

Public private partnership projects in Singapore: Factors, critical risks and preferred risk allocation from the perspective of contractors

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Abstract

Public private partnership (PPP) procurement was introduced into Singapore in 2003, and 10 PPP projects were successfully completed and have been in operation. This study aims to examine the critical success factors as well as the relative importance of positive and negative factors influencing the attractiveness of PPP projects in Singapore, and to identify the critical risk factors and preferred risk allocations for PPP projects in Singapore. The questionnaire survey results indicated that negative factors were more affirmative than the positive factors, and that 23 risk factors had significant criticalities. Eight risks would be preferably allocated to the public sector while 19 risks could be assigned to the private sector. 11 risks were preferred to be shared by both parties and the allocation of four risks depended on project circumstances. The findings of this study provide valuable information for organizations that intend to participate in PPP projects in Singapore.

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1. Introduction

Public private partnership (PPP) has been widespread in infrastructure development in Asia and considered as an effective way to achieve better value for money in delivering infrastructure projects (Ke et al., 2010; Li et al., 2005b). Some countries have adopted PPP due to fiscal deficit, budgetary pressure, demand–supply gap, and inefficient public services to infrastructure, while other countries choose PPP for operational efficiency, innovative technological and management skills, and more active involvement of private players in public services (Chowdhury et al., 2011).

The concept of PPP was introduced to Singapore in 2003 when the first PPP contract was awarded by the Public Utilities

Board (PUB) for a desalination plant (Gunawansa, 2010). The Ministry of Finance (MOF) published the PPP Handbook in 2004, which provides the public and private sectors with the guidelines for successful structuring and management of PPP projects in Singapore. Subsequently, the government outsourced projects worth S\$1.3 billion (S\$1 ≈ US\$0.79) to the private sector for the next 3 to 5 years (Li, 2006). 10 PPP projects were successfully completed and are in operation now, while three projects were terminated or on hold (Gunawansa, 2010; Weaver, 2010).

The nature of PPP projects makes risk an important factor in the project procurement. Most PPP projects are involved with risks that are difficult to control and analyze. Hence, risk management is critical for both public and private parties in PPP projects to attain their objectives. In addition, it is necessary to balance the risks and rewards of public and private sectors in PPP projects (Grimsey and Lewis, 2002). Appropriate risk allocation was recognized as critical to successful PPP projects (Chan et al., 2010; Zhang, 2005) and should be done at the early stage of the projects. A commonly accepted principle is to

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allocate risks to the party best able to manage it at least cost (EC, 2003).

The objectives of this study are (1) to examine the critical success factors (CSFs) as well as the relative importance of positive and negative factors that influence the attractiveness of PPP projects in Singapore; and (2) to identify the critical risk factors and preferred risk allocations in PPP projects in Singapore. The findings of this study help both public and private sectors to better understand the important factors for PPP projects as well as risk factors and their allocation, providing valuable information for organizations that intend to participate in PPP projects in Singapore.

Following the introduction to this study, the second section provides the background information relating to PPP projects. In the third section, research methodology and a profile of the respondents are presented. Then, data concerning the CSFs for PPP projects, positive and negative factors for PPP projects, risk criticalities and risk allocation preferences are analyzed, and the results are discussed in the fourth section. Finally, the fifth section draws conclusions of this study and recommends further research.

2. Background

2.1. Current status of PPP in Singapore

According to the MOF (2004), implementing PPPs in Singapore enables the public sector to get better value for money in delivering public services, provides the private sector with more business opportunities to innovate and offer efficient solutions for public services, and combines the expertise of the government and the private sector to meet the needs of the public effectively and efficiently. Hence, all government infrastructure projects that are worth over S\$50 million need to be considered for suitability as PPP projects. A number of sectors in Singapore have been identified by the MOF as suitable for PPPs. These include sports facilities, incineration plants, water and sewerage treatment works, large IT infrastructure deals, education and healthcare facilities, expressways and government buildings. In addition, the government ensures that the private sector can meet the public needs effectively; there is clear accountability when services are delivered by the private sector and the public knows who to approach for service queries and feedback; public security, health and safety are not compromised in PPP projects; and confidentiality of information is observed.

2.2. CSFs for PPP projects

CSFs have been widely used as a method to make explicit the key areas that are necessary for management success (Boynton and Zmud, 1984). A number of previous studies have been conducted to identify the CSFs for PPP projects. Qiao et al. (2001) identified eight CSFs for build-operate-transfer (BOT) projects in China: appropriate project identification; stable political and economic situation; attractive financial package; acceptable toll/tariff levels; reasonable risk allocation; selection of suitable subcontractors; management control; and technology transfer. Zhang (2005)

examined the significance of five main CSFs for PPP projects based on a worldwide questionnaire survey: favorable investment environment; economic viability; reliable concessionaire consortium with strong technical strength; sound financial package; and appropriate risk allocation via reliable contractual arrangements. Li et al. (2005a) identified five groups of CSFs for PPP projects in the UK: effective procurement; project implementability; government guarantee; favorable economic conditions; and available financial market. Chan et al. (2010) explored five underlying CSFs for PPP infrastructure projects in China: macroeconomic environment; shared responsibility between public and private sectors; transparent and efficient procurement process; stable political and social environment; and judicious government control. These previous studies enabled this study to select 8 CSFs for PPP projects based on the context of Singapore. The importance of these 8 CSFs is identified in this study, which demonstrates the factors most critical to a successful PPP project in Singapore.

2.3. Positive and negative factors for PPP projects

There are positive and negative features that influence the attractiveness of PPP in the delivery of public facilities and services. Li et al. (2005c) summarized a list of positive and negative factors for PPP projects via a comprehensive literature review, and identified the relative importance of these factors based on the perceptions of PPP project participants in the UK. Li et al. (2005c) found that the four most important groups of positive factors were associated with better project technology and economy, greater benefit to the public, public sector avoidance of regulatory and financial constraints, and public saving in transaction costs, while the three most important groups of negative factors were related to the inexperience of the public and private sectors, the over-commercialization of projects, and high participation cost and time for participants. Similarly, Cheung et al. (2010) explored the perceived importance of positive and negative factors for PPP projects using questionnaire surveys conducted in Hong Kong and Australia, respectively, and found that the attractive factors were more affirmative than the negative ones. Based on the previous studies, seven positive factors and seven negative factors were selected in accordance with the context of Singapore. The relative importance of the positive and negative factors is shown in this study, revealing the attractiveness of PPP projects to the public and private sectors in Singapore.

2.4. Risk identification in PPP projects

Risk identification is a critical phase in a project risk management process. It is desirable to identify the risks as early as possible (Wang et al., 2004), and a simple but valid method is the development of a risk checklist (Fang et al., 2004). As an integrative part of risk identification, risk categorization structures the diverse risks that affect a project (Zou et al., 2007). Xu et al. (2010) and Ke et al. (2010) identified 37 risk factors associated with China's PPP projects, and Ke et al. (2010) categorized them into country, project and market risks. Based

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