Scientific Research Publishing

American Journal of Industrial and Business Management, 2023, 13, 751-760
https://www.scirp.org/journal/ajibm
ISSN Online: 2164-5175
ISSN Print: 2164-5167

Risk Research Based on the PPP Model of Small and Medium-Sized Cities in the Southwest Area in China

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How to cite this paper: Li, Y. F., Zhong, Y. W., & Deng, Q. (2023). Risk Research Based on the PPP Model of Small and Medium-Sized Cities in the Southwest Area in China. *American Journal of Industrial and Business Management, 13,* 751-760.
https://doi.org/10.4236/ajibm.2023.137041

Received: May 31, 2023
Accepted: July 23, 2023
Published: July 26, 2023

Abstract

Since 2006, China has significantly increased its construction of PPP projects, with research in this area mainly focused on large and medium-sized cities, with little attention given to PPP projects in small and medium-sized cities. Particularly lacking are studies on the risks encountered during the implementation of the PPP model in small and medium-sized cities in the southwestern region. This paper adopts literature research methods and case analysis to classify the risks that currently hinder the implementation of the PPP model in small and medium-sized cities in the western region from multiple dimensions such as lifecycle. Through case analysis, the paper provides a reasonable analysis of the risk factors, which serves as a useful reference for future studies on PPP model risks in the southwestern region.

Keywords

PPP Model, Small and Medium City, Venture Capital Analysis, Risk Identification

1. Introduction

At present, my country's PPP projects are in a stage of rapid development. According to the data of the National PPP Comprehensive Project Information Management Platform of the Ministry of Finance's Government and Social Capital Cooperation Center, as of April 15, 2022, there are 10,244 PPP projects included in the management database nationwide, with a total investment of more than 16 trillion yuan (Tao et al., 2016; Jiang & Ma, 2015). Taking Sichuan Province as an example, the total number of PPP projects in Sichuan Province is 750, with a total project value of 2125.3 billion yuan. Among them, the number of

PPP projects in small and medium-sized cities accounts for 73.03% of the total projects in Sichuan Province. There are certain differences between infrastructure projects in small and medium-sized cities in my country and PPP projects in large cities in terms of project size, construction requirements, and personnel allocation. Infrastructure projects in small and medium-sized cities should be based on their own characteristics and limitations, and the successful experience of large cities cannot be copied mechanically (Huang & Wei, 2019; Zhao et al., 2014).

The difference between small and medium-sized city infrastructure projects and big city infrastructure projects:

1) Project scale: Due to the regional area and geographical environment of small and medium-sized cities, the scale of infrastructure projects in small and medium-sized cities is destined to be small and the investment is less.

2) Building type: Due to the limited population and environmental carrying capacity of small and medium-sized cities, the choice of infrastructure projects is also relatively limited, and they cannot build some large-scale sports venues or large-scale transportation facilities like big cities.

3) Technical level: Since the infrastructure projects in big cities may involve large transportation facilities or large sports venues, the use of new technologies and new materials will be significantly ahead of the infrastructure in small and medium-sized cities.

4) Construction standards: The construction procedures of infrastructure projects in small and medium-sized cities are simpler than those in big cities, so the construction standards and quality requirements are not as high as those in big cities.

5) Source of funds: The infrastructure projects of small and medium-sized cities cannot rely entirely on the investment of the government and state-owned enterprises, so the infrastructure projects of small and medium-sized cities need to attract part of social capital to complete the investment.

6) Project operation: Most infrastructure projects in small and medium-sized cities are designed to meet the actual production and living needs of local residents, such as basic hydropower facilities, road facilities and municipal equipment. Part of the infrastructure in big cities is to meet the higher needs of the people: for example, large sports venues, libraries and exhibition halls.

For decision makers, it is necessary to formulate different programs and standards based on local actual conditions and needs to meet the needs of local residents to the greatest extent and contribute to the sustainable development of the city.

2. Definition of PPP Model

The full name of the PPP model is Public-Private Partnership, that is, the government-social capital cooperation model. According to the classification of PPP mode on the Chinese government procurement website, it can be divided into

two types: broad sense and narrow sense.

Some stock asset projects in small and medium-sized cities are implemented through the PPP model. On the one hand, the total amount of social investment has been increased. The development of basic industries has driven the development of related industries and promoted the steady economic growth of the entire society. On the other hand, revitalizing the stock assets of urban infrastructure will attract more social funds to invest in urban infrastructure construction, which will promote the rapid development of related industries from the perspective of investment and promote the steady growth of social economy. In the current environment where financial funds cannot meet the needs of construction, by introducing social capital to participate in the construction of public services, fiscal expenditures can be reduced, and the government's short-term expenditure pressure can be eased.

In a broad sense, the PPP model specifically includes BT, BOO, TOT, OT, PFI, ROT and other operating modes. It usually refers to the establishment of a long-term cooperative relationship between the government on behalf of the public and social capital, and the construction of public service projects that are not limited to infrastructure (Zhao et al., 2016). Maximize the utility and achieve mutual benefit and win-win results, as to better protect the public interest. The PPP model in a narrow sense means that the government and the private sector form a special-purpose institution (SPV), introduce social capital, establish a "whole-process" partnership, jointly design and develop, share risks, and then hand over to the A development and operation method for government departments.

3. Definition of PPP Model Risks

Risk is an objective existence, and the loss caused by it is uncertain. After systematic sorting, various information of the project can be accurately grasped, so that potential crises can be discovered in time, and effective measures can be taken to prevent them, as to realize the long-term stable development of the project (Cai et al., 2017). The risks of PPP projects can be divided into two categories according to their controllability: controllable risks and uncontrollable risks. The former is related to the objective market environment, while the latter is closely related to project construction, operation, finance, etc., and "controllable risk" specifies how to ensure the safety efficiency and legality of the project, so as to ensure the smooth completion of the project.

1) Construction risks

"Construction risk" refers to the various possible consequences caused by the project not being implemented on schedule, delayed or failing to meet expected operational requirements. These possible results may include: a substantial increase in the investment cost of the project, an increase in the interest rate of the loan, the inability to obtain funds according to the original plan, prolonging the repayment time of the loan, and missing market opportunities.

2) Operational risks

"Operational risk" usually refers to the risk caused by various factors, such as technology, resources, energy, raw materials, production, operation, personnel, etc., in the initial stage of the project. These risks usually include but are not limited to cost, maintenance, technical support, etc.

3) Market risks

Market risk refers to the challenges that enterprises face when investing in a certain project. These challenges include domestic and foreign market competitiveness of products, possible partners, international prices, tariff policies, etc. These factors will affect the profitability of the enterprise and may have an adverse effect on the development of the enterprise. Therefore, enterprises should carefully consider these factors to ensure their competitiveness in the market and reduce market risks as much as possible.

4) Financial risks

When conducting project financing, both investors and borrowers need to carefully assess and deal with financial market volatility caused by uncertainty. These fluctuations include exchange rate fluctuations, interest rate fluctuations, inflation and tax fluctuations.

5) Political risks

In the development of PPP projects, the relevant decision-makers must consider the policy risk, because the policy risk is a very important risk, it may directly affect the economy and life cycle of the project. Policy risks may involve the adjustment of government departments' policies or the modification, implementation and interpretation of relevant laws and regulations. Policy risks can be considered as changes in the policies of local governments on PPP projects, which may greatly affect the project plan, budget and revenue, resulting in the failure to complete the project on time or the end of the project.

The content of policy risk includes but is not limited to the following aspects:

Changes in government policies or regulations: Changes in government policies or relevant laws and regulations of PPP projects may directly affect the operation status of the project, directly increase the investment cost, thereby reducing the rate of return and affecting the progress of the project (Wu et al., 2023; Tan et al., 2022).

For example:

a) Tax policy: The local government may adjust the tax policy during the operation stage of the project, which will directly affect the revenue of the project

b) Environmental policy: With the adjustment of national strategies, project-related environmental requirements may increase, resulting in unplanned investment support, which will affect the overall project income.

c) Financial policy: Due to changes in the financial situation of the local government, its financial subsidies for PPP projects may be reduced.

d) Legal policies: The government may also change relevant laws and provisions or modify the interpretation and implementation of the original laws, which will have an impact on the legal status of the project and the rights of investors.

For these risks, we need to take a series of prediction, analysis and response measures to reduce the project risk and ensure the success of the project. For example, we can formulate risk management plans, reasonably avoid risks, establish good relations with the government, improve contract terms and other ways to deal with policy risks. At the same time, we also need to pay close attention to government policy changes and related risk events, and timely adjust the project plan to ensure the successful development of the project.

6) Environmental protection risks

Environmental protection risks may lead to new resource input, or force the project to stop operations, and these risks may affect the environment.

7) Government handover risks

When a region's government is at risk, it may take steps to address the problem, such as rescinding a franchise agreement or franchise, and taxing businesses in the region in full or in part, as required by law.

8) Insurance risks

Insurance risks generally refer to those risks that cannot be identified by other means, such as technical, financial, etc. They usually arise at the beginning of the project, where some risks can be identified through agreements or contracts, but over time, these risks may become unidentified. In addition, the increase in insurance costs will also cause the project to face more risks.

9) Bankruptcy risks

Bankruptcy risk mainly refers to the possible bankruptcy risk of the private sector or the project company during the construction period or concession period of the PPP project. Since this risk will directly affect the normal construction or operation of the project, the public sector must carefully select a more suitable private sector for cooperation.

10) Potential accidents risks

Potential accidents in some equipment and other aspects (including funds) bring the risk of damage and loss to the project. This risk may overlap with other risks, for example, it cannot be considered repeatedly with environmental risks brought about in the early stage of project handover.

11) Technical risks

Technical risk refers to the technology-related risks during the construction period of the project (different from the technical risks during the operation of the project), mainly manifested in the fact that the use of imported technologies may not meet the required standards: technological progress may cause some technologies to become obsolete (known as technology update risk or technology obsolescence risk).

12) Policy risks

Governments may face liability for breaches of concession agreements and may have implications for their controls.

13) Sustainability risks

Sustainability risk refers to the risk that after the concession expires, when the private sector partners hand over the project facilities to the public sector free of

charge, the project facilities will be damaged and cannot continue to operate.

14) Force majeure risks

"Force majeure risk" refers to some accidents or other reasons, which usually affect the progress of the project. These risks often have a significant impact on the success or failure of the project.

4. Identification and Research of Related Model Risks

The PPP project has a long investment cycle and complex operation procedures, and the project management requirements for PPP projects are different at each stage (Zhang et al., 2018; Huang et al., 2020). The Ministry of Finance and the Social Capital Cooperation Center conduct the management and information disclosure of my country's PPP projects in stages, as shown in **Figure 1**. Each stage involves the allocation of government and social capital responsibilities and obligations, and the work priorities involved are also different. Different, the debt risk faced by the government at each stage also changes with the progress of the project. Therefore, analyzing government debt risks from the whole project cycle and identifying debt risks will help improve the quality of risk management and prevention. The five stages of PPP are: project identification, preparation, procurement, implementation and handover, and the key work of each stage will be introduced below.

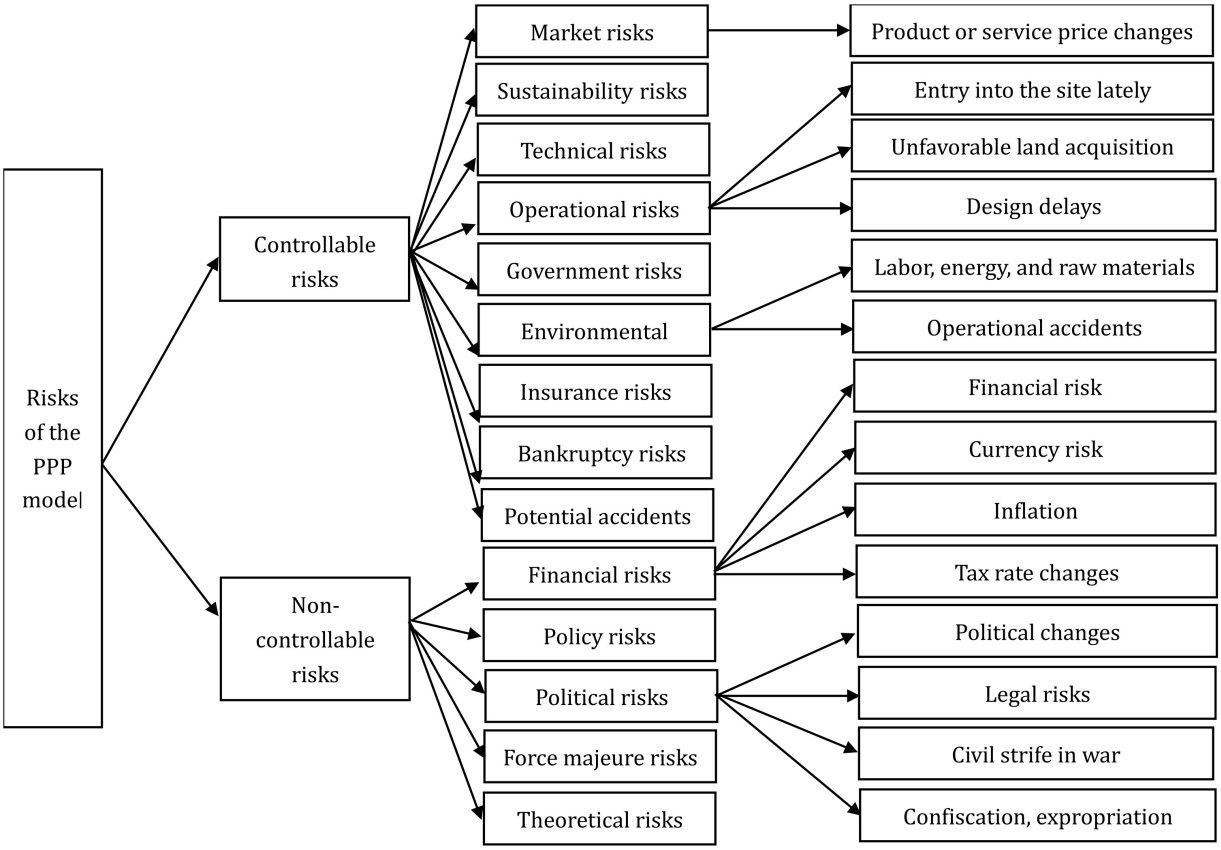

Figure 1. Diagram of the process and results of project risks.

1) Project Identification Phase

The main purpose of this stage is to identify whether the project does not meet the PPP model standards, whether the PPP model can be adopted, and play the role of project screening and screening. Therefore, the important criteria for the financial department to screen PPP projects at this stage come from the evaluation of project feasibility and implementation necessity in the double demonstration report. The purpose of adopting the PPP model is to complement each other's advantages, improve the efficiency and quality of project construction, and alleviate the debt pressure of local governments. Value-for-money evaluation and financial affordability demonstration are important basis for judging whether PPP projects can achieve their goals. The former is to demonstrate whether the PPP model is worth adopting, and whether the use of this model will cost more than the traditional model of infrastructure construction. If the cost is higher than the traditional model, it means that the use of the PPP model is invalid; the latter is to assess the government's financial support Ability to play the role of risk assessment and control. The common method is to measure the four fiscal expenditure responsibilities and judge whether the sum of the four fiscal expenditures of the government will exceed 10% of the public budget expenditure of the local government. The requirements for measurement accuracy are relatively high. To sum up, the quality of work in the PPP project identification stage is crucial to the entire process of the PPP project.

2) Project Preparation Stage

This stage is mainly to prepare for the subsequent bidding work. It is necessary to establish the management structure of the project and complete the preparation and review of the implementation plan. The content of the implementation plan mainly includes the design of the transaction structure, risk allocation, performance appraisal mechanism and regulatory framework, as well as the proposed project procurement method and the calculation of the return mechanism. The work in the preparation stage is mainly to serve as a reference and guide, and to make sufficient preparations for the contract formulation in the subsequent procurement stage.

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3) Project Procurement Phase

The procurement stage of the PPP project is the final stage before its formal implementation of construction. Its core work mainly focuses on the bidding process and result review in the project implementation preparation, the final

determination of the project implementation unit, etc. The purpose of this stage is to confirm the partners, clarify the rights and obligations of multiple parties to ensure the smooth progress of the project. The selection of partners must comply with the regulations, and there are high requirements for credit rating, financial strength, construction, and operation experience, etc. For the two parties to reach an agreement, the design of the contract terms is crucial. The method of sharing benefits and risks must be equal and reasonable. The design of the transaction structure, reward mechanism, performance evaluation and supervision mechanism must be legal and compliant, and the standards for project handover must be clear and clear. However, in the actual promotion process of PPP, due to the long project cycle, many participants, complex policy systems and other reasons, the local government's immature understanding of contract tools leads to great uncertainty in the follow-up forecast. Often face the risk of renegotiation, the contract will be supplemented according to the renegotiation content, making the contract less binding. In addition, at this stage, in order to attract social capital to speed up the progress of the project and transfer the financial pressure of the local government, the local government has to tilt more risks to the government in the contract, which leads to corruption of social investors and government departments, resulting in guarantees and backstops in the contract, financial subsidies and other unequal terms.

4) Project Execution Phase

At this stage, after the participants determine the cooperative relationship, they formally invest in the establishment of the project company, and start the project's financing, operation, performance evaluation, supervision, and issuance of evaluation reports. At this stage, the project is officially on the right track. The participants need to perform their respective rights and obligations according to the contract. The government needs to regularly supervise and manage the project, clarify the project progress and quality, and regularly evaluate the performance of the project. In this process, the government not only needs to Assuming the risks stipulated in the contract, but the government may also face the risks brought about by economic and environmental changes. In addition, due to the unclear definition of property rights in the implementation stage, it is difficult to divide risks, and the government may take too much risk due to risk transmission at this stage.

5) Project Handover Phase

In the project handover stage, the pre-construction of the project has been completed, the government will take back the assets agreed in the contract, the government and the social capital will conduct performance tests before the asset delivery and make a performance evaluation of the social capital according to the asset delivery situation. In the project procurement stage, the transfer standard is generally stipulated in the contract, but in the actual construction and operation process, social capital ignores the control of project quality to reduce operating costs. To ensure the smooth transfer of the project, there may be corruption problems. To public infrastructure quality and service level, the subse-

quent maintenance cost of the project will increase, so that the fiscal expenditure of local governments will gradually increase.

5. Conclusion

The main purpose of this article is to explore and analyze the location and types of risks that may occur during the operation of the PPP model in small and medium-sized cities in Southwest China. According to the relevant research on the risk factors in this model, it will summarize and clarify the ways to detect risks one by one. It is convenient for the decision-makers and implementers of the PPP model in small and medium-sized cities to prevent in advance or detect the existence of risks during the implementation process, as to avoid the occurrence of adverse situations.

Since the author of this paper did not directly participate in the relevant PPP projects in small and medium-sized cities in Southwest China, there are still some shortcomings in this paper. This paper does not use the PPP projects of many small and medium-sized cities in Southwest China to carry out field research and practical analysis and does not add the analysis of specific cases to it. In particular, the impact of various risk factors on the actual returns of PPP projects makes it impossible to further analyze the impact proportion of various risks on PPP projects in southwest China. If there is a chance in the future, the author of this paper will further analyze the proportion of the impact of various risk factors on the actual return of the project, so as to help the project decision maker to better complete the PPP project.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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