Research on Contractor’s Fairness Concerns in Construction Projects

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Abstract: A change in construction contractual status might trigger the contractual reference point effect, thereby influencing contractors’ perceptions of psychological fairness and ultimately their performance. Contract clauses that affect the claimed interests of contractors constitute the foundation for contractor fairness concerns. This will be considered as the basis for contractual reference point research. Through a two-stage content analysis, this study encoded clauses of typical subway construction contracts, and identified seven fairness concerns that can influence a contractor’s perceptions of fairness. In addition, by analyzing the reference point effect with actual amended contracts, this study verified elements of fairness in contract clauses that might affect a contractor’s behavior. The results show that clauses of risk responsibility, risk compensation, and risk return can influence a contractor’s perception of distributive justice. The role of contractors in decision making in the contractual process can influence their perceptions of procedural justice. Clauses regarding two-way communication ensure that a contractor is informed, and can influence interactional justice. This research provides theoretical guidance for employers to develop appropriate contractual incentive strategies.

Keywords: Construction contract, reference point effect, fairness concerns, contract clauses, content analysis

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1 INTRODUCTION

Chinese academics in the field of project management and project managers themselves have long been pursuing both contracts and credibility, namely the realization of the goal of the contract. Because construction contracts are often incomplete and long term, it is inevitable that they will undergo some amendments (Ke et al. 2014). Furthermore, a contractor is certain to compare the difference between the initial contract and the amended contract, implementing corresponding performance strategies (Fehr et al. 2009). This will often result in performance problems. To solve the problem of the ex-post efficiency of long-term contracts, Hart (2008) proposed the contract reference point theory, dividing project performance into literal performances and perfect performances. Thus, it provides a measure for the psychological feelings of both transaction sides. If behavioral agents deserve the rights specified in the contract or to be treated fairly, they will provide perfect performance behavior (Xu 2012; Nie 2008). Based on the theory of contract reference point, it is important to understand how to encourage contractors to perceive the contract as fair, thereby providing a quality performance. Such behavior is objective in nature, and is difficult to confirm. This is the key to solving the ex-post performance problem (Hart 2008).

From the perspective of fairness preference, the formation of fairness perceptions depends on the comparison between the perception result and the reference point based on fairness concerns (Li et al. 2010; Li et al. 2013). When the perception result of behavioral agents goes beyond the negative psychological threshold, they will produce a negative psychological sense, and most likely engage in opportunistic behavior for psychological balance in the execution of the contract process (He and Bai 1997; Xu and Tan 2014). In contrast, when the perception result is close to the threshold of the positive perception result, the contractor will display a positive attitude and behavior (Hart 2007; Fehr et al. 2015). Therefore, contractor fairness concerns regarding construction contracts play a cornerstone role, and reveal that a contractor’s fairness perceptions influence performance.

In view of the above, this research is based on the
theory of the contract reference point, studies a sample of five typical urban subway construction contracts, and uses content analysis to identify fairness concerns that can induce psychological feelings of equity in contractors. Thus, a comparison with existing data in the literature is used to demonstrate and explain the contract characteristics of fairness concerns. This research will provide theoretical guidance for employers to develop a contractual incentive strategy that will induce positive contractor performances.

2 LITERATURE REVIEW

2.1 Research Limitations and Introduction

In the practice and theoretical research of construction projects, the establishment of incentive and constraint mechanisms is important to solve the agency problem. In this way, the contractor is encouraged to give a positive performance. Incentive mechanisms emerged in previous studies based on hypotheses concerning postmortem contracts, forming a contract governance mechanism with risk sharing at its core (Ke et al. 2014; Yin et al. 2015). However, employers’ bounded rationality means that they cannot fully know the possible risk factors, and the contract is only part of the ultimate contract process (Jiang and Fei 2008). A contract with risk sharing requires a preset adjustment mechanism to be used at a later date. Therefore, once a contractor attempts to require future adjustment using loopholes in the contract, the employer will be restricted by the risk, representing a new source of agency problems (Shi and Li 2014). Recent studies found that both sides of large complex projects form relationship behaviors with trust, cooperation, and commitment by introducing relationship governance mechanisms (Fehr and Schmidt 1999; Hart 2008) that can effectively restrain an agent’s opportunistic behavior, thus resolving the agency problem.

However, the above incentive studies based on contract governance and relationship governance do not fully reveal the factors and mechanisms that promote the positive performance of contractors. Thus, behavioral research is required to embed behavior theory analysis in incentive theory (Yan and Yang 2016), and to analyze the transaction behavior mechanism of both employers and contractors.

The field of construction project management has investigated the contract reference point theory, and found that there is a reference point effect when a contract’s status is significantly changed (Wu et al. 2012). When this happens, fairness becomes an important psychological variable. For example, Lu et al. (2014) demonstrated that fairness is an important factor in the benefit distribution mechanism of general contracts. Furthermore, Du et al. (2014) discussed the influence of initial trust on cooperation regarding fairness perception as an intervening variable. Thus, the contractor is willing to choose to engage in a perfect performance, but this depends on whether they perceive the desired right to be fair.

2.2 The Influence of Fairness Perceptions

The objective function of behavioral agents is not simply to pursue the maximization of interests, but more to show their fairness preference, and then pursue a satisfactory solution (Ho and Zhang 2008; Dong 2011). Treating contracts as reference points, perceptions of fairness have an important influence on the choice of the contractor’s performance strategy (Xu 2012; Dong 2011; Pu and Jin 2015). Under the guidance of research logic, studies on construction projects found that fairness perception is an important psychological variable, and has a considerable influence on the behavior of construction contractors and project managers (Li et al. 2013). Moreover, existing research referenced the division of the dimensions of fairness theory, deconstructed dimensions of fairness perception, and concluded that the contractor also holds fairness perceptions regarding procedural justice (Du et al. 2014, 2016).

The formation of a contractor’s perception of psychological fairness is a subjective judgment process that depends on the choice of reference point. The contract provides the rights of the contract parties, and is an important reference point. First of all, the protection of the contractor’s own rights and responsibilities is embodied in the settlement of the contract price (Jin and Zhang 2012; Yin et al. 2014). Clauses that influence the determination, adjustment, and realization of contract price are judgment benchmarks, ensuring, at their core, that the interests of the contractor are treated fairly. Second, contract procedural provisions on payment, settlement, change, visas, claims, and contract price adjustment are important arrangements that ensure the rights and interests of the parties are achieved (Aibinu et al. 2008; Yan and Wu 2014; Yan et al. 2010). When the procedure lacks fairness, the degree of positivity with people’s attitudes and behavior will be affected by the result. In adverse circumstances, procedural fairness has significant effects on attitudes and behavior (Brockner and Wiesenfeld 1996). Finally, a contract has a cooperative and harmonious function. The purpose of the contract is to appropriately assign project risk and management responsibility (Weber and Mayer 2011; Malhotra and Lumineau 2011; Fischer et al. 2011). Contracts not only establish control clauses, but also flexible clauses outlining the institutional arrangements of ex-post adjustments (Shi and Li 2014). Therefore, a large number of scholars have studied interactive clauses regarding the handling of disputes, emergency responses, and early warnings. Interactive justice will significantly positively affect, for example, an employee’s job performance and job satisfaction (Wu et al. 2012).

In summary, construction project contracts are used as reference points, comparing the fairness reference point with contractors’ fairness preferences. The contract as a reference point means that contractors’ fairness perceptions affect their choice of behavior. Therefore, this study refers to the fairness reference point of construction contractors on the basis of three fairness dimensions: distributive justice, procedural justice, and interactive justice.
Table 1. Content analysis units of typical subway construction contracts

<table>
<thead>
<tr>
<th>Typical project</th>
<th>Project A</th>
<th>Project B</th>
<th>Project C</th>
<th>Project D</th>
<th>Project E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract mode</td>
<td>Total contract construction</td>
<td>Total contract construction</td>
<td>Total contract construction</td>
<td>Total contract construction</td>
<td>BT</td>
</tr>
<tr>
<td>Contract clauses</td>
<td>326 item</td>
<td>278 item</td>
<td>413 item</td>
<td>378 item</td>
<td>233 item</td>
</tr>
<tr>
<td>Content analysis units</td>
<td>195 item</td>
<td>159 item</td>
<td>261 item</td>
<td>223 item</td>
<td>144 item</td>
</tr>
</tbody>
</table>

Table 2. Design of semi-structured interview questions

<table>
<thead>
<tr>
<th>Hierarchical design</th>
<th>Description of interview questions</th>
<th>The purpose of hierarchical design</th>
<th>The extraction of qualitative data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situational context</td>
<td>1. What is the main job of analyzing the tender document of your company in the project bidding? 2. What is your company focus on the review of contract conditions? What are the most common problems?</td>
<td>Enable the interviewees to understand the interviewer’s interest in this interview and gradually into the state of questions and answers</td>
<td>Contractors’ concerns about the object in contract review</td>
</tr>
<tr>
<td>Core issues</td>
<td>3. In your opinion, which aspects of project when undertaking the project should pay attention most? 4. In your opinion, what are the most important clauses of construction contract? 5. According to your experience, which one is the most pleasant cooperation with employer? Why?</td>
<td>Specific understanding of contractor’s fairness concerns</td>
<td>In order to obtain fairness concerns of contractor</td>
</tr>
<tr>
<td>Depth description</td>
<td>According to your experience, what is the most unfair project to be treated? Why?</td>
<td>Reverse the situation, from another side to understand fairness concerns of contractor</td>
<td>In order to obtain fairness concerns of contractor</td>
</tr>
</tbody>
</table>

3 RESEARCH METHODS AND PROCEDURES

3.1 Research Methods

There is little research on fairness in the field of domestic construction contracts (Du et al. 2014). Thus, a framework detailing contractor fairness concerns has not yet been designed. Existing research results do not provide a reference, with the recognition and determination of contractor fairness concerns belonging to typical exploratory research. The study of the fairness concerns of contractors in construction projects focuses on the clauses of the initial contract, analyzing the relevant text in depth, which logic conforms to the basic research pattern of content analysis. Hence, in this study, content analysis aims to identify the contractor’s fairness concerns in relation to the contract and then build a conceptual framework model of contractor fairness concerns.

3.2 Research Procedures

3.2.1 Sample Selection and Data Collection

To ensure objectivity and sound research, the selected sample contracts are limited to the following characteristics: they must be of similar project size, investment subject, and contract mode. Thus, the interference of project characteristic differences is excluded to clarify the fairness concerns of contractors. Considering the change of contract status focused on large and complex projects, a contractor with a fairness preference will pay more attention to the fairness of contract clauses, and choose an appropriate performance strategy. This research focuses on the characteristics of investment subjects and the similarities of contract modes. Using a database of public infrastructure construction projects (from previous research) five different subway contracts are selected via purposive sampling (Zhou 2014): project A, project B, project C, project D, and project E.

The subway contracts are analyzed to determine whether they contain standard fairness clauses. Below are the three criteria that represent the fairness concerns and therefore fairness perceptions of contractors: (1) the contract clauses comprise the allocation of risk responsibility; (2) the contract clauses comprise project changes and price adjustments; and (3) the contract clauses comprise the allocation of the control rights of participating parties in project management. By screening the contract fairness clauses, the following content analysis units are obtained as shown in Table 1.

Based on a content analysis of sample selection diversity, relevant supplementary information was obtained through semi-structured interviews. The selected subjects came from various regions: four from north China, three from east China, two from central China, three from southern China, and two from southwest China. The subjects have more than three years experience in subway project contract management. The design of the semi-structured interview questions gives full consideration to the characteristics of the hierarchical structure of contractor fairness concerns. This is done via a situational method that gradually guides subjects to the core problem, as shown in Table 2.
Table 3. Example of exploratory content analysis coding

<table>
<thead>
<tr>
<th>Source of coding</th>
<th>Coding unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement request of employer in clause 9.1.2 of project A contract</td>
<td>If the specification, quantity and quality of equipment provided by employer does not meet the requirements of contract or commitment date of delivery delay, resulting in contractor milestone schedule delays over 28 days, increased costs and reasonable profit losses are born by employer, contractor has the right to claim according to the provisions of clause 20.3. Due to the problem of equipment supply caused by the design of employer, according to the management responsibilities of contract parties, responsibilities of contractor is not included in the scope of the claims. After the arrival of equipments that provided by employer in accordance with the plan requirements, contractor cannot refuse to inspect and receive, if the losses are caused, employer has the right to claim against contractor in accordance with the clause 20.3.</td>
</tr>
<tr>
<td></td>
<td>Fairness perception characteristic elements of materials and equipments procurement - employer supply delay, division of responsibilities, claim compensation</td>
</tr>
</tbody>
</table>

Table 4. Example of structural content analysis coding

<table>
<thead>
<tr>
<th>Source of coding</th>
<th>Coding unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milestone schedule delay in clause 11.1.2 of project D contract</td>
<td>In the project implementation process, if milestone schedule delay, contractor shall pay the time delay compensation to employer, this does not relieve the obligations of contractor to finish the project obligations, and other duties, obligations or duties in contract. Over the Milestone Schedule for 15 days give a yellow card warning, more than 15 days later, a fine of 200000 CNY per day. When affect the milestone schedule of the test-run period, the compensation criteria are as follows. 1) Delay not more than 30 days, to pay 150000 CNY per day. 2) Delay more than 30 days, to pay 300000 CNY per day.</td>
</tr>
<tr>
<td></td>
<td>Distributive fairness - risk compensation equivalence - loss compensation - default compensation</td>
</tr>
<tr>
<td></td>
<td>Fairness concern of project delay - loss compensation</td>
</tr>
</tbody>
</table>

3.2.2 Category Construction

To improve the reliability of the coding (Liu et al. 2013), this research used a two-stage method for category construction, exploratory content analysis, and structural content analysis. In the exploratory content analysis, based on the research purpose, 354 analysis units concerning project A and project B were broken up and regrouped as units in light of the three dimensions of contractor fairness concerns. Five research assistants coded independently, creating the detailed categories of the characteristic elements of contractor fairness concerns. Five research assistants coded independently, creating the detailed categories of the characteristic elements of contractor fairness concerns in project contracts by exploratory content analysis, and compiling a code table. An example of the exploratory content analysis code is shown in Table 3.

To ensure exhaustive and exclusive category constructs, similar original constructs were combined in exploratory content analysis. For example, “responsibility division” and “responsibility confirmation” both mean responsibility confirmation regarding the contract event, and therefore are defined as “responsibility confirmation”. Based on the above, 354 analysis units produced 487 original constructs, and obtained 319 initial constructs after the merger. After an extensive merger process and several rounds of hierarchical analysis of the 319 initial constructs, and the exploratory content analysis code table shows four categories and 72 items, including three first-order categories (e.g., distributive justice), seven second-order categories (e.g., risk return equivalence), 21 third-order categories (e.g., contract price adjustment), and 41 fourth-order categories (e.g., price fluctuation). After coding, it is found that the number of new constructs gradually approaches 0, and meets the requirement of theoretical saturation.

Before the start of the structural content analysis, two experts in the field of project contract management were invited to examine and amend the independent and mutually exclusive units, ensuring independent mutual exclusion and other coding principles. On this basis, a coding group was established, and referring to the coding table obtained from the exploratory content analysis, the group conducted a structural content analysis of the 628 analytical units in the contracts of project C, project D, and project E. The structural analysis code table was obtained using the top-down classification method, which differs from the bottom-up classification process of exploratory content analysis. An example of the structural content analysis code is shown in Table 4.

3.3 Reliability and Validity Test

Because multiple coding was used in the structural content analysis, the target of the coding group was to ensure the consistency of the coding results (this would test the interaction reliability among coders) to guarantee reliable results. In this paper, the authors used the formula of the average mutual agreement of the code, and then tested the consistency among coders (Holsti 1969). The results show that the mutual reliability R...
value of the three-level category of contractor fairness concerns is above 0.85, as shown in Table 5. According to the principle of coding reliability analysis (Rourke and Anderson 2003), the coding reliability of the structural content analysis is good, and consistent with the test standard of content analysis reliability.

In terms of validity, this research guarantees the following aspects. First of all, coders underwent unified training before starting coding work, and worked to eliminate low reliability, non-significant items in the process of exploratory coding. Thus, this would ensure that content analysis has high validity. Second, it aims to improve the reliability of the coding by way of structural content analysis and to ensure the validity of the coding result. Therefore, the content analysis of contractor fairness concerns has a high level of content validity.

4 DIMENSIONS AND STATUS ANALYSIS OF FAIRNESS CONCERNS OF CONSTRUCTION PROJECT CONTRACTORS

4.1 The Dimensions of Contractor Fairness Concerns

This research obtained the initial category structure and code table of the fairness concerns of construction project contractors by exploratory content analysis, and then used structural content analysis and tests of reliability and validity for any adjustments. Finally, the code table confirmed four category levels and within those, 68 categories of the construction project contractor. The code table contains three first-order categories, seven second-order categories, 19 third-order categories, and 39 fourth-order categories. Therefore, the fairness concerns of project contractors demonstrate a multi-dimensional structure. A model of the fairness concerns of construction project contractors is shown in Figure 1.

The code table (covering four category levels) clearly identifies the various characteristics of the elements of fairness perceptions of construction contracts. Specifically, the first-order category represents the classification of fairness concerns, and the second-order category the content of fairness concerns. The third-order category denotes the elements of fairness concerns and the fourth-order category is the refined characterization of the third-order category.

4.2 Distributive Justice at the Core of Contractor Fairness Concerns

Regarding distributive justice, the relative proportions of risk responsibility equivalence, risk revenue equivalence, and risk compensation equivalence are 28%, 33%, and 39% respectively. The first two have relatively similar proportions, while risk compensation equivalence the highest. The absolute proportions for the three factors are 19%, 16%, and 21%. The sum of the absolute proportions is higher than the absolute proportion of both distributive justice and interactive justice.

This means that distributive justice based on risk responsibility equivalence, risk revenue equivalence, and risk compensation equivalence is at the core of the fairness concerns of contractors.

Risk liability equivalence as a contractor fairness concern, is where contract parties pay attention to the result of risk distribution, including clauses of risk sharing and disclaimer. For example, Hayford and Partner (2006) believed that the key to achieving the maximum driver of “value for money” is risk transfer in public-private partnership (PPP) projects. Namely, the project risk is transferred reasonably to the private sector party who can better control the risk to obtain a high-quality infrastructure at a lower price. However, Loosemore and McCarthy (2008) believed that the harmony, effect,
and efficiency of a construction project depend on the effective risk sharing in the contract. Hence, risk liability equivalence not only relates to the profit of contract parties, but is also a key factor in a project’s success.

Risk revenue equivalence is an important element of the fairness concerns of the contracting parties, as it emphasizes the equivalence between risk and its corresponding revenue. Thus, there is a large body of literature discussing this point. Zhang and He (2003) proposed the principle of risk sharing, in that the party who gains the largest economic interest should bear the risk. This principle is reflected the equivalence idea of “liability and revenue”. Lam et al. (2007) also proposed the principle that the risk should match the benefit. Liu and Wang (2006) suggested that regarding risk distribution in PPP projects, both the public and private sectors should negotiate the issues via a win-win approach. In this way, the level of risk will match the reward. Therefore, the risk revenue equivalence of the distributive justice dimension is another fairness concern of the contractor. Regarding specific contract clauses, it mainly includes price adjustments and valuation changes.

4.3 Procedural Justice and Interactive Justice are Key Supports of Distributive Justice for Contractors

4.3.1 Procedural Justice Provides a System Guarantee for Distributive Justice

Regarding procedural justice, the relative proportion of participation rights equivalence is 60% and rights restriction equivalence is 40%. Furthermore, the absolute proportion of participation rights equivalence and rights restriction equivalence are 13% and 10%, respectively. The results of the longitudinal comparison show that the weight for two fairness concerns elements of procedural justice is lower than the relative elements in the dimension of distributive justice. However, participation rights equivalence and rights restriction equivalence provide an important system guarantee for the distributive justice of contracting parties. This means that the elaboration of construction contracts will be constrained by specific game rules. That is, forming system environment of project contracts via the constraint of artificial designing to model the specific interaction of contract parties in project contract (Du et al. 2016; Turner and Simister 2001). Based on the research paradigm of new system economics, the system exists both unofficially and officially. The procedural justice dimension places a greater emphasis on the official system.

The elaboration of the project contract is a dynamic game procedure of the parties based on the specific system environment discussing the concerns of the contract clauses. Thus, contracting parties have the same participation rights in decision making concerning the elaboration of contracts. These rights include the right to give feedback and to participate in decisions. In light of the right to give feedback, the modifiable rule is one of the basic rules of procedural justice theory (Thibaut and Walker 1975; Gergen 2012). It gives the contractor the right to raise any concerns during the decision procedure. Therefore, before the employer makes a decision, the contractor has the right to express his own opinions. Furthermore, people desire fairness because it can obtain long-term favorable outcomes. If all parties are given a “voice”, it is more likely that a procedure will be considered fair (Lind and Tyler 1988).

Similarly, in the elaboration process of a project contract, the restriction of the rights of the contracting
5 CONCLUSIONS AND IMPLICATIONS

5.1 Conclusions

According to Hart’s contract reference point theory, in a contract signed by construction project parties, the provisions will induce feelings of fairness in the contractor and will be a reference point for fairness concerns. This study analyzed a sample of typical domestic subway project contracts, investigating the content of provisions that stimulated the formation of contractors’ perceptions of fairness. The analysis revealed that contractor fairness concerns consist of three dimensions: distributive justice, procedural justice, and interactive justice.

1. Concerns regarding distribution justice include three aspects: risk responsibility equivalence, risk return equivalence, and risk compensation equivalence. These aspects can be found in provisions of risk sharing, price adjustment, revenue sharing, and loss compensation. Distributive justice is at the core of a contractor’s fairness concerns, and determines the contract risk responsibility of the contractors and the final benefit of corresponding compensation.

2. Concerns regarding procedural justice focus on two aspects: participation right equivalence and power constraint equivalence. These aspects can be expressed further as the right to give feedback, the right to participate in decisions, and the unilateral limitation of rights. Procedural justice provides an institutional guarantee for distribution justice, and also sets the dynamic game rules for the two parties to fulfill the contract.

3. Concerns regarding interactive justice include two aspects: bi-directional communication equivalence and coordination equivalence. These aspects can be expressed as the provisions of information sharing, dispute handling, and cooperation. Interactive justice provides the foundation for cooperation and taking a win-win approach. It is also an important supplement to procedural justice.

5.2 Implications

The terms of a contract should give full consideration to the above to improve contractors’ perceptions of fairness and motivate good performances. Therefore, based on the results of this research, the following recommendations are made:

1. “Sincere” risk allocation and risk return. Risk allocation and risk return in a construction project contact emphasize the rationality of risk distribution and the correspondence between benefits and risks. “Sincere” risk allocation and risk return emphasize fair pattern formation between benefits and risks. Therefore, developers should provide the corresponding returns when risks are transferred to experienced contractors. For example, the contract price can be determined based on a combination of “total price + true settlement”, the developer can...
transfer some of the risks to contractors via risk responsibility, and can also adopt a true settlement when contractors are unable to bear the risk. This reflects the “sincerity” of the developer and ensures that the contract pricing is reasonable and flexible.

2. “Opening” price adjustment and engineering change. Under the pattern of risk sharing, the developer shall set up an “opening” for contractors when they cannot foresee some risk about to adjust the contract price. For example, for complex geological conditions, although the developer uses a fixed-price contract, the developer reveals that price adjustments and engineering changes can be made when geological risk appears. Therefore, the “opening” price adjustment and engineering changes are necessary conditions to ensure that the contractor views the contact as fair and smooth progress occurs.

3. “Bounded” loss compensation and revenue sharing. Under the terms of the contract, the developer shall make a detailed explanation of any possible breaches of contract. In the case of not touching the “bottom line” of the contractor, the contractor will bear part of the loss. For example, if a developer fails to pay on time, the contractor can deduct a certain amount of the price as a default penalty from the bid guarantee, and also require the developer to pay corresponding interest. In addition, to encourage the contractor to carry out additional work to create and provide a perfect performance, or to achieve a value-added project, the developer can formulate corresponding revenue sharing clauses (e.g., incentive clauses, set a certain amount of fees as a provisional sum).

4. “Participating” work procedures and decision making. In terms of contract drafting, the focus should be on clauses regarding the engineering program or decision-making procedures, specifying the responsibility/authority of the parties. The developer can participate in the contractor’s decision-making process, realize the limitations and constraints on the rights of the contractor, and control the projects. Contracts are usually drafted so that the developer has the right of review and veto in the selection process of subcontractors and suppliers. At the same time, the developer should also pay attention to the contractor’s views of fairness, and give them some degree of participation rights. For example, regarding payments (being one of the contractor’s biggest concerns), the contractor reserves the right to postpone the payment of the claim demanded and the right to raise any concerns that arise during the process. This will improve the contractor’s perceptions of fairness, suppress opportunistic behavior, and increase the likelihood of a perfect performance.

5. “Interactive” communication and coordination. In terms of contract drafting, the focus should be on the terms of the mechanisms for information sharing and coordination. The developer can include information sharing mechanisms in contract clauses, requiring the contractor to share information along various stages. For example, in view of project uncertainty, parties should encourage interaction, and establish clauses for early warning and emergency linkage. Furthermore, they should formulate work and contingency plans by sharing information. To ensure the smooth implementation of the project and to express cooperative attitudes, the contract should include terms concerning joint meetings, council transfers, design liaison meetings, and joint decision making.

5.3 Study Limitations

Contract reference point theory has enabled the use of behavior analysis approaches in the study of engineering project management. However, there are significant differences in the operation and complexity of construction projects, so to explain how contractor fairness concerns are based on the contract reference point theory, it is necessary to refer to a specific contract situation. Only then is it possible to discuss the important constructs such as reference point, fairness preference, and compliance behavior.

The content analysis identified seven contractor fairness concerns in construction project contracts. However, validation occurs mainly via the means of qualitative research, as the conclusions will inevitably contain personal subjective influences. In addition, the research sample was limited to subway project contracts, so there is a need to further verify the applicability of contractor’s fairness concerns in different types of construction contracts.

This research focused on the behavioral factors of contracts, the elements of psychological perceptions, and thus it was important to choose an experimental method that could accurately verify the relationship between a contractor’s perceptions of fairness and fairness reference points. Therefore, a future research direction could be the use of eye-tracking technology to organize the relevant clauses of the contract and fairness categories. Such research collects eye-movement data by setting an area of analysis, analyzing the corresponding images and eye-movement data, and then verifying the correlations between construction reference points and perceptions of fairness. Another possible avenue is the use of a system dynamics model to simulate contractor performance after status changes, providing the basis for the adjustment of clauses in the contract.

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