

Research on investment and financing risk problems and countermeasures of PPP construction projects

Xingyu Shang

Chongqing Saiwate Power Technology Co. LTD, Chongqing, 400000, China

Abstract. This study analyzes financing costs, capital liquidity, policy changes and contract execution risks in PPP project investment and financing, and puts forward strategies such as optimizing financing platforms, reducing costs, strengthening regulations, regulatory coordination and improving prevention capabilities. By exploring the causes and effects of risks, combined with domestic and foreign cases to verify the effectiveness of the strategy. This study enriches the theory of PPP risk management, provides guidance for the practical operation of the project, and promotes the healthy development of the PPP project.

Keywords: PPP project; Investment and financing risk; Risk management; Financing costs; Policy changes; Contract execution.

1. Introduction

Public-private Partnership (PPP) model, as an innovative financing and management model for infrastructure construction, shares the risk of the whole life cycle of infrastructure projects through effective cooperation between the government and social capital, and realizes resource sharing and complementary advantages[1]. This model has been widely used in large-scale infrastructure projects such as highways, Bridges, tunnels and urban rail transit around the world, which not only alleviates the financial pressure of the government, but also significantly improves the construction efficiency and operation quality of the project through the introduction of professional management and technological innovation of social capital. In China, with the optimization of the policy environment and the maturity of the market mechanism, the PPP model has become the core force to promote infrastructure construction and urban development. In-depth research on the investment and financing risks of PPP projects and effective countermeasures are of great significance for ensuring the healthy development of projects, maintaining public interests and social stability.

This paper will deeply analyze the investment and financing risks of PPP construction projects, focusing on the effective strategies to identify, evaluate and manage these risks. In view of the important role of PPP model in infrastructure construction and urban development, it is particularly important to study its investment and financing risk countermeasures. Through in-depth discussion of various risks and influencing factors that may be encountered in the process of investment and financing of PPP projects, this paper strives to put forward targeted and operable risk coping strategies to promote the healthy development of PPP projects and safeguard public interests and social stability. In addition, this paper also hopes to provide useful reference and guidance for the government and social capital in PPP project cooperation, and promote the sustainable development of infrastructure construction[2].

2. Risk analysis of PPP construction project financing

2.1. Overview of financing risks

In the process of PPP project promotion, financing risk is one of the core factors to consider, which mainly includes financing cost risk, capital liquidity risk, policy change risk and contract execution risk. The fluctuation of financing cost directly affects the economic feasibility of the project, the insufficient liquidity of capital may lead to the delay of construction, the uncertainty of policy casts



a shadow on the stability of the project, and the complexity of contract terms and the difficulty of implementation test the management wisdom of the project parties. These risks are intertwined and require the project team to have keen insight and efficient coping strategies to ensure the smooth implementation and long-term operation of PPP projects[3].

2.2. Specific risk analysis

First, financing cost risk. PPP projects face multiple investment and financing risks, mainly the risk of financing cost, which is affected by market interest rate fluctuations, capital market competition and project complexity. Unreasonable cost setting weakens the economic attraction of the project. Both parties need to formulate a cost plan with balanced benefits based on full investigation and risk assessment to reduce risks and ensure the steady progress of the project. In addition, the risks of capital liquidity, policy changes and contract execution should not be ignored, and targeted strategies should be adopted to deal with them¹.

Second, capital liquidity risk. Due to the long construction period and large capital demand, PPP projects face significant capital liquidity challenges. Continuous capital investment requires stable financing channels and efficient management. Market fluctuations such as interest rate adjustments, policy changes and global economic uncertainties increase risks, affecting financing costs and capital chain stability, and posing a potential threat to project advancement. Therefore, it is necessary to attach great importance to liquidity risk assessment and coping strategies to ensure that projects are financially sound and flexibly respond to market changes².

Third, policy risk. PPP projects are vulnerable to policy changes, resulting in unstable project revenue expectations. Uncertainty and lack of transparency in government decision-making may directly change the mode and conditions of cooperation, increasing the difficulty and cost of project implementation. Therefore, the project side should pay close attention to the policy dynamics, assess the policy risks, and formulate flexible coping strategies to mitigate the adverse impact of policy changes on the project³ (see Table 1).

Table 1: Major policy changes affecting PPP projects in recent years and their impact analysis

(Data source: National PPP Comprehensive Information Platform, International Monetary Fund (IMF))

Serial number	Name of policy document/report	Release time	Key points of policy change	Impact analysis on PPP projects
1	Notice on Standardizing the Project Database Management of the Comprehensive Information Platform for Public-Private Partnership (PPP)	November 2017	We will strengthen the warehousing management of PPP projects and clean up non-compliant projects	Improve the quality of PPP projects, but in the short term may lead to the financing of some projects blocked, affecting the project schedule
2	Implementation Opinions on Promoting the Standardized Development of Cooperation Between Government and Private Capital	October 2019	The standardization and transparency of PPP projects should be emphasized to prevent hidden debt risks	Promote the healthy and sustainable development of PPP projects, but put higher requirements on project financing and operation
3	Guiding Opinions on Strengthening Supervision of Hidden Debt of Local Governments	June 2020	We will strengthen management of hidden debt of local governments and limit illegal borrowing	It has a great impact on projects involving government payment and feasibility gap subsidies in PPP projects, increasing the difficulty of financing
4	Revised edition of the Operational Guide on the Model of Public-Private Capital Cooperation (Trial)	Released in 2021	Clarify the PPP project operation process and key nodes, and improve the standardization and transparency of project operation	Provide more clear operational guidelines for PPP projects and reduce uncertainty in project execution

official website)

Fourth, contract risk. The imperfection of the contract terms and the lack of legal protection often become a major hidden danger in the smooth implementation of the project. In practice, if the contract does not make clear and specific provisions on key matters, or lacks necessary support and protection at the legal level, the project may encounter many uncertainties in the execution process, which will affect its economic benefits. For example, vague definitions of responsibilities can lead to frequent disputes, and the lack of an effective dispute resolution mechanism can lead to project deadlock. Therefore, a comprehensive legal review and risk assessment before the contract is signed is essential to ensure the smooth progress of the project and the realization of economic benefits[4].

2.3. Discussion on the causes of risk

The investment and financing risks of PPP projects are mainly due to the imperfect negotiation mechanism, imperfect laws and regulations, and the lack of supervision mechanism. In the process of negotiation, if the positions of both parties are very different and the communication is not smooth,

the contract terms are easy to be ambiguous, which will lay hidden dangers for the subsequent implementation. At the same time, the lagging or unclear laws and regulations make the project appear weak in legal protection and difficult to effectively deal with potential legal disputes[5]. In addition, the absence or weak implementation of regulatory mechanisms to fully and effectively monitor the project implementation process increases the risk of project failure. Therefore, the establishment of a sound consultation and negotiation mechanism, the improvement of laws and regulations and the strengthening of supervision are the key to reducing the risk of PPP project investment and financing (see Figure 1).

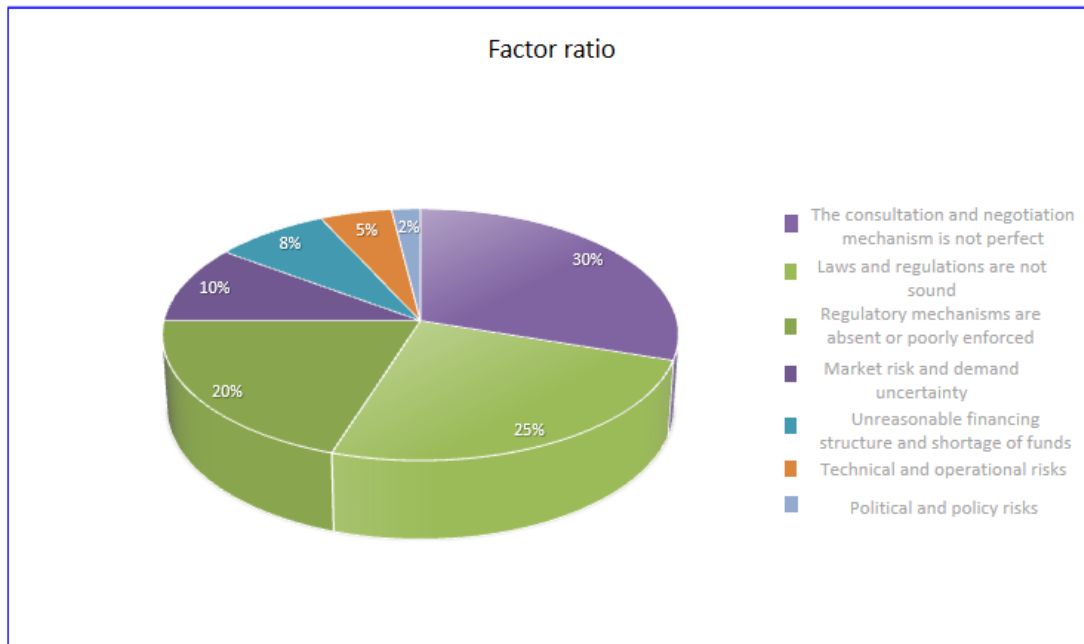


Figure 1: PPP project investment and financing risk distribution map

(Data source: questionnaire survey and expert interviews)

3. PPP construction project investment and financing risk countermeasures

First, optimize the construction of financing platforms. To address financing bottlenecks, market-oriented financing should be actively promoted and diversified financing channels, such as international capital, private sector capital and innovative financial instruments, should be introduced to enhance financing flexibility and sustainability. In addition, strengthen the research and application of asset securitization, and transform the future earnings of infrastructure projects into tradable securities, in order to broaden financing channels and improve capital liquidity, and provide a solid guarantee for infrastructure construction.

Second, lower financing costs. In order to effectively reduce the financing cost of infrastructure construction projects, it is necessary to strengthen the consultation and negotiation mechanism between the government and social capital, ensure the balance of interests of both sides, and promote in-depth cooperation. At the same time, the flexible use of fiscal subsidies and preferential tax policies to directly reduce the financial burden of the project and attract more social capital participation. Actively explore the application of financial innovation tools, such as green bonds, infrastructure REITs, etc., through capital market financing, spread risks and reduce capital costs, and provide long-term and stable funding sources for projects (see Figure 2).

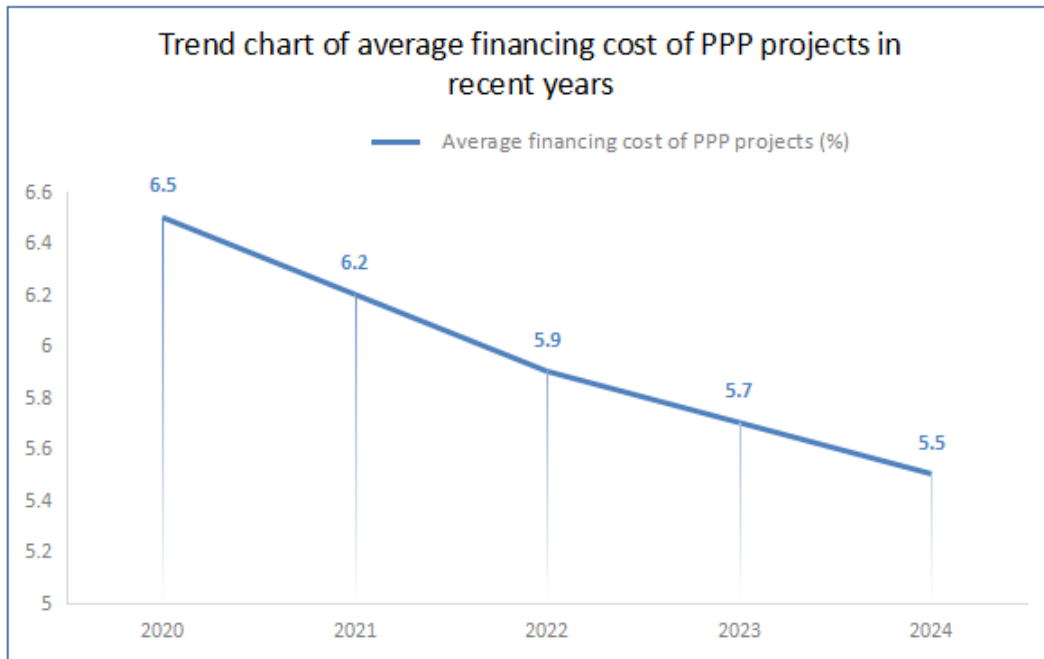


Figure 2: The average financing cost of PPP projects has changed in recent years

(Data source: National PPP Comprehensive Information Platform project database)

Third, we will strengthen the development of laws and regulations. It is imperative to improve the legal and regulatory system of PPP. It is necessary to clarify the rights and responsibilities of project parties, strengthen the enforcement of laws, and ensure the effective implementation of laws and regulations in accordance with the current policy orientation. At the same time, closely follow the international trend, learn from international best practices, promote the legal framework and international standards, in order to enhance the internationalization level of China's PPP projects and attract more social capital participation. In addition, a sound and efficient judicial guarantee mechanism should be established to provide a fair and timely solution to disputes over PPP projects, and further enhance the confidence and enthusiasm of social capital in PPP projects. Through these measures, we will jointly lay a solid legal foundation and guarantee for the steady operation and sustainable and healthy development of PPP projects.

Fourth, strengthen supervision and coordination. In the supervision of PPP projects, relying on the data advantages of the national PPP comprehensive information platform project database, we need to deeply explore the data value of the national PPP comprehensive information platform project database[6], and build a set of efficient and transparent supervision system with the latest practice as the guide. By strengthening information disclosure and ensuring the full disclosure of project information, the public can not only understand the project dynamics in a timely manner, but also enhance the social recognition and trust of the project. At the same time, we emphasize the close coordination between the government, private capital and financial institutions, use the project database as an information exchange platform, promote the effective integration and optimal allocation of resources of all parties, jointly address project challenges, and promote the sustainable and healthy development of PPP projects in an open, transparent, collaborative and efficient environment. It provides more opportunities and possibilities for international exchanges of higher education, and economic and trade cooperation provides a platform for promoting academic exchanges, student mobility and scientific research cooperation among countries along the Belt and Road (see Figure 3).

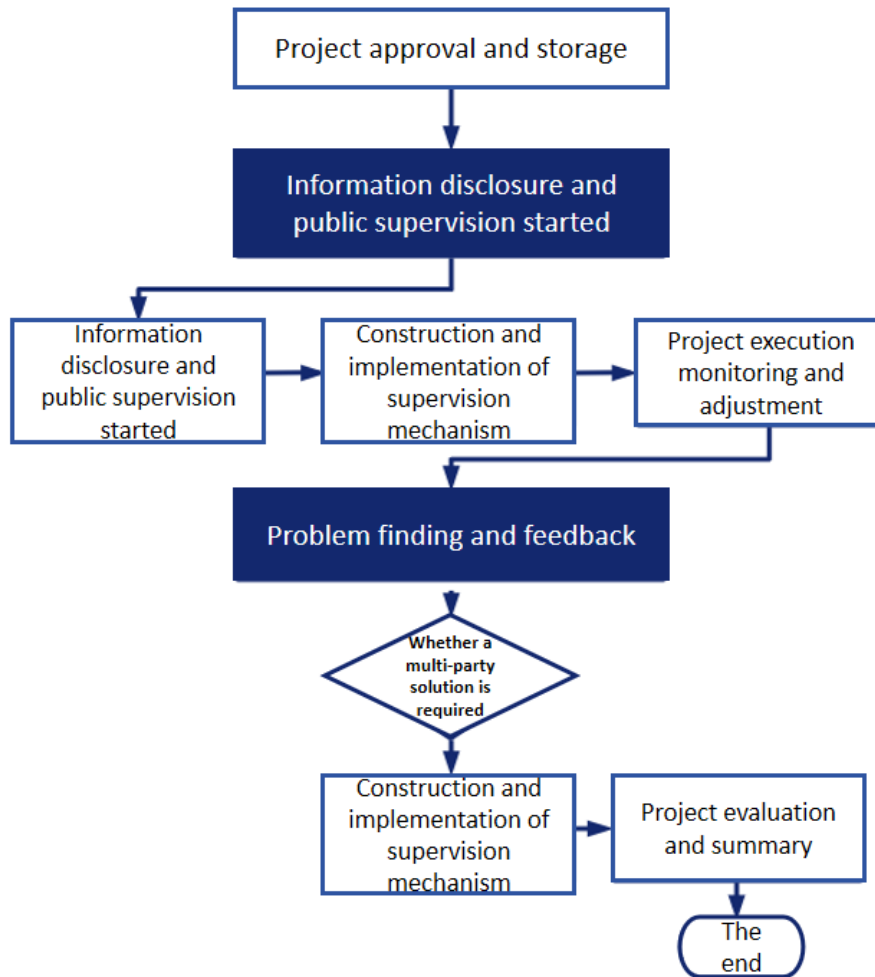


Figure 3: Schematic diagram of PPP project supervision process

Fifth, we need to improve our ability to prevent risks. The key to improving the risk prevention ability of PPP projects is to select partners with rich project experience and sound financial foundation. Through strict review of management and business qualifications, ensure that the partner has the necessary professional capabilities. At the same time, strengthen the management of contract terms, clearly define the rights and obligations of all parties, and provide legal protection for the project. Implement dynamic risk assessment, regularly monitor the progress of the project, timely identify and respond to potential risks, and ensure the steady progress of the project within a controllable scope. These practical measures can effectively improve the anti-risk capability of PPP projects.

4. Case study

4.1. Successful Cases

In the field of PPP projects, there are successful cases worth learning at home and abroad. A domestic urban rail transit project has effectively reduced financing costs through innovative financing models, combined with policy banks and social capital investment, and established a strict financial management system to ensure the efficient flow of funds[7]. At the government level, provide tax incentives, land allocation and other support, and simplify the approval process to create favorable conditions for project advancement. The project contracts are detailed and standardized, and third-party professional organizations participate in the review and supervision, which strengthens the legal protection. Efficient communication mechanisms and regular joint meetings between the two sides have promoted regulatory coordination and problem solving, and enhanced social trust.

Internationally, an environmental infrastructure PPP project in Europe is also a model. The project has successfully used low-interest loans from international financial institutions such as the European Investment Bank to reduce financing costs. The advanced information management system realizes the transparent management of funds. A number of policy incentives from the EU and member State governments, such as subsidies, guarantees and tax incentives, support the project. In strict compliance with international regulations, the cross-departmental regulatory coordination body ensures the legal compliance and efficient progress of the project. These cases provide valuable experience and inspiration for PPP project practice.

4.2. Failure Cases

A domestic sewage treatment PPP project, as a failed case, deeply reveals the problems in negotiation, legal and regulatory construction and supervision mechanism. At the beginning of the project, the government and the social capital failed to reach a consensus on key terms in the negotiation and negotiation, resulting in frequent amendments to subsequent contracts, which increased the uncertainty of the project[9]. The unsound laws and regulations make it difficult to quickly resolve legal disputes in the implementation of the project, hinder the progress of the project, and the lack of supervision mechanism leads to opaque capital flow, serious lag in the progress of the project, and finally force the suspension of the project. In view of this, it is suggested to strengthen the consultation and negotiation mechanism to ensure the balance of interests of all parties. Improve relevant laws and regulations to provide solid legal support for the project; And establish a sound regulatory system to ensure transparent and compliant operation of projects, so as to promote the steady development of PPP projects.

5. Conclusion

This study deeply discusses the risks in the investment and financing process of PPP construction projects, including key risks such as financing cost, capital liquidity, policy changes and contract execution, and puts forward specific countermeasures. By optimizing the financing platform, reducing the financing cost, strengthening the construction of laws and regulations and the coordination of supervision and other measures, this study provides an effective path for the steady promotion of PPP projects. The research results not only enrich the risk management theory of PPP projects, but also play a direct role in guiding the actual project operation, and make an important contribution to improving the risk management level of PPP projects.

Looking into the future, it is imperative to deepen the risk management of PPP project investment and financing. On the one hand, it is necessary to learn from advanced experience at home and abroad, such as the diversified financing model studied by Li Lei[5], and actively explore and apply innovative financial tools such as green bonds and infrastructure REITs to broaden financing channels, reduce financing costs, and enhance the economic attractiveness and feasibility of projects. On the other hand, continue to improve the PPP related laws and regulations system, ensure policy transparency and stability, provide a solid legal guarantee for projects, and mitigate the adverse impact of policy changes on projects. At the same time, strengthen cross-departmental regulatory coordination, rely on big data platforms to achieve information sharing, improve regulatory efficiency, and ensure that the project is promoted in an open, transparent, collaborative and efficient environment. In addition, the project parties should improve their risk prevention capabilities, strengthen the management of contract terms, clearly define rights and obligations, promote the effective implementation of dynamic risk assessment mechanisms, and ensure the sound operation of the project within a controllable range. These measures will further promote the scientific and standardized risk management of PPP project investment and financing, and lay a solid foundation for the wide application of the PPP model in the world.

References

- [1] Research on risk identification and quantification of PPP project investment and financing [J]. Construction Economics, 2023, 44(5): 45-49.
- [2] ZHAO Min. Project Investment and Financing Risk Management [M]. Guangzhou: Central South University Press, 2021.
- [3] Wang Qiang. Research on Public-Private Partnership (PPP) Mechanism of Public Projects [M]. Shanghai: University of Finance and Economics Press, 2022.
- [4] Wang Fang. PPP project failure case analysis and its risk implications [R]. Beijing: Construction Industry Research Center, 2021.
- [5] Li Lei. Comparative Study on financing models of PPP projects at Home and abroad [D]. Tsinghua University, 2022.
- [6] National PPP Comprehensive Information Platform project Database [EB/OL]. (2023-09-01)[2023-10-15]. <http://www.ppp.gov.cn>.
- [7] The world bank's PPP putted forward [EB/OL]. (2023-08-01) [2023-10-15]. [HTTP://https://www.worldbank.org/ppp](https://www.worldbank.org/ppp).