A Research Framework of the Synergistic Mechanism between the Contract Rigidity and the Contract Flexibility Based on the Improvement of Project Management Performance

Hua ZHAO¹,a,* Hui-Jie JIANG²,b, Jian-Jun ZHU¹,c

¹School of Accounting, Wuhan Textile University, Hubei, China
²School of Construction and Environmental Engineering, Shenzhen Polytechnic, Guangdong, China

azhao_hua_08@163.com, b12482871@qq.com, c578132733@qq.com

*Corresponding author

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Abstract. The synergistic mechanism between the contract rigidity and the contract flexibility is an effective way to improve the project management performance, but the lack of research on measurement of this mechanism has hindered the scientific decision-making in practice. The paper constructs an empirical research framework which includes the research logic, the research contents, the research methodology and some application strategies and so on. This framework has a certain methodological significance for the study of the contract design or the contract optimization.

Introduction

The improvement of project management performance (PMP) is an important proposition in the field of project management. To design project contract reasonably is one of the crucial issues to improve the PMP [1]. According to the incomplete contract theory, the key to contract design is the balance of the contract rigidity and the contract flexibility [2][3]. In other words, the rigidity and flexibility of incomplete contract have synergistic effect and there exist a theoretical equilibrium point. In the project transaction contract, the closer the combination of the rigid component and the flexible component is to the equilibrium point, the closer the contract is to the optimal contract, resulting in the best transaction efficiency [3].

In reality, the project contract is a natural incomplete contract. The PMP must be affected by the contract rigid and flexible components at the same time. Therefore, revealing the synergistic mechanism of contract rigidity and its flexibility, and then achieving contract design optimization, is an important way to improve the PMP. In the present study, more attention is paid to the beneficial effect of contract flexibility on the improvement of the PMP [4][5], the relationship between the PMP and the combination program of the contract rigidity and its flexibility is still lack of systematic considerations, it is also difficult to achieve the improvement of the PMP by using the best synergistic effect between the contract rigidity and the contract flexibility.

Literature Review

Contract Rigidity, Flexibility and Contract Efficiency

The early theory of incomplete contract focuses on the problem of special investment, and emphasizes the solution of the ex-post rip-off problem by allocating the property right to the important party in the initial contract, which may be helpful to realize the transaction efficiency [6]. In recent years, Hart and others turned to behavioral economics, the initial contract is understood as a reference point, which provides the contract performer with a subjective sense of the expected benefits of the transaction [3][6]. Under the effect of the reference point effect, if the perceived benefits of the trader are
impaired, he (she) may take a rough performance behavior (O. Hart called it shading), resulting in the perfunctory performance (perfunctory performance) [3][6]. When signing the initial contract, rigid contract terms are helpful to reduce speculation in the contract execution and improve contract efficiency, but also undermine the flexibility of ex ante adjustments [7]. If flexibility is injected through a reasonable strategic ambiguity in the initial contract, there is a greater scope for cooperation and renegotiation between the transaction parties, which is more favorable for contract efficiency [6][7]. It can be seen that the efficiency of the incomplete contracts derives from the synergistic effect of the rigid and flexible contract components. In theory, there should be a contract equilibrium point between the rigid components and the flexible components [6][8], simply emphasizing any of these aspects is not conducive to achieving desirable contract efficiency [9].

**Rigidity and Flexibility of Project Contract and Its Influence on the PMP**

The project contract must be a combination of rigid and flexible components, both of which have potential effect on the PMP [10]. On the one hand, the contract rigidity is a static trading order, which is the basic principle and bottom line of the interests of both parties [9], and it provides a right security perception for the trader in the contract execution stage, which should have a positive effect on the PMP [5]. On the other hand, the contract flexibility is a kind of rapid response and strategy space extension in project governance. It is a potential contract strategy to deal with project uncertainty, also contributes to the improvement of the PMP [11][12]. In contrast, the importance of contract flexibility and its impact on the PMP are more concerned by scholars. In the research field of the improvement on the PMP, a large number of scholars demonstrated the positive effect of the contract flexibility from different perspectives [12-15]. However, Patrick and Steven, Laure and Sephane et al are skeptical of the above-mentioned conclusions [9][16]. It can be seen that the relationship between the contract rigidity, flexibility and the PMP has not yet formed a unanimous conclusion, which needs to be tested through the sample project datum.

**Empirical Studies on the Rigidity, Flexibility of Project Contract and the PMP**

Most scholars agree that the balance of contract rigidity and flexibility can be helpful to improve the PMP [17], but the measurement research on the rigidity and flexibility of the project contract is still in the exploratory stage, this conclusion is still lack of rigorous empirical test. In the project contract, the contract terms completeness, semantic clarity, and fixed contract price terms are regarded as typical contract rigidity components, Athias L. and Saussier S. revealed that the project contract rigidity is inversely related to the reliability of contract execution through analyzing and comparing a large number of the actual PPP project contract terms in the above dimensions [18]. DU Ya-Ling has proposed a preliminary analysis framework on the rigidity connotation of the contract [5], but there is distance from the formation of measurement scale. In contrast, contract flexibility measurement has made positive progress. Harris et al developed a measurement scale from re-negotiation flexibility, price adjustment flexibility, and incentive flexibility, which achieved good test results [19]. Based on the PMP measurement [4][5][7], Yin Yi-Lin and Wang Yao carried out Chinese contextualization on Harris’ scale and reveal that the contract flexibilities have some positive effect on the PMP by collecting the projects datum in China [4].

**Methodology and Research Contents**

**Research Logic and Objectives**

The improvement path design of the PMP comes from a number of the influencing factors of the PMP and their action mechanism can be revealed. Project contract is obviously an important
medium to the improvement path design of the PMP, in a certain sense, that is to choose the different combinations of the contract flexibility and the contract rigidity. In Chinese engineering management practice, the contract strategy always is that either to emphasize the contract rigidity or to emphasize the contract flexibility, the actual level of the PMP is often discrete (good or bad) rather than continuous correspondingly. In fact, in the incomplete project contract, there are rigid components and flexible components naturally, which affect the level of the PMP together. Naturally, for the degree of impact on the PMP, the contract rigidity is different from the contract flexibility. A good contract governance strategy is to choose the best combination of the two aspects in order to achieve its synergistic effect. Therefore, revealing the mechanism of the two aspects influences on the PMP has become the key issue in current. Based on the above theoretical analysis, the research logic in this paper is as shown in Fig. 1. According to the research logic in Fig. 1, this study must achieve the following objectives:

A. Constructing a regression model of contract rigidity, contract flexibility and the PMP based on the empirical analysis of sample project data.

B. Revealing the synergistic mechanism of the rigidity and the flexibility of the project contract, deriving a set of strategies to achieve this synergistic effect, guiding the design and optimization of the project contract.

Research Contents

Connotation Analysis and Measurement of the Variables. The core variables of this study include the contract rigidity, the contract flexibility and the PMP. At present, the measurement of the above variables shows the following characteristics. (1) The analysis of the rigidity of the contract, especially the measurement of the contract rigidity is still at the initial stage [5]. (2) For the measurement of the contract rigidity and the PMP, there are more research results in current [4][19]. In view of the above, the research contents of this part include the following contents:

A. Analyzing the connotation of the contract rigidity, characterizing its measurement dimension, selecting or constructing the relevant observation index.

B. On the basis of the measurement research results on the contract flexibility and the PMP, revising its observation index to adapt Chinese context.
C. Developing the measurement scales of the above three variables, collecting sample project data through interviews and questionnaires.

D. Testing the reliability and validity of the measurement scales by statistical analysis.

**Analysis of the Correlation among the Variables.** Most of the existing researches have discussed the influence mechanism of contract flexibility on the PMP and provided theoretical support for proposing to inject more flexible components into the project contract, but it is difficult to provide an operational feasible solution on the issue that the contract design should be a trade-off between the contract rigidity and the contract flexibility. The task of this part is to analyze the contribution of contract rigid and flexible components to the PMP, to examine the sensitivity of the two aspects for the PMP, and to reveal the synergistic mechanism of the two aspects under the constraint of the PMP level. The main contents are as follows:

A. Preparing the questionnaire (its measurement scales have been tested by the sample data), collecting sample project data, and accomplishing the data pretreatment.

B. Constructing the optimal fitting model on the contract rigidity, contract flexibility and the PMP by the regression analysis.

C. Based on the optimal fitting model, taking the PMP as the dependent variable, analyzing the sensitivity to contract rigidity and flexibility.

D. From the perspective of achieving the best synergistic effect, choosing different levels of the PMP, measuring the optimal combination or the equilibrium point of the rigidity and the flexibility of the project contract.

**Application and Testing of the Optimal Fitting Model.** This part is the strategy research, and the basic task is to form several practical strategies according to the results of the above empirical analysis. The core issue is to derive the practical contract strategy for contract design or contract optimization. The main contents are as follows:

A. Based on the results of regression analysis and sensitivity analysis, this part concludes the overall strategy of the initial contract design of the project contract with the project transaction situation.

B. According to the optimal numerical combination or equilibrium point between the contract rigidity and the flexibility, combing and constructing the best way to achieve the best synergistic effect through literature research and interviewing, and forming the operational strategy set of the initial contract design.

C. Through expert interviews, analyzing the operability of the set of strategies in practice and revising the set accordingly.

**Summary**

In China, the project construction scale is still extremely large. The project management practice requires scientific theoretical guidelines so as to improve the PMP continuously. In the past practice of the project transactions, the situation is very common to emphasize on the contract rigidity or the flexibility unilaterally, which has become an important constraint to improve the PMP. This paper provides an integrated research perspective and constructs a research framework from a synergistic effect of the contract rigidity and the contract flexibility as follows. At first, the connotation of related
core variables must be measured in order to develop measurement scales, such as contract rigidity, contract flexibility and PMP. And then, selecting suitable project samples in practice and collecting actual information to construct an optimal fitting regression model among the contract rigidity, contract flexibility and PMP. After that, based on the optimal fitting regression model, we can explore the relationship between the contract rigidity and the contract flexibility, so that the best synergistic effect from the above two aspects may be achieved. At last, through the empirical test of the fitting regression model and the synergistic effect aforementioned, we can develop some practical project implementation strategies to improve PMP in construction projects. For practitioners, it should be understood that there is no contradiction between contractual rigidity and contractual flexibility, and that actual management decision-making objectives should aim at achieving good synergy between the two aspects. For the theoretical researcher, this framework has a certain methodological significance for the study of the contract design or optimization.

References


