

Research on Risk Control Measures of Construction Project under the Model of PPP

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Abstract: In recent years, PPP model has been implemented in the construction industry, which can effectively alleviate the shortage of funds and maximize the use of social capital. However, there are many risks in all stages of construction project under PPP model. This paper analyses the risks in the preparation stage, building stage and operation stage of construction projects, and gives risk prevention measures, sharing measures, mitigation measures and avoidance measures to provide some references for relevant researchers.

1. Introduction

The construction industry is a special industry. The main engineering projects of the construction industry are infrastructure construction and some public service projects. The main investor in the construction industry is the government. However, the government's financial funds are limited, and many projects are facing shortage of funds. With the rise of people's living standards, the scale of social capital is becoming larger and larger, and it has become an important part of the capital market. Promoting PPP model in the construction industry can improve the shortage of funds in the construction industry [1]. The use of social capital under the supervision of the government under the PPP model can effectively improve the shortage of funds in the construction industry, and also can effectively improve the efficiency of the use of social capital. Of course, the implementation of PPP mode in the construction industry requires the construction industry to select appropriate projects and strictly control the use of funds, so as to promote the stable development of the construction industry. The government and the project company sign a special operation agreement and transfer the special operation right to the project company. At the same time, the project company is responsible for the financing, construction and operation of the project in a specific period of time. The project company is composed of construction enterprises as social capital, so it is necessary to do a good job in financing to promote the smooth implementation of the project. PPP mode can be used in the management of construction projects to realize the sharing of technology and resources among members more effectively. In addition, during the whole project construction process, the owner should attach importance to the whole process of participation in the project construction, assume the leading obligations, provide a platform for smooth communication between the parties, and avoid contradictions. For the owner, PPP model can be used to make the construction party bear certain risks and strengthen the responsibility of the construction party. Under the restraint of cooperative relationship, all participants are a whole, resisting external risks together, and ultimately can get their own satisfactory benefits [2].

2. Main Risks of Construction Project under the Model of PPP

2.1 Risks of Construction Project in Preparation Stage.

In the project preparation stage, construction enterprises are facing various risks under PPP mode. As the leader of the project construction, the government departments have the supervisory power when choosing the project construction plan. In the process of implementing the contract, there will

be some phenomena such as non-execution or partial execution of the obligations stipulated in the contract, administrative interference in the normal operation of the project and so on, which will bring greater pressure to the construction party. In the project preparation stage, each project investor will set up a project company and corresponding organizational structure, assign the positions of the investor in the organizational structure, and choose a specific PPP mode. In this process, if the organizational structure and its position distribution are not scientific and reasonable, or the PPP mode is not properly chosen, it may cause the construction and operation process of the project. In the passive situation. Diversification of financing subjects can break the financing bottleneck. Owing to the particularity, political relevance and dependence of property rights of state-owned construction enterprises, it is easier to obtain government support and participate in project construction with the government. In the process of PPP project financing of state-owned construction enterprises, the government plays a very important leading role in project selection, project review, partner determination, price management, exit mechanism and performance evaluation by means of franchising, purchasing services and equity cooperation. Therefore, the uncontrollable risks caused by government actions such as policy changes are relatively large. For some specific urban infrastructure projects, it is very difficult to require the government or relevant departments to make certain assurances and commitments. In PPP mode, contract is the key to stipulate the rights and obligations of each investor. Therefore, in the stage of project preparation, we must pay more attention to the terms of financing, procurement, construction and transfer, so as to prevent contract risks caused by ambiguous rights and obligations of both parties and overlord clause [3].

2.2 Risks of Construction Project in Building Stage.

Under PPP model, the main risk of construction enterprises in the construction stage of projects lies in the cost overruns, that is, because the construction cycle of PPP projects is generally longer, if the cost of labor and construction materials rises during this period, or because of the agreement of the enterprises themselves to bear the increased cost of project changes in the signed construction contracts. Due to technical errors or inadequate implementation of schemes and other reasons, the cost rises and the construction period lags behind, which directly reduces the operation period of the project and causes unnecessary losses. Serious or even very likely, the project schedule cannot be completed or the project will be shut down for construction. Due to the lack of proficiency in the application of new technology or the defects of new technology itself, the quality of the project fails to meet the requirements of design drawings and national standards, thus affecting the function of the construction project, increasing the cost of later operation, and reducing investment returns. Due to the problems caused by delayed completion, rising salaries of materials, raw materials, machinery and personnel, lax project management measures, insufficient safety of construction environment and construction technology, the construction cost exceeds the approved budget, and the cost exceeds the budget, which may lead to the shortage of project construction funds [4].

2.3 Risks of Construction Project in Operation Stage.

Under PPP model, the risks of construction enterprises in project operation stage are mainly reflected in the uncertainties of their operating income. In the project operation stage, the factors such as high maintenance cost, insufficient funds from the government or users are caused by the insufficient demand, inadequate supporting facilities and frequent maintenance, which result in the project operation income. Uncertainty risks, such as lower operating costs, lower revenue than expected, etc. Market and operational risk refer to the adverse impact on the actual income of the project due to the changes in the market price or demand of the products or services provided by the project. In the process of operation, the risk of a project usually comes from the fluctuation of the market and the situation of operation. Once the market changes dramatically, the economic benefits of the project will be affected, which will lead to insufficient returns for investors. Therefore, in the development of PPP mode of construction projects, we must try to ensure that investors can obtain relatively reasonable economic benefits, so as to further stabilize the confidence of investors. In the actual operation of the project, because of the low economic benefits of some basic equipment

projects and the unsatisfactory operation, the project cannot obtain the expected income, which leads to the failure of social capital partners to obtain the corresponding economic returns. Extensive project management, low degree of refinement, weak awareness of personnel quality and safety, inadequate management ability and inadequate site management may lead to problems in project quality or safety. Once problems arise, enterprises will suffer corresponding economic, benefit and reputation losses.

3. Risk Control Measures of Construction Project under the Model of PPP

3.1 Risk Prevention Measures.

We should focus on policy risk, financial risk and legal risk, implement professional evaluation system, and make professional evaluation of key indicators affecting the smooth operation and profitability of PPP projects, so as to achieve risk prevention and control through professional evaluation system. Assess the risk of fund organization and dispatch, focusing on the expected arrival rate of funds; at the same time, according to the profitability of the project and the solvency of the enterprise, make a debt repayment plan beforehand; because of the fluctuation of interest rates, the risk of increasing the financing cost of enterprises should also be paid special attention. In addition, the scale of liabilities must be strictly controlled. The basic arrangement plan and monitoring mechanism of cash flow should be formed. According to the expected future income, cash flow, financial situation and investment plan of the project, the cash flow budget should be accurately prepared by quantifying the situation. According to the indicators of receivables, payables and inventory items, a short-term financial early warning system is established to assess whether cash flows are balanced and periodically reflect the cash flows of projects. Emphasis is laid on evaluating the project income under normal conditions, and attention should be paid to offsetting the impact of low-price strategy on the income by means of engineering quantity accounting and compensation for claims. Focus on strengthening the compliance review of pre-signed contracts. By reviewing the compliance of the project, legal sanctions caused by non-compliance with national laws and regulations can be avoided.

3.2 Risk Sharing Measures.

PPP model is based on the cooperation between the public sector and the private sector. In the process of cooperation, both sides need to share the project risk of the project. Generally speaking, risk sharing mechanism can be reduced. PPP project risk has the function of probability. After the emergence of project risk, risk sharing mechanism can play a role in reducing the risk of loss of partners. Risk sharing mechanism can also strengthen the prudence of PPP project participants in the implementation process, and then provide guarantee for the normal promotion of the project. According to the actual situation of PPP project, risk sharing measures based on a certain principle cannot effectively promote the effectiveness of risk management mechanism. Therefore, relevant units need to determine risk management mechanism according to the actual situation of the project, so as to effectively control the risks that the project may face. In PPP project, if each risk of PPP project is borne by the party who controls the lowest risk cost, the total cost of project risk control is the lowest. The minimum principle of controlling risk cost and the most powerful principle of controlling are mutually connected, and are generally the same unit that participates in the project. The principle of matching risk taking with reward. For the environmental risks such as market risk, social risk, natural risk and the main risks caused by the actions of both parties, such as the conflict of contract documents, the change of fees and so on, both sides of government and enterprises need to allocate risks reasonably. Considering the possibility of risk occurrence and the cost when the government retains risks, the government should reduce the losses caused by risk occurrence and the willingness of the private sector to take risks. Make enterprises and government take risks and return match. The upper limit must be set for any risk taking. When the risk is over the upper limit, the government or the enterprise should share the risk again through the subsidy mechanism and the price

adjustment mechanism.

3.3 Risk Mitigation Measures.

The risk mitigation measures of engineering projects under PPP mode are to reduce the probability of risk occurrence and the adverse effects of risk occurrence by means of mitigation measures. Recognition of the objective existence of risk factors is the precondition for the application of risk link measures in engineering projects under PPP mode. After the application of risk mitigation method to PPP project practice, project builders need to apply more assured construction technology in the process of construction work, such as the application of more familiar construction methods, purchase of high-quality materials and equipment and other measures. From the content of risk mitigation methods, risk management measures can be divided into tangible means and intangible means. It is an effective measure to deal with the project risk under PPP mode by means of tangible means to avoid more serious losses caused by project risk by risk-takers, expenditure of certain manpower, material and financial resources. Under the PPP model, the application of risk link measures requires the relevant personnel to reduce the risk of each stage of the project to the acceptable scope of the enterprise, and then effectively control the risk of the project. Risk mitigation can reduce the loss of project risk by reducing the probability of risk occurrence or risk deterioration. Generally speaking, the cost of preventive measures before the occurrence of risk is lower than that of remedial measures after the occurrence of risk, so prevention in advance is better than remedial measures after the occurrence of risk. Risk mitigation measures can minimize the loss of risk.

3.4 Risk Avoidance Measures.

Risk avoidance measures are the risk response measures to abandon the project risk or change the original design scheme of the project, such as abandoning the ongoing project, changing the original project plan scheme and improving the original project construction scheme plan, organizational structure, operation process and building materials. Risk avoidance measures are a negative risk response measure. This measure has certain expressiveness in PPP mode. This construction scheme can be applied only when the project risk is difficult to mitigate and other project implementation schemes with less risk exist. When the probability of PPP project risk occurrence is high and the loss is large, the method of avoiding risk can achieve good results. But not all risks of a project can be dealt with by risk aversion, such as natural disaster risk, political risk, legal risk, etc. Another feature of risk avoidance is that risk avoidance may lead to new risks. When the project is going on halfway, it will be very difficult to change the project plan temporarily, or it will take too long, or the cost will be too high, which may have a negative impact on the whole project. Therefore, risk avoidance should generally be carried out before the start of the project. Before the start of the project, considering the various risks that may arise from the project, strengthening the communication between all parties of the project, inviting experts to put forward opinions and suggestions to evade part of the risk or the overall risk of the project can produce good results.

4. Conclusion

PPP model is an important measure for our government to effectively apply social capital. Promoting PPP model in our country can effectively alleviate the financial pressure of the government on infrastructure construction and public service construction, and also effectively improve the interests of construction enterprises. It is of great significance to China's construction industry. This paper analyses the problems existing in the application of PPP model in construction industry, and puts forward some suggestions for improvement. It is hoped that this paper can promote the promotion of PPP model.

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