

# STUDY TO COMPLETE THE RISK ALLOCATION PROCESS IN THE PUBLIC PRIVATE PARTNERSHIP (PPP) PROJECT IN TECHNICAL INFRASTRUCTURE CONSTRUCTION INVESTMENT IN VIETNAM

## HOÀN THIỆN QUY TRÌNH QUẢN LÝ RỦI RO DỰ ÁN ĐẦU TƯ XÂY DỰNG CƠ SỞ HẠ TẦNG KỸ THUẬT THEO HÌNH THỨC ĐỐI TÁC CÔNG TƯ (PPP) TẠI VIỆT NAM

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**Abstract** - Risk allocation is the key to successful risk management of PPP projects in technical infrastructure construction investment. Risks should be allocated to the party who is best, that is able to control and manage risks. Reasonable allocation of risks provides incentives for all parties to prevent and minimize risks. This paper has focused on the study of the optimal risk allocation process for stakeholders of PPP projects in Vietnam in technical infrastructure development, in order to increase the readiness and clarify responsibilities of stakeholders in risk management through all phases of the project life cycle, that contributing to improving the efficiency of PPP project implementation in Vietnam.

**Key words** - Risk management and Insurance; A Risk Management Approach: Risk of Public Private Partnership project; The risk allocation: The Public Private Partnership project.

### 1. Introduction

Today, the demand for capital investment in infrastructure construction is growing rapidly. According to estimates of the Asian Development Bank (ADB), in the period of 2015 - 2025, the investment demand for infrastructure in Vietnam is an average of 16.7 billion USD / year. Attracting investment in the PPP is an urgent and it is necessary solution [1]. It not only contributes to attracting domestic and foreign private capital, but also takes advantage of management experience from outside investors. According to statistics of the World Bank, 32 projects have been implemented under PPP in the period 1994-2009, the total committed capital in this period is about 6.7 billion USD [2], it is implemented by two main types of contracts: BOT and BOO. In the period from 2009 to 2018, the number of projects in the PPP method has increased greatly. The establishment and completion of the legal system related to PPP that has shown the State's interest in the public-private partnership method. From that situation, it is necessary to have a comprehensive plan with a long-term vision and goals for the PPP program.

However, in Vietnam, risk management in general and risk allocation in particular are being studied very limited: Most of the studies are limited to identifying and allocating risks, proposing a total solution for PPP projects in transport development ([3], [4]), there are not the research that study about investment projects on technical infrastructure construction. The risk management in general and the allocation of risks in particular are very passively: Risks are only managed when risks occur and there is no plan to

**Tóm tắt** - Phân bổ rủi ro là chìa khóa để quản lý thành công các rủi ro của dự án PPP trong đầu tư xây dựng cơ sở hạ tầng kỹ thuật (CSHTKT). Rủi ro nên được phân bổ cho bên có khả năng kiểm soát và quản lý tốt nhất các rủi ro. Việc phân bổ rủi ro hợp lý tạo động lực để các bên có thể ngăn ngừa và giảm thiểu rủi ro. Bài báo này đã tập trung nghiên cứu hoàn thiện quy trình phân bổ rủi ro tối ưu cho các bên liên quan của dự án PPP ở Việt Nam trong phát triển CSHTKT, nhằm làm tăng tính sẵn sàng và làm rõ trách nhiệm của các bên liên quan trong công tác quản lý rủi ro qua các giai đoạn của vòng đời dự án, góp phần nâng cao hiệu quả triển khai thực hiện dự án PPP tại Việt nam.

**Từ khóa** - Quản lý rủi ro và giải pháp; Phương pháp tiếp cận quản lý rủi ro: Rủi ro của dự án Đối tác Công tư; Phân bổ rủi ro; Dự án hợp tác công tư.

identify, respond and allocate risks right from the start of the project; Most risks are only determined when the project has a risk problem; If a risk arises at any stage, the party managing that phase is responsible for resolving it

The optimal risk allocation and a reasonable reduction of risks is the most important to ensure the feasibility of projects, contributing to minimize the level of damage when a risk occurs. Therefore, the study to completion the risk allocation process in the PPP project in investment about technical infrastructure construction is really necessary in Vietnam

### 2. Overview system

Risk allocation is the key that to managing risks related to the public private partnership projects in infrastructure investment in general and technical infrastructure in particular. The optimal risk allocation among stakeholders, in particular public and private, that is the nature of successful implementation of PPP projects not only in Vietnam but also in countries around the world in general.

Many studies around in the world and in Vietnam, that have focused on how to achieve the optimal risk allocation (effective or fair) between the stakeholders involved to minimize costs and risks. Risks should be allocated to the party that can best control the risks. Reasonable risk allocation will create incentives for stakeholders to may control, and use its influence to prevent or mitigate risks, that in order to increase the overall benefits of the PPP projects in infrastructure development in general and in technical infrastructure development in particular.

### 2.1. Overview of research on risk allocation in PPP projects in investment on technical infrastructure construction in the countries in Vietnam

In Vietnam, there are very few authors that interested in researching about the risk allocation of technical infrastructure investment projects in the public private partnership method. Typically there is only a PhD thesis by Than Thanh Son [3], and an article by Do Tien Sy et al [4]. These studies mainly focus on transport infrastructure projects, there are no studies on the field of technical infrastructure. Most studies suggest that risks are only identified when a project has a problem, if a risk arises at any stage, the party managing that phase is responsible for resolving it, the risks are not allocated from the beginning [3], the problem of risk management is implemented passively. The studies of Than Thanh Son and Do Tien Sy show that most real risks are allocated to the State or shared to both, very little risk shared to private sector. The study also proposes that risks should be allocated optimally, primarily to the private sector

The actual study of the process of risk allocation of PPP projects in technical infrastructure construction in countries around the world and in Vietnam that will help the author to complete the risk allocation process a reasonable way

### 2.2. Overview of research on risk allocation in PPP projects in investment on technical infrastructure construction in the countries in the world

Many studies of authors in countries around the world have been interested in research about risk allocation in the PPP projects on investment in technical infrastructure construction and propose optimal allocation solutions. Typically, the studies are summarized through the following Table 1.

**Table 1.** Summary of research about the risk allocation in the PPP projects in about technical infrastructure construction investment in foreign countries

| Order | Country   | The author                           | Year | Field                            | Risk allocation | References |
|-------|-----------|--------------------------------------|------|----------------------------------|-----------------|------------|
| (1)   | (2)       | (3)                                  | (4)  | (5)                              | (6)             | (7)        |
| 1     | England   | Li et al 2005b                       | 2005 | Technical infrastructure         | 5/3/24/0        | [5]        |
| 2     | Australia | Loosemore, M                         | 2006 | Railway transport infrastructure | 5/1/23/0        | [9]        |
| 3     | Europe    | Lam et al.                           | 2007 | The infrastructure               | 9/3/8/0         | [12]       |
| 4     | China     | Ke at al (2010c)                     | 2010 | Technical infrastructure         | 8/7/20/0        | [13]       |
| 5     | China     | Ke và Wang (2010b)                   | 2010 | The infrastructure               | 13/16/15/0      | [6]        |
| 6     | Nigeria   | Moham- med et al                     | 2012 | Traffic infrastructure           | 10/0/22/0       | [10]       |
| 7     | Egypt     | A. Samer Ezeldin et al.              | 2013 | Water supply                     | 0/13/9/7        | [14]       |
| 8     | Singapore | B. G. Hwag, X. Zhao and M. J. S. Gay | 2013 | The infrastructure               | 8/10/19/3       | [7]        |
| 9     | The World | Carbonara et al.                     | 2015 | Road transport infrastructure    | 0/7/27/0        | [8]        |
| 10    | Colombia  | Lina Maria Sastoque et al            | 2016 | The infrastructure               | 5/10/27/0       | [11]       |

|   |       |           |      |                    |          |      |
|---|-------|-----------|------|--------------------|----------|------|
| 11  | China | Kangni Yu | 2017 | The infrastructure | 7/22/6/0 | [15] |
| Notes: Risk allocation: State / Share / Investor / Project dependency |       |           |      |                    |          |      |

Thus, through Table 1 shows that, the study of Li et al. show that over 70% of the risk is allocated to the private sector in the UK [5], but Ke et al. show that this ratio is only 27% in PPP projects in China [6]. This ratio can be used to assess the degree of achievement of the risk transfer goal from the public to the private sector. Therefore, the analysis results of B. G. Hwag, X. Zhao and M. J. S. Gay show that the level of risk transfer to the private sector is nearly 70% [7], that is higher in China, but lower than in the UK. To the study of N. Carbonara et al., the level of risk transfer to the private sector is nearly 80% [8]. This shows that PPP method has become relatively mature in the UK because the UK has been using this PPP method since 1992. At the same time, this method has been increasingly developed and perfected in developed countries such as Singapore. Over time, developed as well as developing countries tend to share risks and allocate risks much to the private sector ([9], [10], [11]).

## 3. Background of PPP

### 3.1. Definitions of risk

In this study, the author conceives that risk is a combination of random events that affect things and phenomena. It makes change the outputs of phenomena in a negative or positive direction. That random effects can be measured or not measured by probability theory

### 3.2. Definitions of risk allocation

**Lam et al.:** Risk Allocation that is the risk was sharing for the party that have the best ability to control the consequences of risk and the party is able to handle risks with the best method, the least cost and the shortest time [12]

**Abednego and Ogunlana:** Risk allocation is the determination of who is allocated and when is allocated, and the application of appropriate strategies to prevent or minimize the consequences of risks [16].

**In the author's view:** Risk allocation is the division of responsibilities of stakeholders in order to help the responsible parties to assess, manage and control risks in the best way. Risks should be shared to the best party, that have the best ability in managing and controlling risks

### 3.3. The rule of risk allocation

**Loosemore** is shown that Risk should be allocated to the party: Have a full awareness of risks; Having the highest ability about qualification and sufficient authority to effectively manage risks (and thus calculating the lowest risk premium); Having the ability and resources to respond when risks occur. There is a big enough incentive to take risks and have enough expenses to handle risks appropriately [9].

**Flanagan and Norman** suggest that risks should be allocated to the party with the best ability to control the possible causes of risks; Risks must be properly identified, understood and evaluated by the parties; There must be a party that have enough competence and technology to manage risks; There must be a party with financial capacity



to deal with the consequences of the risk or that to prevent the risk from occurring; and there must be a party willing to take risks [17].

**4. Research method**

On the basis of using the qualitative research methodology from the relevant documents, the paper has analyzed the trend of risk distribution of countries in the world and the situation of risk distribution in Vietnam, thereby Identify the problem of risk allocation that has a strong impact on PPP projects in technical infrastructure development in countries around the world, thereby proposing the optimal allocation process for stakeholders in the implementation of PPP projects in Vietnam.

Research method is shown by the diagram:

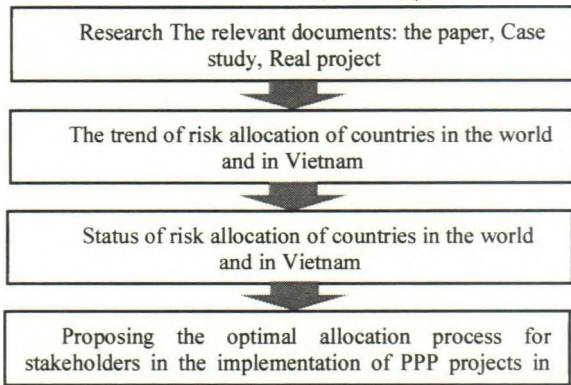


Figure 1. The Diagram is showing research method

**5. Study to complete the Risk allocation process in the public private partnership project in technical infrastructure construction investment**

**5.1. Experience in risk allocation in countries around the world**

Based on the study of risk allocation overview of many countries in the world, the author realized that: The State (the Private) plays a decisive role in allocating risks and selecting risk management party. In order to allocate risks, Firstly, the State should determine the list of project risks, then determine the phase of project which risks occur, estimate the likelihood of each risk and estimate the financial consequences of the risk.

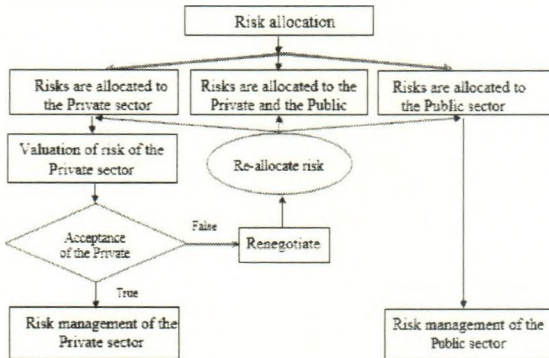


Figure 2. The actual risk allocation process of the PPP project in infrastructure construction investment [5]

Actual risk distribution of countries in the world is

shown by the process diagram Figure 2.

According to experience of risk allocation of some countries in the World that were shown in Figure 2. Risks will be allocated to related parties such as the State, Private investors or shared to both parties. If the risk is allocated to the private sector, then the private need to value the risks and estimate the cost to manage the risk through the bid price. If the bid price is too high, the State may decide to negotiate with the selected investor to negotiate on the bid price that were proposed by the investor. In case, if the transfer costs are high, it could lead to the renegotiation of the State or the state takes on either risk or the risk will be allocated to the State and the private sector, which in many cases can lead to the decision not to continue developing the project in the PPP method.

According to Figure 2, The Public plays a decisive role in allocating risks and selecting risk management party. Without the agreement of the Public, the risk can be re-negotiated to allocate to both parties or The Public will bear that risk.

**5.2. Study to complete the risk allocation process**

According to Figure 2. The author recognizes that the allocation of risk should not depend on the risk assessment of the private sector or State's acceptance of risk handling costs. The risk allocation should depend on the risk acceptance of stakeholders after they have an accurate assessment of that risk. If the risk is not accepted by either party, the risk will be allocated to the State and the Private.

In order to reduce the burden on the State in risk management, and at the same time uphold the role of private investors in the process of risk allocation that to ensure balanced benefits for the parties in the public-private partnership (PPP) project, the author has researched, supplemented and completed the risk allocation process in technical infrastructure construction investment by the PPP method according to Figure 3.

The optimal risk allocation process of the PPP project in technical infrastructure construction investment is shown by the process diagram Figure 3.

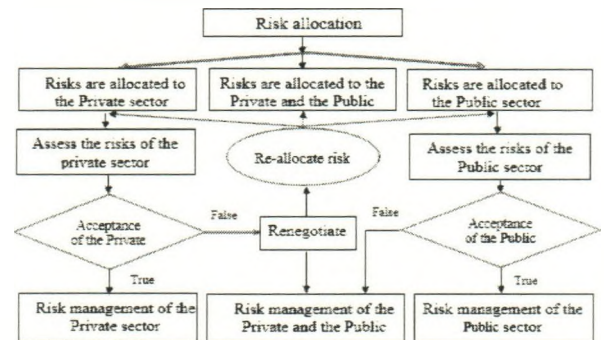


Figure 3. The optimal risk allocation process of the PPP project in technical infrastructure construction investment

According to Figure 3, In the case that both the Public and the Private do not accept the risk, the best option is that the risk should be allocated to both parties that to bear the responsibility of handling the risk.

If the allocation of risks is agreed and specified in the

contract, both the private investor and the state sector can go to the risk management stage by contract management. According to this process, a reasonable risk allocation mechanism provided by the State when the beginning of the project implementation, that is really necessary and very important because it makes the project become attractive to investors privately and reduces the time to negotiate risk redistribution. In addition, the appropriate allocation of risks will also attract more attention to the project, leading to a more competitive bidding process, and in the end, the state will choose a better investor

## 6. Conclusion

The results of the study will enable relevant stakeholders to establish risk allocation frameworks during the stages of PPP projects in technical infrastructure investment in Vietnam.

The application of a reasonable risk allocation framework through the process of risk allocation process in technical infrastructure construction investment projects by the PPP method in Vietnam, that will improve transparency and reliability in managing the risk of PPP projects. In order to create favorable conditions for the risk management in technical infrastructure development project by the PPP method, the application of the optimal risk allocation process according to the process that were studied to complete by the author, will lead to the following improvements:

+ Increase readiness in implementing the risk management by increasing the transparency of risk allocation in stages and clarifying responsibilities of the Stakeholders;

+ Assign responsibilities for managing risks in different stages according to the life cycle of project for each party involved through the contract were signed;

+ Raising the common awareness about risk management for each participant;

+ Proposing a list of possible risk control measures for each contracting party as a basis for a structured risk allocation process.

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