future interaction would increase the chances of occurring a pattern of cooperative behavior (Heide and Miner 1992), but these studies mainly adopted mathematical models, which call for further empirical tests. What’s more, the iterated games literature only focused on a cooperation-defection dyad. A nuanced mechanism differentiating between in-role behavior and extra-role behavior need further investigation. In a construction project, the contractor not only needs to complete the tasks specified in the contract, but also needs to make extra efforts to enhance project performance.

Generally, the contract is regarded as one of the most important approaches to promote cooperation.
Many scholars are interested in the effect of contractual governance on participants’ cooperative behavior. For example, Luo (2002) discovered that term specificity and contingency adaptability in a contract have a positive effect on cooperation; Olander et al. (2010) found that the importance of contractual governance varies at different stages of collaboration. Based on previous research, this paper will further investigate the effect of contractual governance on different types of cooperative behavior.

Besides contracts, the effect of relationship on cooperation has also received wide attention. Macneil (1977, 1996) classified transactions into two categories, namely discrete transactions and relational exchanges. In the latter case, the identity of the participants and the relationship between them cannot be neglected. Construction projects are usually described as one-off transactions because every construction project is unique, but it doesn’t mean that there is no relationship in the past and future between two trading parties, except for the focal transaction. In fact, in many cases, repeated transactions often take place between the same pair of owner and contractor. In other words, construction projects are relational exchanges rather than discrete transactions, making the participants’ identities and relationships crucial.

Relational exchanges must be considered in accordance with previous history and anticipated future (Dwyer et al. 1987). Some scholars investigated the effect of prior-deal experience on cooperation (Gulati and Singh 1998), and found that the shadow of the future and long-term orientation affected participants’ current cooperative behavior (Heide and Miner 1992; Yang et al. 2011). Consistent with these views, whether the owner and the contractor have prior cooperation experience, the quality of antecedent collaboration and the expectation for repeated transaction are assumed to influence the current cooperative behavior in this research. Anticipated interaction as a representative of the “future” and prior tie as a proxy for the “past” are expected to have an interaction, and their effect on in-role behavior and extra-role behavior would be different.

In one word, the importance of cooperation has drawn much attention from various disciplines, and the mechanisms of promoting cooperative behavior mainly include two aspects: contractual governance and relational governance. The authors hold the view that each one plays a different role in promoting in-role behavior and extra-role behavior among the numerous factors that can influence cooperative behavior. However, previous studies seldom distinguish between them. In fact, what promotes in-role behavior may not bring more extra-role behavior.

Instinctively, the contractor’s in-role behavior takes place passively under certain stipulation, limitation and monitoring, while extra-role behavior is more likely to be done actively out of some other incentives. Contracts usually provide rights and obligations, monitoring, penalties and some other functions which drive the contractor to conduct in-role behavior. By comparison, the relationship between two parties and the owner’s trust in the contractor can increase the possibility that the owner chooses the same contractor again and adds to the owner’s cooperative behavior in future projects. Therefore, when the contractor has strong aspiration to repeated transactions or perceives a high possibility of repeated transactions, his in-role behavior and extra-role behavior may well increase in order to gain the owner’s trust. This empirical study on the factors affecting different cooperative behaviors is exactly based on the aforementioned logic.

Smith et al. (1995) concluded five categories of theories about cooperation, including exchange theories, attraction theories, power and conflict theories, modelling theories and social structure theories. They believed that any single one of these theories could not fully explain cooperation independently, and a multi-theoretical perspective would be more instructive. Gulati (1995) also adopted transaction cost theory and sociological theories simultaneously to analyze choices of governance structures in alliances. The authors of this research hold the same view that the combination of economic and social perspectives could lead to many interesting results. Transaction cost theory and social embeddedness theory are chosen here to get into the different roles of contracts and social embeddedness in promoting in-role behavior and extra-role behavior.

2 THEORETICAL BACKGROUND

2.1 Cooperative Behavior

Cooperation is defined in the research field of strategic management as partners’ willingness to pursue mutual and compatible interests in the alliance rather than act in opportunist ways, and partners’ behavior that makes toward the goals of the temporary multi-organization (Das and Teng 1998; Anvuur and Kumaraswamy 2011). Cooperation has longly been focused on, but it is treated as a general concept by many researchers (Das and Teng 1998; Luo 2002). In the early study on organizational behavior, Katz (1964) proposed two types of organizational members’ basic behavior which are essential for organizational operation, including role performance which requires people to execute their role assignments in a dependable fashion, and non-role performance, which refers to the innovative and spontaneous activity transcending organization members’ role prescriptions. Likewise, based on whether partners’ action is within the scope of responsibilities agreed by both sides, some other scholars subsequently classified cooperative behavior into in-role behavior and extra-role behavior (Anvuur and Kumaraswamy 2011), or formal cooperation and informal cooperation (Smith et al. 1995), or task-oriented behavior and relationship-oriented behavior (Pinkley 1990; Fu et al. 2015). Since the behavior of an organization is virtually done by its members, this classification can be extended from individual level to organizational level (Fu et al. 2015), and its applicability has been verified in the field of
inter-organizational relationships including construction projects (Anvuur and Kumaraswamy 2011; Kashyap and Sivadas 2012).

Based on existing literature, the two dimensions of cooperative behavior are defined as follows: In-role behavior refers to the behavior that complies with the mutual agreement and assignment of works in the contract, and the effort which must be done for the fulfillment of a project target. Extra-role behavior refers to the voluntary and spontaneous behavior beyond the description of specified role, which is only mentioned in the contract but not mandatory or possibly even not mentioned. For instance, the contractor could put forward constructive proposals for the project design document, or enhanced project value through innovative project schedule.

2.2 Contractual Safeguarding

Study of economic organizations represented by Transaction Cost Economics (TCE) usually adopts a contractual approach (Williamson 1996), which emphasises safeguarding of investments and property against misappropriation by a partner through contract design. This theoretical perspective has had a significant influence on the organizational and economic fields, and led to a range of empirical studies on which test hypotheses are based (Grover and Malhotra 2003). It is widely accepted that contract is an important governance mechanism in underpinning cooperative relationships (Arrighetti et al. 1997). Based on the assumption that humans have bounded rationality and opportunism tendency and complex transactions are full of uncertainties, the prevailing TCE-based view considers contract arrangement to play a safeguarding role so as to decrease opportunism behavior and achieve cooperation (Williamson 1985; Scheper et al. 2014). According to prior definition and construction project practice, the safeguarding function of construction project contract mainly aims at monitoring, restricting and penalising the opportunistic behavior which may harm the other party’s interests.

2.3 Anticipated Interaction

Contrary to enlightening, the singular emphasis on transaction costs treats each inter-organizational transaction as independent and ignores the relationship emerging from repeated transactions between the same partners (Gulati 1995; Lumineau and Henderson 2012). In practice, due to some reasons, such as partner trust, market size, professional techniques and dedicated devices, it is common to see repeated transactions between the same pair of owner and contractor. When the contractor anticipates interaction with the same owner in the future, his behavior is very likely to change. Definition of anticipated interaction in this paper includes the following two aspects.

One is the contractor’s aspiration to repeated transactions, similar to the “long-term orientation” by Yang et al. (2011). The typical characteristic of long-term orientation is partners’ expectation and desire of continuity in the relationship (Noordewier et al. 1990; Ganesan 1994), which reflects the subjective willingness. Participants with aspiration for repeated transaction value long-term concerns rather than short-term ones when making decisions (Yang et al. 2011).

The other one is partners’ perceived possibility of repeated transactions, similar to the “shadow of the future” or possibility of repeated game, which reflects the perception of objective circumstances. According to game theory, anticipated open-ended future interaction, or extendedness will increase the occurrence of cooperative behavior (Heide and Miner 1992).

2.4 Prior Tie

Now that repeated transactions are not rare in the construction industry, prior tie is likely to exist between owner and contractor. Some scholars have investigated the influence of prior tie on subsequent inter-organizational transactions. Gulati (1995) discovered that repeated alliances between two partners are less likely to use the equity alliance mode than other alliances. Ryall and Sampson (2009) found that firms with prior deal experience tend to add more details and invoke penalty clauses in contracts than firms with no prior deal experience, and the phenomena become more obvious when the prior deals are between the same partners. Thus, behaviors in economic transactions are affected by economic governance mechanisms as well as the social ties generated from prior interactions (Gulati and Singh 1998; Luo 2002). Based on previous studies, the prior tie between owner and contractor here includes the number of times of prior transactions, the number of years since the first collaboration and degree of satisfaction between two parties (Reuer and Arino 2007; Gulati 1995; Parkhe 1993).

3 CONCEPTUAL MODEL AND HYPOTHESIS DEVELOPMENT

3.1 Contractual Safeguarding and Cooperative Behavior

The behavioral assumption of transaction cost theory implies that humans are potentially opportunistic and tend to seek self-interests with guiles, which is inconsistent with the spirit of cooperation. If opportunism cannot be controlled, it will incur high transaction costs (Williamson 1985, 1996). One of the most important mechanisms to protect one’s interests against opportunistic misappropriation by a partner is the contract (Gulati 1995), which is characterised by mandatory and enforceability by virtue of its legal effect. In the six types of motivational patterns for the behavioral requirements by Katz (1964), the legitimate rules of the organization concern only one type, namely: reliable role performance. Served as a means of legality, the contract can reduce opportunism behavior through
monitoring, restrictions and penalties, thus making the participants comply with the agreements and perform their obligations as stipulated (Mellerwigt et al. 2012). The stricter the contractual safeguarding stipulations are, the stronger the constraint force on participants’ behavior will be. Thus, we develop the following hypothesis:

H1: Contractual safeguarding is positively associated with contractor’s in-role behavior.

Whether the contractual safeguarding stipulations are strict or not, it has an effect on the contractor’s in-role behavior, but it has no direct effect on the contractor’s extra-role behavior. As Katz (1964) pointed out, role performance though legitimate rules can effectively be guaranteed, thereby helping to achieve the minimal level of standards for role requirements, this minimal level actually becomes the maximal level as well. For those voluntary and spontaneous behaviors beyond responsibility requirements, rule enforcement is useless by definition. The contractor’s extra-role behavior needs to be analyzed from other perspectives. Thus, we develop the following hypothesis:

H2: Contractual safeguarding is unrelated with contractor’s extra-role behavior.

3.2 Social Embeddedness and Cooperative Behavior

Granovetter (1992) criticized the under-socialised view in mainstream economics and the over-socialised view in sociology in which the former ascribes decisions to a utilitarian pursuit of self-interest entirely, and the latter completely attributes human’s behavior pattern to the internalisation of prior experience. With an atomised conception of human action, both of the views isolate the agent’s decision and behavior from the specific social context. According to Granovetter (1992), behavior of an agent is embedded in the relational network interacting with other agents. The regular expectations and principle of reciprocity in ongoing interpersonal relationship exert a significant effect on the agent’s behavior. Social embeddedness includes relational and structural embeddedness (Granovetter 1993). This research only analyzes the relational embeddedness because a dyadic tie is focused on here.

3.2.1 Effect of Anticipated Interaction

Participants become embedded in the relationship with each other due to the existence of anticipated interaction, which leads to a long-term orientation (Yang et al. 2011) and the shadow of the future (Parkhe 1993). A firm with long-term orientation tends to rely on relational exchanges and maximises its profit in a series of transactions rather than relying on the efficiency of market exchange and maximising its profit in a single transaction as the firm with short-term orientation (Yang et al. 2011). Similarly, under the shadow of the future in an iterated game, a firm will also display a different cooperative behavior pattern in contrast to a firm in a one-time game.

However, the prior definitions of long-term orientation and the shadow of the future haven’t distinguished the following two aspects: subjective aspiration for repeated transactions and perceived objective possibility of repeated transactions. The two aspects are actually different and their effective mechanisms for in-role and extra-role behavior are discussed respectively as follows.

According to game theory, participants have an incentive to breach a one-time game out of self-interest. In contrast, when open-ended future interaction is anticipated, under the powerful constraint of potential cheaters (Fehr et al. 2002), a pattern of cooperative behavior will probably occur in exchange for partner cooperation. Cooperation is thus maintained as participants compare the immediate gain from cheating with the possible sacrifice of future gains that may result from violating an agreement (Telser 1980). The view of social embeddedness and social exchange also implicate that when long-standing relationship exists, participants will have economic motivation to make themselves seem trustworthy, so that their future deals will go more smoothly (Granovetter 1985). In the context of construction partnering, the contractor in the anticipation of repeated transactions with the same owner usually hopes to gain the trust of the owner, because inter-organizational trust can bring about lots of benefits, such as lowering transaction cost (Das and Teng 1998), stimulating desirable behavior (Madhok 1995), promoting dispute resolution (Ring and Van de Ven 1994), etc. That is to say, when the possibility of perceived objective of a repeated transaction is high, the contractor will care more about benefits from future cooperation. As a result, the contractor will reduce current opportunism and try to complete stipulated tasks (Parkhe 1993), namely increasing in-role behavior.

On the other hand, with subjective aspiration for repeated transactions, the contractor will hope to increase the chance of future transactions. The contractor’s conscientious fulfilment of the in-role obligations amounts to the release of the competence signal of the owner. In this way, the owner’s trust in the contractor would be strengthen and the owner becomes more likely to choose to continue the collaboration with the contractor (Pinto et al. 2009). That is to say, the higher the subjective aspiration for repeated transactions is, the more in-role behavior the contractor will exhibit. Thus, we develop the following hypothesis:

H3: Anticipated interaction is positively associated with contractor’s in-role behavior.

The contractor’s extra-role behavior is the spontaneous effort beyond contract stipulations. Cooperative behavior, which is not conducted passively under stipulations of the contract provided in advance, is to release a positive signal of goodwill and to express strong cooperative willingness (Chaserant 2003) through
which the relationship between the two sides is enhanced. People tend to treat their partners in different ways under a weak-tie relationship and a strong-tie relationship (Yang et al. 2011). A self-interested tendency is expected in a weak-tie relationship, while the belief that partners will not pursue self-interest at each other’s expense exists in a strong-tie relationship (Uzzi 1997). If the contractor builds a strong-tie relationship by extra-role behavior, then the owner is expected to think more about the contractor’s interest and respond with reciprocal behavior (Wong et al. 2005). For example, the owner may pay progress payments more timely, assist the contractor in applying for licences, communicate and share information with the contractor more frequently, etc. Therefore, the higher the possibility of perceived objective of repeated transactions are, the more extra-role behavior the contractor will exhibit in order to maintain the relationship with the owner and benefit in future cooperation.

Embedded in the social network of the construction industry, the contractor values its reputation (Gulati et al. 2012) and the owner’s trust. Beuve and Saussier (2012) found that cooperation can be enhanced by a partner’s reputation. Some owners have a short-list for contractors, from which the contractor with a good reputation and the owner’s trust due to prior collaboration will be chosen if a similar project needs to be done in future. The view of social embeddedness emphasises that in economic activities, trust is generated by social relationships rather than institutional arrangements or generalized morality (Granovetter 1985). Therefore, the contractor with strong subjective aspiration for repeated transactions will be highly motivated to strengthen the relationship with the owner with the aim of increasing the owner’s trust. In comparison with fulfilling in-role tasks, the contractor’s extra-behavior is a goodwill and cooperative signal for the owner, which can further enhance the owner’s goodwill trust.

H4: Anticipated interaction is positively associated with contractor’s extra-role behavior.

3.2.2 Effect of Prior Tie

For an owner and a contractor who intend to foster a long-run relationship, the first collaboration when both parties still do not know each other well is always of great importance. Furthermore, if the contractor has not collaborated with the owner before when the transaction is very likely to be repeated in future or the contractor has strong aspiration for repeated transactions, the contractor needs to perform extra-role behavior for releasing a signal of goodwill.

In contrast, things will be different if the parties have prior collaboration. On the one hand, the repeated transactions help the parties build up “knowledge-based trust” through on-going interactions (Shapiro et al. 1992; Gulati 1995). In this case, the revenue of performing more extra-role behavior would be lower than that when prior tie doesn’t exist. Therefore, the established trust would weaken the contractor’s incentive to perform extra-role behavior for the purpose of releasing signals of goodwill and earning the employer’s trust. On the other hand, according to social embeddedness theory, repeated transactions result in a fairly strong dyad relation between the parties (Yang et al. 2011). There exist inter-organizational routines in these relations, namely the patterns of interactions developed and refined from prior repeated transactions (Zollo et al. 2002). These inter-organizational routines have nothing to do with trust, while they can release the parties from designing detailed mechanisms for purpose of monitoring and coordination. Under this psychological contract and stable relations, the contractor generally would not behave non-cooperatively just for self-interest seeking and would fulfill the in-role obligations more thoroughly. However, the stable routines and proficient processes would also make the contractor cooperate just as is, instead of proactively performing extra-role behavior. Hence we hypothesise that,

H5: Prior tie weakens the positive relationship between anticipated interaction and contractor’s extra-role behavior.

![Figure 1. Hypotheses model of this research](image_url)
4 METHODOLOGY

4.1 Sampling and Data Collecting

In order to test the proposed hypotheses, a questionnaire survey was conducted to collect data from project management professionals. In order to be ensured that the respondents had sufficient knowledge and general understanding of the project implementation and contractual terms, two criteria were applied to identify qualified respondents, including: (1) they must be personally involved in the construction project and (2) they must be familiar with the complete contract. Participants were asked to reveal information on themselves and the project to judge whether they were of acceptable expertise regarding the mentioned topic. Before answering the questionnaire, respondents were asked to recall a newly-completed project or under construction in which they had hands-on experience.

Respondents were chosen to be learners of in-house training hosted by several group companies, which are independent economic entities with adequate qualification to contract and implement construction projects in global market, either individually or jointly. Their subsidiaries are scattered home and abroad and had business scopes covering various fields. The learners were selected from different subsidiaries and ongoing projects; most of them were experienced managers or engineers at a site. In each round of data collection, we prepared some gifts (e.g., professional books authored by one of the researchers) for respondents and made them feel hyped up by lottery to decide the lucky ones, thereby increasing the odds of obtaining a satisfactory response rate. Of the 241 distributed surveys, 238 responses were obtained, representing a 98.7 per cent response rate. To alleviate common method bias, the respondents were informed of the guarantees of confidentiality (Podsakoff et al. 2003), which may also have motivated respondents to provide accurate information. Several other steps were taken in an attempt to reduce errors in retrospective accounts, including providing explanations for the survey and conducting a pilot study, using structured questions and asking for their email address to offer our results to them. In total, of the 241 questionnaires distributed on site, 238 completed responses were collected. After deleting records including missing data, unmatched data and inconsistent data, 202 valid responses were available, with an effective rate of 83.8 per cent.

The sample of respondents comprised department managers (33.7%), projects managers (37.1%) and non-management staff (29.2%). 33.7% of the respondents had more than 10 years’ work experience and 41.6% had 5 to 10 years work experience; only 24.7% of them had work experience of less than 5 years. In the projects in which respondents participated, 48.5% were construction only, 47.0% were EPC turnkey and 4.5% were other types. 202, of those whom were knowledgeable as regards the survey’s topic, represented major industrial groups in construction projects, including building engineering (46 projects), petrochemical engineering (32 projects), port and waterway engineering (31 projects), roads and bridges engineering (25 projects), municipal engineering (9 projects), water and hydropower engineering (9 projects), survey engineering (8 projects), information and telecommunication engineering (5 projects), railway engineering (3 projects), power engineering (2 projects) and others (32 projects), corresponding to proportions of 22.8%, 15.8%, 15.3%, 12.4%, 4.5%, 4.5%, 4.0%, 2.5%, 1.5%, 1% and 15.8%, respectively.

4.2 Measurement

Items measuring in-role and extra-role behavior were developed in line with the study of Anvuur and Kumaraswamy (2011) and Kashyap and Sivadas (2012). To make their scales more adaptable, we translated the description from individual level to project level and applied the average of indicators such as Quality, Cost and Time for Completion as the performance indicator. Contractual safeguarding was determined by measurement from Luo (2002) and Zhang et al. (2016). As can be seen from Table 1, four items in terms of contractual safeguarding are used to evaluate the extent to which the formal contract is currently carried out in existing exchanges. The items measuring anticipated interaction were adapted from scale of long-term orientation advanced by Yang et al. (2011), including the objective possibility of repeated transactions and willingness to sign up again. These dependent and independent variables were measured with 7-point Likert scales with anchors ranged from 1= never disagree to 7= totally agree.

Moderating variable (prior tie) is measured by multiplying times and duration that owner and contractor have been previously collaborated with in accordance with Reuer and Arino (2007), Gulati (1995) and Parkhe (1993). To ensure the validity of the measurement of prior tie, which were not reflective indicators, indicators that reflected the satisfactory and close relationship between both parties were adopted. In hypotheses analysis, we standardized prior tie before adding it into hierarchical regression analysis.

To be in line with previous research, this study controlled the project scale by including contract price and project duration as control variables. Moreover, previous studies have also found owner capacity (Lu and Hao 2013) and switching cost (Wuyts 2007) to be associated with cooperative behavior. To rule out possible alternative explanations, owner performance, cooperative atmosphere (Wuyts 2007) and strategic importance (Reuer and Arino 2007) were controlled. However, correlation analysis predicted that first four variables (price, duration, owner capacity and switching cost) had no significant relation to independent and dependent variables, so their effect is neglected in the further analysis. Item measures for the variables in this study are presented in Table 1.
Table 1. Scale of study variables

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item measures</th>
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<tbody>
<tr>
<td>In-role behavior</td>
<td>IB1. The contractor has fully performed the duties specified in the contract.</td>
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<tr>
<td></td>
<td>IB2. The contractor has completed all the tasks that should be done.</td>
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<tr>
<td></td>
<td>IB3-1. The contractor has fully met the quality objectives of the project.</td>
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<tr>
<td></td>
<td>IB3-1. The contractor has controlled the time for completion within the owner’s requirement.</td>
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<tr>
<td>Extra-role behavior</td>
<td>EB1. The contractor has actively fulfilled tasks beyond the contract specified.</td>
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<td></td>
<td>EB2. The contractor has been willing to undertake work outside the scope to promote project performance.</td>
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<tr>
<td></td>
<td>EB3. The contractor has been able to give reasonable suggestions in order to improve the performance of the whole project.</td>
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<tr>
<td>Contractual safeguarding</td>
<td>CS1. The contract provisions were strict and able to prevent the violation of contract.</td>
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<tr>
<td></td>
<td>CS2. The contract severely penalised and punished selfish behavior.</td>
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<td></td>
<td>CS3. There were rigid monitoring and supervising provisions in the contract.</td>
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<td></td>
<td>CS4. The contract heavily sanctioned deception.</td>
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<tr>
<td>Anticipated interaction</td>
<td>AI1. In the bidding process, the contractor made a plan and extra effort in order to sign up with the same owner in future.</td>
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<td></td>
<td>AI2. The contractor would earn high profits if maintaining long-term cooperative relationship with the owner.</td>
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<td></td>
<td>AI3. The contractor was willing to continue long-term relationship with the owner.</td>
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<td></td>
<td>AI4. At the beginning of the project, the perceived possibility of repeated transaction between the owner and the contractor was high.</td>
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<tr>
<td>Prior tie</td>
<td>PT1. Before the focal project, did the owner and the contractor collaborate on other projects?</td>
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<tr>
<td></td>
<td>PT2. Before the focal project, how many times and how long did both parties collaborate?</td>
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<tr>
<td></td>
<td>PT3. In prior projects, the owner and the contractor were satisfactory with each other.</td>
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<td></td>
<td>PT4. In general, the owner and the contractor had had a close relationship before.</td>
</tr>
<tr>
<td>Owner performance</td>
<td>OP1. The employer had fully fulfilled the responsibilities and tasks specified in the contract, and were good at working with the contractor.</td>
</tr>
<tr>
<td>Owner capacity</td>
<td>OC1. The owner had a strong professional capacity.</td>
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<tr>
<td></td>
<td>OC2. The owner had a strong legal capacity.</td>
</tr>
<tr>
<td>Cooperative atmosphere</td>
<td>CA1. The owner and the contractor identified with each other’s corporate culture.</td>
</tr>
<tr>
<td></td>
<td>CA2. The owner and the contractor were similar in terms of company value.</td>
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<tr>
<td></td>
<td>CA3. The owner well recognised that the contractor played a very important role in this project.</td>
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<tr>
<td>Switching cost</td>
<td>SC1. If the project were terminated, the contractor had to spend a lot of time and effort transferring the material and human resources that had been devoted.</td>
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<tr>
<td></td>
<td>SC2. If the project were terminated, the contractor’s knowledge learned specially for the project would be wasted.</td>
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<tr>
<td>Strategic importance</td>
<td>SI1. Fulfilment of the project had a significant strategic significance to the contractor</td>
</tr>
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</table>

5 RESULTS

5.1 Reliability and Validity Analysis

To confirm the internal consistency and reliability of the scales, the SPSS 21.0 software package was used to compute the Cronbach’s alpha value of multiple-item scales. Because the traditional notions of internal consistency and reliability apply to constructs with reflective indicators rather than formative indicators (Diamantopoulos and Winklhofer 2001), the Cronbach’s alpha indicator of prior tie was not calculated. As Table 2 shows, the Cronbach’s alpha values of the five multiple-item scales used in this research were all above the 0.7 benchmark, indicating sufficient and satisfactory internal consistency and reliability (Andrews and Robinson 1991).

Ratings of our independent variables and dependent variables were obtained from the same participants, which may have led to possible common method bias accounting for the association between variables. This study adopted Harman’s one-factor test to assess whether a significant amount of common variance existed in the data. The untwisted results of exploring factor analysis performed on all items shows that no single factor emerged from the factor analysis, and no general factor accounted for the majority of the covariance among the measures, indicating that common method bias is not a significant problem in this research (Podsakoff et al. 2003).

Confirmatory factor analysis (CFA) was used with the help of the AMOS 7.0 software package to justify the factor structure, convergent validity and discriminant validity. As shown in Table 2, all the factor loadings are significant and greater than 0.7 and values of composite reliability (CR) of multiple-item scales are all greater than 0.8. The model fit indices were χ² = 304.556 (d.f. = 155, χ²/d.f. = 1.965), IFI = 0.944, RMSEA=0.065, CFI=0.943, indicating that the model is acceptable. As shown in Table 2, the average percentage of variance extracted (AVE) values of the constructs are higher than 0.5, indicating the acceptable convergent validity. Moreover, Table 3 summaries that the square roots of AVE exceed their inter-correlations (the off-diagonal elements), which implies the existence of discriminant validity.

5.2 Hypotheses Analysis

Hierarchical regression analysis was conducted to test and verify each hypothesis. In this procedure, owner performance, cooperative atmosphere and strategic importance were first entered into the first slide to control their effects. Next, all the independent variables
were entered as second block to assess their unique contribution in explaining in-role and extra-role behavior respectively. Moreover, the interaction term between prior tie and anticipated interaction was entered to examine the moderate effect of prior tie. To ensure the reliability of these analyses, the variance inflation factor (VIF) scores in two full models (Model 1b and 3c) were verified. The scores (from 1.3 to 2.0 in Model 1b and 1.2 to 2.1 in Model 2c) suggested the absence of multi-collinearity among all predictors and control variables. Table 4 summaries the results of proposed hypotheses. Model 1a and Model 2a function as baseline models by incorporating the control alone, while Model 1b, 2b and 2c augment the baseline models with two predictor variables. Our first hypothesis predicted that contractual safeguarding is positively related to contractor’s in-role behavior. Model 1b provides support for the hypothesis. As Table 4 shows, the greater the safeguarding provision built into the contract, the greater the in-role behavior ($\beta = 0.15, p < 0.05$). The third hypothesis argues that anticipated interaction can promote contractor’s in-role behavior. Model 1b shows that anticipated interaction has a significantly positive effect on contractor’s in-role behavior ($\beta = 0.14, p < 0.05$), supporting Hypothesis 3.

As shown in Table 4, Model 2a and Model 2b confirm that contractual safeguarding has no significant effect on extra-role behavior ($\beta = 0.03, p > 0.1$), which is consistent with Hypothesis 2. By contrast, there is a significantly positive relationship between anticipated interaction and extra-role behavior ($\beta = 0.19, p < 0.01$), which supports Hypothesis 4. To test the moderating role of prior tie, prior tie and the interaction item between prior tie and anticipated interaction were introduced in Model 2c. To deal with multi-collinearity within interaction terms, each scale that constitutes an interaction term was centralised and the interaction term was created by multiplying the relevant centralised scales. However, the regression coefficient of the interaction item is not significant ($\beta = 0.10, p > 0.1$) and does not support Hypothesis 5.

**6 DISCUSSION**

**6.1 Theoretical Contribution**

With respect to cooperative behavior, the prevailing TCE-based view emphasises how to design contracts to restrain opportunistic behavior and promote cooperation. However, most attention has been focused on contract design issues, such as contract functions and contractual completeness rather than cooperative behavior itself. Katz (1964) has implicated that legitimate rules don’t work in those behaviors exceeding stipulated role requirements, although they can ensure the minimal level of standards for role requirements. Based on the division of cooperative behavior into in-role behavior and extra-role behavior, this research proposed a novel point of view: contract can only promote the contractor’s in-role behavior, while it cannot promote extra-role behavior; extra-role behavior is driven in a great extent by informal governance means, thus it can be motivated by anticipated interaction. This is consistent with the study by Axelrod (2006) who argued that informal cooperation spontaneously arises under the conditions that parties perceive they will enter into a long-term contact with each other. This result is helpful for a deeper understanding of cooperative behavior and its antecedents.

Economic action embedded in social structure has caused debates about whether the effect of social relations on economic behavior is positive or negative (Uzzi 1997). Generally speaking, strong tie relationship is more favourable than weak tie relationship. Strong tie relationship can decrease the possibility of opportunistic behavior and invoke reciprocity. However, excess is just as bad as deficiency. Some scholars have suggested that when the bilateral relationship is too strong, contract will lose efficacy and cannot increase trust or decrease opportunism any more (Yang et al. 2011). Some scholars also mentioned that being embedded in the social network may insulate organizations from new information and chances, so the investment in developing relationships requires careful consideration (Uzzi 1997; Gargiulo and
Table 3. Descriptive statistics and Pearson correlation matrix

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In-role behavior</td>
<td>5.78</td>
<td>0.96</td>
<td>-0.813</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Extra-role behavior</td>
<td>5.2</td>
<td>1.26</td>
<td>0.584**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Contractual safeguarding</td>
<td>5.18</td>
<td>1.11</td>
<td>0.409**</td>
<td>0.283**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Anticipated interaction</td>
<td>5.71</td>
<td>1.11</td>
<td>0.432**</td>
<td>0.414**</td>
<td>0.296**</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Prior tie(^c)</td>
<td>28.06</td>
<td>166.76</td>
<td>0.268**</td>
<td>0.301**</td>
<td>0.029</td>
<td>0.236**</td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>6. Duration(^a)</td>
<td>1.51</td>
<td>0.59</td>
<td>0.017</td>
<td>0.037</td>
<td>0.043</td>
<td>-0.048</td>
<td>-0.021</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Price(^a)</td>
<td>2.37</td>
<td>1.16</td>
<td>-0.173*</td>
<td>-0.074</td>
<td>0.036</td>
<td>-0.139*</td>
<td>-0.023</td>
<td>0.580**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Owner performance(^b)</td>
<td>4.94</td>
<td>1.5</td>
<td>0.517**</td>
<td>0.456**</td>
<td>0.376**</td>
<td>0.315**</td>
<td>0.280**</td>
<td>-0.032</td>
<td>-0.1</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>9. Owner capacity(^a)</td>
<td>4.69</td>
<td>1.41</td>
<td>0.331**</td>
<td>0.298**</td>
<td>0.456**</td>
<td>0.333**</td>
<td>0.213**</td>
<td>0.004</td>
<td>-0.106</td>
<td>0.517**</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>10. Cooperative atmosphere(^a)</td>
<td>5.13</td>
<td>1.14</td>
<td>0.585**</td>
<td>0.495**</td>
<td>0.474**</td>
<td>0.474**</td>
<td>0.329**</td>
<td>-0.037</td>
<td>-0.016</td>
<td>0.548**</td>
<td>0.537**</td>
<td>-0.775</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>11. Switching cost(^a)</td>
<td>4.54</td>
<td>1.25</td>
<td>0.175*</td>
<td>0.208**</td>
<td>0.209**</td>
<td>0.144*</td>
<td>0.011</td>
<td>0.135</td>
<td>0.177*</td>
<td>0.272**</td>
<td>0.216**</td>
<td>0.189*</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>12. Strategic importance(^a)</td>
<td>5.84</td>
<td>1.23</td>
<td>0.398**</td>
<td>0.326**</td>
<td>0.236**</td>
<td>0.337**</td>
<td>0.226**</td>
<td>0.11</td>
<td>0.137</td>
<td>0.303**</td>
<td>0.305**</td>
<td>0.437**</td>
<td>0.257**</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note: \(N = 202\), \(^\ast p < 0.05\), \(^{\ast\ast} p < 0.01\);
The bold numbers in parenthesis on the diagonal are the square root of the AVE, not applicable (N/A) for \(^a\)excluded construct, \(^b\)single item construct and \(^c\)formative construct.

Table 4. Standardised coefficients of hierarchical regression analysis

<table>
<thead>
<tr>
<th></th>
<th>In-role behavior</th>
<th>Extra-role behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1a</td>
<td>Model 1b</td>
</tr>
<tr>
<td>Contractual safeguarding</td>
<td>0.15*</td>
<td></td>
</tr>
<tr>
<td>Anticipated interaction</td>
<td>0.14*</td>
<td></td>
</tr>
<tr>
<td>Prior tie</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipated interaction × Prior tie</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Owner performance</td>
<td>0.27***</td>
<td>0.24**</td>
</tr>
<tr>
<td>Cooperative atmosphere</td>
<td>0.34**</td>
<td>0.23**</td>
</tr>
<tr>
<td>Strategic importance</td>
<td>0.18**</td>
<td>0.16**</td>
</tr>
<tr>
<td>(F)</td>
<td>46.00**</td>
<td>31.41**</td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.41</td>
<td>0.45</td>
</tr>
<tr>
<td>(\Delta R^2)</td>
<td>0.41</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Note: \(N = 202\), \(^* p < 0.05\), \(^{**} p < 0.01\)

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Note: N = 202, *p < 0.05, **p < 0.01; The bold numbers in parenthesis on the diagonal are the square root of the AVE, not applicable (N/A) for a excluded construct, b single item construct and c formative construct.
Taking anticipated interaction and prior tie into consideration, the authors try to answer this question from these two aspects of social relationship. The authors consider that anticipated interaction has a positive effect on cooperative behavior and prior tie will weaken such effect. The former hypothesis is supported by the data while the latter one is not. There should be some other inference paths to explain the effect of prior tie. In later interviews with some Chinese contractors, the authors discovered that most construction projects are under the status of a buyer’s market in which the contractors are in fierce competition. Every contractor may receive impact from rivals in spite of satisfying completion of the previous projects. Thus, the probable reason for the non-significant moderating effect of prior tie may be that the contractor still need cement the relationship with the owner even they have prior tie.

This paper has certain illuminations on a further understanding of the economic and social attributes of individuals and organizations. The complexity of human nature is reflected by the fact that humans sometimes value short-term interest and seek personal interest at others’ expense, while they sometimes value long-term interest and behave cooperatively and reciprocally. There is no absolute integrity, selfishness, rationality or non-rationality, each of which is part of human nature and manifests in different circumstances. Certain action is expected in certain contexts. Such context may be culture, or embedded relations and relationship networks, etc. Different theories often give seemingly contradictory explanations to a same question in that they focus on different contexts. However, these explanations ought to be complementary rather than contrasting.

6.2 Managerial Implications

This paper implies that the owner should adopt different methods to promote the contractor’s different types of cooperative behavior in different situations. Katz (1964) has discussed the different effects of each motivational pattern on performance, leading to the conclusion that one motivational pattern may be effective in promoting a certain type of behavior but fail to change another. According to the empirical results of this research, if the owner wants to motivate the contractor to complete in-role tasks, then contractual arrangement needs to be improved and appropriate relational governance is also helpful. If the voluntary and spontaneous cooperative behavior beyond role stipulation is more important (instead of relying on contractual safeguarding), the wise choice is to motivate the contractor by embedded social relationship and mechanisms of reputation and trust.

7 LIMITATIONS AND FURTHER RESEARCH

There are several limitations of this research as well as directions for further research. First, each questionnaire only inquired about the perception of either the contractor or the owner. A refined research in the future should survey both sides in order to eliminate the bias caused by different positions in the dyad (Kashyap and Sivadas 2012). Second, the questionnaire includes the following two items simultaneously: “at the beginning of the project, the perceived possibility of repeated transaction between the owner and the contractor was high”, and “at the end of the project, the perceived possibility of repeated transaction between the owner and the contractor was high”. These two items were given different scores in 40.6 per cent of all the valid questionnaires, confirming that the process and result of the project could change participants’ expectation for future collaboration. This result is consistent with Hawke’s (1994) research that indicated the happenings in a project could reinforce or reduce the trust among the people involved. It brings about the enlightenment for further study that combination of case study is feasible to investigate the dynamic evolution of anticipated interaction through a project under the impact of contract execution, bilateral relationship, cooperative behavior and some other factors.

8 CONCLUSION

This research develops a conceptual model involving cooperative behavior motivated by contractual governance and relationship concern. Based on the two-dimensional definition of cooperative behavior, the authors start with contractual mechanism concerned by traditional economics, and find that contractual safeguarding can promote in-role behavior but is not consistent with extra-role behavior. Subsequently, the effect of social embeddedness is taken into account with a social perspective, which leads to the finding that anticipated interaction positively affects in-role and extra-role behavior. Thus, this research offers nuanced insight on the antecedents of cooperative behavior, verifies the differential effects of contractual safeguarding and anticipated interaction on different types of cooperative behavior, enriches the literature on contractual governance, relational governance and cooperation. Moreover, it has some reference values and practical significance for promotion of the contractor’s cooperative behavior in the construction industry.

REFERENCES


