Transport infrastructure provision and operations: Why should governments choose private–public partnership?

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A B S T R A C T

Recent transport sector liberalisation, as well as global economic crisis, is favouring the implementation of transport infrastructure projects through Public–Private Partnerships (PPP). However, there is a debate as to whether PPP schemes are a better option than conventional procurement. To this end, an evaluation framework is proposed, to assess which of these two alternative schemes for transport projects financing is preferable for the public. The proposed framework is complimentary to the Value for Money (VfM) approach and is based on a Multi Criteria Analysis (MCA). The first step is the estimation of the Public Sector Comparator (PSC) for the case of conventional procurement, dealing with construction, maintenance and operation costs revenues, as well as any costs associated with risks undertaken by the public. As for the PPP case, it includes any payments by the public sector and related risks costs. The MCA is then applied only if the PPP is found preferable for the public sector. The latter considers additional impacts, including among others the social attributes of a particular scheme, job creation, environmental impacts and safety and security aspects. The proposed framework was applied to a pilot Bus Rapid Transit (BRT) corridor infrastructure project in the city of Indore, India, in order to demonstrate its validity. The framework and its application could provide useful guidance when considering PPP for a transport project, since it demonstrates in a transparent way the society's attitude towards this project, something that is critical to its acceptance.

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1. Introduction

Until the end of the previous century, the public sector, being the owner and the responsible entity for the transport infrastructure in almost all countries, was, with a few exceptions, engaged directly in the financing and administration of transport infrastructure construction, maintenance and operations. Nevertheless, the 1990s were marked with a significant development of Public Private Partnerships (PPP), and from then onwards, PPPs have gained worldwide acceptance.

The United Kingdom is the country that leads the way in this approach, naming it Private Finance Initiative (PFI), and applies it to other sectors, such as public transport. The European Commission has also been promoting the use of PPP in the implementation of the Trans-European network.

Despite the latter, there is still considerable debate, adding to the public's confusion, as to whether a PPP financing scheme will most likely perform better than any traditional standard model of exclusive public involvement and financing. A common problem with PPP projects was that private investors obtained a rate of return that was higher than the government's bond rate, even though most or all of the income risk associated with the project was borne by the public sector.

To this end, several Value for Money (VfM) evaluation approaches have been developed, which although have wide application, are believed to suffer from several drawbacks, the most important being that they focus purely on financial aspects, failing to accommodate other significant non-readily-quantifiable factors, such as social impacts that affect public acceptance.

Based on the above, a methodological framework for the evaluation of the two alternative schemes for transport projects is

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proposed, complimentary to the one of the conventional VfM. It is based on a Multi Criteria Analysis (MCA), introducing non-quantifiable impacts.

2. The Value for Money evaluation approach

The main debate with regard to PPP is focused around value for money for the society, and hence, the systematic use of tools assessing the value for money of PPP is gaining increased attention in Europe and the rest of the world. Nevertheless, their application differs amongst countries, and there is no comprehensive generic study of the PPP market at an international level. For example, the Value for Money (VfM) approach employed in the UK and in other European countries, as well as Japan and Australia, has been relatively unknown until recently in the United States (Morallos, Amekudzi, Ross, & Meyer, 2009).

The VfM approach is used to compare the required public funds for two cases: the first case refers to the implementation of the project with PPP, while the second case to the delivery of the project (construction, maintenance and operation) by the public sector, termed as the reference project. The latter constitutes a hypothetical risk-adjusted costing by the public sector as a supplier, to an output specification as part of a PPP procurement exercise. To this end, according to guidance issued by the UK Treasury (HM Treasury Green Book, 2003) and followed by other countries, all projects that have been approved for PPP proceed to ex-ante quantitative comparison of their costs against a public benchmark, namely the "Public Sector Comparator" (PSC). The VfM is determined through the application of PSC, which is not based on a full cost-benefit analysis, but on a comparison in Net Present Value of costs (NPV) for the public sector over the duration of the PPP contract for the two cases. Therefore, the PSC is based on estimates of full costs, revenues and risks, set out in cash flow terms, discounted at a public sector rate to an NPV.

For the case of public delivery, the total costs occurring to the public sector are estimated. These are related primarily to the construction, maintenance and operation costs, regardless if these are undertaken by a third party after a tendering procedure. They also include costs of retained risks and cost of adjusted risks, for those risk items that the private sector would undertake in the PPP case, and which would have to be attributed to the public sector for the case of public delivery. In this way, both cases are compared on equal terms. These costs are compared to the ones occurring to the public sector in the case of PPP, and which are related to the service payments to the private companies with the adjustment for risks and costs retained by the public. In order to estimate the total costs to the government for achieving the targeted outputs, it is assumed that the project is handled in the "normal" way, with reasonably foreseeable efficiency improvements. Finally, the VfM is determined for a specific discount rate, with the values of NPV obtained with application of PSC, as per the following equation:

$$VfM = NPV_{PPP\ project} - NPV_{public\ delivery} \qquad (1)$$

Thus, if VfM > 0, the PPP is preferable to the public delivery. Needless to say, this can be applied to several alternative scenarios for PPP project implementation, choosing the one with the highest positive value of VfM.

Although, there has been strong political consensus with regard to the VfM methodology, since it brings financial rigour, considers risks as well as the full life cycle of the project, there are still several issues that are being debated. Among others, Grimsey and Lewis (2005) carried out a thorough review of the literature's commentators, summarising the main concerns with regards to the validity of the method and the accuracy and comprehensiveness of the information used and assumptions made. Their findings are:

- Given that the PSC value is hypothetical, its value is entirely dependent on the assumptions made, particularly on the one with respect to the crucial element of risk transfer to the private sector.
- The appropriateness of the discount rate, which does not provide a measure of social time preference, but is related to market values.[1] Because of the discounting inherent in calculating NPVs, even small changes in the discount rate applied will alter the end outcome.
- Irrespective of how much risk is transferred to the private sector, the main risks (obsolescence, changing needs and service performance outcomes) are born by the public sector with costs falling upon the general public.
- The real issue should be uncertainty, not risk, and this distinction questions the validity of risk calculations.
- The way tax is considered and how it is treated in the calculations.
- Efficiency assumptions with respect to the translation of a PSC to a shadow bid.
- With long-term contracts, financial evaluations related to cost estimates, discount rates and risk allocation provide incomplete data to draw conclusions about the viability of proceeding with the PPP option; thus, more emphasis needs to be given to non-financial elements in a macro term evaluation.
- The public sector delivery option may not be the only/best benchmark.

In addition to the above, there are socio-economic and other qualitative factors that by definition cannot be monetised in the cost-benefit analysis, and thus, cannot be included in the PSC. These are related to the wider social impacts to the general public, in terms of benefits and costs, the level of services offered by each transport infrastructure, environmental and safety impacts, credentials and reputation of the bidder, the private sectors perception of the PPP projects, etc. On the other hand, private sector organizations are reluctant to assume the traffic revenue risk associated with PPP road projects in developing countries (Singh & Kalidindi, 2006), an issue that cannot be addressed by PSC.

3. Proposed methodological framework

3.1. Overview

Based on the above discussion, the purpose of this paper is to present a novel three-step framework for a comparative evaluation of PPP and PSC approaches for financing transport projects.

Although overlooked, the distribution of 'costs' and 'benefits' of a transport infrastructure project across population groups and regions, often receive much public and political attention in the decision-making processes. They play a key role in terms of general public acceptance of PPP transport infrastructure projects, and will ultimately assist these to reach implementation, and, therefore, need to be taken into account. Failing to do so increases the risk of strong reluctance and protest against the participation of the private sector. Public acceptance should be a vital factor in PPPs, and therefore, for the purpose of transparency, governmental agencies and other organisations should make their guidance, documentation, and analysis reports accessible to the general public.

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[1] The government and the private sector typically adopt different approaches to pricing market risk. The government tends to use the social time preference rate (STPR) or some other risk-free rate to discount future cash flows when appraising projects, while private bidders for PPP projects typically include a risk premium in the discount rate they apply to future project earnings.