

Successful Tendering in Public Private Partnership, Cost Opportunity Analysis

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ABSTRACT

Due to inadequate public financial status and increasing demand on infrastructure facilities, many governments worldwide are exploring new arrangements through Public Private Partnerships (PPP). However, PPP approach are not applicable for all projects and investors may pay a lot of time and money for preparation for a tender that may not have adequate return back. Therefore, private investors are seeking a model to support them to decide whether bid or no bid in a PPP tender. This paper presents a decision support system based on MADM decision-making models to evaluate Cost Opportunity of tenders. Utilizing the proposed model, private investors can rank the PPP tenders and select most tender with least cost opportunity. Applying the proposed model in eleven Iranian PPP project in the field of water and power plant, prove that private investor decide to bid in a tender not only for fiscal attracters of project, but also they consider how public authority is organized and committed to responsibilities. Public party can improve the success chance of PPP tenders by offering some incentive and advocate de-risking mechanisms.

KEYWORDS

Infrastructure, PPP projects, BOT contracts, Success Evaluation, MCDM model

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1. Introduction

Preparing public-private partnership projects is a time-consuming and costly process [1]. Moreover, to prepare a bid in a public-private partnership tender or negotiation, the investor must design a detailed technical and economic package, consolidate a consortium of financiers, and provide heavy financial guarantees. Therefore, investors must evaluate the cost of the bidding opportunity before participating in an investment tender or entering into exclusive negotiations. Finally, the decision to participate or not to participate in the tender is made based on the evaluation of the opportunity cost.

The purpose of this paper is to provide a quantitative model for predicting the opportunity cost of public-private partnership tenders so that a developer or private investor can decide whether or not to participate in a public-private partnership tender or negotiation. "Opportunity cost" represents the ratio of investor risk to invest time and cost versus the probability of successful bidding and expected return on investment. In this paper, by developing the conceptual framework of successful deal, a quantitative model for estimating the probability of success of public-private partnership projects is presented. The proposed model is developed based on one of the multi-criteria decision making models, called technique for order of preference by similarity to ideal solution. This model can determine the opportunity cost of each of the invited tenders and recommend a suitable prioritization between them based on the opportunity cost.

2. Literature review

In recent years, with the widespread acceptance of the public-private partnership approach, a serious issue has arisen between the governments to attract private investors [1]. Hence, the success factors to attract investors in private partnership projects have been the subject of several research on different country [2].

Reviewing previous studies, an urgent need to a quantitative model for evaluation of the success of public private partnership projects is obvious [3]. Accessing a quantitative model that determines the probability of success of tender can be assure investors and provide quick guide to public authority whether decide participate in an investment tender or investment negotiation. The development and proper application of such a model can require the waste of limited investment resources to participate in numerous tenders and the loss of other attractive investment opportunities.

In this paper, the ant colony algorithm is used to find the optimization function. The ant colony algorithm is one of the types of heuristic algorithms that can be high in searching and identifying the optimal position in the space of "discrete" answers [4]. Therefore, this algorithm be appropriate to find the point of deviation in this research, where decision maker is looking for only appropriate answers (and not necessarily the absolute optimal answer) in a discrete answer space (where the resolution variable and response options are generated discretely). The performance and operation of the ant colony algorithm are introduced in the appendix of the article.

3. Methodology:

For the purpose of this study, which is to evaluate the opportunity cost of participating or not participating in the tender, a decision support system based on multi-criteria decision models has been designed. This decision-making system gives the ability to private sector companies to decide whether or not to participate in a tender by modeling the decision-making method of Delphi technique when assessing the opportunity cost of bidding. For this purpose, the proposed model, by receiving tender data by several qualitative criteria, can advise the decision maker to participate in the tender or investment negotiation. On the other hand, it is more appropriate to not participating in the tender and Search other opportunities for investment. Figure 1 in the following shows the model development process.

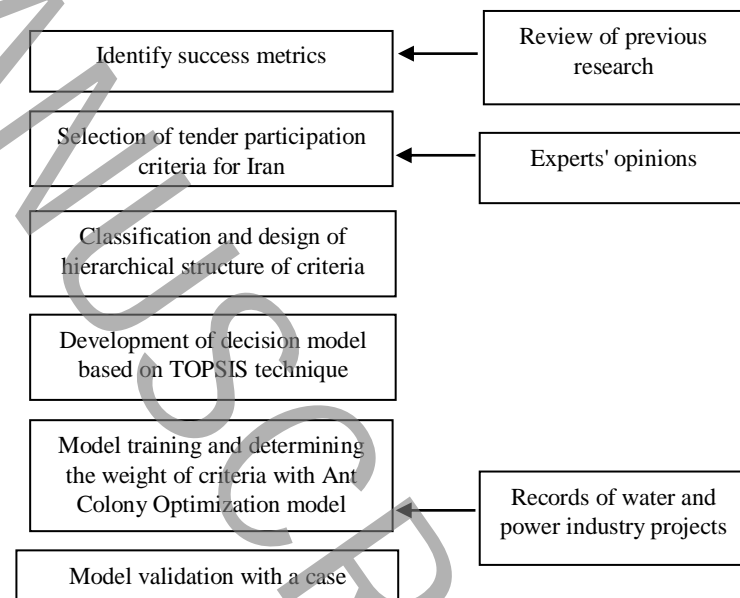


Figure 1. Flowchart of a proposed model for deciding to participate in a public-private tender

The Delphi method was chosen to collect and converge the opinions of experts for this method, a team of 17 representatives of 12 companies or holding companies active in investing in the field of water and energy industry in the country was formed in absentia. These companies had participated in the largest number of tenders in the field of dams and power plants through public-private partnership in the last 5 years.

4. Identify evaluation criteria

To identify the factors influencing the participation or non-participation of investors in public participation tenders, the key success criteria identified in previous research were provided to the team of experts with their knowledge and experience of private public participation tenders and negotiations, model information. Complete.

To determine the weight of each criterion in the model, the respondents were asked to evaluate the criteria identified in the literature qualitatively and using two criteria: 1- impact on the success of the tender and 2- ease of evaluation during and with the tender budget. To.

The criteria obtained were classified into three groups based on the successful transaction model: 1. The subject of the tender should be attractive; 2. The parties to the transaction are committed to do so; And 3. The win-win transaction process is designed

5. Validation of the Model in a case study

To control the performance of the proposed model, this model is used in a case study and its results are analyzed. For this purpose, a power plant project that was recently tendered by the "Iran Water and Power Resources Development" company to attract investors was selected. The results are compared after applying the corrections in the diagram.

Regarding the output of the model, to improve the tender conditions and attract more investors; Negotiations were held with the owner and some amendments to the tender documents were proposed based on the criteria introduced in the proposed model. The proposed amendments include: granting electricity export licenses, modifying the risk allocation pattern, creating strict conditions for reducing transportation costs, and committing to pay bank interest in the event of late payment of tariffs.

The final score earned after modification, can well cover investor, concerns and provide a strong investment opportunity to attract private funding in the market compare to other financial markets.

6. Results and Discussion:

Given the high cost of preparation in the public-private partnership method, there is a vital question for investment firms as to whether a particular tender is an attractive opportunity to bid or the high cost of preparation that leads to not taking part in bidding. Deciding to participate or not to participate in the tender means evaluating the cost of the investment opportunity, which is the main purpose of costly and time-consuming feasibility studies. In this paper, a decision support model is presented that by evaluating the project success criteria, can calculate the opportunity cost of a public-private tender and help the decision maker in deciding to participate or not to participate in the tender. The proposed model in the form of a computer program that is developed based on multi-criteria decision models receives the specifications of the tender and finally calculates the opportunity cost of tender.

The model has an important advantage that can estimate the opportunity cost of tender before bearing any expense for preparing the bid (which is usually a considerable amount). Lower opportunity costs in a tender show the investor that they will reap more benefits than the risk they take, so it is advisable to bid. Conversely, high opportunity costs mean that the investor has to spend a lot of money, time, or credit in return for the benefits he or she may reap. Therefore, the recommendation of the proposed model is not to participate in the tender. In this case, in the negotiation process, the investor can reduce the opportunity cost of the tender by requesting some guarantees and incentives, and even request a review of the plan change in the executive structure, composition of financing, etc. Reduce the cost of bidding opportunities and increase the attractiveness of the project for investment. Using the sensitivity analysis tools provided in this model, it is possible to re-evaluate the opportunity cost of the tender by providing a variety of government incentives or private sector initiatives.

Therefore, this model creates an efficient and flexible tool for decision makers in cost-effectiveness analysis of various incentives to increase success and thus attract investment. The results of the implementation of the proposed model show that the success of the project can be increased by providing incentives to increase the financial justification of infrastructure projects and embedding mechanisms to reduce risk. This study also shows how public authority is organized and committed to advance private investment, in addition to financial attractiveness of project, plays a effective role in the success of public-private partnership projects and investors' willingness to participate in tenders.

[1] B. Li, A. Akintoye, P.J. Edwards, C. Hardcastle, Critical success factors for PPP/PFI projects in the UK construction industry, *Construction management and economics*, 23(5) (2005) 459-471.

[2] R. Osei-Kyei, A.P. Chan, Review of studies on the Critical Success Factors for Public–Private Partnership (PPP) projects from 1990 to 2013, *International journal of project management*, 33(6) (2015) 1335-1346.

[3] E. Cheung, A.P. Chan, S. Kajewski, Factors contributing to successful public private partnership projects: Comparing Hong Kong with Australia and the United Kingdom, *Journal of Facilities Management*, (2012).

[4] G. Khazaeni, M. Khanzadi, A. Afshar, Optimizing risk allocation in construction projects; the ant community optimization algorithm, *Sharif Scientific and Research Journal*, 229(3) (2013) 61-69.