

FRAMEWORK FOR RISK ALLOCATION IN PPP INFRASTRUCTURE DEVELOPMENT

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ABSTRACT

Public Private Partnership (PPP) can be an effective means to achieve value for money in infrastructure project investment. An efficient risk allocation is one of the factors that determine value for money. The basic principle is that the risks should be allocated to the party best able to assume and manage them effectively. Conceptually, this paper provides a framework for risks allocation in PPP schemes. Based on literature review, 54 (generic) potential risk events are identified in PPP, which are grouped in site, design and procurement, construction, financing, financial, market and revenue, operation and performance, force majeure, politics and regulation, and social risks. Risk allocation framework consist risks retained by the public sector, transferable risks to private sector, and shared risks. The paper also discusses a number of issues in the practice of risk allocation, such as the possibility of a divergence as a result of the subjective views of risk (such as party that should bear, the size of the impact and likelihood of events), the complexity of risk because due to its nature some of risks are not necessarily allocated only to certain parties, the difficulty of risk allocation in the field because some risks are unmanageable so that cannot be insured, such as force majeure risk, as well as other influences beyond the specific context such as the level of risk expectation of return. This paper can be a reference to develop a framework of efficient risk allocation in PPP infrastructure development.

KEY WORDS: PPP, infrastructure, risk, risk identification, risk allocation

1 INTRODUCTION

Traditionally, funding and management of public infrastructure development is the government's domain. The limited sources of government funding for infrastructure projects and the issue of efficiency of public providers for infrastructure services have become a rational basis for the private sector involvement in infrastructure provision. Through Public Private Partnership (PPP) schemes, private sector involvement is no longer in the conventional way in design and construction procurement activities, but includes the funding and operation of infrastructure that interact directly with end users. As confirmed in the literature (Harris, 2004; Grimsey and Lewis, 2005; Li, et al, 2005; UNECE, 2008; Kwak, et al, 2009), PPP is understood assumed to be a very effective means to achieve value for money (VfM) investment in infrastructure projects.

There are a number of factors as drivers for VfM, such as innovation, risk transfer and allocation, improved asset utilization, integrated planning and design of the facilities-related services, and improved project management (DTF SV, 2001; AG DFA, 2006; HM Treasury, 2006). In this case the risk transfer and allocation is understood to be one of the most important drivers (Grimsey and Lewis, 2004; Sarmiento, 2010). Efficient risk transfer is very important aspect due to the aim of the partnership is the sharing of responsibilities and risks (Hardcastle, 2006).

PPP in infrastructure development commonly involves many stakeholders such as Government, Private and Community, in which each party has different objectives and interests, and often contradict one another (Merritt and Smith, 2004; Subprasom and Chen, 2005). Therefore it is important for the parties to understand all the risks that potentially arise

throughout the concession period. In contrast to traditional procurement projects, the complexity of PPP generally involves many dimensions of social, political, economic, legal, technical and environmental, so that risks sometimes are under estimated which risk allocation is not supported by knowledge as well as ability of the parties to manage it effectively (Ng and Loosemore, 2006).

Based on extensive literature review, this paper discusses the risk allocation framework for the parties involved in PPP schemes for infrastructure development. It includes scenarios risks retained by the public sector, transferable risks to private sector, and shared risks. Systematically, the paper presents a brief description about the concept of PPP in infrastructure development, the concept of the relationship between risk and VfM, a generic framework for potential risks in PPP infrastructure development and allocation preferences, the issues that need to be considered in order to practice allocation of risk efficiently, and conclusions.

2 AN OVERVIEW PPP IN INFRASTRUCTURE DEVELOPMENT

PPP has some main elements (Yescombe, 2007): (1) long-term contract ("PPP Contract") between the public sector (in this case the Government) with the private sector, (2) to design, construct, finance, and operate ("facility") performed by the private sector, (3) throughout the contract period, the private sector receives payment for the use of facilities from Government or the community as users of the facility, and (4) ownership of the facility still remains on the Government, or ownership will be submitted to the Government when the contract expires. Thus the main features of PPP are on the provision and sale of services, not just build activities or hold assets/physical facility and operate it.

The major difference between PPP and traditional procurement methods lies in the mechanism of return of investment for the private sector. With PPP, the private sector's return of investment associated with the services produced and the performance of the asset during the concession period. Private sector as service provider is responsible not only for the

provision of asset/facilities, but also for management and overall project implementation as well as operation for several years thereafter. In this case, the payments to the private sector for assets and services provided are very different. Although there is no widely accepted definition of traditional procurement, it can be characterized through the following factors (Davies and Eustice, 2005): (1) public sector provides assets, not services which are generally provided by the private sector, (2) the asset is determined by input, in this case public sector to do the design prior to procurement (for construction), (3) the private sector is only responsible for building an asset, not for long-term performance beyond the standard warranty period, and (4) project management of procurement is usually held by the public sector.

In the practice, PPP can be applied in a variety of schemes starting from a simple Service Contract to a Concession Contract for a broader and complex partnership. In brief, under the Service Contract the private partner is responsible for a service within a specified period, such as network maintenance and meter recording. Under the Management Contract, Government handed over responsibility to the private sector to provide management services to run the operation and maintenance activities, including decision-making. Under the Lease Contract, Government leases a service facility for private sector to operate and maintain. Private partner is responsible for providing working investment to maintain and improve efficiency and effectiveness of service during certain operation period. While the BOT (Build-Operate-Transfer) is a form of partnership with the Government providing the right (also called "concessions") to the private partner to invest in building a particular facility - (usually in the area there are no facilities (greenfield project) - which subsequently operated during the concession period and at the end of the concession period the facility will be handed over to the Government. The Concession Contract gives responsibility to the private sector not only for operations and maintenance of project assets, but also for its investments. Based on the Concession Contract, ownership of assets remains in the hands of the Government, while the management rights are on private parties. When the contract is completed (usually long duration between 25 to 30 years), the right

to use all of the assets, including assets constructed by private parties, will be returned to the Government. Concession Contract exceeds BOT in some respects; among others Concession Contract can provide incentives to expand service to consumers, increase investment, and maintain existing assets. Concession Contracts are a combination of Lease scheme for existing assets and BOT for the construction of new facilities (Asian Development Bank, 2000). Concession Contracts are suitably adopted by a country whose government is committed to the existence of private sector investment but not yet ready for full divestment. Concession Contracts are also useful if the government of a country do not have the institutional, legal, and appropriate regulations to lead to full privatization with independent regulation.

PPP contracts are generally involved many parties, which may include government agencies (Central / Local Government) in charge of arrangements such as fiscal and monetary policies, including the contract; consumers who always give their attention to the reliability of service and price; concessionaire or project

company who plans, finances, constructs, and operates the project, lenders who provide debt financing for the project, project sponsors, and shareholders; contractors who build facilities; suppliers, distributors, and insurance company; as well as insurers who bear most from project to project risk (Leman, 1996). Figure 1 shows a typical structure for the Concession Contract.

Most of the PPP agreement in the Contract codified in a series of complex agreements that include: (i) the concession agreement, (ii) government licenses, (iii) the ownership documents for land use rights and the rights to use all existing fixed assets (if there are assets transferred at the beginning of the project to be developed), (iv) joint venture agreement between the project sponsors, (v) shareholder agreements, (vi) the company's constitutive documents of the project, (vii) project management agreements and technical consulting services contract, (viii) construction contracts and subcontracts, and (ix) agreements concerning the environment.

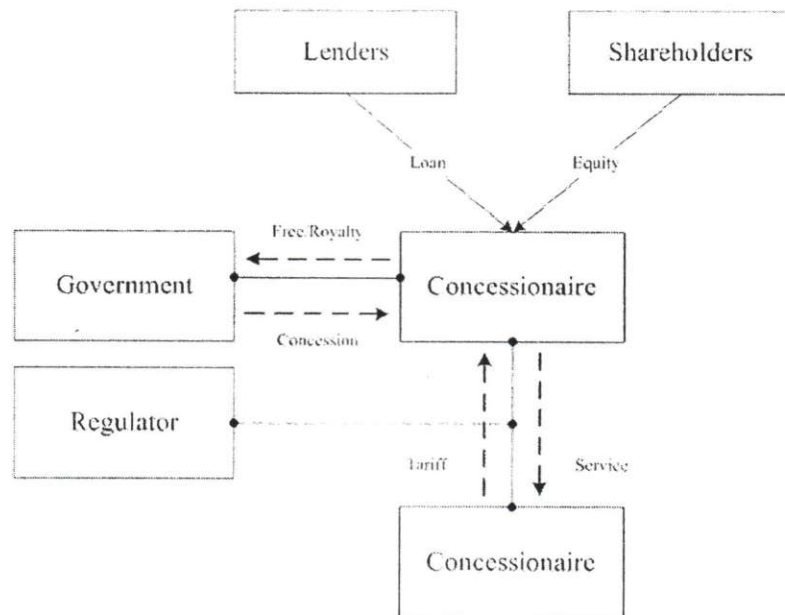


Figure 1. Typical Structure for PPP Concession Contract

3 CONCEPT OF RISK TRANSFER AND VALUE FOR MONEY IN PPP

As confirmed by many researchers (ie Harris, 2004; Grimsey and Lewis, 2005; Li, et al, 2005; UNECE, 2008; Kwak, et al, 2009), they seem to confirmed that VFM is the most important motivation as the basis for the public sector (Government) to invite the private sector in infrastructure development. In this context Vfm is defined as 'the optimum combination of whole life cost and quality (or fitness for purpose) to meet the user's requirement (OGC, 2002).

The appropriate of risk allocation and transfer is one of the most powerful drivers and is a key prerequisite for an optimal Vfm outcome (Shen, et.al, 2006; AG DFA, 2006). Access to privately owned expertise provides flexibility for the public sector to transfer more major project risks to the private sector. Allocation of risk to the party best able to manage risk will usually produce an optimal Vfm outcome (AG DFA, 2006). Optimum risk allocation between the parties requires that risks should be allocated to the right or capable parties who can manage and minimize risk during the concession period at the cheapest price (HM Treasury, 2006).

At the rhetoric level, risks related to all project cycle, as designing, financing, construction, operation and services provision will be transferred to private parties. All efficiencies achieved from effective risk management are important factors that supposedly reduce whole-life-cost of the project. Mainly, it is because of the best practices of private sector management, which is a Vfm for the public sector since it is used private money (Lapsley, 2001). However, it is important to understand the investment motivations of PPP schemes from the standpoint of the private sector. In this context, to determine the willingness of the private sector to participate in PPP schemes generally range on two aspects: (i) whether the risks and rewards inherent in the output provision required can actually create business opportunities for interested parties, and (ii) whether the banks and markets financial will support the proposed project. As noted by Grimsey and Lewis (2004), these issues in turn requires more detailed study on the commercial aspects such as whether the risk can be managed or insured, whether accounting arrangement and taxation is an incentive or barrier to the project, and how is the

capital market and the level of activity in the market at that time.

Private entities believed to be more efficient in managing the projects if they have the money for stake, and if the risks encountered can be managed (Monteiro, 2010). This means that an efficient contract will not transfer as much risk on the public sector to private partners, but only those risks where private partners are better able to manage it than public authority. Excessive risk transfer will only make the excessive payment of risk premium borne by private partners, which can be translated into the failure of the private sector, as well as the occurrence of political and budget risks (EIC, 2003). It needs to be emphasized because public managers tend to avoid the risks associated with provision of public services and receive financial burden and risks that affect future budgets. Therefore, it is necessary to create balance required to ensure that Vfm is based on risk allocation to the party best able to manage those risks and thereby reducing costs and at the same time improving performance. As an illustration (adapted from OECD, 2008), Figure 2 shows the optimal risk transfer schemes for VFM.

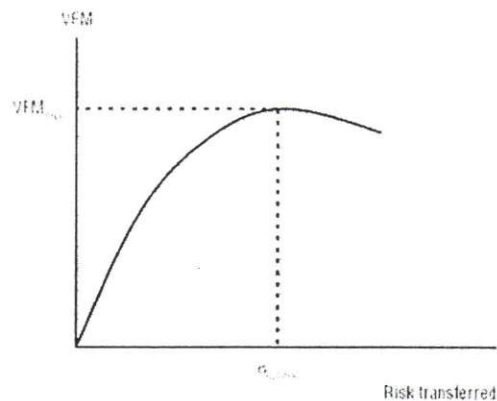


Figure 2. The Optimum Risk Transfer for Vfm

4 FRAMEWORK FOR POTENTIAL RISKS IN PPP AND ITS ALLOCATION

In general, risks in PPP infrastructure development can be analyzed by investment-related risks associated with investment in new infrastructure, such as expanding the existing network, building new facilities or rehabilitating existing facilities; and operation-related risks regarding the operation and maintenance

services. There are many literatures (Irwin, et al, 1999; Wang and Tiong, 2000; Asian Development Bank, 2000; Askar and Gab-Allah, 2002; Thomas, et al, 2003; Grimsey and Lewis, 2004; Li, et al, 2005; Singh and Kalidindi, 2006; Rouboutsos and Anagnostopoulos, 2008; Ke, et al, 2010; Wibowo and Mohamed, 2010) that have been specifically discussed the risk allocation preferences in PPP schemes. Literature generally describes the risk allocation scheme with the consideration that the risks should be allocated to the party most able to bear and manage risks effectively at the most efficient cost. Practice in the field shows the risk allocation in PPP schemes can be divided into three strategies, namely (Rouboutsos and Anagnostopoulos, 2008): (i) risks that are retained and assumed by the Government, (ii) risks that are transferred (by Government) to be borne by the private sector, and (iii) risks are

shared between both parties (Government and private).

Based on the compilation of relevant literature that has been mentioned earlier, the study identifies at least 54 (generic) potential risks in PPP infrastructure development. The risks acknowledged can be classified into site risk, design and procurement risk, construction risk, financing risk, financial risk, market risk and revenue, operational and performance risk, force majeure risk, political and regulatory risk, and social risk. The framework of risk allocation in PPP schemes in general are presented in Table 1. Risk allocation scheme shown is a conceptual framework. In its application in the field, the procurement team or the parties involved may modify or update it according to the context of the project at the time. Similarly, the identified potential risks can still be renewed.

Table 1. Conceptual Framework for (Generic) Potential Risks in PPP Infrastructure Development and Its Allocation Preference

Risk Event	Risk allocation preference in the literature										Synthesis			Tendency	
	Irwin, et, al, (1999)	Wang and Tiong (2000)	Asian Development Bank (2000)	DTF SV (2001)	Thomas, et, al (2003)	Grimsey dan Lewis (2004)	Li, et, al (2005)	Singh dan Kalidindi (2006)	Rouboutsos and Anagnostopoulos (2008)	Ke, et, al (2010)	Wibowo and Mohamed (2010)	Public Sector (Pu)	Private Sector (Pr)		Shared (S)
Site Risks															
Lack of information on existing condition of assets			Pu			Pr						50%	50%	0%	Shared
Lack of information on geotechnical condition				Pr		Pr	Pr		S			0%	75%	25%	Private
Lack of information on protected geological and historical object		Pu		Pr		Pu			Pu			75%	25%	0%	Public
Design and Procurement Risks															
Incomplete tender document			Pu									100%	0%	0%	Public
Lack of competition in bidding									Pu			100%	0%	0%	Public
Changes in scope/output specification				Pu				Pu				100%	0%	0%	Public
Defects in design/inadequate specifications				Pr		Pr	Pr		Pr			0%	100%	0%	Private
Construction Risks															
Construction cost escalation	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	0%	100%	0%	Private
Adverse weather during construction		Pr						Pr		S		0%	67%	33%	Private

Risk Event	Risk allocation preference in the literature								Synthesis			Tendency		
	Irwin, et, al, (1999)	Wang and Tiong (2000)	Asian Development Bank (2000)	DTF SV (2001)	Thomas, et, al (2003)	Grimsey dan Lewis (2004)	Li, et, al (2005)	Singh dan Kalidindi (2006)	Roumboutsos and Anagnostopoulos (2008)	Ke, et, al (2010)	Wibowo and Mohamed (2010)		Public Sector (Pu)	Private Sector (Pr)
Construction time overrun	Pr	Pr	Pr	Pr	Pr				Pr	Pr	0%	100%	0%	Private
Failure to meet performance criteria (quality shortfall/defects in construction/commissioning tests failure)	Pr	Pr	Pr		Pr						0%	100%	0%	Private
Material/labor availability	Pr						Pr	Pr			0%	100%	0%	Private
Land cost escalation	Pu				Pu		Pr	Pu	Pu	Pu	83%	17%	0%	Public
Land expropriation	Pu										100%	0%	0%	Public
Environmental damage during construction phase	Pr	Pr					Pr		S		0%	75%	25%	Private
Financing Risks														
Delay or failure in financial closure					S			Pr		Pr	0%	67%	33%	Private
High financing costs							Pr	Pr			0%	100%	0%	Private
Financial Risks														
Interest rate fluctuation	Pu	Pr	S			S	Pr	Pr	S	Pu	25%	38%	38%	Shared
Exchange rate fluctuation	Pu	Pu							S	Pr	50%	25%	25%	Shared
Inflation rate volatility	S		S		S	Pr			S	Pr	0%	33%	67%	Shared
Market and Revenue Risks														
Actual demand below projection	S	Pu	Pr		S	Pr	Pr		S	Pr	13%	50%	38%	Shared
Fluctuation in demand (service used)	S	Pu	Pr		S	Pr	Pr		S	Pr	13%	50%	38%	Shared
Problems in collecting revenue		Pu	Pu						S		67%	0%	33%	Public
Uncertainty in tariff adjustment		S	Pu	Pr		Pr			S	Pu	33%	33%	33%	Shared
Abuse of power by government officials									Pu	Pu	100%	0%	0%	Public
Operation and Performance Risks														
Operation and maintenance cost escalation					Pr	Pr	Pr		Pr	Pr	0%	100%	0%	Private
Early termination of concession by concessionaire		S								Pr	0%	50%	50%	Shared
Technical obsolescence		Pr								Pr	0%	100%	0%	Private
Fluctuation of cost and availability of fuel/coal			Pr								0%	100%	0%	Private
Maintenance more frequent than expected		Pr		Pr		Pr		Pr			0%	100%	0%	Private
Environmental damage during operation phase		Pr	Pr			Pr			S		0%	75%	25%	Private
Equipment defect-caused interruption						Pr				Pr	0%	100%	0%	Private
Shortfall in service quality			Pr	Pr		Pr		Pr			0%	100%	0%	Private
Force Majeure Risks														
Declared war		S		S			S	Pu	S	S	29%	0%	71%	Shared

Risk Event	Risk allocation preference in the literature									Synthesis			Tendency		
	Irwin, et, al, (1999)	Wang and Tiong (2000)	Asian Development Bank (2000)	DTF SV (2001)	Thomas, et, al (2003)	Grimsey dan Lewis (2004)	Li, et, al (2005)	Singh dan Kalidindi (2006)	Roumbousos and Anagnostopoulos (2008)	Ke, et, al (2010)	Wibowo and Mohamed (2010)	Public Sector (Pu)		Private Sector (Pr)	Shared (S)
Riots	S	S	S	S	S	Pr	S	S	S	Pu	13%	13%	75%	Shared	
Natural disaster	S	S	S	S	S	Pr	S	S	S	Pu	13%	13%	75%	Shared	
Manmade disaster	S	S	S	S	S	Pr	S	S	S	Pr	0%	25%	75%	Shared	
Fire	S	S	S	S	S	Pr	S	S	S	Pu	14%	14%	71%	Shared	
Epidemic	S	S	S	S	S	Pr	S	S	S		0%	17%	83%	Shared	
Terrorism attack	S	S	S	S	S	Pr	S	S	S	Pu	14%	14%	71%	Shared	
Politik and Regulation Risks															
Expropriation or nationalization of assets	Pu	Pu				Pr	Pu			Pu	Pu	83%	17%	0%	Public
Change in law (generic) during construction phase	Pu	Pu		Pu		Pr	S	S	Pu	Pu	Pu	67%	11%	22%	Public
Change in law (generic) during operational phase	Pu	Pu		Pu		Pr	S	S	Pu	Pu	Pu	67%	11%	22%	Public
Foreign currency inconvertibility	Pu	Pu	Pu							S	Pr	60%	20%	20%	Public
Foreign currency non transferability	Pu										Pr	50%	50%	0%	Shared
Failure/delay in obtaining permit/approval		S	Pu			Pu		Pu		Pu		80%	0%	20%	Public
Change in tax regulation		S				Pr	Pr		Pu	Pu		40%	40%	20%	Shared
Early termination of concession by government		Pu	Pu			Pu					Pu	100%	0%	0%	Public
Breach of contract by Government						Pu		Pu			Pu	100%	0%	0%	Public
Political instability/unstable government			S				Pu	Pu	Pu			75%	0%	25%	Public
Strong political opposition/hostility			Pu			Pu	Pu	Pu	Pu	S		83%	0%	17%	Public
Restriction on import of equipment/materials		Pu	Pu			Pu						100%	0%	0%	Public
Social Risks															
Public resistance or opposition to project						Pr		S				0%	50%	50%	Shared

In general, risk allocation preference in literatures has not shown a trend towards a consensus. In this case, the study identifies about 63 percent risk event (34 factors) have a preference varies among literatures. While 37 percent risk event (20 factors) that have a preference for 100 percent risk allocation to one party, are: 8 factors allocated to public sector (incomplete tender document, lack of competition in bidding, changes in scope/output specification, land expropriation, abuse of power by government officials, early termination of concession by government, breach of contract by government, restriction on

import of equipment/materials); 12 factors allocated to private sector (defects in design/inadequate specifications, construction cost escalation, construction time overrun, failure to meet performance criteria (quality shortfall/defects in construction/commissioning tests failure), material/labor availability, high financing costs, operation and maintenance costs escalation, technical obsolescence, fluctuation of cost and availability of fuel/coal, more frequent maintenance than expected, equipment defect-caused interruption, shortfall in service quality).

5 ISSUES FOR AN EFFICIENT RISK ALLOCATION

The commitment of each PPP contract should be based on agreement that the main purpose of committing partnership is to share the responsibility and risk (Hardcastle, 2006). In this circumstance, all parties must understand the aspects considered as risks and the desired outcome. It is essential because without mutual understanding, a failure is guaranteed, either during negotiations or later on when construction or operation proceeds.

From the public sector's point of view, while PPP terminology states that Government is a representation of the public sector, Government and the public can have an entirely different perception of a risk profile. It could happen at the planning and approval phase; for example, rejection to the proposed risk management (provision of support/warranty) by the Government or misinterpretation of the user. If this situation occurs, then the risk culmination can be observed after the start-up phase; in this case whether the project can demonstrate technical and social performance. Throughout the concession period until the expiration of the contract, the Local Government (LG) can also experience the impact of such risks as the performance problems that interfere with service provision, thus require LG intervention to provide alternative facilities to complement it. On the other hand, for the user, the impact of risk is experienced on the operational phase, ie, when the escalating trend of prices. If the scenario goes accordingly then this perception could be reduced gradually when all the benefits (such as better service and reliable) promised are accomplished. Similarly, concerns related to quality could have occurred, and continuity of service will decline towards the end of the contract.

From the standpoint of the private sector, the sponsor desired outcome is basically a reasonable return on capital investment. For international investors, to be able to invest successfully in Indonesia may be one desired outcome. Included in the risk for the sponsor are (i) the failure to reach agreement after absorbing the costs for project development, (ii) the failure to secure project financing at an acceptable level, (iii) technical failures and/or contractor financial, (iv) failure during operation, (v)

policy changes during the project that increase costs or reduce revenues, (vi) market failure or the unexpected competition, and (vii) changes in monetary policy and situation that may negatively affect the foreign exchange and remittance procedures. Meanwhile, the outcome desired by the lenders of the project is principal and interest payable recovery on an agreed schedule. The risks involved include the overall risk previously outlined. In terms when a project experiences a loss of momentum for any reason, especially in the early phase of the project, then the debt service will be delayed or canceled. In general, the main risks are unforeseen technical delays during the construction phase and the financial instability of the project sponsor.

In theory, the purpose of efficient/optimum allocation policy is that the risks should be allocated to the party most able to accept and manage them with minimal cost. That principle may be easily stated but more difficult to implement. In this case Hayford (2006) indicated several issues to consider in risk allocation practices such as: (i) the possibility of a difference as a result of the subjective views of risk (such as party that should bear, the size of the impact and likelihood of events), (ii) the complexity of risk because naturally a lot of risks are not necessarily in power (to be managed) of certain parties, (iii) the presence of risks in practice that are difficult to allocate so that the risks cannot be insured, such as force majeure risk, and (iv) other influences beyond the specific context of risk such as commercial requirements (linking risk and return), bargaining power; and debt financiers' requirements. All these considerations are very reasonable because in the context of PPP, risk allocation (retained risks and transferred risks) underpinning the monetary values attributed to retained and transferred risks can also have a bearing on the willingness of government to Depart from its preferred risk allocation. These influences dictate that, inevitably, risks will not always be allocated in accordance with the principles of efficient risk allocation. For that reason, it is also possible that, the reality is that sometimes risks will be allocated to the party least able to refuse the risk rather than the party best able to manage the risk. This requires caution and thoroughness of all parties, including opening it up to risk transfer alternative to others outside the parties involved.

6 CONCLUSION

This paper focuses on risk allocation framework for the parties involved in PPP schemes for infrastructure development, which includes scenarios risks retained by the public sector, transferable risks to private sector, and shared risks. Systematically, the paper presents a brief description about the concept of PPP in infrastructure development, the concept of the relationship between risks with VfM, a framework (generic) for potential risks in PPP infrastructure development and allocation preferences, as well as issues that need to be considered to practice risk allocation efficiently. The study identifies at least 54 (generic) potential risks in PPP infrastructure development. The risks identified can be classified into the risks associated site risk, design and procurement risk, construction risk, financing risk, financial risk, market and revenue risk, operational and performance risk, force majeure risk, political and regulatory risk, and social risk. In general, risk allocation preference in literatures has not intended towards a consensus. In this case about 63 percent identified risk event (34 factors) have a preference varies among literatures. While 37 percent risk event (20 factors) that have a preference for 100 percent risk allocation to one party, public sector or private sector.

It has been widely recognized that the basic principles that apply to each PPP scheme is that the risks should be allocated to the party best able to bear and manage them effectively. However, to arrive at an efficient risk allocation practices, some crucial considerations are required as the possibility of a difference as a result of the subjective views of risk (such as party that should bear, the size of the impact and likelihood of events), the complexity of risk because naturally a lot of risks that are not necessarily in power (to be managed) of specific parties, the presence of risks in practice that are difficult to allocate so that the risks cannot be insured, such as force majeure risk, as well as other influences beyond the specific context risks such as the level of return expectation, and so on. In this case, caution and thoroughness of all parties are necessary, including opening it up to alternative risk transfer to others outside the parties involved.

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