

# Preferred risk allocation in China's public–private partnership (PPP) projects

Yongjian Ke<sup>a,\*</sup>, ShouQing Wang<sup>a</sup>, Albert P.C. Chan<sup>b</sup>, Patrick T.I. Lam<sup>b</sup>

<sup>a</sup> *Department of Construction Management, Tsinghua University, Beijing 100084, China*

<sup>b</sup> *Department of Building and Real Estate, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong Special Administrative Region, China*

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## Abstract

As part of a comprehensive research into PPP implementation, a two-round Delphi survey was conducted with experienced practitioners to identify the preference of risk allocation in China's PPP projects. The results show that the public sector would take sole responsibility for the risk "Expropriation and nationalization", and take the majority of responsibility for 12 other risks related to government or government officials and their actions. Fourteen risks which neither the public nor private sector may be able to deal with them alone are preferred to be shared equally. The private sector would take the majority of responsibility for 10 risks that are at the project level. Interestingly, no risk fell into the category that should be solely allocated to the private sector. Further analysis of the reasons behind these allocation preferences was then conducted. Recommendations on commercial principles and contract terms between the public authorities and private consortia are also made.

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## 1. Introduction

The Public–private partnership (PPP) form of procurement is recognized as an effective way of delivering value-for-money public infrastructure or services. It seeks to combine the advantages of competitive tendering and flexible negotiation, and to allocate risk on an agreed basis between the public sector and the private sector (Li et al., 2005). Since a transparent procurement process is regarded as critical to the success of PPP projects (Jefferies et al., 2002), it is important that risk allocation is clearly communicated and understood between the parties. It is thus essential for public clients and private bidders to evaluate all of the potential risks throughout the whole project life. Public and private sector bodies must place particular attention on

the procurement process while negotiating contracts for PPP to ensure a fair risk allocation between them. In recent years there have been an increasing market of PPP for the development and operation of infrastructure projects in China. With the fast pace of market-oriented transformation in the planned economy of China, a delicate balance has to be sought among private sector capacity, government regulatory function, and public satisfaction. This paper attempts to develop an equitable risk allocation scheme for the delivery of PPP projects in China. The research findings will contribute to both the practice and research in risk management for China's PPP projects and also provide valuable information for those international companies intending to invest in infrastructure construction in China.

## 2. Related previous research

Risk is inherent and difficult to deal with, and requires a proper management framework both theoretically and practically. Therefore, particular attention in the research field

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\* Corresponding author.

E-mail addresses: [kyj05@mails.tsinghua.edu.cn](mailto:kyj05@mails.tsinghua.edu.cn) (Y. Ke), [sqwang@tsinghua.edu.cn](mailto:sqwang@tsinghua.edu.cn) (S. Wang), [bsachan@polyu.edu.hk](mailto:bsachan@polyu.edu.hk) (A.P.C. Chan), [bsplam@polyu.edu.hk](mailto:bsplam@polyu.edu.hk) (P.T.I. Lam).

has been drawn on risk allocation of PPP projects. Governments procuring a PPP project would state its preference as to how the project risks should be shared; private investors would assess their capability of taking these risks, and then propose a bidding price. The contract negotiation would probably focus on the risk-sharing scheme. A general principle is that each risk should be allocated to the party best able to manage it and at the least cost (Cooper et al., 2005). In other words, an optimal risk allocation is not to pass all risks to the private sector, but to seek a solution minimizing both the total management costs of the public and private sectors.

Unfortunately, this criterion, although very sensible, often causes contrasting results in the risk allocation context. Sometimes, the partner from which the risk emanates and thus who is best able to control it, may not be able to control the risk in the most efficient way and at the lowest cost (Medda, 2007).

Questionnaire survey is the most common research technique used to obtain a risk-sharing scheme. For instances, Li et al. (2005) developed a preferred risk allocation scheme for PPP projects in the United Kingdom based on an opinion survey with 53 suitable responses; Rouboutsos and Anagnostopoulos (2008) conducted a similar survey using the same questionnaire in Greece and compared the findings to those in the UK; Jin and Doloi (2008) gathered data from an industry-wide survey to test the theoretical framework for understanding risk allocation practice in PPP projects. Case study is another useful technique to explore a suitable risk allocation scheme for PPP projects. For examples, Abednego and Ogunlana (2006) carried out a case study research on a toll way project in Indonesia for the purpose of demonstrating an approach to achieve proper risk allocation in PPP tollway projects; Similarly, Ng and Loosemore (2007) studied the allocation via a case study of a railway project in Sydney. Recent researchers have been adopting more complicated and vigorous methods in the risk allocation arena, such as game theory (Medda, 2007), etc., instead of qualitative analyses that were used in earlier research work.

However, to the best of the authors' knowledge, only a little effort has been committed to the systematical identification and management of risks in China's PPP projects, as reported by international construction management journals in recent years. Capitalizing on the Chinese government's increased PPP experience in the last decade, they have made a lot of efforts to improve the investment environment, including moving towards the adoption of international contractual practices and working out an equitable risk-sharing scheme (Wang and Ke, 2008; Chen and Doloi, 2008). This paper aims to conduct research on risk allocation and management with regard to PPP projects in China.

### 3. Research methodology

#### 3.1. Identification of the risk factors

A desktop literature review and telephone interviews were carried out to collect actual data from 16 PPP projects

in China. As a result, 13 principal risks causing the failures of these cases were identified. The analysis showed that these risks were mainly political risks, i.e. legislative changes, project approval and permit, political opposition, reliability and creditworthiness of Chinese entities, etc. (as shown in Table 1).

Another study involving an empirical questionnaire survey concerning PPP features and risk management in both mainland China and the Hong Kong Special Administrative Region was carried out by the authors from October 2007 to December 2007. In this study, analysis was conducted to compare variations in the perception of risks for different groups of respondents. The results of derived from academics were compared to those from industrial practitioners, and mainland Chinese were compared to Hong Kong respondents. The results showed that for some of the risks, the different groups of respondents did share varied views regarding their relative importance. These risks included project approval and permit, government's intervention, inflation, poor political decision-making, public/political opposition, etc. These risks are believed to be of particular interest; hence they have been included in this study for further analysis.

In addition, a comparative analysis of the different allocation schemes in Lam et al. (2007), Ng and Loosemore (2007), Li et al. (2005), Arndt (1998), Wang and Tiong (2000), Victorian Department of Treasury and Finance (2001) and National Treasury of South Africa (2004) was conducted as presented in Table 2. Although this analysis may not be very meaningful due to the different definitions of each risk and different risk list of each literature, an observation which could be made is that the equitable risk allocation is highly related to the unique social, economic, legal situation of the country. The conclusion reinforces again the objectives of this paper. Risk factors which were allocated to different sectors according to Table 2 have also been listed in this study.

Taking into account the desktop literature review, telephone surveys, and previous works of the authors, a list of 34 potential risks were identified as shown in Table 3. This risk list includes three parts: (1) principal risks in past projects; (2) the risks for which different groups of respondents (academics vs. industrial practitioners, mainland Chinese vs. Hong Kong respondents) share varied views regarding their relative importance and preferred allocations in the previous relative survey; and (3) the risks which have different allocations in those existing foreign risk allocation schemes. This list has been used to explore the perceptions of PPP participants towards risk allocation for construction projects in China. The findings are presented in this paper.

#### 3.2. Application of the Delphi survey

A two-round Delphi survey was conducted in mainland China from December 2008 to February 2009 to analyze the risks and their allocations for PPP projects in China.

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