

Original Paper

Risk Mechanism Analysis of Rural Infrastructure Investment PPP Model and Prevention Path Selection

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Abstract

In view of the frequent risk problems in the current PPP mode of rural infrastructure investment, this paper discusses the mechanism of risk generation from four aspects: environment, contract, behavior, ability and cognitive factors, and puts forward risk prevention paths, including establishing and improving institutional guarantee, decision-making mechanism, dynamic risk adjustment mechanism, dynamic incentive measures, supervision and risk monitoring system.

Keywords

rural infrastructure PPP model, risk prevention

1. Introduction

In recent years, using the public-private partnership model (hereinafter referred to as the PPP mode, private sector investment in China's infrastructure sector has continued to increase rapidly. The advantages of the PPP model are mainly reflected in higher economic efficiency, increased investment, improved financial soundness of the public sector, and improved quality of infrastructure. However, due to the lack of risk prevention, some problems have been exposed in practice in some PPP investment projects, which makes the government and private investors suffer losses, reduces the credibility of the government, and affects the overall welfare of the public.

Rural infrastructure is of great significance in the construction and development of rural areas and agriculture, reflecting the characteristics of foundation, externality and public welfare. Compared with urban infrastructure investment, rural infrastructure investment may encounter a series of problems such as smaller project scale, stronger public welfare, longer payback period, low return rate, and greater impact by natural climate conditions. Therefore, more risks may arise in project operation. At the same time, in the initial stage of the promotion and application of the PPP model of rural infrastructure investment, strict feasibility studies and relatively complete risk prevention mechanisms are conducive

to avoiding the emergence of investment risks, and township and county governments will bear new financial burdens, so as to ensure the long-term and sustainable development of rural infrastructure investment.

With the development of PPP model, some scholars have analyzed the risks faced by PPP investment projects, such as policy risk, government credit risk, construction risk, operation risk, financial risk, market risk, etc., and have made in-depth discussions on how to share risks scientifically. Government departments need to effectively prevent the fiscal risks caused by PPP projects to avoid the deterioration of fiscal conditions. In the practice of PPP investment, there are still some problems such as focusing on financing, neglecting management, and imperfect mechanism, which restrict the development of PPP model. Some scholars analyzed the problems of PPP implementation in China through typical cases, and put forward suggestions for effective management of PPP projects.

The problem of risk prevention is the focus and difficulty in the practical application of PPP mode in rural infrastructure investment. On the one hand, PPP projects take a long time to build and operate, have a poor foundation, and involve many risk factors. On the other hand, the contract conditions and external environment of each project are different. The quality of risk prevention is related to the success of the project and the length of life. Therefore, the risk prevention of the whole life cycle is crucial to the successful operation of PPP investment projects. At present, the cognition of risk prevention and the prevention framework and measures are still relatively imperfect. Therefore, this paper studies the risk prevention problem of PPP mode of investment in rural infrastructure, analyzes the risk formation mechanism of PPP mode, proposes the risk prevention path of PPP mode.

2. PPP Model Risk Formation Mechanism Analysis

The risk sources of PPP mode of rural infrastructure investment exist both in institutional level and management details. Some risks come from a single factor, and some come from the combined action of many factors. The participants of PPP mode have corresponding risk factors in the process of cooperation due to their behavior law, and through a certain path of transmission and diffusion, the cooperation results eventually deviate from the expectation. This paper mainly analyzes the root causes of risk from four aspects: environmental factors, contract factors, behavior factors, ability and cognitive factors.

2.1 Environmental Factors

The development of PPP model cannot be separated from a series of specific economic, policy and other environmental factors. Environmental factors not only affect the choice of subject behavior, but also affect the play of organizational efficiency. In the process of PPP model construction and operation, due to the instability of the partnership, on the one hand, it is easy to promote the formation and diffusion of risks, breeding internal risk factors; on the other hand, the partnership is also vulnerable to the impact of external environment, resulting in corresponding risk factors. The external inducing factors of PPP risk are mainly reflected in institutional environment, economic environment and natural environment. Policy support or change has a significant impact on the development of PPP activities. The smooth operation

of the PPP model requires an accurate grasp of the market demand and supply conditions, and keep up with the changing speed of the market environment. If we cannot grasp the market situation correctly, the development prospect of PPP model is impossible to talk about. Natural environment such as high temperature, rainstorm, earthquake and other unexpected conditions are very likely to delay the project deadline.

2.2 Contract Factors

The contract relation of PPP model is formed by the connection between the relevant subject and the contract as the carrier. On the one hand, if the terms set by the initial contract are unscientific, too vague or lack specific quantitative indicators, the incentive mechanism, benefit distribution and risk sharing have certain irrationality, and the binding and incentive of the contract relationship are insufficient, it will not be able to restrict the behavior of the subject, which will cause some subjects to lose the motivation for cooperation and innovation, resulting in inertia, and inevitably lead to the failure of cooperation between the two parties. On the other hand, the effective operation of PPP projects requires not only the establishment of a proper contractual relationship between the government and social capital, but also the integration of this contractual arrangement with environmental conditions. If the contract design of PPP model is slow to respond to changes in the external environment, and the adaptability is insufficient, and the distribution of benefits and risks cannot be adjusted in time, cooperation will inevitably fail.

2.3 Behavioral Factors

Due to the incompleteness of contracts and asymmetric information, the PPP model is highly likely to produce self-interested behavior and cause moral hazard due to the pursuit of interests in the performance process. These behaviors are contrary to the concept of cooperation, which leads to the obstruction of the contract, and thus brings various risks to PPP projects.

The problems of contract governance shown by governments and enterprises in PPP practice have a certain universality, mainly due to the deviation of behavior caused by the pursuit of their own interests. The government gives priority to social and public interests when carrying out rural infrastructure PPP projects. Enterprises, on the other hand, give priority to profit maximization in order to obtain stable market and investment returns. Due to the difference of interests between the government and enterprises, both parties may have moral hazard in the case of information asymmetry, resulting in conflict of interests, which will affect the smooth development of cooperation and cause problems of contract governance. For example, a small number of enterprises use government credit financing to make money, negatively operate rural infrastructure PPP projects, directly affect the public interest, or provide substandard products and services for short-term profits. A small number of local governments have a weak sense of contract, and when there are changes such as staff changes and institutional adjustments, they cannot fulfill their expired commitments, resulting in negative social impacts.

2.4 Ability and Cognitive Factors

Subjective ability and cognition determine the behavior of contract related entities, and are reflected in every link of rural infrastructure PPP projects. The success or failure of the project operation is closely related to the organizational management ability, project management strength, technical level and personal management preference of the manager. The unclear boundary of management functions may lead to poor coordination in the management process. The strength of project management is reflected in the construction technology level of the project itself, the feedback ability to deal with conflicts and changes, and the dynamic processing ability. The lack of technical level will lead to the smooth connection of the project, and eventually lead to the delay of the construction period and increase the cost. In addition, in the process of management, the personal management preference of managers and the limitation of cognitive ability may lead to the risk of PPP model.

To sum up, under certain environmental factors, various actors in the PPP model realize cooperation through the mutual connection of PPP contracts, and the improper behaviors, abilities and cognitive limitations of participants will affect the smooth development of cooperation activities and breed risks. The four factors of PPP model risk are not isolated, but interact with each other and jointly affect the generation and development of risks.

3. PPP Risk Prevention Path Selection of Rural Infrastructure Investment

According to the causes of risks, through advance planning, mechanism improvement, in-process monitoring and other measures, improve the risk prevention process, improve prevention awareness, and achieve the purpose of reducing the probability of various risks and reducing losses. The external environment presents dynamic changes, which will inevitably lead to the dynamic changes of project risks, and the project management presents different characteristics in different stages, so it is necessary to conduct dynamic risk prevention research.

3.1 Complete System Guarantee

Formulate a unified and standardized legal system and improve the legislative support for the PPP model. The division of labor between departments should be clearly defined, and the various links involved in PPP projects should be stipulated comprehensively and systematically. The relevant provisions of the current Contract Law cannot cover all the contracts involved in the PPP model. It is necessary to further improve the support of the existing system for PPP projects, establish a complete institutional guarantee system, ensure that farmers' rights and interests are not infringed, and promote the healthy development of the PPP model in rural areas.

3.2 Improve the Standard Decision-making Mechanism

Scientific decision-making is a good start for the PPP model of rural infrastructure investment. Strictly carry out feasibility studies and all-round demonstration in the preparatory stage of PPP projects, comprehensively consider public welfare, economy and sustainable development, strengthen top-level design and build a scientific decision-making system involving the public, third-party institutions and

experts, which reflects scientific, rational and forward- looking, and lays a solid foundation for PPP projects.

3.3 Flexible Dynamic Adjustment Mechanism

The investment cycle of PPP projects in rural infrastructure investment is generally long, most of which are 10-30 years. Due to changes in relevant policies, demand, prices and other factors, it is unrealistic to accurately predict all risks. It is difficult to implement the contract due to environmental changes, which is an important reason for disputes in the later period. Operators will face inflation, exchange rate changes, demand changes, material price increases, interest increases and other factors, so they should establish a dynamic risk adjustment mechanism, set adjustment conditions, methods and other contents, when the conditions and environment of the implementation of a PPP project change, affecting the progress of the project, contract stakeholders through communication to adjust the corresponding contract terms, to ensure the performance of the contract on schedule. Including price adjustment measures, subsidy adjustment measures, term adjustment measures, income distribution adjustment measures, exit conditions and set the trigger conditions for renegotiation.

Price adjustment measures. Including the conditions and methods of price adjustment for the services or products provided by PPP projects. The operation time of a PPP project is long, and market fluctuations may lead to an increase in project costs and a decrease in benefits. Price adjustment measures should be introduced to keep the profits of both parties within a reasonable range and ensure normal performance of the contract.

Subsidy adjustment measures. The return on investment in rural infrastructure under the PPP model is generally low and depends heavily on government payments. In the contract of PPP project, the amount of expenditure and the government payment of construction cost should be set flexibly. Because the cost and price are greatly affected by market and policy factors, government subsidies should also be set up a certain change or adjustment mechanism.

Income distribution adjustment measures. Includes measures to adjust income distribution in the event that profits exceed the agreed margin. In order to effectively protect the balance of interests of the contract subjects and prevent one party from getting excessive profits while the public interest is damaged, the adjustment measures of income distribution are necessary. Term adjustment measures. Including PPP project term adjustment methods, adjustment conditions and other measures. The cooperation term of a PPP project is usually determined in the early stage of the project demonstration by referring to the service supply period, the technical life cycle of the project assets, the investment recovery period, the financial bearing capacity and other comprehensive multi-factor assessment. Usually set a fixed term, but due to the government's default caused by the extension of the term or due to the government bear force majeure caused by the extension, the early end of the term, etc., need to timely adjustment of the cooperation period. Exit conditions. It is established in order to maximize the protection of social interests. The lack of active withdrawal conditions will make the participants withdraw negatively under certain conditions, resulting in project stagnation and greater losses. When the above adjustment measures are

ineffective, renegotiation mechanism can be chosen to avoid the failure of PPP projects. The reasonable setting of dynamic adjustment measures in PPP project contracts can have an important impact on the long-term stable cooperation between the government and private capital, and can keep the flexibility and timeliness of PPP projects. Especially in the case of information asymmetry, unethical behavior and uncertainty, different risk-sharing mechanisms, benefit distribution arrangements and contract terms will produce different risk-avoidance effects.

3.4 Dynamic Incentive Measures and Comprehensive Supervision System

Static incentive can not meet the characteristics of long construction and operation cycle of PPP projects and many changes, which will lead to the loss of enthusiasm and innovation motivation of enterprises to perform the contract, and bring performance risks to the project. Therefore, dynamic incentive measures need to be designed to make up for the deficiency of static incentive. At the beginning, the government cannot accurately judge the ability of social capital, so the government can judge its service operation ability by the actual output of social capital, so as to determine the incentive intensity of the government. The input of social capital not only affects its current returns, but also the returns in the subsequent cooperation stage, so as to better realize the incentive effectiveness. In practice, the government needs to implement different incentive measures for enterprises with different characteristics in order to effectively play the incentive role under certain conditions.

Establish a scientific regulatory system, improve the efficiency of cooperation in public projects through pre-access supervision, in-process supervision and post-review supervision, take into account the interests of investors and the public, and promote social equity and social welfare. Prior access supervision mainly covers the supervision of project initiation and partner selection; In-process supervision mainly covers price and quality supervision, financial supervision, safety and ecological supervision, anti-monopoly supervision, financial commitment supervision to government departments, etc. Ex post audit supervision focuses on auditing PPP projects. Risk monitoring and early warning. Risk monitoring must run through the whole life cycle of PPP projects and is an effective means of risk prevention. The purpose of risk monitoring is to check the effect of risk prevention, find the change of risk in time, and adjust the risk prevention strategy. Regularly track and report the risk status, check the applicability of risk prevention strategies, determine and assign specific risk prevention responsibilities, constantly identify and measure potential risks, timely issue risk early warning and formulate relevant preventive countermeasures to reduce the probability of risk occurrence.

4. Conclusion

Compared with other investments, PPP mode of rural infrastructure investment generally has problems such as smaller project scale, stronger public welfare, longer payback period and less income. Its construction and operation face a large number of risk problems. Therefore, reasonable selection of risk prevention mechanisms and measures is the inevitable direction to improve and develop the PPP mode of rural infrastructure investment. Aiming at the frequent risk problems in the current PPP mode of rural

infrastructure investment, this paper discusses the mechanism of risk generation from four aspects: environmental factor, contract factor, behavior factor, ability and cognition factor, and puts forward risk prevention paths, including establishing and improving institutional guarantee, decision-making mechanism, dynamic risk adjustment mechanism, dynamic incentive measures, supervision and risk monitoring system.

In the future, we can consider increasing the number and breadth of case studies and keeping up with the development practice of the PPP model of rural infrastructure investment to ensure the effectiveness of the PPP model in rural areas. Further improving the means of risk prevention is the next research direction.

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