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Abstract: Contractual and relationship governance mechanisms are complementary, so contract strategy in public construction projects is multi-dimensional and involves interaction between both mechanisms. The connotation and formation of contract strategy for public construction projects in China remain unclear. Based on field interviews of participants in such projects, and using grounded theory for interview report encoding, this paper builds three dimensions of contract strategy in such projects: contractor selection, contract strategy focus, and problem prevention methods. Eight contract strategies are identified through theoretical screening and further analysis for different project phrases and relationship types. Through theoretical analysis and literature review, this paper identifies two paths for optimizing contract strategy. First, contract theory can be extended to incorporate cooperation and coordination functions. Second, contract planning in the early stage of public construction projects in China can encourage public clients to view a contract as more than just a means of control, enhancing trust and cooperation, and achieving contract management of partnerships.

Keywords: Public construction project, contract strategy, relational governance, contractual governance, grounded theory

DOI: http://dx.doi.org/10.7492/IJAEC.2017.002

1 INTRODUCTION

From the perspective of embeddedness, contract strategy in public construction projects can be defined as a multi-dimensional profile construct comprising contractual and relationship governance and their dynamic interaction. Existing studies on project governance focus on the dual principal-agent relationship in construction projects and ignore the social network organization aspect. The introduction of embeddedness theory emphasizes the impact of social relations and social network on subject decision-making and behavior, which promotes the refinement and application of project governance theory. The mainstream literature and the practice of public projects also prove that relational governance based on trust and relational norms improves performance (Tan and Mu 2008; Caniëls et al. 2012). Contracts are naturally incomplete, even a very detailed contract cannot easily cover all possible future eventualities involving a project (Cao and Lumineau 2015). However, relational governance can significantly restrict opportunistic behaviors (Caniëls and Gelderman 2010). Therefore, contract strategy for public construction projects must consider the impact of relational governance on contract formulation and execution, including its support function.

The practice of public construction projects in China commonly emphasizes formal contractual governance, while avoiding or restricting relational governance (Ning and Ling 2013a). Several misunderstandings of the connotation of contract strategy exist. First, understanding of contract strategy in public construction projects remains static, yet the relationships among the involved parties and uncertainty in public construction projects are both dynamic and developing. Second, contract strategy fails to consider the complementary effects between relational and contractual governance in the contracting process from the embeddedness perspective. Improving project performance requires the combination of both relational and contractual governance (Tan and Mu 2008; Caniëls et al. 2012; Carson et al. 2006). The ideal is to realize an equilibrium between both governance types (Wang and Chen 2006). Therefore, several different combinations may exist. Furthermore, in research on knowledge sharing in collaborative R&D projects, Olander et al. (2010) showed that the relative importance of relational and contractual governance varied with collaboration phase.

Thus, the construct of contract strategy in public construction projects in China is incomplete, and the role of relational governance needs to be considered. First, we conduct exploratory analysis of the connotation of contract strategy to identify strategy types based on grounded theory. Second, from the perspective of context, we analyze the causes of contract strategy type, and define the external system and project environmental

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factors that affect the formation of combinations of relational and contractual governance. Finally, we clarify that contract strategy optimization requires promotion of the equilibrium of governance mechanisms in the process of contracting. Our findings are based on analysis of contract strategy in public construction projects in the Chinese context, and clarify that interaction between contractual and relational governance is associated with a dynamic and combinational contract strategy. These findings support the effective embeddedness and application of relational governance in contract strategy for public construction projects.

2 LITERATURE REVIEW

Practices in supply chains, PCP arrangements, industrial project procurement, family business governance and vertical transactions within industrial chains have shown that contractual and relational governance can coexist and their combination improves performance. Wuyts and Geyskens (2005) studied whether the appropriate configuration of contractual and relational governance can reduce opportunism, promote satisfaction, and enhance contextual performance. Roehrich and Lewis (2014) emphasized that the combination of contractual and relational governance in IS outsourcing, and found that equilibrium was reached in different project phases. Cao et al. (2013) led exploration and in-depth studies. Based on study of buyer-supplier R&D collaborative projects, Caniëls et al. (2012) found that relational governance only benefitted project performance when accompanied by contractual incentives and control systems. Accordingly, based on relative effect, four combinations of governance mechanisms exist: weak relational-weak contractual, weak relational-strong contractual, strong relational-strong contractual and strong relational-weak contractual.

Researchers also identified the dynamics of the complementary effects of contractual and relational governance. Poppo and Zenger (2002) confirmed the complementary relationship between contractual and relational governance, and noted that the complementary effect was dynamic. To verify the dynamics of complementary effect, scholars interested in R&D collaborative projects, as well as IS service and IT outsourcing have carried out in-depth studies. Based on study of buyer-supplier R&D collaborative projects, Olander et al. (2010) reported that the relative importance of contractual and relational governance varied in different project phases. Cao et al. (2013) led exploration of the equilibrium of contractual and relational governance in IT service outsourcing, and found that equilibrium was reached through a four-stage evolutionary process. The four stages are: relational governance → contractual governance → relational governance (flexible procedure) → equilibrium of governance. From a process perspective, Huber et al. (2013) revealed the dynamic and intertwined relationship of contractual and relational governance in IS outsourcing. The complementarity and substitution of governance mechanisms are better understood as temporal states than as stable properties, so the relationship between complementarity and substitution fluctuates.

In public projects, researchers pointed out that the two governance mechanisms had a complementary effect on project governance performance. Zheng et al. (2008) further confirmed the dynamic interaction between contractual and relational governance in PFI projects, with each mechanism following a different development path in the process of project implementation. In studying the impact of governance mechanism on construction project performance, it is found that the complementary effect between mechanisms resulted in a dynamic development process. Thus, the development trajectory of contractual and relational governance changes from one project phase to the next, providing strong empirical support for the dynamics of governance mechanisms.

Because only the coexistence of contractual and relational governance is effective in the management of public construction projects, we should coordinate governance mechanisms at different times rather than incorporating governance mechanisms in each dimension for separate application. Consequently, strategies that combine governance mechanisms are necessary. In public construction projects, government owners should consider the Chinese context in developing contract strategy, and should consider the complementary effect between mechanisms from the perspective of embeddedness and dynamics to perfect the contract strategy. Then, we need to clarify the state and specific indications shown by relational governance throughout the process of contracting, and promote the selection and application of governance mechanisms in contract strategy in public construction projects.

3 RESEARCH METHODOLOGY

3.1 Research Method

Grounded theory is a qualitative research method that emphasizes inductive analysis of data by open coding, axial coding, and selective coding, and that focuses on conceptual framework or theory formation. Little research exists on contract strategy in public construction projects in the Chinese context, and there is also a lack of related literature and theories. Thus, grounded theory is a rational choice in this study because it uses inductive analysis to refine basic theory on a field from practical data, builds and perfects the theoretical system.

Therefore, based on the Chinese context, this research investigated public construction projects in China using field interviews and questionnaires. Based on the investigation, we arranged project information captured in the form of interview reports. Based on analysis of the interview reports, we obtained client attitudes towards contractual and relational governance, as well as the interplay between the two governance mechanisms. Through analysis and using grounded theory, we built the formation model for contract strategy where a complementary effect between contractual and relational governance exists.

3.2 Research Design

In China, public construction projects are fixed-asset investment projects invested by state-owned funds (including state-owned enterprises). Accordingly, the Chinese public construction projects selected for investigation in this paper mainly comprise five urban infrastructure projects, including subway projects, new university campus construction projects and petrochemical projects. The research group follows three principles when determining project location: (1) high level of economic development and perfect industry regulation; (2) massive public investment and a large choice of projects; (3) previous cooperation with the research group (to facilitate data collection).
3.2.1 Interview Outline

Semi-structured in-depth interviews have three main purposes, as follows: first, to understand the relationship between clients and contractors in the existing market pattern of public construction projects macroscopically; second, to identify client’s attitudes towards the contract and cooperation among the parties; third, to recognize the development of the relationships between the clients and contractors in different phases. The interview questions are divided into three levels (Table 1).

3.2.2 Interviewee Selection

To ensure data accuracy, reliability and originality, the main means of data collection is a field interview supplemented by a questionnaire. The principles used to screen interviewees are as follows: (1) Effectiveness. The interviewees should have participated in contract planning and execution in public construction projects and be familiar with the process of contract drafting; (2) Representativeness. The interviewees should be familiar with actual contract execution and the difficulties in contract control; (3) Feasibility. Completion of the interview should be possible within time and budget constraints. The interviewees comprise clients and their representatives associated with government-invested public construction projects. Table 2 shows the basic information of interviewees.

3.2.3 Reliability and Validity

In the design of the interview, the screening of interviewees based on focus group ensures the accuracy and effectiveness of the interview results, as shown in Figure 1. We contacted the interviewees by e-mail and telephone, and introduced the aims and an interview outline. To win the trust of interviewees, we promised that the data would be used only for research purposes. To ensure the effectiveness of the interviews, we conducted internal training of the participating researchers. Each interview involved three individuals, the interviewee, the interviewer, and a third person responsible for recording the interview content. After each interview, researchers who had not participated in the interview organized the records to avoid subjective judgements affecting the results. We then let the interviewees check the summarized interview data to ensure accuracy. Finally, we finished the interview reports.

Research data are obtained from multiple sources, and the interviewees come from different departments and positions in different companies. The interviewees include organizational heads, departmental heads, contract department managers and clerks and general staff. After each interview, the interviewees need to complete a structured questionnaire that includes sections dealing with attitude to relationship, relational behavior and project performance. Additionally, the interviewees provide bidding documents and contracts on the typical completed project to be used for our research. Multi-angle and multi-source data satisfy the triangle test, thus ensuring the effectiveness of the research.

3.2.4 Theoretical Saturation

When the data are mined adequately and no new categories are identified, the theory will tend to be saturated. Testing for theoretical saturation is essential to ensure reliability. By analyzing 14 labels from four remaining interview reports, we find no new categories, and also find no supplement to the main categories. Therefore, we can ensure the credibility of the model built by grounded theory, and can also ensure the saturation and credibility of the theory. We select a total of 22 samples, which satisfies the condition that the test of theoretical saturation should use 20-30 samples (Fassinger 2005).

4 MODEL ESTABLISHMENT

Guided by grounded theory we followed three steps. The first step is open coding. In the encoding process, we extract the words of interviewees as labels to form the initial concepts, with 18 interview reports being used to build the model, while the remaining four are used to test the theoretical saturation. The second step is axial coding. This aims to filter out the main categories related to our research. By identifying the relationship and logic order between the concepts and categories, we cluster similar concepts and form a collection. By examining the 45 concepts and 12 categories and combining them with the background of public construction projects, we finally form three main categories and six subcategories of contract strategy from a project management perspective. Finally, the third step is selective coding. The purpose of selective coding is to find the main “clue” by researching the internal relations of the available information, then determining the core categories that can cover most of the research results to gradually improve the research framework. The researchers can choose one of the available categories or refine the existing categories, then abstract the core category. Given the content of this study, we define the core category as “contract strategy in public construction projects”.

Using this coding analysis based on grounded theory, we build three dimensions of contract strategy in public construction projects in the Chinese context: contractor selection, the focus of contract strategy and the method of problem prevention. The three dimensions correspond to the key nodes in the whole project process. The construction of contract strategy is immeasurable and abstract, and the dimensions are also invisible. Only the items used to measure the dimensions are observable indexes, and these indexes are used to guide the measurement of the relationship behaviors. We can then conclude the formation model of the contract strategy throughout the contracting process of public construction projects.

5 THE MODEL ANALYSIS

5.1 Impact of External Environment in Different Phases

The relative position of relational and contractual governance reflected in contract strategy varies in different phrases because external environment affects the interplay between relational and contractual governance in projects.

5.1.1 Consideration of Relational Governance Constrained by the Bidding System in the Bidding Phrase

One characteristic of the reform of the implementation method of public construction projects in China is to introduce competition, build a bidding system, and replace administrative management with contractual management. In Figure 2, a11a21a31,
Table 1. The set of interview questions

<table>
<thead>
<tr>
<th>Level</th>
<th>Specific question</th>
<th>Setting instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Does your company tend to adopt strict and detailed contract to ensure the execution or just to appoint something in principle so that the later execution can be flexible? What is the reason?</td>
<td>To preliminarily understand the contract strategy of the clients to provide the basic idea for the follow-up interview</td>
</tr>
<tr>
<td>Level 2</td>
<td>(1) Has your company ever considered the impact of prior and current cooperation on future cooperation under the bidding system? (2) What is the main basis for solving the adjusting events in the execution phase? When faced with the events in absence of an agreement which involve a huge amount of money and the difficult division of responsibility, will you make a compromise for the consideration of future cooperation?</td>
<td>To guide the interviewees to state according to interview ideas to thoroughly understand the clients’ attitude towards relational embeddedness</td>
</tr>
<tr>
<td>Level 3</td>
<td>Has your organization ever taken part in some harmonious projects? What is the reason for good cooperation in your opinion? Is there any innovation in the projects?</td>
<td>To ask the clients to supplement interview content on under the precondition of basic understanding</td>
</tr>
</tbody>
</table>

Table 2. Basic information of interviewees

<table>
<thead>
<tr>
<th>Items</th>
<th>Amounts</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project types</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial project</td>
<td>13</td>
<td>59.10%</td>
</tr>
<tr>
<td>Civil project</td>
<td>9</td>
<td>40.90%</td>
</tr>
<tr>
<td>Work post</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head of the company</td>
<td>4</td>
<td>18.18%</td>
</tr>
<tr>
<td>Head of the department</td>
<td>6</td>
<td>27.27%</td>
</tr>
<tr>
<td>Clerk of contract department</td>
<td>7</td>
<td>31.82%</td>
</tr>
<tr>
<td>General staff</td>
<td>5</td>
<td>22.73%</td>
</tr>
<tr>
<td>Education background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PhD</td>
<td>6</td>
<td>27.27%</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>8</td>
<td>36.36%</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>5</td>
<td>22.73%</td>
</tr>
<tr>
<td>Junior college and others</td>
<td>3</td>
<td>13.64%</td>
</tr>
<tr>
<td>The experience for public projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 3 years</td>
<td>4</td>
<td>18.18%</td>
</tr>
<tr>
<td>3 - 5 years</td>
<td>6</td>
<td>27.27%</td>
</tr>
<tr>
<td>6 - 10 years</td>
<td>7</td>
<td>31.82%</td>
</tr>
<tr>
<td>More than 10 years</td>
<td>5</td>
<td>22.73%</td>
</tr>
</tbody>
</table>

Figure 1. The screening process of interviewees based on focus group

Open tendering makes it impossible for both sides to maintain cooperative relationships (Ling et al. 2013). Additionally, public accountability, value for money, transparency (open, equitable and fair competition), propriety/integrity/probity, and confidentiality impede contractors bidding for public construction projects from gaining competitive advantage through social networks, and the indifference of public clients reduces the enthusiasm of contractors and consultants (Ning 2014).
5.1.2 The Inability to Innovate for Public Clients
Restricts the Use of a Win-win Strategy in the Contracting Phases of Public Construction Projects

The “laziness” of public clients leads to their not choosing the most reasonable procurement route according to the best engineering practice (Lædre et al. 2006). From the field interviews, some clients may ignore the characteristics of a new project, and simply directly select the previously used contract. For example, in Figure 2, the four contract strategies a11a21a31, a11a21a32, a12a21a31 and a12a21a32 usually do not consider the incentive terms for risk allocation, and only pay attention to client interests. This can be attributed mainly to two factors. First, public clients are subject to rules and regulations, and cannot innovate and quickly change because standing orders, public accountability and probity constraints restrict their innovation (Palaneeswaran and Kumaraswamy 2000). The rigid organizational boundaries of public clients lead to well-defined jurisdictions, responsibilities, and a hierarchy of authority. Such traditional bureaucratic systems hinder effective cooperation between organizations. The copious rules and regulations involved in public projects create large obstacles to the adoption of relational behavior, so that public clients become likely to adopt formal controlling methods (Ning and Ling 2013b). Second, public clients are restrained by beliefs like “there is no need to change current approaches/practices that are good enough (or even better than others)”, or may see the manifestation of a “not invented here” syndrome that favors locally invented approaches/practices (Palaneeswaran and Kumaraswamy 2000). Clients that are too dependent on strict procedures cannot cope with contract change and deviation. In engineering practice, the habits of public clients lead them to tend to choose the previously used procurement route rather than considering the procurement route most suitable for the project.

5.1.3 Due to a Lack of Client Commitment, Problem Prevention is More Dependent on Formal Institutions in the Execution Phase

The loss of government commitment decreases long-term cooperation, leads to opportunistic behaviors becoming the dominant strategy for contractors (Yin et al. 2014), and forces clients to respond with strict regulation and control measures, as in strategies a11a21a31, a11a22a31, a12a21a31, and a12a22a31. Because of the lack of long-term effective and institutional regulations and constraints on government, government agents can either commit blindly or make no commitment in the pursuit of their own interests. This eventually leads to the absence of effective institutional commitment, and hence a lack of government commitment. In infrastructure concessionary projects, changes in government, the self-interest of government, consumer pressure, a lack of professional assessment, inadequacy of related laws and regulations and uncertainty surrounding concession projects can all cause a lack of long-term government commitment (Chen and Liu 2015). Public clients represent public and national interests, and causal commitment may cause a loss of interest. During the interviews, clients’ attitudes towards long-term commitment were usually neutral or opposed. The clients were worried about the long-term commitment to contractors involved in corruption, were afraid of being held accountable, and were concerned with the loss of their own interests.
5.2 The Impact of Relationship Type on Projects

5.2.1 The Contract Strategy under the “Non-contract” Partnership Focuses on Increasing Relational Governance in the Execution Phase

The “non-contract” partnership introduces the idea of partnership to improve existing project management, as in strategies a11a2132, a11a22a32, a12a21a32, a12a22a32. In this type of partnership, public clients follow open tendering, but consider harmonious relationships between project participants in the process of engineering project management. In some interviews, the clients require the contract to be strict as far as possible, and that the contract terms reflect their own requirements and previous experience related to engineering practice. However, the clients’ attitude towards the contract changes from simply seeking to protect their own interests to also considering cooperative relationships. In the process of implementation, the clients strengthen communication and coordination, and assist contractors in relation to procedures and systems, to ensure work progresses smoothly. The clients measure project content through subordinate departments to understand actual costs and give contractors reasonable compensation, as in strategy a11a22a32.

5.2.2 The Contract Strategy on the Design of the Incentive Mechanism in the Contracting Phase

In the “contract” partnership, the clients adopt a partnership contract directly compiled according to the idea of partnership for engineering project management. In Figure 2, the clients revise the partnership contract based on consideration of the project characteristics in the contracting phase under strategy a12a22a32. The partnership contract sets out the framework of positive cooperation and collaboration among project participants in the execution phase. This strategy can effectively use the resources of project participants, and avoid disputes caused by unnecessary loss, so as to improve the interests of all parties and the efficiency of project delivery. Quality management and safety management systems are particularly strict in the petroleum and petrochemical industry. Hence requirements related to company strength, quality, and security system are high, as are those related to contractor ability. Therefore, prior cooperation experience is particularly important for clients when selecting contractors. Suitable contractors should be familiar with the requirements of the management system in the petroleum and petrochemical industry, and both sides should be able to establish mutual trust, tacit understanding and a smooth working relationship. Since contractors are professionals involved in dangerous operations, clients should not manage them too strictly. As long as contractors deliver the project smoothly, the clients tend to develop a good partnership with those contractors, bound within a reasonable scope.

6 DISCUSSION AND SUGGESTIONS

6.1 Suggestions for Management

This study will help to change the traditional concept where-by the contractor treats the contract as a legal document and method of control, and will also help strengthen the understanding and attention of owners with regard to the contract coordination function. Only in this way can the improvement of project performance be maximized. This study thus hopes to provide a theoretical basis and guidance for project pre-contract planning.

6.1.1 Improving the Multi-dimensional Function of the Contract, and Promoting the Embeddedness of Relational Governance Elements in the Process of Contract Execution

Although a contract is a legal document that defines the rights and obligations of signatory parties, the latest research on contract theory has considered contracts as combining the functions of control, coordination, and adaptation (Malhotra and Lamineau 2011).

The focus of contract strategy should be to improve contract coordination and adaptation functions, add a risk-allocation scheme and incentive clause, and provide an ex-post processing mechanism for contract execution. Contract coordination can better adapt to the actual situation of a project and create a good atmosphere for cooperation. As an important complement to the controllability terms in a contract, contract coordination can improve contract flexibility and further decrease the space for opportunistic behavior. Because the government emphasizes its own interests, it is difficult to obtain commitment from contractors. Therefore, it is necessary to strengthen default clauses to better enable clients to commit (Chen and Liu 2015). This can enhance contractors’ perceptions of fairness and promote mutual trust and cooperation.

Emphasizing explicit contract terms and clear roles and responsibilities can make clients pay more attention to reasonable risk allocation and risk compensation. This promotes mutual trust and cooperation, and so provides conditions for the embeddedness of relational governance, and promotes governance mechanisms that can help reach an equilibrium.

6.1.2 Improving Relational Governance based on Trust and Cooperation, and Realizing Contract Management of Partnerships

Rational selection of agents in public construction projects is not sufficient. Contract terms are not set purely based on considerations of economic interest, but also designed to create cooperative organizations (Turner and Simister 2001). Therefore, it is necessary to consider support for realizing contract goals and how relational governance mechanisms can restrict opportunistic behavior (Camiëls and Gelderman 2010). Clients can improve contractual governance by strengthening relational governance. Specifically, clients hope to restrain opportunistic behavior by strengthening relational governance to increase trust, promote risk allocation, and create a friendly atmosphere conducive to problem resolution. Clients highly value previous cooperation experience, tend to sign win-win contracts, and encourage contractor performance by using coordination, such as working together to solve problems. In highly specialized public construction projects, clients often add requirements such as prior cooperation experience when selecting contractors. Clients thus can seek familiarity with contractors to ensure projects will be carried out smoothly. This can decrease uncertainty of contractors’ behavior and decrease the dependence of owners on contracts. Clients can also ensure friendly cooperation by improving mutual trust and interorganizational management. During cooperation, both sides will pay attention to achieving a win-win outcome.
Project success relies on the establishment of cooperation. Although contractual governance is the core of project management, smooth project implementation is based on the formal contract (Rahman and Kumaraswamy 2002). Trust becomes more effective when combined with a contractual mechanism. Improving trust and cooperation between clients and contractors facilitates the formation of good partnerships. A partnership functions best when both sides exercise self-restraint to facilitate smooth project progress. However, if either side fails to exercise restraint or pursues disputes, contracts will play a restrictive role.

6.2 Limitations and Future Research

This study contributes to the research on contract strategy on public construction projects in China from the perspective of embeddedness. Our results clarify the connotation of contract strategy in public construction projects in China, namely that it is a profile construct comprising contractual governance, relational governance and the dynamic interplay between them. The relationship types and external system environment in the contracting process influence types of contract strategy. The optimal objective of contract strategy is to promote the equilibrium between contractual and relational governance and enhance project management performance. Future research should be conducted on the following three aspects: (1) discussion of the moderating role of the external system environment on the interplay between contractual and relational governance; (2) the specific impact path of contract strategy on project management performance; (3) cross-level research on relational behavior in contract strategy in public construction projects.

REFERENCES


