Contract Realization of Risk Allocation Plan for PPP Municipal Infrastructure Projects in China: A Case Study

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Abstract. As is well-known, risk allocation played a key role in the process of risk management of PPP municipal infrastructure projects. In China, thousands of PPP projects are initiated by all levels of local governments. However, it is not known whether the risk allocation plan came true in contract. How to identify risk factors, methods of risk allocation and risk response measures were paid attention by current researchers in PPP risk area. But there were few students focusing the question about contract realization of risk allocation plan, especially in Chinese municipal infrastructure projects. Based on case study method, this paper proposed that most of the risks which allocated in execute plan are actually implemented in the contract, but not all. This research can militate positive impacts for the risk allocation and contract signing process, so as to enhance the effect of risk allocation and improve the value for money of Chinese PPP municipal infrastructure projects.

1. Introduction
Public–private partnerships (PPP) has been discussed in several academic articles, and many researchers and practitioners define PPP in various concepts[1]. In China, those identified as PPP are generally defined as ‘a long-term cooperation’ between government at all levels and social capital[2]. Although PPP is delivered in various forms, providing public facilities or services is the core of China’s PPP. In comparison to traditional public procurement, PPP can accomplish ‘the optimum combination of whole life costs and quality,’ which also means value for money (VFM) for infrastructure projects[3].

PPP has been widely applied in the infrastructure development both in developed and developing countries[4]. Because of strained financial situation, PPP is more popular and has been utilized widely for the development of infrastructure projects in many developing countries [5]. In China, a total of 4,815 projects have been managed, with an investment of ¥7.3 trillion by the end of the 31 January 2019[6]. “Sharing risk, sharing benefits” plays a key role in successful PPP projects. As a result, projects’ risks allocation became a crucial issue on the PPP study area. Notably, whether the risk allocation plan can be reality or not will affect the benefits allocation in the process of PPP projects. An excellent risk allocation plan is a critical success factor of PPP projects. However, there were few scholars focusing on contract realization of risk allocation plan. Based on a case, this paper pointed that contract realization of risk allocation plan in Chinese PPP projects was incomplete. In fact, this is by no means an isolated case, more cases remain to be found and solved.
2. Literature review
Risk allocation in PPP projects is to allocate risks to major stakeholders reasonably and make agreements in the process of contract negotiation[7]. Statistical analysis is one of the most common methods of risk allocation. Experts in PPP field will directly respond to the risk allocation plan through questionnaire survey and calculate the proportion of experts to bear various risk factors. Game theory model is another method used by many scholars[8]. Some scholars applied the bargaining model to analyse the impact of different bidding orders of government departments and private parties on the risk allocation scheme of PPP projects[9]. Another student used the final bid arbitration game theory to discuss the behaviours of both parties in the risk allocation process of PPP projects.

However, risk allocation has no unique solution and there is no fixed model, so it should be determined in a specific project. it is hard to assess the extent to which risk should be transferred to the private sectors[10]. The application of risk allocation in PPP project is not ideal. Some scholars found that in concession negotiations, the government tends to transfer more risks to the private sectors, especially those risks that the private sectors cannot effectively manage, such as exchange risk and interest rate risk[11]. The research of other students found that the risk allocation of PPP projects was too subjective and the project did not achieve the expected effect.

There were many researches on risk allocation, whatever about risk allocation principle or risk allocation methods[12]. But nobody focused on whether the allocation plan real come true in contract. As a result, based on case study method this paper studied the actual reality in contract about whether risk allocation implement.

3. Method

3.1. Case selection
Case X project was chosen because of its representativeness. X project was “PPP project for the construction of overall urbanization municipal road and comprehensive pipe gallery in Tuojiang new city, Luzhou city, Sichuan province.” X project was the third batch of national demonstration projects. It represented the development level of this type of PPP projects.

3.2. Case overview
As figure 1 shows, X project was located near Tuojiang new city, Luzhou. It reaches Kangcheng road in the north, Chengxi avenue in the south, the second ring road in the east, and Yunfeng road in the west. The total investment of the project is about 2 billion Chinese yuan. The construction content mainly includes: the 20 kilometres municipal road and about 9.1 kilometres underground comprehensive pipe gallery.

![Figure 1. X project planning area.](image-url)
### 3.3. Risk allocation plan of X project

The risk allocation plan of X project is as follows:

**Table 1. Risk allocation plan of X project.**

| Risk identification                      | Undertaken by local Government | Undertaken by private sectors | Undertaken jointly |
|-------------------------------------------|-------------------------------|-------------------------------|--------------------|
| **Political risks**                      |                               |                               |                    |
| Cancellation and requisition              | √                             |                               |                    |
| Macroeconomic change                      |                               | √                             |                    |
| Delay in obtaining approval               |                               |                               |                    |
| **Pre-project risk**                     |                               |                               |                    |
| Planning determination and change         | √                             |                               |                    |
| **Financing risks**                      |                               |                               |                    |
| Not enough money is needed                |                               | √                             |                    |
| Financing costs exceeded budget           |                               |                               |                    |
| Refinancing uncertainty                   |                               | √                             |                    |
| **Construction risks**                   |                               |                               |                    |
| Poor construction quality                 | √                             |                               |                    |
| Site safety or Cost overruns              |                               | √                             |                    |
| Delayed completion                        | √                             |                               |                    |
| Defects and hidden defects                |                               | √                             |                    |
| Archaeological relics protection          |                               |                               | √                  |
| Construction technology is unqualified    |                               |                               |                    |
| Change of project PPP contract            |                               |                               | √                  |
| Breach of contract by subcontractor       |                               |                               |                    |
| Site of the accident                      |                               | √                             |                    |
| **Operational risks**                    |                               |                               |                    |
| Operating cost overrun                    | √                             |                               |                    |
| Operator default or Poor service          |                               | √                             |                    |
| High maintenance cost                     | √                             |                               |                    |
| Maintenance is too frequent               | √                             |                               |                    |
| Low O&M efficiency                        | √                             |                               |                    |
| Equipment maintenance status              | √                             |                               |                    |
| Operational requirements change           |                               |                               | √                  |
| Delay payment of operational fee          |                               | √                             |                    |
| O&M is unqualified by design defects      |                               | √                             |                    |
| O&M is unqualified by personnel           | √                             |                               |                    |
| Cost overruns due to raw material prices  | √                             |                               |                    |
| **Fiscal risks**                         |                               |                               |                    |
| Inflation/Interest rates/Foreign exchange | √                             |                               |                    |
| **Transfer risks**                       |                               |                               |                    |
| Cannot meet government requirements       | √                             |                               |                    |
| Transfer cost is over budget              | √                             |                               |                    |
| Cannot meet transfer conditions           | √                             |                               |                    |
| The force majeure                         |                               |                               |                    |
| Risks including of land expropriation and demolition | √ |                               |                    |
| Minimum demand risk for user fees         | √                             |                               |                    |
| Risks including of changes in laws, regulations and policies | * |                               |                    |

*Note: For the risks involving changes in laws, regulations and policies, if the local government can control the changes to be borne by the local government, in addition, force majeure shall be Shared by both parties*
4. Results

4.1. Realization of political risks’ allocation
According to clause 45.02 (4) of chapter 14, "if this agreement cannot be performed or the purpose of this agreement cannot be realized due to reasons of party A, party B shall have the right to terminate this agreement", and the distribution of sub-risk "cancellation and expropriation" has been realized. According to clause 50.06 of chapter 15, "due to reasons attributable to party A, the project commencement date set forth in this contract cannot be started..., the project period will be postponed, the overall cooperation period will remain unchanged, the calculation method and payment date of party A's payment will remain unchanged, and the allocation of sub-project risk "delayed approval" has been realized. According to clause 42 of chapter 13 of the agreement, the allocation of sub-risk "macroeconomic change" has been realized.

4.2. Realization of pre-project risk’s allocation
According to clause 15.01 of chapter 5, "party A shall be responsible for land acquisition, project establishment, special examination, construction drawing design, budget, review and other work" and clause 50.06 of chapter 15, "due to reasons attributable to party A, the construction cannot start on the scheduled start date agreed in this contract..., the project period will be postponed accordingly, the overall cooperation period will remain unchanged, and the calculation method and payment date of party A's payment will remain unchanged ". This risk allocation has been realized.

4.3. Realization of financing risks’ allocation
According to clause 6.02 (3), clause 2 of the agreement, "party B shall provide the registered capital, loan funds, performance bond, bank performance guarantee, etc. of Special Purpose Vehicle (SPV)" and clause 35.36.37 of chapter 11 of the agreement, the distribution of this risk has been realized.

4.4. Realization of construction risks’ allocation
According to clause 24.02 of chapter 7, "Party A has the right to terminate this agreement, pay the bank guarantee for the corresponding amount of losses, and hold party B and the SPV liable for breach of contract...". The distribution of the risk sub-items "poor construction quality" and "site accident" has been realized. According to clause 19 of chapter 9, "progress, quality, safety and regulatory requirements" and accessories "engineering general contract and special terms of contract" and clause 31 of chapter 9 regulations on construction performance appraisal, risk items "site safety", "delayed completion", "the defects and hidden defects", "the protection of the archaeological and historical relics", "construction technology does not pass" and "subcontractor default" distribution has been achieved. According to clause 18.3.2.3 of chapter 6, "if the SPV fails to complete the construction within the construction period stipulated in the contract due to reasons of social capital, reasonable return during the construction period will not be calculated.", the allocation of the risk sub-item "cost overrun" has been realized. According to clause 51 of chapter 16, "all disputes arising from the performance of the contract by the parties hereto shall first be settled through negotiation...", the allocation of risk sub-item "project PPP contract change" has been realized.

4.5. Realization of operational risks’ allocation
According to clause 27.02 of chapter 8, "the SPV shall carry out operation maintenance and repair in accordance with government and industry management standards...And submit various statements as required by party A or relevant departments...", the allocation of risk sub-item "operation and maintenance technology requirements change" has not been realized.

According to the clause 18.3.3 of chapter 6, "payment of operation and maintenance performance", clause 32 of chapter 9, "performance assessment index of operation and maintenance period" and clause 50.08 of chapter 15, the allocation of risk sub-item "delayed payment of operation and maintenance service fee" has been realized. According to clause 25, 27, 28 and 30 of chapter 8
and clause 32 of chapter 9, "operation and maintenance phase of the performance appraisal index" regulation, risk items "operating cost overruns," default "operators", "service quality is bad", "the high cost of maintenance", "maintenance too often", "operational efficiency", "maintenance", "due to design flaws cause operations not amount to mark", "caused by operations staff don't obey the discipline operations is not up to standard" and "due to rising prices of raw materials and the rise in the Numbers of operating cost overruns" distribution has been achieved.

4.6. Realization of fiscal risk's allocation
According to clause 18.3.1.2 of chapter 6 of the agreement, "...I mean annual return on investment of 7.8%...", the risk allocation has been realized.

4.7. Realization of transfer risks' allocation
According to clause 33.01 (4) of chapter 10, "the party A, party B and SPV shall assume their respective itself for the cost of transfer ", the item risk "transfer cost budget allocation has not come."

In accordance with clause 33.01 (1) of chapter 10, "...if it fails to meet the handover requirements, party B shall carry out rectification and maintenance within a reasonable period determined by party A, and shall go through the handover procedures in accordance with the provisions after meeting the requirements. If the rectification work is not completed within a reasonable period of time or the rectification work still fails to reach the standard, party A shall have the right to take back the project, terminate the agreement and invite a third party to carry out maintenance and repair. The maintenance and repair costs shall be borne by party B and the SPV after financial audit settlement... ", the allocation of sub-risk "the project cannot meet the requirements of the government at the time of transfer" and "does not meet the handover conditions" has been realized.

4.8. Realization of the force majeure risk's allocation
The distribution of this risk has been realized in accordance with clauses 41, 42 and 43 of chapter 13 hereof.

4.9. Realization of the allocation of risks including of land expropriation and demolition
According to clause 5.02 (5) of chapter 2, "party A undertakes to solve the costs and expenses beyond the investment commitment of party B and assume the liabilities and risks arising therefrom" and clause 18.3.1 of chapter 6 "...If party A each subproject requisition work day is later than the plan more than 30 calendar days, party B shall have the right to request the party A or supervision company postpone time limit for a project commissioned by party A, still can request payment terms agreed to pay to party A in the clause 18.3.1.3 has invested the requisition investment principal and reasonable returns ", the risk allocation has been achieved.

4.10. Realization of the allocation of minimum demand risk for user fees
According to clause 18.1 of chapter 6 of the agreement, "...The project's return source is user fee plus feasibility gap subsidy, which is equal to usability service fee plus operation and maintenance performance maintenance fee. The government will charge the management gallery service fee to the enterprises entering the gallery...When the project construction and operation costs cannot be fully covered by the paid management corridor use fee, the government shall provide subsidies in the form of cash subsidies... ", the risk allocation has been realized.

4.11. Realization of the allocation of risks including of changes in laws, regulations and policies
According to 44.01 of chapter 13, "...Party B has the right to ask party A for compensation in case of any changes in laws and policies that are under the control of the municipal government." And clause 44.02 "...Party A shall calculate the actual investment and reasonable return of party B and the SPV in accordance with the provisions of this agreement to conduct repurchase... ", the risk allocation has been realized.
5. Conclusions
Through analysis of above sections, "operational requirements change" and "transfer cost is over budget" risks’ allocation was not realized in the contract. Based on a case, this paper proposed that most of the risks which allocated in execute plan are actually implemented in the contract, but not all. This research can militate positive impacts for the risk allocation and contract signing process, so as to enhance the effect of risk allocation and improve the value for money of Chinese PPP projects.

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