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Tendering Procedures in PPP: A Literature Review

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Abstract

Purpose – This paper aims at providing an overview about literature on tendering process in PPP, with particular regard to transportation PPP case.

Design/methodology/approach – The approach is based on the analysis of the pertinent publications on the theme.

Findings – Three main interest areas can be found in the literature: tendering procedures, evaluation methods and evaluation criteria.

Social implications – Contract authorities have several tools in order to pre-qualify and select bidders and negotiate with them: they can choose the instruments which best fit to their market

Originality/value – The paper provides a complete overview on PPP tendering procedures both used by practitioners and proposed by scholar and offers suggestions for further research on this issue.

Keywords:

Tender, tendering procedures, bid evaluation methods, bid evaluation criteria

Contribution to Working Group WG1.

1 Introduction

In last decades, due to the restrictions to the use of public budget and to the need of get higher efficiency levels, more and more Governments have chosen Public Private Partnerships (PPPs) as a way of satisfy the increasing demand for transportation infrastructure. In particular, the adoption of this delivery solution has found wide application in developing countries, where there is both a strong demand and reduced capital availability. Otherwise, also in developed countries, in many cases governments have chosen to provide new highway, railway, airport and ports by PPP for a set of reason, like budget constraints and larger efficiency of private companies in carrying out and manage infrastructure.

Many factors can determine the success of a PPP project. One of these is the decision making process before the start of a PPP project. Many decisions are required to a public contracting authority going to address a PPP process. Among these:

- whether carrying out a project by PPP or traditional procurement;
- what phases to delegate to the private partner;
- what risks to transfer to the private partner and what else to retain;
- which partner to choose for the PPP.

While much attention has been paid to the three former issues, not many contributions focus on the selection and awarding procedure of a private partner for the PPP. Generally, the private party of a PPP is awarded by means of a public tender, given the public interest of such a competition. The tendering processes of PPP are more complicated and more costly than those of conventional procurement. Birnie (1997) found that tender costs for PFI projects in the UK ranged from 0.48-0.62% of the total project costs, which are higher than those for conventional procurement (i.e., design-build projects (0.18-0.32%) and traditional design-bid-build projects (0.04-0.15%)). Other estimates about impact of tendering on total PPP cost are even much higher, until to 10% [Zhang 2005b]. A well-structured tendering process is therefore the base for minimizing tendering costs and encouraging competition [Kwak et al. 2009].

Addressing tendering procedures is strategically relevant especially in transportation PPPs. Indeed, most of these markets are characterized by oligopolistic conditions, with actors having strategic power and using it [Meunier and Quinet 2010]. In such cases, contracting authorities have to design opportunely the tendering process, in order to maximize their outcome: a wide knowledge of the existing procedure is essential to this aim.

An overview of the existing literature on the theme shows three relevant issues regarding tendering in PPP. The first one is about the procedure to follow in the tender: different phases can form the PPP tendering process, but some of them can be missing in some cases. Secondly, there are different awarding methods used in real projects and some other ones are proposed in the literature. Lastly, due to the complexity of such
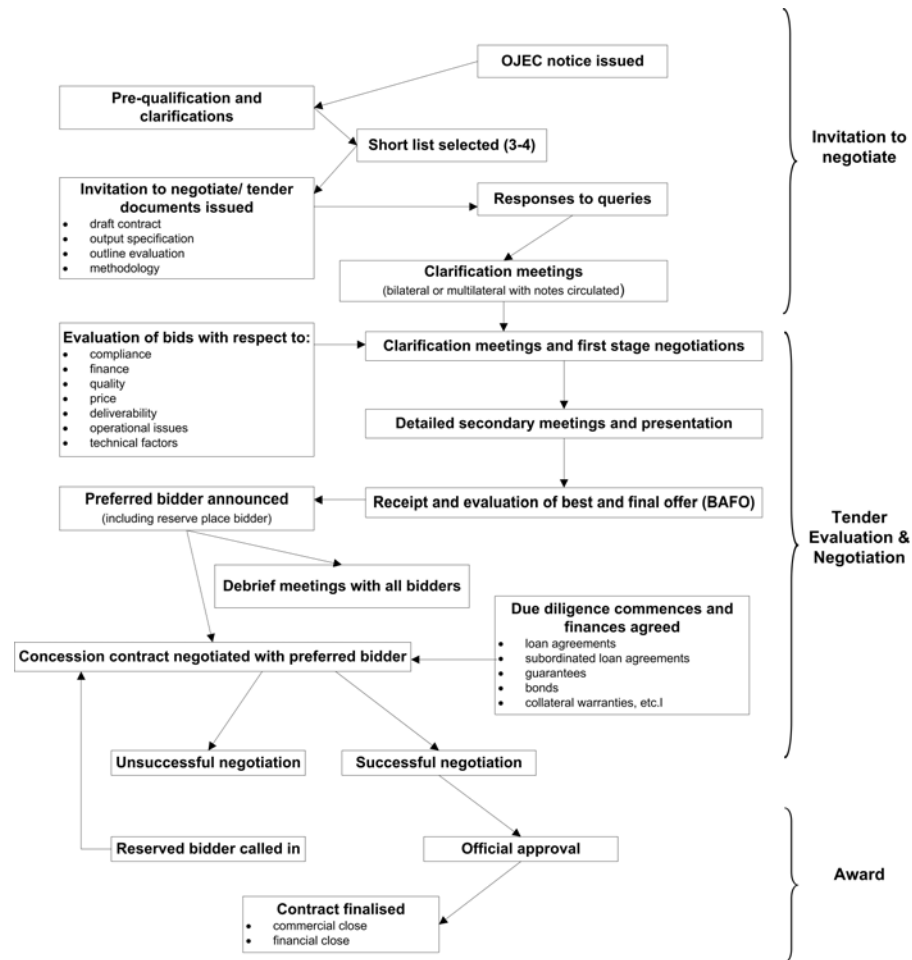
Figure 1: The PPP procurement stages up to financial close [CIC 1998; Ahadzi and Bowles 2001].

projects, most of the cited awarding methods are assessing different factors: consequently, it is important to provide a collection of the used evaluation criteria.
This paper aims at providing an overview of the research about tendering in PPP, by offering a focusing on the existing contributions for each of the three cited areas of interest. An analysis about the existing gaps to fill and possible further research development is made.

2 Procedures for PPP tendering

Five different kinds of procedures can be used in PPP tenders [Wang and Dai 2010]:
- open competitive tendering
- invited tendering
- registered lists
- project-specific prequalification and shortlisting
- negotiated tendering

A survey made by Zhang (2004a) shows that, among these, open competitive tendering is the most used and the most recommended procedure. This consists of the following phases [Zhang 2004b]:
- request for prequalification
- prequalification
- invitation to tenders
- tender evaluation and shortlisting
- negotiation with shortlisted tenders
- selection of best tender and award

Figure 1 shows a possible scheme for the PPP procurement stages up to financial close. While some of these tasks are simple to be carried out by the contracting authority, like calls for bidders to be pre-qualified and calls for tenders of qualified bidders, three main phases can be distinguished in the tendering procedure [Tiong and Alum 1997]:
- **Prequalification of tenders.** The aim of this prequalification stage is to reduce the number of interested tenders to a shortlist, which consists only of reputable and experienced tenders, which are able to take over project risks. Unnecessary tendering costs of weaker bidders are avoided.
- **Evaluation tenders.** This stage consists in the selection of one or more among qualified bidders. Tenders on the shortlist are invited to submit detailed proposals that are evaluated in accordance with the predefined evaluation criteria.
- **Negotiation with preferred tenders.** This stage consists in the negotiation prior to the final awarding with one or a few preferred tenders. At this stage, provisions in agreements are carefully reviewed. Once the agreement is signed, a contract award notice will be published and the contract is implemented.
- **PPP awarding.**

For instance, as the works of To and Ozawa (2007) and Tiong and Alum (1997) highlight, prequalification phase is missing in some Asian countries like Hong Kong, Thailand and Malaysia, because, their governments think that, due to large effort

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required by such works, only big experienced companies take part to the tender, while many other contracting authorities in countries like Australia, Canada, Philippines, USA, UK use the prequalification of bidders [Tiong and Alum 1997]. Also negotiation phase can be missing, as in the case of Philippines procedure [To and Ozawa 2007].

Hong Kong procedure is also illustrated in Zhang et al. (2002) for two tunnel projects: even if the Government propose a design to follow, different design solution can be proposed by each competitor by means of additional bids for the same tender. After the evaluation phase, the preferred tenderer is called to a final negotiation with the Government before submitting the Best and Final Offer. Otherwise, the UK's PFI procurement process is an example of is a multi-stage tendering process which includes almost all stages [Kwak et al. 2009], as shown in Figure 2.
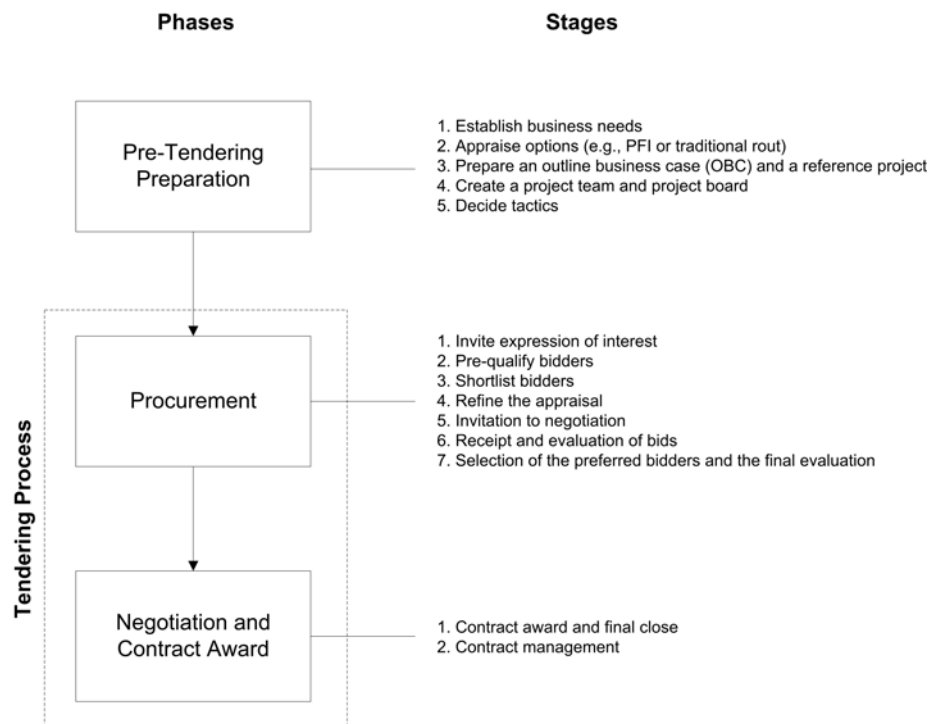

Figure 2: UK's PFI Procurement Process [Kwak et al. 2009].

There is a wide literature comparing negotiation with auction as exclusive tendering procedure: nevertheless, these contributions do not express a clear preference of a procedure over the other one [Saussier et al. 2009]. As described before, in many cases

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both approaches are used sequentially in the tendering process. As Saussier et al. (2009) state about Public Private Agreement (whose PPP is considered as an example), a final negotiation phase after the tender evaluation is useful because it allows joining the flexibility needed in such complex project with the rigor given by the tendering mechanism.

In order to provide contracting authorities guidelines to follow for designing PPP tenders, Doni (2007) compares three kinds of procedures: the negotiation, the auction and the competitive negotiation procedures. In absence of collusion among one bidder and the public agent, the competitive negotiation gives a higher expected value to the Government than other methods and negotiation is preferable to competitive auction, especially if the public negotiation power is high and the bidder is quite reliable. In such a situation, competitive tendering can work better than negotiation only if the suppliers' market is widely competitive. Otherwise, if there is a strong probability of having a corrupt public agent, auction determines a better value for Government. The power of the negotiation phase is affirmed also by Torta (2005), who underlines that, if negotiation phase had been used the BOT project for the Milano-Brescia highway in Italy, better final conditions could have been obtained by the public counterpart. The Irish PPP procurement process is set out in detail by the Central PPP Unit (2006). It is similar in many respects to the UK process but it also identifies eight tasks to be completed before the OJEC notice is issued. Most of these are concerned with the assessment of the project to establish that PPP is actually the most appropriate procurement method. One of the key decision points revolves around capital value, as a project with a capital value of greater than €20 million is required by legislation to be assessed as to its suitability for procurement as a PPP.

3   Methods for private partner selection

The literature contributions about methods to rank candidate partners for PPP and choose the best one can be distinguished according two classifications. The first one is concerned with the moment of the procedure in which selection method is applied: according to this perspective there are some methods applied for supplier pre-qualification and other ones used in the final awarding. In addition to this, it is possible to distinguish techniques actually applied in the real cases and methods only suggested in the literature.

Zhang (2004a) classifies four commonly used prequalification methods: binary method, simple scoring, multi-attribute methods, other methods. As illustrated above, these are methods used also for assessing tenders of pre-qualified bidders.

As regards the bid evaluation, Wang and Dai (2010) reports some methods from practice: lowest price or shortest period, Kepnoe-Tregoe method and Least Present Value of Revenues (LPVR). According to the first case, the awarded concessionaire is the one asking for the lowest price for carrying out the project or the shortest concession period. This is an approach similar to that used in traditional procurement, but it is

strongly criticized by many scholar for not taking in account non-price factors in the project. Kepnoe-Tregoe technique [Zhang et al. 2002] is based on the distinction between must and want criteria. The former are "on-off" criteria: all proposals not satisfying all musts are rejected. The remaining bids are evaluated on want criteria: a committee chooses the sponsor best meeting these requirements. The limit of this method is the discretionary power of the decision makers in distinguishing must and want factors.. The LPVR concept consists in awarding the bidder with the lowest price and letting her operate the concession until the budget value of the project (previously decided by the public client) is obtained.

Some of these methods are also recalled in the classification offered by Zhang (2004a), which includes:

- simple scoring;
- NPV;
- multi-attribute analysis;
- Kepner-Tregoe;
- two envelope method;
- NPV+simple scoring;
- binary methods+NPV.

In the simple scoring, each criterion is assigned a maximum achievable score and each bid is assigned a score ranging from 0 to the maximum achievable for each criterion. The awarded bid is the one with the highest sum of scores on all criteria. According the NPV method, the project is awarded to the bidder with the lowest NPV of the overall required toll during the concession. NPV can be used together with scoring method for the qualitative evaluation of the bid or after the exclusion of bids violating mandatory requirements (binary method). Instead, in the multi-attribute analysis, criteria are grouped in packages and subpackages, each of which having its own weight. The bid with the best weighted sum score is awarded. As regards the two envelope method, technical proposal seals are firstly opened and bid are ranked against non-price criteria. Then economical price envelopes are open: the best technical-ranked bid within the Governmental budget is awarded. The choice of the method is influenced by the complexity of the project: binary, simple-scoring and two-envelope methods well suits to small-sized and simple projects, while NPV is a valid choice for projects with proven technologies and, finally, Kepner-Tregoe analysis better fits to complex projects.

As regards the application of such techniques, Kepner-Tregoe is generally adopted in Hong Kong BOT projects [Zhang et al. 2002], while NPV and multi-attribute analysis are used in PFI projects in the United Kingdom [Kwah et al. 2009]. Simple scoring technique is adopted in some Italian PPP projects, like, for instance, the Brescia-Milano highway project described by Torta (2005). According to a survey of Zhang (2004a), among these, NPV and multiattribute analysis are the most used and the most recommended methods. Table 1 lists the described techniques by practitioners for pre-qualification of bidders and bid evaluation.

Table 1. Methods for bidder pre-qualification and bid evaluations used by contracting authorities.

	Significant methods	**Selected literature**
Prequalification	• Binary method • Simple scoring • Multi-attribute methods	Zhang (2004a)
Bid evaluation	• Simple scoring • NPV • Multi-attribute analysis • Two envelope method • NPV+simple scoring • Binary method + NPV • Lowest price • Shortest concession period • Kepnoe-Tregoe technique • Least Present Value of Revenues	Zhang (2004a), Wang and Dai (2010)

Besides the methods used by practitioners, some other proposals can be found in the literature. Rudzianskaite et al. (2010) suggest an evaluation procedure based on TOPSIS (Technique for Order Performance by Similarity to Ideal Solution): even if the procedure is addressed to the choice among different projects, it could be applied to the evaluation of different bids for the same project. In addition to this, Costantino et al. (2011) propose a technique based on evaluating different bids according to different stakeholders' perspective: the convenience of each of them is evaluated by means of an appropriate indicator. Finally, Zhang (2009) proposes the adoption of a fuzzy logic system for his best value concessionaire selection, based on four groups of criteria defined by the same author and illustrated in the following section.

4   Criteria for private partner selection

Many authors have proposed different set of criteria for choosing the best among the candidate sponsors for a PPP project. Also in this case, some authors focused on prequalification criteria, while many else proposed criteria to be satisfied for the final awarding.

Table 2. Criteria for bid evaluations.

	Significant criteria	Selected literature
Financial and Economical criteria	• Sound financial analysis • Reasonable source and structure of funds • Innovation of financing method • Net present value • Tariff/toll setting up and adjustment mechanism • Ability to address commercial risk (e.g., supply and demand risks) • Minimal financial risks to the client • Internal rate of return • Financial strength of the participants in the project company • Financial guarantee • Total investment schedule • Concession period • Strong financial commitments from shareholders • Pay-Back Period • Profitability Index	Zhang (2005a), Rudzianskaite et al. (2010)
Technical criteria	• Qualifications and experiences of key design and construction personnel • Experience in similar projects • Conforming to client's requirements • Competencies of designer/subdesigners • Contractor/subcontractors • Conforming to design requirements • Costruction programs and abilities to meet them • Design and construction quality control schemes • Use of advanced technologies • Maintainability • Design life • Design standard • Quality management and assurance systems	Zhang (2005a), Wang et al. (2007)
Safety, Health, and Environmental Criteria	• Qualifications/experience of relevant personnel • Management system of safety, health and environment • Conformance to laws and regulations • Construction/demolition waste disposal • Control of air and water pollution • Past environmental performance • Protection of items of cultural/archeological values • Management safety accountability • Noise reduction and dust reduction	Wang et al. (2007), Zhang (2005a), Rudzianskaite et al. (2010)
Social Criteria	• Importance of the project for public transport	Rudzianskaite et al. (2010)
Managerial Criteria	• Project management skills • Constitution of the management, their qualification and experience • Coordination system within the consortium • Success rate of cooperation among private consortium • Leadership and allocation of responsibilities in the consortium • Effective project controlling system • Working relationship among participants	Zhang (2005a), Wang et al. (2007)

As regards the prequalification, Zhang (2004b) proposes 11 requirements to meet. Some of them are financial, like the financial report of companies taking part to the consortium, used sources and debt/equity ratio. Other ones are concerned with the meeting of legal requirements, like details of pending or threatened proceedings.

Another important subset of criteria is that of the experience requirements: in particular past similar work done by competitors, their current workload, their advisors' experience, their experience in managing PPP projects. Finally, other prequalification criteria are the management structure of the consortium, the technical, operational and financial capabilities, quality, health and safety requirements and meeting and presentation of consortia.

While the prequalification phase is simply based on the qualifications and the capabilities of the candidates, the awarding phase aims at assessing the specific features of the offers. Zhang and Kumaraswamy (2001) propose 9 main criteria used for BOT highway projects awarded in the early Nineties in Honk Kong: two of them are about the proposed toll regime, three are about the robustness of the presented solution, three more are about the financial sustainability, while the last criterion is the benefit that the community can gain from the assessed proposal. In a following paper, through a review of the international literature, experience about real case and interview with practitioners, Zhang (2005a) has found 83 criteria for the private partner selection. He divided them in four categories: financial (26), technical (26), health, safety and environmental (15), managerial (16). The author interviewed public practitioners, private practitioners and academics and found that the most important criteria are the financial and the technical one for all of them. No significant differences could be found among the assessment of the different interviewed groups. A similar but more synthetic criteria classification is that proposed by Wang et al. (2007): they proposed 18 criteria for the private partner, whose five are about the financial issues, four determine the ability to design, building, managing and operating, four are about health, safety and environment issues and the remaining are classified as "other factors". Finally, Rudzianskaite et al. (2010) propose a set of seven sustainability indices regarding road projects: four of them are economical (Net Present Value, Internal Rate of Return, Pay-Back Period, Profitability Index), two of them are environmental (noise reduction and dust reduction) while the last one is a social factor (importance of the project for public transport).

Table 2 shows a summary of significant criteria selected in the literature.

5   Conclusions

The tendering phase is one of the most important aspects in Public Private Partnership, but, until now, international literature has not paid this issue the same attention as other ones, like Value for Money and risk management, for instance. Nevertheless, there are some relevant contributions, illustrated in this paper, which traced a road for this research.

An overview about the tendering procedures used in the different countries adopting PPP is lacking in the literature: this would be useful to understand what procedures are

mainly used and whether there is a relationship between these and the economy of such countries. Moreover, it would be of great significance to understand how transaction costs increase by adding phases like prequalification and negotiation and if this increase is justified by the consequent benefit in terms of best and final offer.

As regards the selection method, it would be interesting to verify whether bidders' behaviour changes with the shifting of the method and, consequently, if a method can lead to a best awarded bid than the others. In addition, the application to PPP partner choice of other supplier selection methods coming from Supply Chain Management (SCM) could be tested. Moreover, even if the contributions about evaluation criteria for the private partner selection are quite exhaustive, also in this case a comparison with analogous works in SCM literature could enlarge the knowledge in this field.

Finally, this overview on tendering methods in PPP can be a starting point for the definition of appropriate awarding process in the sector of transportation: the selection of the private partner is paramount in this project typology, due to the large required budget and the long time horizon. Consequently, setting tendering procedures which foster competition and best fit the features of this particular market is essential.

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