

# A review of studies on Public–Private Partnership projects in the construction industry

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## Abstract

Public–Private Partnership (PPP) in construction is gaining in popularity. Although papers published in major journals have documented real cases of PPP projects, there appears to be a lack of systematically summarizing what they have already provided. Consequently, this paper reviewed PPP studies published in the six top journals in the construction field. The objectives are to compare and contrast the findings of the studies so as to provide insights for directing further PPP research and improving the existing practices of PPP projects. To achieve the review objectives, studies were first classified as either empirical or non-empirical. Empirical studies were further grouped under three themes: risks, relationships, and financing. Non-empirical studies were grouped under five themes: financing, project success factors, risks, and concession period. Suggestions for further research are risks, financing, contractual agreements, development of PPP models, concession periods, and strategies in choosing the right type of PPP.

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## 1. Introduction

Public–Private Partnership (PPP) projects have caught researchers' attention since this kind of project was introduced in the construction industry. Many researchers have attempted to improve the operation of PPP projects by identifying key aspects of these projects (e.g. Erridge and Greer, 2002; Grimsey and Lewis, 2002; Li et al., 2005b). Though the PPP approach was widely implemented in the late 1990s, private investment in public infrastructure can be traced back to the 18th century in European countries. A notable example is the concession contract that supplied drinking water to Paris. In the 19th century, further similar cases were added from not only the European community (e.g., the Suez Canal and Trans-Siberian Rail-

way, as well as canals, turnpikes, and railroads in Europe) but also their American and Asian counterparts (e.g., United States, China, and Japan) (Kumaraswamy and Morris, 2002).

Since 1997, the PPP approach has been heavily utilized in England (Winch, 2000). Specifically, private companies have so far been involved in facilities development, including designing, financing, construction, ownership, and/or operation of a public sector utility or service (Akintoye et al., 2003a,b). In China, on the other hand, it is foreign firms or international financial institutions rather than domestic institutions that have been involved in PPP projects (Luo et al., 2001). For example, the most successful PPP project in China perhaps is Laibin B power station in Guangxi in 1997.

In fact, there are many forms of PPP, which include the outright privatization of previously state-owned industries (Ng, 2000) and contracting out of services (Efficiency Unit, 2005a). The latter includes services to be performed by private firms, such as refuse collection and cleaning and the

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use of private finance in the provision of social infrastructure (Li and Akintoye, 2003; Sindane, 2000; Tanninen-Ahonen, 2000). In addition to lessons learned from case studies (James et al., 2005), researchers have suggested the advantages of various aspects of PPPs, which include:

- Enhanced partnership between the public sector and the private sector (e.g. Erridge and Greer, 2002; Ysa, 2007; Zhang and Kunaraswamy, 2001a; Zhang et al., 2002; Zhang, 2004a,b).
- Better risk management (e.g. Grimsey and Lewis, 2002; Li et al., 2005a; Shen et al., 2006).
- Clearer government policies (e.g. Ball and Maginn, 2005; Hart, 2003).
- Revealed critical success factors (e.g. Li et al., 2005b).
- Improved maturation of contract (e.g. Ho, 2006; Tranfield et al., 2005).
- More appropriate financial analysis (e.g. Akintoye et al., 2003a,b; Norwood and Mansfield, 1999; Huang and Chou, 2006; Saunders, 1998).

Despite the fact that studies focused on PPP in construction have been increasing, to date there appears to be a lack of attention paid to the need for summarizing what has already been presented in the literature. In addition, a critical review of the existing literature may improve our understanding of the PPP's advantages and disadvantages. As Li et al. (2000) suggested, "rather than arguing for a particular viewpoint, it would be more beneficial to investigate systematically what we do know and how we can proceed to learn more". Therefore, a systematic review of relevant PPP studies is undertaken in this paper. In particular, two research objectives have been derived:

- (1) To compare and contrast the findings of the studies by use of a structure set for this paper. This structure is built up by empirical and non-empirical studies.
- (2) To provide insights for directing further PPP research. By conducting more research, the existing practices of PPPs can be improved.

The paper starts with a description of the background of the PPP, including its definitions and various forms. The review methodology is then described, including a classification system made for categorizing the retrieved studies. The findings section presents the comparison of results, followed by the discussion section, in which suggestions for further investigation will be given. The final section concludes and summarizes the present research.

## 2. Background of PPP

### 2.1. Definitions of PPP

Sagalyn (2007) contended that existing Public–Private (PP) projects have three generations. In the first generation, mistakes easily emerged due to lack of experience by public

and private partners and their consultants. In the second generation, large development companies developed specialized PP urban development projects, often by employing planners who managed PP projects for public entities or led PP corporations. As a result of social development, the third generation has emerged, which are PP projects initiated by developers seeking private-sector involvement. The number of PP projects is expanding in the third generation and it is anticipated that they will be used more widely in public service, city reconstruction, and so forth.

The idea of allowing private firms to finance projects of public sector infrastructure results in the emergence of PPPs (Li and Akintoye, 2003; The World Bank, 1992). However, due to many forms of PPP projects and situations in different countries, PPP has various definitions. In the UK, the United Nations Development Programme (2007), when planning PPPs for the Urban Environment, stated that the definition of the PPP should be broad such that even the informal dialogues between government officials and local community-based organizations, which are perceived to be essential to successful PPPs, should be included. In the US, the National Council for Public–Private Partnership defines a PPP as a "contractual arrangement between a public sector agency and a for-profit private sector developer, whereby resources and risks are shared for the purpose of delivery of a public service or development of public infrastructure" (Li and Akintoye, 2003; United Nations Development Programme, 2005). In Canada, the Council for Public–Private Partnerships (2004) defines a PPP as a "cooperative venture between the public and private sectors, built on the expertise of each partner, which best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards".

In Hong Kong, Efficiency Unit (EU) has developed another definition. The EU was set up as a unit of the Office of the Chief Secretary for Administration in Hong Kong in 1992. The vision and mission of the Unit are to provide bureaus and departments with high quality management consultancy services and to advance the delivery of world-class public services to the people of Hong Kong (EU, 2005b). The EU (2005a) created a new focus on private-sector involvement (PSI) to "assist the government in meeting its priorities, building on the clear recognition that public funds are limited". As shown in Fig. 1, PSI has two forms: Outsourcing and Public–Private Partnerships (PPPs). It introduced the concept of PPP for the maintenance of infrastructure facilities in Hong Kong, and defines a PPP as "arrangements where the public and private sectors both bring their complementary skills to a project, with varying levels of involvement and responsibility, for the purpose of providing public services or projects". The Unit describes six forms of PPPs as shown below:

- *Creating wider markets* means to utilize the assets in terms of skills and finance from both the public and private sectors.

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