

Risk Inclusion in the Reserve Price Estimation for Toll Road Concession Award

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Abstract—Investors' risks in toll road concession award are related mainly to land acquisition; toll tariff, and tender process. Although the first of two are dominant risks, this study is focused on the risks associated with tender process. The reserve price, as a comparator for investors, bids has been criticized by investors, as it does not include proper cost of risks. There is a need to develop a more equitable reserve price that considers the risks, both at the project and at the business/corporate level. These risks have been identified based on existing regulations, and from the point of views of both parties, i.e., the investors and the government were identified through semi-structured interviews. The findings indicated that while investors understand the need to estimate the cost of risks, this cost is not fully included because it is not fairly considered the reserve price. There are twelve significant risks identified including: the risk associated with overloading (poorly imposing the limitation of heavy vehicles) and the risk related to route/traffic management (lower traffic volume due to changing routes). In theory, these risks can be mitigated by strict regulation and enforcement. However, lack of policy coordination among different parties within the government have been problematic and aggravating risks to the investors.

Index Terms—public-private partnership, risk, reserve price, estimation, toll road, concession.

I. INTRODUCTION

Roads are one of the most important infrastructure supporting national economic development. However, the availability is inadequate and the condition of a number of roads are poor. The National Development Planning Agency of Indonesia has estimated that Rp. 1.924 trillion for the period 2010-2014 is needed for infrastructure financing, while the government's funding capacity is only Rp. 560 trillion. Thus, the involvement of private sector in infrastructure financing is necessitated.

To support the Public Private Partnership (PPP) in road infrastructure, the government has established various regulations, such as Law 38/2004 on Highways, Government's Regulation 15/2005 on Toll Roads, and Government's Regulation 67/2005 on Public and Private Partnership for Infrastructure Provisions, and also the Ministry of Public Works' Regulation 13/2010 on Guidelines for Toll Road Concession Award. A Toll Road Authority (namely BPJT) was founded in 2005. In

addition to these, there are several other technical guidelines to evaluate the private investment viability in tender for toll road concession.

Expanding toll road construction is one of the targets in the Strategic Planning of the Ministry of Public Works for 2010-2014 period [1]. However, this target is difficult to achieve because the execution of several projects has been delayed and re-tendered. Land acquisition issue is the main obstacle faced by the investors [2]. That the two most important issues are: land acquisition and tariff determination [3]. Toll roads backlog is inhibited by problems related to legal and institutional framework [4]. The lack of private sector interest is due to the substandard project preplanning by government [5].

In addition to those challenges, there are issues related to the tender process. The government's price has been criticized by investors to be low while considering inadequate costs of risks. While a well-designed competitive bidding process will yield the true market value without the need for a reserve price, the government is required by law to establish a reserve price as a safeguard against collusion and for public credibility. Research indicated that the concept of a reserve price is often misunderstood by the public [6]. Frequently, when the actual bid far exceeds the announced base price, there is criticism that the reserve price was set too low. The government should not be trying to guess the winning bid (it is problematic). Ideally, the government's price should be set at the minimal justifiable level in order to spur as many bids as possible.

The government's estimate (called "HPSPJT") is a reference in assessing the reasonableness of concession price and/or investment for toll road investors. To be a realistic reference, the estimation of HPSPJT has to consider relevant/major risks, both at project level and business/corporate level. Optimal risk allocation is the primary goal of all PPP schemes, where the value of risk transferred need to be incorporated into the bid price [7]. Thus the estimation of reserve price does not just take into account the direct and indirect costs only, but also need to cover the cost of risks.

While recognizing that there are many more problems in boosting investors' participation, this study focused on the risks associated with the concession tender process, i.e., relevant risks that need to be included in the estimation of reserve price for toll road concession. Risks were identified based on literature. Furthermore, semi-

structured interviews with PPP toll road stakeholders were conducted to obtain primary and most recent data.

II. RESERVE PRICE FOR TOLL ROAD CONCESSION

Concession is generally an arrangement of granting from government to the private sector to provide certain services under significant market competition [6]. Tender for toll road concession is done to select and assign the firms who has the qualifications and business ability, from the administrative, legal, technical and financial aspects to carry out the toll road concession.

The government's estimate (called "HPSPT" or *Harga Perkiraan Sendiri Perusahaan Jalan Tol*) is a reference in assessing the reasonableness of concession price and/or investment for toll road investors. HPSPT is prepared by the Toll Road Authority (or "BPJT" *Badan Pengatur Jalan Tol*). A guideline for Toll Road Concession Award, instruct that HPSPT should include: a). investment costs estimate; b). construction costs; c). land acquisition costs; d). design and supervision costs; e). projected traffic volumes; f). Tariff/toll rates, including adjustment and toll revenue; g). operation and maintenance costs estimate; h). profit/loss projection; i). cash flow projection; j). adequacy of loan payback ratio calculation; k). NPV, IRR, Profitability & Pay Back Period calculations; l). summary of total investment costs of toll road concession; m). initial toll rates; n). concession period [8].

III. LITERATURE REVIEW: RISKS OF PPP TOLL ROAD

Risks associated with toll road concessions can be defined as a loss to investors caused by unexpected events and not as planned, led to additional costs, delays, or revenue reduction.

Risk identification can be performed by making a list of risks that may affect each major element of a toll road concession project. The objective of risk identification is to produce a comprehensive list of risks. It is important to evaluate all potential risks that may occur during the concession period from the point of view of the parties involved in the procurement process. This is to ensure a fair allocation of risk between two parties (government and private sector).

The risks that must be addressed from the perspective of investors, among others: i). pre-construction (corridor for the highway, environmental issues and opposition from some groups, legal issues, arrangement of project financing issues); ii). uncertainty of traffic and demand for the toll road; iii). investment/business risks (revenues, expenses, interest rates, inflation), taxation and regulatory risks; iv). construction risks such as cost over-runs, delays, specifications are not met; v). operations risks, ie: inefficiency and toll route competition with existing high quality non toll road; vi). maintenance and rehabilitation risks [9].

A report identified that there are 46 risks on the toll road investment in Indonesia. The risks are divided into four categories, namely: (1) project performance risks, (2)

project credit risks, (3) demand risks, and (4) force majeure risks [10]. Project performance risk consist of planning risks (competition, market/time, default, and project viability), construction risks (cost overrun, delay, permits, technologies, and designs), operational risks (operational costs, operator's default; revenue, permits, technologies, designs, and environment). Project credit risks consist of market risk (revenue risks), counterpart default, exchange rate, interest rate (lead to an increase in financial costs), and refinancing. Demand risks consist of political risks (uncertainties security, economic stability and government policy uncertainty), laws and regulations (changes in laws and regulations, including policies which may affect the project feasibility), and foreign exchange convertibility. Force majeure risks consist of natural disasters (earthquakes, floods, volcanoes, hurricanes and other), political risks (war, rebellion, revolution, terrorism, strikes, disorder community safety, etc). This report further analyzed the amount of risk factor. The entire risk elements show a similar trend, where in general those risks are in the moderate to high risk category (risk factor > 50%).

Other studies on the risk of PPP toll road projects in Indonesia have also been carried out. A questionnaire surveys and using the Delphi method, identifies 7 risks for Solo - Kertosono toll road project, namely: land acquisition (land acquisition cost certainty and availability of land), construction (time and cost), the cost of money (amount of loan, interest, and loan payback period), operation and maintenance (construction quality), traffic volume, pricing policy and force majeure [11]. And another study through questionnaire surveys and interviews, identified risks during the construction and operation (excluding land acquisition risk) [12]. In this research on Cipularang Toll Road Project - Phase II, there were four main risk groups, i.e., government policy, construction risks (cost; design and construction; the risk of material, labor and equipment), financial and economic risks, and legal aspects risks.

IV. RISK IDENTIFICATION ON PPP TOLL ROAD PROJECT – INTERVIEWS WITH STAKEHOLDERS

Recent study has been performed using structured interviews with respondents to identify risks on PPP toll road projects in Indonesia. The respondents were representatives of the Indonesia Toll Road Authority (BPJT), three major investors: PT. Jasa Marga Tbk, PT. Nusantara Infrastructure Tbk, PT. Citra Marga Nusaphala Persada Tbk, and Indonesian Toll Road Investors Association (ATI). These respondents represent all major stakeholders.

The Indonesia Toll Road Authority (BPJT) is an agency authorized to exercise part of the Government's authority in regulation, business management and monitoring of toll road enterprises. In accordance with its authority to regulate toll road investments, BPJT attempts to encourage private investors and regional government to participate in toll road development.

Jasa Marga has a very long history and is the pioneer in Indonesian toll road industry. To support the economic growth, the Government realized that Indonesia needed reliable road networks; in 1978 Jasa Marga was established with main tasks to plan, build, operate and maintain toll roads along with the facilities so that roads are able to function as highway providing more benefits compared to the non-toll roads. In the beginning, besides functioning as operator, it was also responsible as the national toll road authority. Until 1987, Jasa Marga was the only toll road operator in Indonesia and its development is financed by the Government with overseas loan funding and the issuance of bonds.

Since late 1980s, more investors have been involved and Jasa Marga was also then assigned as "the authority," facilitating private investors most of whom had problems completing their projects. In 2004, the role as the authority was conveyed to newly founded BJPT.

Citra Marga Nusaphala Persada (CMNP) is the first private company in Indonesia engaging in toll road concession sector through the construction and the operating of Jakarta Intra Urban Toll road. When it was first founded, CMNP was a consortium, consists of several State-Owned Companies (BUMN) and national private companies operating in infrastructure sector, especially in toll-road and other related sector. The establishment of CMNP has opened the new era of public and private partnership in toll-road business. Along with the business growth and demand, CMNP strengthen its work by enlisting as a public company since 1995.

Nusantara Infrastructure is one of the leading private integrated infrastructure company, currently owns infrastructure concessions in both western and eastern parts of Indonesia. In toll road sector, it controls the shares of PT Marga Utama Nusantara, a company which started operations in 2010 for dealing with its all toll road projects in Jakarta and Makassar areas.

Toll road investors established an association, namely ATI. While this organization does not have any legal authority in the policy developments, their roles have been influential. Their role in promoting toll roads includes initiating stakeholders' forum.

Interviews with the two groups (government/BPJT and investors) were conducted between September 2012-February 2013. Findings showed that there are twelve risks on the tender for toll road concession in Indonesia, namely:

- *Tender duration risk*: related to the length of time to evaluate the bidding document, which may result the delays in construction.

The time required to evaluate the bids can take up to 1-2 years. The start of construction will be delayed and prices can increase in a significant value. The long period of time in the tender process is caused by several factors including in many cases the lack solid tender preparation.

- *Competition risk*: investors with lower financial capability have higher probability of losing bids.

Financial capability of investors is the most significant factor in bid evaluation process. The financial aspect

contributes 80% of an investor's score, while past performance/experience contributes 20%.

- *Concession contract risk*: the contract often does not arrange the investment risks in great detail (such as tariff adjustments and compensation).

Investors believed that the clauses on the concession contracts are not fully comprehensive when dealing with risks. Investors need clarity in the context of risk adjustments due to realizable traffic volume.

- *Concession period risk*: have an impact on the payback period.

While it is possible that the government provide support in tariff adjustments, in the case of low traffic volume investors only get concession period extension. This is not satisfactory, since it prolongs the investors' payback period.

- *Land acquisition risk*: related to the length of time to acquire land and increase in land prices.

Land acquisition is the most problematic. The time to finalize the whole process cannot be predicted or reasonable estimated. In the meantime, land prices increase considerably often far exceeding initial estimates. The government recently has established the land revolving fund mechanism to minimize this risk, however, the effective implementation of such mechanism is still on progress.

- *Traffic volume risk*: may impact the toll revenues.

The estimation of traffic volume in the future and in the long-term is difficult, particularly in a developing country in which policy enforcement is highly unpredictable. In many cases, the assumption of routes change due to policy changes made by different institution unrelated to the parties involved during toll road planning. Another cause is the lack of solid feasibility study performed by less than qualified consultant.

- *Toll tariff risk*: affected by the road user's ability to pay thus affecting the amount of revenues.

Tariff adjustment is scheduled every two years due to inflation. Investors wish that the tariff could also be factored by the willingness to pay, not just the ability to pay as stated in the existing law. Another issue is the strong influence of politics into the decision of tariff adjustment.

- *Investment cost risk*: particularly on very long concession period, may affect the investor's break-even point.

The costs accrued in the long run frequently exceed initial estimation. These are partly caused by changing in the public policy. While the government acknowledge the problem, they can only compensate the costs with concession period extension which is not satisfactory.

- *Overloading risk*: increases the operation and maintenance costs.

Overloading due to weak enforcement of the traffic route for trucks and other heavy vehicles has been a major risk. Traffic route management is not within the authority of BPJT nor the Ministry of Public Works. The Ministry of Transportation and the Police have the direct

authorization to overcome this problem. However, these institutions are part of the parties which involve in the initial planning/agreement in the PPP projects.

- *Legal and institutional support risks*: lack of legal support for investors.

While rules and regulations have been produced to permeate PPP issues, the implementation and legal enforcement have been weak. This has caused investors additional investments.

- *Inflation risk*: lead to cost escalation.

Inflation rates in a developing country such as Indonesia are somewhat unpredictable. The same problem with exchange rates and discount rates. This becomes a bigger issue in a long period of concession.

- *Interest rate risk*: particularly on the loans using the effective interest rate.

Similar to inflation risk, interest rate risk in Indonesia is not easy to estimate.

Of the overall risk above, there are three main risks to be the most important risk faced by private investors, which is related to land acquisition problems, toll road tariff, and tender process. In many cases toll roads in Indonesia, land acquisition is the main problem. Many projects delayed due to land acquisition problems. This poses another risk, i.e., the risk of construction delays and the risk of interest to be paid to creditors. Risk of toll rates related to the toll tariff adjustment mechanism. While the risk of tender process are related to the length of time to tender process and inadequate of tender documents (unaccurate information/data in tender documents).

TABLE I. RISK IDENTIFICATION FOR PPP TOLL ROAD

Risk Event	Code	Literature			Interview (2012-2013)
		Widiantono 2003	Winarsa 2005	Naimah 2009	
I Pre - Construction					
<i>Tender</i>					
1. Lack of transparency in tender process	R1	x			
2. Inadequate tender documents	R2	x			x
3. Inaaccurate data for feasibility study	R3	x			x
4. Changes in the scope of work by owner (design and volume)	R4	x	x		
5. Low competition	R5				x
6. The length of time for tender process	R6				x
<i>Land Aquisition</i>					
1. Uncertain time for land aquisition	R7	x		x	x
2. Uncertain price for land aquisition	R8	x		x	x
<i>Concession Contract (PPJT)</i>					
1. Incomplete contract (related to risk arrangement)	R9				x
2. Concession period	R10				x
II Construction					
<i>Financing</i>					
1. Error in construction cost estimation	R11	x		x	
2. Uncontinuous funding / difficulty in obtaining bank loans	R12	x	x	x	
3. Interest rate uncertainty (changes in loan interest rate significantly)	R13	x	x	x	x
4. Changes incurrency exchange rates	R14	x	x		
5. Payment to subcontractors in a timely manner	R15		x		
<i>Construction</i>					
1. Unforeseen condition	R16	x			
2. Severe weather	R17	x	x		
3. Loss of material or logistic risk (theft)	R18	x			
4. Contractor's experience	R19		x		
5. Poor quality of construction (does not meet the criteria of the specification)	R20	x			
6. Labor strike	R21	x			x
7. Risk of construction delay	R22	x	x	x	x
8. Subcontractor's ability	R23		x		
9. Material price escalation due to inflation and cost escalation	R24	x			x
10. Uncertainty in procurement import equipment	R25	x			
11. Poor performance of equipment	R26	x	x		
12. Inappropriate construction method	R27		x		
<i>Force majeure</i>					
1. Natural disasters in project regions	R28	x		x	
2. Political changes (lead to demands for nationalization of projects owned by foreigners).	R29	x			
3. Vandalism (destruction of property)	R30	x		x	
<i>Legal Aspect</i>					
1. Lack of legal support for investors	R31				x
2. Changes in government policy	R32		x		x

III Post - Construction					
<i>Risk of Operation and Maintenance Cost</i>					
1. Ineffective and inefficient in operation and maintenance	R33	x			
2. Construction defects	R34	x		x	
3. Escalation cost for operational and maintenance due to inaccurate estimation	R35	x			x
4. Risk of high traffic accidents	R36	x			
5. Disruption of toll road operations due to the demonstration	R37	x	x		x
6. Overloading risk	R38				x
<i>Risk of Toll Revenue</i>					
1. Inaccurate traffic volume estimation	R39	x	x	x	x
2. Determination of initial tariff and tariff adjustment mechanism	R40	x	x	x	x
3. Business risks (competitive routes)	R41	x			
4. Corruption, collusion and nepotism	R42	x			
<i>Risik of Force Majeure</i>					
1. Natural disasters in project regions	R43	x		x	
2. Political changes (lead to demands for nationalization of projects owned by foreigners).	R44	x			
3. Vandalism (destruction of property)	R45	x		x	

V. RISK IDENTIFICATION ON PPP TOLL ROAD PROJECT –LITERATURE REVIEW AND INTERVIEWS WITH STAKEHOLDERS

The results of risk identification on PPP toll road projects based on literature studies and interviews with stakeholders can be seen in Table I below. In the future study, the findings will be used to identify risks that will be included in the reserve price for toll road concession in Indonesia. Thus, a more equitable reserve price can be proposed as better reference in assessing investors' bids, that considers the relevant risks, both at the project and at the business/corporate level.

Overall, there are 45 identified risks. Ref. [10] used respondents from multi-stakeholders, however, the study is outdated while numerous improvements in the regulations have been implemented by BPJT. Ref. [12] and Ref. [11] focused on one case study/project. Based on literatures and our study, it was indicated that land acquisition is the main problem. Other main risks are traffic volume estimation and tariff adjustment mechanism. Additional recent risks identified are overloading and lack of strong legal support for investors (e.g., related to route/traffic management resulting in lower traffic volume due to changing routes).

Risks that have been identified in Table I will be analyzed further. Risks analysis for toll road investment is a complex process, because the risk event are often related to each other. Not all risks are worth considered and included in the calculation of reserve price. Risk analysis can help identify risks that could significantly affect the feasibility of toll road investment and help to take the right first step to manage those risks appropriately in reserve price.

Comprehensive risk analysis consist qualitative and quantitative assessment. Qualitative risk assessment is conducted to screen and prioritize risk, while quantitative risk assessment is conducted to determine the most appropriate risk to considered in the calculation of reserve price. Risks that has a significant impact on the toll road investment are appropriate to considered in reserve price

calculation. Probability of occurrence and impact assessments of risk are the two main characteristics that are used to screen and determine the significant risk which would then be included in reserve price calculation. This research will then conduct a risk analysis and mapping them into probability-impact matrix. Various risks are categorized as high risk will be recommended to considered and included in the calculation of reserve price.

VI. CONCLUSION

Based on literature and our study, there are 45 identified risks. Land acquisition has been and still is the most significant risk factor. Other main risk factors are traffic volume estimation and tariff adjustment mechanism. Additional recent risk factors identified are overloading and lack of strong legal support for investors. Risks analysis for toll road investment is a complex process, because the risk events are often related to each other. Not all risks should be included in the calculation of investors' bids and the government's reserve price. Risk allocation for government and private sectors is also still have to be evaluated.

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