

Managing Risks in Public-Private Partnership Projects in India: A Systematic Literature Review



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Abstract

Public-Private Partnerships (PPPs) are gaining popularity over time as a lucrative means of developing infrastructure and delivering public services in many countries across different sectors. Many practitioners and the researchers are putting their consistent efforts to improve the conceptual arrangement for PPP. Hence, it is essential to review their works over the period of time to identify the recent PPP trends. This would not only help the reader to understand the status quo of the field but also would help in identifying and fulfilling the knowledge gap in the literature of PPP. In this paper, the author has reviewed a number of international journals from the different discipline, i.e. engineering, management, public administration etc. This review study has been conducted with the perspective of identifying the various risks in PPP projects and compares the means of allocating these risks proposed by different researchers.

Keywords: Public-Private Partnership (PPP), PPP research trend, Risks in PPPs, Risk Allocation in PPP, etc.

Introduction

With the increasing acceptability of Public-Private Partnerships (PPPs) throughout the world, the industry has also witnessed many practical changes emerged as the execution model of public procurement projects for the improved public service delivery. The procurement of public asset through PPPs has been ascertained as an efficient mechanism of bringing value-for-money for the government infrastructure projects or public service delivery. The method combines the benefits of "Competition in the Market" through competitive tendering, flexible negotiation, and risk allocation on the basis of the consent of both the parties (Li et al, 2005) and the "Competition for the Market" through continuous improvement in the technology and process innovation. All such process characteristics of PPPs lead to an increase in the percentage of private participation for the government projects. Another essential characteristic which is responsible for the successful execution of PPP projects is the transparency in the process of public procurement (Jefferies et al., 2002).

The process adopted for the project execution should be transparent enough that all the prospective risks is being communicated, analyzed thoroughly, and allocated among both the parties, i.e. public sector entity and the private sector consortium. The project stakeholders are supposed to pay thorough attention during the preparation stage of the contract to ensure the proper risk allocation between them. PPPs have also been adopted increasingly as an approach for rapid development of infrastructure in India during last few years. The government of India (GoI) is using the PPP route of public procurement in different sectors like; road & urban development, energy sector, health sector, port development, food storage and recently also for the cold chain supply as well. This paper intends to identify the concept of risk in the PPP paradigm, and reviewing the latest development for risk allocation method for the PPP projects.

Concepts of Risk and Risk Allocation

The concept of risk has been illustrated by many academicians & research scholars according to their respective field of studies. In the context of infrastructure literature, many researchers have defined the risk in their work. It has been defined as the possibility of mis-happening of any explicit event or sequential events throughout the process of infrastructure project execution (Faber, 1979); the unpredictability of the planned result or consequences during the decision-making process (Hertz & Thomas, 1983), etc. It is important for a scholar to understand the concept of risk,

and identify different kinds of risk affecting the PPP projects in India, and understanding the risk allocation schemes for PPPs.

The PPP risks have been generally classified into two broad categories depending upon the types of exposure to the risks i.e. Domestic risk and International (Global) risk and the source of risk i.e. internal risk and external risk, etc. (Grimsey & Lewis 2002; Flanagan & Norman, 1993). The Domestic risks occur due to financial, operational, and revenue-generation issues; however, International risks comprise environmental, legal, and political risks. The

risks related to regulatory, and environment can be managed in better manner by the government sector, while the private sector partners are in better position for managing the operational, financial and revenue-generation risks. The managers should have a broad understanding of these risks for their proper allocation during the process. On the basis of origin, these risks have been classified as the internal and external risk. The table (Prepared by author) below demonstrates some of the major risks that arise in the PPP project irrespective of their sector and exposure.

S. No.	Risks Identified	As per exposure to the risk	As per source of the risk	In the better position to manage
1	Change in law	International	External	Government
2	Approval and permit	International	External	Government
3	Poor political decision-making	International	External	Government
4	Public/political opposition	International	External	Government
5	Government's reliability	International	External	Government
6	Financial risk	Domestic	Internal	Private Consortium
7	Insufficient income	Domestic	Internal	Private Consortium
8	Market demand change	Domestic	External	Both in a joint effort
9	Tariff change	Can be both*	External	Government
10	Corruption	Domestic	External	Government
11	Defective design	Domestic	Can be both*	Both in a joint effort
12	Inflation	Domestic	External	Government
13	Change in Scope	Domestic	External	Government
14	Delayed land acquisition	Domestic	External	Government
15	Raw material supply	Domestic	Internal	Private Consortium
16	Workforce supply	Domestic	Internal	Private Consortium
17	National economy condition	Can be both*	External	Both in a joint effort
18	Logistics infrastructure availability	Domestic	Internal	Private Consortium
19	Community attitude	Can be both*	External	Government

*Can be both - On the basis of project origin country

Major PPP risks identified in the literature that arise in PPP projects

The PPP projects are usually susceptible to the internal risk irrespective of their management parties, and location (international or domestic projects). The international projects are prone to external risks also like, unfamiliar social circumstances, economic and political conditions of the project country and different legal formalities and regulatory framework in the project country, etc. These risks are so dynamic in nature in the case of the international project (Flanagan and Norman, 1993). Optimal allocation of these risks among the different stakeholders of the PPP project is one of the significant factors for increasing the private participation and investment in the infrastructure project. The risk allocation is, therefore, important to consider during the early preparation phase of the PPP project (Albalade, D. et al., 2015).

Defining the PPP Concept

Each concept in the literature took a specific period of time to evolve. The PPP concept has also emerged out of continuous efforts in a definite period.

The PPP was commonly termed as Public Finance Initiative (PFI) in its initial days. The PFI was commenced by the most conformist government of Britain at the height of recession (Shaoul, 2011). However, the conformist government of Britain developed the PFI policy in its early time but the initiatives taken were too slow that it couldn't achieve the pace and popularity because of many other reasons as well. For instance, some people argued that the private participation would undermine the factor of public interest in the public procurement (Ball, Heafey, & King, 2007). The term PFI has been termed and rebranded as the Public-Private Partnership (PPP) during the 1990s when it was accepted by the rest of the world. During the same time, the PPP had got popularity, when the other countries, governments, and the international organizations argued that PPP can provide an optimal solution for much-needed infrastructure and development of the world economy.

At this time, the PPP was referred to as the cooperative arrangement between the public sector unit and the private sector entity where the risks and

the rewards are being shared between both the partner entities. These arrangements include Design-Build-Finance-Operate (DBFO), Build-Own-Operate-Transfer (BOOT), Build-Operate-Transfer (BOT), Public Finance Initiative (PFI), etc. However, many new forms of PPP have emerged over time that developed trust among the private investors. In the research paper, numerous research articles of previous years were analyzed thoroughly with the purpose of reviewing the risk allocation arrangement proposed by various researchers. The key topics covered in the further sections of this paper include the PPP as a concept, risks identified in PPP, and risk allocation in PPP.

Review of Literature

PPP projects are susceptible to the various risks and uncertainties as they operate at an arm's length from the political arena. These risks are to be carefully considered during the preparation stage of the project. It is essential to prepare an appropriate management framework for dealing with these risks. Many researchers have paid substantial attention for identifying various risks and formulating a risk allocation mechanism for the PPP projects. "All the risks should be allocated to the party who is best capable of taking it at the lowest cost (Cooper et al., 2005)". The government entity monitoring the project should thoroughly recognize the various risks inherent in the project and decide on a reasonable allocation method.

The research trends contributing to the field of knowledge of PPP represents that these risks were being completely transferred to the private sector during initial days. After substantial developments in the field of PPP over time, the literature suggests that all the risks should not be completely passed on to the private sector. However, the parties contracted in the project should jointly decide upon the most optimal way of sharing the risks and minimize the total cost of the project. Many researchers have tried to identify the various risks and prepare the framework for risk allocation using different research methods. For example, Abednego & Ogunlana (2006) proposed a risk allocation method by conducting research through a case study in a tollway project. In the same way, Ng and Loosenmore (2007) conducted another case based study on a railway project for reviewing the risk allocation approach in Sydney. On the other hand, Jin & Doloi (2008) conducted an industry-wide survey for developing a theoretical framework for allocating different risks in PPP projects; Li, et al. (2005) has also proposed an arrangement for the allocation of risks for PPP projects in the United Kingdom (UK) using a survey research method i.e. the most common research approach; similarly, Roumboutsos & Anagnostopoulos (2008) also conducted a pilot research survey in Greece and compared the results to those found in the UK. The research methods used in different timelines have been changed completely, over time. Many modern researchers have adopted more complex research methods like, meta-analysis, game theory, experiment design, etc (Ke, Y. et al., 2010).

Some of the recent research studies were also conducted in the area of PPPs and risks in PPPs using similar research methods. For example, Pinz, A., Roudyani, N., & Thaler, J. (2018) suggested on the basis of their study that PPPs can be used and promoted for bringing the sustainability factor into the public procurement process. They proposed the PPP as instrument to achieve the social or environmental sustainability, and economic (including financial sustainability of PPPs) sustainability and managing the risks properly. Pinz, A., et al (2018), considered the sustainability factor as one of the critical success factor for a PPP project. They have referenced the collaboration framework proposed by Bryson, Crosby, and Stone's (2006, 2015) and explained that initial preparation, process of partnership, PPP arrangement, PPP governance, risk sharing, and contingencies & restrictions are some of the important factor to bring in the sustainability in the PPP procurement process. Similarly, Cui, C., et al. (2018), reviewed the various aspects of PPP framework for infrastructure projects using the systematic review method and identified the need for effective risk management framework through optimized decision making and feedback process. They also identified the requirement of incorporating the flexibility in the contract designing process so that risk and uncertainties could be managed thoroughly during the PPP process. Cui, C., et al (2018), also proposed the government monitoring / supervision as one of the key success factors for PPP projects. Ke, Y., et al., conducted their research study in China using multiple research methods, including content analysis, case study and focus group meeting. They identified "seven types of critical success factors for the PPP projects, including government financial guarantee i.e. Viability Gap Funding (VGF), risk allocation, financial model of the project, public accountability, government policy and guidelines, productivity considerations, and organizational marketing strategies (Ke, Y., et al., 2017)."

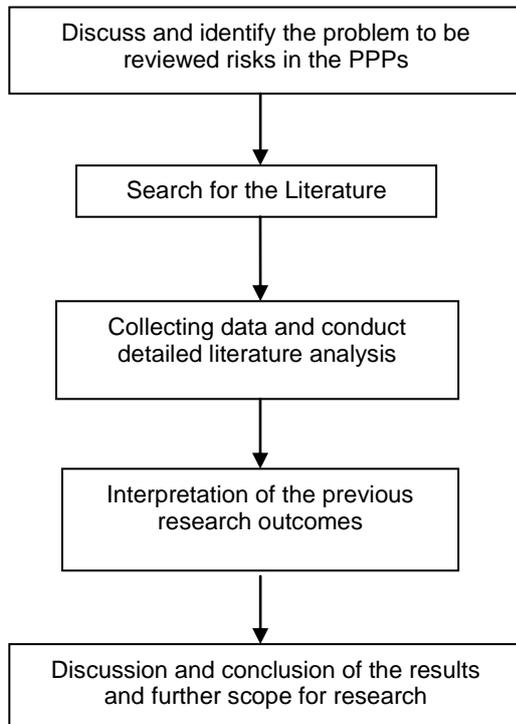
In similar kind of research studies conducted in Indian context, the risk allocation policies/model has been recognized as one of the significant factors for sustainable development in current PPP procurement process (Patil, N. A., & Laishram, B. S., 2016). Some of the other key factors which were recognized by Patil, N.A. & Laishram, B. S. (2016) for sustainable development in the present PPP procurement process are; stakeholder's participation, environment impact assessment, value for money analysis, user's charges, transaction and bidding cost, and bid evaluation criteria; Almarri, K., & Boussabaine, H., (2017) also conducted their research for identifying the factors influencing sustainable development in the PPP process. They stated in their paper that, "Appropriate risk allocation and multi-benefit objectives of all stakeholders were found to be significant predictors of the service performance of the PPP project (Almarri, K., & Boussabaine, H., 2017)." Thus, the PPP literature has recently started focusing on improving the sustainability of the PPP procurement process. The literature has recognized the risk allocation as one of

the key factors for improving the PPP framework in India and other countries as well.

Hence, the PPP literature has seen many sequential changes in the research methods adopted during different times. Several industry-wide and cross-country research studies were conducted with the increasing experience in the field of PPP. However, much less proportion of work has been done for reviewing the systematic risk allocation framework proposed in the previous literature in India. India has seen a remarkable growth in the PPP projects adopted numerally for the public procurement in the different sectors in the recent years. Many initiatives have been taken by the government of India for encouraging the private participation, improving the business conditions for Indian & the foreign investors, like; adoption of improved risk & reward sharing mechanism, taking up of international contractual practices, etc., in India. In the paper, a number of research papers have been reviewed for identifying the various risks in the PPPs, and the recent shift in the risk allocation & management practices in the field of PPPs.

Research Method

In this study, a number of research papers were reviewed thoroughly using Systematic Literature Review (SLR) method as the method is more clear-cut in process of selection of articles (Torchia, Calabro, & Morner, 2015). All the collected journal articles published earlier on the topic related to risk allocation methods in PPP were recognized using the ISI Web of Science, and Google Scholar databases. A stepwise method was adopted for conducting the review through the SLR method as, (Also shown in the figure - summary of the SLR method).



Summary of Systematic Literature Review (SLR) Method

Discuss and identify the problem to be Reviewed

We have discussed and identified the key research problem to be reviewed for this paper.

Search for the Literature

In Web of Science, we started our search with the keywords like; risk allocation in PPPs, risk analysis in PPPs, and the infrastructure PPPs. We restrained our search to the categories of risk allocation in PPPs, risk analysis in PPPs, and the infrastructure PPPs and the risks in the government projects. A total of 144 search results came at first, which were further narrowed down to 97 articles when we constrained to the articles in English language only. We thoroughly refined our search result to 48 articles only by restricting the search to the domain specific search categories like; infrastructure, construction & engineering, transportation, public administration, political science, Public policy management, etc.

We conducted a similar search exercise for collecting the research papers again, on the Google Scholar. This time, we restricted our search to the top cited papers published in the area of PPP and the risk allocation methods in the PPPs only in the English language. Finally, we have found a sufficient number of research papers for our analysis.

Collecting Data and Conduct Detailed Literature Analysis

After collecting and selecting the articles, all these papers grouped together as per the keywords were segregated and screened for the review exercise. An organized spreadsheet was prepared with specific pattern separating the issues like; years of publication, author name, the title of the paper, countries of analysis, journal titles, number of citations, etc. This spreadsheet helped us in identifying and reviewing the impactful references to risk allocation in PPPs and subsequently for examining the previous research studies and reaching the conclusion for this paper.

Interpretation of the Previous Research Findings

We read the identified research papers thoroughly and entirely, including the abstract, research trend, research method, key findings and discussion and conclusion.

Discussion and Conclusion of The Results and Further Scope for Research

In this section, we discussed the key analysis of the numerous research papers on the basis of the result of the SLR method. The paper has also identified the scope of further research regarding risk allocation method in PPPs in India.

Discussion & Conclusion

With the development in the various sectors, the requirement for the public asset and public service delivery has also increased that cannot be satisfied by public procurement approach. Such an enhanced requirement for development has subsequently increased the significance of private sector participation all over the world (Ke, Y. et al., 2009). The PPPs have been widely adopted as a means of bringing in the private investment for the development

and operations of public assets. India is recognized as one of the largest and attractive markets for the PPP projects, now. The government of India has also taken many initiatives during 10th and 11th five-year plans, especially in the sectors like, Urban infrastructure, highways, railways, sea-ports, airports, and energy sector, etc. (Kakati, M. & Baruah, P., 2016). These government initiatives have developed a feeling of trust and stability among the foreign and domestic private investors. Various international organizations operating in the field of PPP are getting encouraged to invest in the Indian market. This substantial growth in the number of PPPs in India and across the world has also increased the need for research that can contribute to the field of knowledge.

Many academicians and practitioners have defined the phenomenon of Public-Private Partnership (PPP) in a different manner. Despite much debate, the literature has not been able to find consensus on the definition of PPP concept, yet. The PPP arrangement has been accepted widely as a systematized approach for public procurement. This method brings a good "value for money" for infrastructure projects through effective allocation of risks between both the parties (Akintoye et al., 2003). It provides the joint advantages of "Competition in the Market" through competitive bidding, allocation of risks, & flexible negotiation on the basis of the consent of both the parties (Li et al, 2005) and the "Competition for the Market" through continuous improvement in the technology and process innovation. The PPP phenomenon was initially seen as the mode of delivery of infrastructure projects but later, the concept has been applied in various sectors like; health, transport, energy and other important sectors during the 1990s (Pongsiri, 2002). During the same duration, the PPP has been explored as a phenomenon thoroughly in the literature by various researchers and suggested as a new governance mechanism for the government project (Osborne, 2000).

The PPP as a concept has captured the attention of many research scholars from various fields or disciplines of literature like; Economics, Management, Transport, Public Policies and Public Administration, etc., (Spielman, Hartwich, & Grebmer 2010). It has been explained as a cooperative arrangement between the public sector entity and the consortium of private players (Hodge & Greeve, 2007) in which the risk & rewards are to be shared between public and private parties. These PPP projects are being governed by long-term legal contracts which are complex in nature and capable of handling the inherent risks and uncertainties in the project. However, it is not an easy task to deal with all the anticipated and unanticipated risks – important for achieving the desired success in the PPP project. In this paper, numerous research studies have been reviewed thoroughly by using the Systematic Literature Review (SLR) method for analyzing the risk allocation framework suggested in the literature.

The PPP literature has provided different approaches of risk allocation in different time horizon. Allocation and sharing of the risks are one of the key

characteristics of the PPP scheme of public service delivery (Jin & Doloi, 2008). During the 1990s, the risk allocation approach comprises of identifying the various risks and transfers them to the private party; however, these identified risks were begun to be shared properly between the contracted parties during late 2000s (Ke, et al, 2010a, 2010b). The bargaining power of the private sectors has increased with time, and all the risks recognized during the preparation stage are defined and assigned to the contracted party, who is best able to manage it (Roumboutsos & Anagnostopoulos, 2008). With the recent development in the field of PPPs, the researchers has now shifted their focus to the PPP process improvement and bringing the sustainable developments through PPPs. The researchers has identified the risk allocation as the prime aspect to be considered for increasing the sustainability of the PPP process in India and other countries as well (Patil, N. A., & Laishram, B. S., (2016); Almarri, K., & Boussabaine, H., (2017); Ke, Y., et al., (2017); Cui, C., et al (2018); Pinz, A., et al (2018)). Thus, the paper recognizes that the proper risk allocation for the PPP project is not only essential for the private sector for reducing the cost, but also for the government to protect the public interest and achieve the best "Value for Money (VfM)" proposition.

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