



Value for Money Assessment for Government and Business Entity Cooperation Projects by Using the Availability Payment Model: Proposition Methodology

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ABSTRACT

This paper proposes a quantitative methodology for ex-ante value-for-money (VfM) assessment to select the best modality option between conventional procurement and public-private partnership under the availability payment model for infrastructure provision within the Indonesian context. The proposed methodology incorporates efficient risk allocation principles into assessment to monetize risk retained by the government and risk transferred to the private sponsor. A simple numerical example under different scenarios of risk allocation for a road maintenance project case is presented to demonstrate its applicability. This paper also identifies some relevant issues, acknowledges limitations of the proposed methodology, and recommends directions for future research efforts.

Keywords: public-private partnership, availability payment, value for money, risk allocation, risk mitigation curve, assessment

SARI PATI

Tulisan ini menyampaikan proposisi alternatif metodologi asesmen *ex-ante value for money* (VfM) secara kuantitatif untuk menentukan opsi modalitas terbaik antara pengadaan konvensional dan kerja sama pemerintah dan badan usaha yang menggunakan model pembayaran atas ketersediaan layanan untuk penyediaan infrastruktur untuk konteks Indonesia. Metodologi ini mengaitkan secara langsung prinsip-prinsip alokasi risiko yang efisien dan asesmen VfM untuk memonitisasi risiko yang ditanggung pemerintah dan risiko yang ditransfer kepada badan usaha. Satu contoh numerik sederhana dengan beberapa skenario alokasi risiko pada kasus proyek pemeliharaan jalan dipresentasikan untuk mendemonstrasikan aplikabilitas metodologi tersebut. Tulisan ini juga mengidentifikasi beberapa isu yang relevan, mengenalkan keterbatasan-keterbatasan dari metodologi yang ditawarkan, dan merekomendasikan arah bagi penelitian ke depannya untuk perbaikan metodologi.

Kata Kunci: kerja sama pemerintah dan badan usaha, pembayaran atas ketersediaan layanan, value for money, alokasi risiko, kurva mitigasi risiko, asesmen

INTRODUCTION

In Presidential Regulation (*Perpres*) No. 38 of 2015 concerning Public-Private Partnership (PPP) in the Provision of Infrastructure mentioned that there are two models of investment returns for implementing business entities, namely payment by users in the form of tariffs and payment for availability of services (availability payment; AP). In the AP model, payments will be made by the Contracting Agency (*PJPK*) if the infrastructure is ready to operate and the service indicators as stipulated in the cooperation agreement have been fulfilled.

As its features, the AP model is suitable to be applied to wholesale infrastructure projects or single-buyer models (Laszlo, 2000) while the rate-based model is appropriate for retail infrastructure projects in which business entities transact directly with their users (read, for example, Wibowo (2013)). The AP model can also be used as an alternative for financing infrastructure projects that do not generate income (non-revenue projects) or whose financial feasibility is far below the desired level; included in this class are social infrastructure projects (e.g., urban facilities, educational facilities, sports facilities and infrastructure, tourism).

One of the fundamental differences between the rate model and the AP model lies in the allocation of demand or usage risk, in which the rate model places a business entity as the party that must bear the risk even though the risk can be mitigated by providing guarantees on demand or implementation risk, for example, shadow toll (shadow toll; Yescombe (2007)) for toll road infrastructure projects. Neither the government guarantee of demand risk nor the shadow toll ever been practiced in Indonesia. However, this does not mean that the AP model provides risk immunization to business entities. In some contexts, investment risk that must be borne by business entities is even higher in this model than the rate model.

Apart from the investment return model in accordance with Presidential Regulation (*Perpres*) No. 38 of 2015, every PPP project must meet the principles of partnership, expediency, competition, risk control and management, effectively, and efficiently. In addition to closing the financial gap between funding needs and the ability of the Government through the State or Local Budget, PPP projects must also be ensured to offer value for money (VfM) compared to conventional projects and this is a general reference in any country that uses PPP to meet their infrastructure financing needs (Basheka, Oluka, & Mugurusi, 2012; De Marco & Mangano, 2013; Eadie, Millar, & Toner, 2013; Grimsey & Lewis, 2005; Henjewe, Sun, & Fewings, 2014; Pantelias & Zhang, 2010; Sobhiyah, Bemanian, & Kashtiban, 2009). There is an expectation that the involvement of business entities in the provision of infrastructure can increase VfM (de la Cruz, del Caño, & de la Cruz, 2008).

Per *Perpres* 38 of 2015, the provision on VfM analysis is one of the prerequisites for the identification of collaborative infrastructure projects. Indonesia's National Government Internal Auditor was also discussing VfM audit needs for PPP projects. An audit is needed to ensure that each PPP project benefits the government, both the central and regional governments as *PJPK*, as measured through its VfM

The central issue is that although every government agency with an interest in the PPP project states that the VfM assessment is important to do, so far there is no standard methodology or at least a standard framework on how VfM is assessed. Academic studies (e.g., Pangeran & Wirahadikusumah (2010); Wibowo (2007)) that have been carried out are still very limited and have not answered thoroughly the existing issues.

To fill the knowledge gap above, this paper offers a basic methodology for calculating

risk-based VfM for PPP projects conducted using the AP model. Although it is still under development and has a number of limitations, the methodology offered is operational, as demonstrated in the case calculation examples presented in other parts of this paper.

VALUE FOR MONEY:

DEFINISION AND APPROACH

An understanding of VfM is not universal (Eadie et al., 2013) which allows each organization to have its own definition. The definition of VfM issued (HM Treasury, 2006) is globally accepted as a reference - not the exception of Indonesia - which states VfM as "the optimum combination of costs over the life cycle and quality to meet user requirements." Therefore, VfM does not mean an option that has the lowest initial cost which must be chosen (Mahdi & Alreshaid, 2005).

Indonesian Ministry of National Development Planning also uses this definition and then adds VfM as "a method for assessing public acceptance of the maximum benefits of goods or services obtained with the resources available in providing public services (Indonesian Ministry of National Development Planning, n.d.)."

Methodology

Value for money is very contextual (Daube, Vollrath, & Alfen, 2008) and VfM assessment is not an exact science (Pitt, Collins, & Walls, 2006) so that operations can differ between one and another organization. In general, there are two approaches used for VfM assessments, namely qualitative and quantitative, which in the case are complementary. A qualitative approach is usually used as an initial stage of assessment to determine whether an infrastructure project can be PPPs while a quantitative approach is taken to ascertain how much VfM is offered if the project is made by PPP and decide whether the project continues to be carried out using a PPP scheme. However, in many cases, governments often

emphasize the importance of qualitative VfM factors but in reality put forward quantitative aspects for their evaluation (Grimsey & Lewis, 2005).

The Indonesia Infrastructure Guarantee Fund Institute (2016) initiated the preparation of a qualitative VfM assessment methodology by considering three criteria, namely achievability, viability, and desirability, each of which has sub-criteria and sub-criteria. The determination of VfM scores on three modality options (i.e., State Budget, government assignments to SOEs, and PPP) is based on analytic hierarchy process (Saaty, 1987). The methodology developed is then outlined in software that allows users to only enter input data in the form of pairwise comparisons (pairwise comparisons) and obtain the results directly.

Public Sector Comparator

The public sector comparator (PSC) developed in the UK for their project finance initiative (PFI) is often used as a reference for quantitative VfM assessments, both on a practical and academic level (Bing, Akintoye, Edwards, & Hardcastle, 2005; Grimsey & Lewis, 2005; Jong, Rui, Stead, Yongchi, & Bao, 2010; Rebeiz, 2012; Yongjian, Xinping, & Shouqing, 2008; Zhang & S., 2012). In principle, for a net cost project, the cost present value of a prospective business entity must be lower than the PSC for an infrastructure project that can be PPP and for the net revenue project (read, Gray, Hall, & Pollard (2010)) applies the opposite.

There are four PSC elements, namely raw cost, transferred risks, retained risks, and competitive neutrality. In general, PSC is calculated as:

$$PSC = Raw\ PSC + Competitive\ Neutrality + Transferred\ Risk + Retained\ Risk \tag{1}$$

with raw cost = all capital and operating costs incurred to produce output in accordance with

specifications for a certain period of time in accordance with the cooperation agreement, competitive neutrality = profit that is only owned by the government (and not owned by a business entity) arising from public ownership, transferred risk = value of risk transferred from the government to business entities, retained risk = value of risk borne by the government. Details of the PSC calculation can be read in (Infrastructure Australia, 2008).

PSC is not the only approach used to determine VfM. Some countries that do not use - or at least formally do not use - PSC use another approach to determine VfM. In Germany, for example, quantitative VfM calculations are based on full economic analysis of each feasible option whose process is very detailed and complex (Grimsey & Lewis, 2005). In the United States, on some VfM social infrastructure projects, the tender process is determined by including the provision that the service costs offered by business entities must be 5-20% lower than the usual costs incurred by the government (Schneider, 1999).

Discussions about the PSC have been carried out both from a technical perspective (eg, Eadie et al. (2013); Prince & Wirahadikusumah (2010); Quiggin (2004); Wibowo (2007)) and possible applications in developing countries (Ballingall, 2013). Despite weaknesses and criticisms, the PSC is considered a compromise methodology on the spectrum of very complex methodologies (e.g., Germany) and very simple (e.g., France; Grimsey & Lewis, 2005).

Risk Management

Risk is the core of the PPP (Public-Private Infrastructure Advisory Facility, 2009). In PSC, efficient risk allocation is one of the vital factors that determine VfM (Daube et al., 2008; Jin & Doloi, 2008; Liu & Wilkinson, 2014; Raisbeck, Duffield, & Xu, 2010). Efficient risk allocation will occur if a risk is handed over to the party who is most able to control the risk, has wider

risk mitigation access, or bears the risk at the lowest cost. While the government is not in the best position to assume all risks, the hypothesis that can be built is that VfM should increase if some of the risk is transferred to business entities on condition that they have better mitigation capabilities; in addition, VfM will not be achieved by holding a PPP.

In the academic field, risk management including risk allocation between government and business entities has been widely carried out (Chan, Yeung, Yu, Wang, & Ke, 2010; Chan, Yeung, Yu, Wang, & Ke, 2011; Heravi & Hajihosseini, 2012; Jin, 2010; Wang, 2011). For the Indonesian context, studies on PPP risk allocation are relatively limited (eg, Personal & Prince (2007); Santoso, Joewono, Wibowo, Sinaga, & Santosa (2012); Wibowo & Mohamed (2010)) and leave plenty of room for future research. In addition to the risk assessment method, risk allocation is still an interesting area of research because there are some risks that still cannot be clearly determined who is the most appropriate to bear them because both the government and business entities do not have full control over these risks.

PROPOSITION OF ASSESSMENT METHODOLOGY

There are two practical issues related to VfM assessment in Indonesia. First, decision makers from the Ministry of Finance, technical ministries, or other government institutions often need preliminary VfM information for decision making whether an infrastructure project can be approved to be held by PPP. What is suspected by (Grimsey & Lewis, 2005) also applies to Indonesia. As understood, the PSC presents the amount of costs during the project life cycle but to find out VfM, the PSC needs to be juxtaposed with the bid price (in present value) proposed by prospective business entities because by definition VfM is the difference between the PSC and the bid price.

Second, the PSC concept that has been known all this time is very dependent on the quantification of risks which incidentally is a function of the probability and impact of the costs and / or time incurred if a risk actually occurs during the period of the cooperation agreement. From the perspective of probability theory, risk can be modeled as a random variable that follows a certain density function. Historical data is needed to estimate the appropriate function and its parameters (i.e., shape and location parameters). In fact in Indonesia, the availability of data remains one of the biggest challenges in risk modeling. The optimal solution is to utilize tacit knowledge owned by expert practitioners and academics that are knowledgeable and experienced in certain infrastructure sectors. This expert judgment will be applied to the input needed in the methodology offered.

Basic Assumptions

Several methodologies have been developed to assess VfM. But the basic weakness that is commonly found is the lack of clarity in the application of the concept of efficient risk allocation in the financial model. The methodology offered in this paper introduces two new concepts, namely the ability to mitigate risks and the costs of residual risk. The assumption used is the higher the ability to mitigate risk by a party, the lower the residual risk costs that must be borne by that party. With this assumption, *ceteris paribus*, an efficient risk allocation will produce the highest VfM.

Calculation Formulation

Assume vector $s = (s_{1,j}, s_{2,j}, \dots, s_{i-1,j}, s_{i,j})$ is the ability to mitigate the risk of party j ($j \in \{1,2\}$) for risk i ($i \in \{1,2, \dots, m\}$) where m = the number of risks evaluated. As mentioned earlier, there is no historical data that can be used to assess this mitigation capability and therefore expert judgment is needed. In this paper, the ability to mitigate this is ordinally stated in a Likert

Scale of 0-5 (0 = very ineffective, 5 = very effective) so that $s_{i,j} \in (0,1,2,3,4,5)$. This scale is not absolutely used and can be replaced with another ordinal scale.

Furthermore, vector $w = (w_{1,j}, w_{2,j}, \dots, w_{i-1,j}, w_{i,j})$ is the proportion of risk allocation i borne by party j with $0 \leq w_{i,j} \leq 1, \forall i=1,2, \dots, m, j = 1,2$ which is $j = 1$ for the government and $j = 2$ for the business entity and the following simple relationship applies:

$$w_{i,j=1} = 1 - w_{i,j=2} \quad (2)$$

If $f(s_{i,j})$ is a function that describes the risk cost reduction i which is adjusted to the effectiveness of party j 's mitigation of risk i , then:

$$C^1_{i,j,k} = w_{i,j} [1 - f(s_{i,j})] C^0_{i,k} \quad \forall i,j,k \quad (3)$$

where $C^0_{i,k}$ = expectation of risk cost i that occurs in the k -year year and $C^1_{i,k}$ is the residual risk cost borne by party j for risk i in the k -th year and

$$C^0_{i,k} = p_{i,k} c_{i,k} \quad (4)$$

where $p_{i,k}$ = probability of risk i occurring in the k -year and $c_{i,k}$ = risk costs arising from risk i occurring in the k -year. Equation (3) is the simplest discrete equation for modeling risk. Theoretically,

$$0 \leq f(s_{i,j}) \leq 1 \quad (5)$$

In ideal and extreme conditions relations can occur as follows:

$$f(s_{i,j} | s_{i,j} = 1) = 0; f(s_{i,j} | s_{i,j} = 5) = 1 \quad (6)$$

which explains that if mitigation cannot be carried out effectively by party j , the risk costs are still the same as the costs of the non-mitigated risk. Conversely, if the risk mitigation by j can be perfectly effective, the risk costs that arise

can be eliminated. Costs over the life cycle to be borne by the government if an infrastructure project is to be funded by purely conventional procurement (i.e. State or Local Budget) can be calculated as follows:

$$C_{j=1}^1 = \sum_{k=0}^n \frac{R_{j=1,k}}{(1+r)^k} + \sum_{k=0}^n \sum_{i=1}^m \frac{[1 - f(s_{i,j=1})] c_{i,j=1,k}^0}{(1+r)^k} + \sum_{k=0}^n \frac{N_k}{(1+r)^k} \tag{7}$$

where $C_{j=1}^1$ = total costs incurred by the government if the procurement of infrastructure projects uses pure state or local budget, n = duration of cooperation agreement, r = selected discount rate, $R_{j=1,k}$ = raw cost (or raw cash flows, depending on whether the net cost project or net revenue project, or a combination) must be borne by the government in the k -year year, N_k = competitive neutrality in the k -year.

If the infrastructure project is to be held by PPP, from a government perspective, the costs incurred during the cooperation agreement will be:

$$C_{j=1}^2 = \sum_{k=0}^n \frac{A_k}{(1+r)^k} + \sum_{k=0}^n \sum_{i=1}^m \frac{w_{i,j=1} [1 - f(s_{i,j=1})] c_{i,j=1,k}^0}{(1+r)^k} + \sum_{k=0}^n \frac{N_k}{(1+r)^k} \tag{8}$$

$C_{j=1}^2$ = total costs borne by the government if the project by PPP, A_k = payment of the availability of services from the government to business entities in the k -year. The second term from Equation (8) reflects the risk costs that must be borne by the government (retained risks). From the perspective of a business entity, the costs incurred $C_{j=2}^3$ are the sum of the raw costs

(or raw cash flows) that must be borne and the risk costs transferred by the government (transferred risks):

$$C_{j=2}^3 = \sum_{k=0}^n \frac{R_{j=2,k}}{(1+r)^k} + \sum_{k=0}^n \sum_{i=1}^m \frac{w_{i,j=2} [1 - f(s_{i,j=2})] c_{i,j=2,k}^0}{(1+r)^k} \tag{9}$$

If payments are made constant (unitary payment) every year, then:

$$A_k = \frac{rC_{j=2}^3}{1 - (1+r)^{-n}} \tag{10}$$

Thus, the resulting VfM is the difference between Equation (7) and Equation (8):

$$V = C_{j=1}^1 - C_{j=1}^2 \tag{12}$$

If $V > 0$, the PPP is a more feasible option, otherwise the state or local is pure. Pairing Equations (7) and (8) can determine the maximum payment amount for availability, namely:

$$A^* = \sum_{k=0}^n \sum_{i=1}^m \frac{w_{i,j=1} [1 - f(s_{i,j=1})] c_{i,j=1,k}^0}{(1+r)^k} - \sum_{k=0}^n \frac{R_{j=1,k}}{(1+r)^k} - \sum_{k=0}^n \sum_{i=1}^m \frac{[1 - f(s_{i,j=1})] c_{i,j=1,k}^0}{(1+r)^k} \tag{13}$$

where A^* = payment of maximum service availability (current value). Furthermore, if the raw cost reflects best practice - the same assumptions are also used in the calculation of the PSC so the risk must be excluded - then the following relationship will occur:

$$R_{j=1,k} = R_{j=2,k} \tag{14}$$

so the value of the risk transferred from the government to the business entity is the

difference between payment of availability and raw cost (all in present value).

Mitigation Curve

To apply the calculation formulation above, information $f(s_{i,j-1})$ is required. There are endless possibilities for this function that can be concave, convex, or a combination of them. Figure 1 shows some examples of functions that can be used to illustrate the effectiveness of risk cost reduction. Intuitively, the curve that occurs should be monotonically up or mathematically

$$\frac{df(s_{i,j})}{s_{i,j}} \tag{15}$$

where $df(s_{i,j})$ is the first derivative of $f(s_{i,j})$.

CALCULATION EXAMPLE

The following is a numerical example to show the operationalization of the methodology that has been presented. One thing to remember is that the data displayed does not have to reflect the actual data from an infrastructure project.

Basic assumption

In this example it is assumed that the government wishes to use the AP model for national road maintenance projects in an area. To obtain services in accordance with the

required specifications, there are design and reconstruction works, each of which occurred at $n = 0$ and $n = 1$ amounting to Rp317 billion and Rp5.7 trillion (real).

It is estimated that the annual (real) maintenance cost per year is Rp1.7 trillion. These costs do not take into account the risks that may arise. The duration of the collaboration was set for 15 years, including design and reconstruction work. The inflation rate is estimated at 6% per year.

Another assumption is that the government will use 100% debt at an interest rate of 12% per year to finance the maintenance project and this interest rate is at the same time a discount rate.

What needs to be emphasized here is that the discount rate does not have to be the same as the loan interest rate. In this case both are equal because the debt ratio used is 100%. The competitive advantage in this case is neutralized by calculating cash flows before tax.

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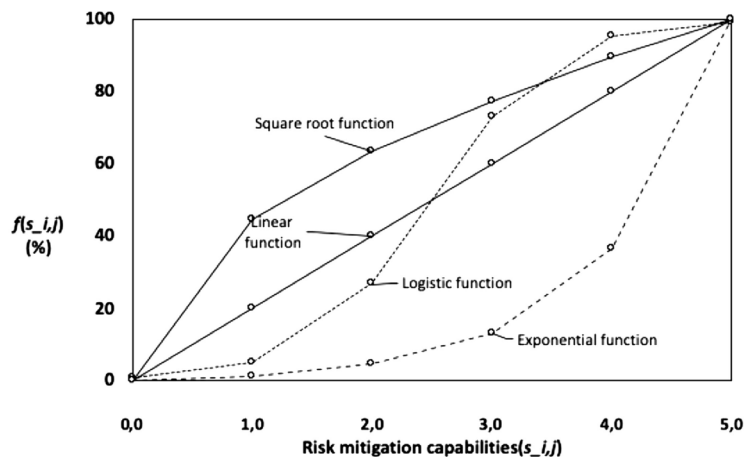


Figure 1. Example of a risk mitigation curve as a function of a score of mitigation capabilities

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There are many risks that need to be identified from the pre-construction phase to the operation. For simplification, there are four risks that will be reviewed, namely design errors, increase in construction costs, construction delays, and overloading. The first three risks occur during the pre-construction and construction period while the risk of overloading occurs during the operating period.

Furthermore it is assumed that: (i) the expected error due to design is an increase in reconstruction costs by 10%, (ii) the expected

increase in risk costs is 44%, (iii) the expected delay in construction is 30 days with a assumed delay of 0.1% per day initial estimated reconstruction costs. Overloading is estimated to be the biggest risk with an expectation of 40% of the estimated initial maintenance costs.

Calculation result

Figure 2 shows the contribution of each risk to the total cost of risk (in present value). As presented, the risk of overloading contributes around 77% of the total risk cost. Table 1 presents other assumptions related to party mitigation capabilities and risk allocation patterns with three scenarios if the project is to be held by PPP. When calculated in more depth, the cost of the four risks is 25.25% of the raw cost.

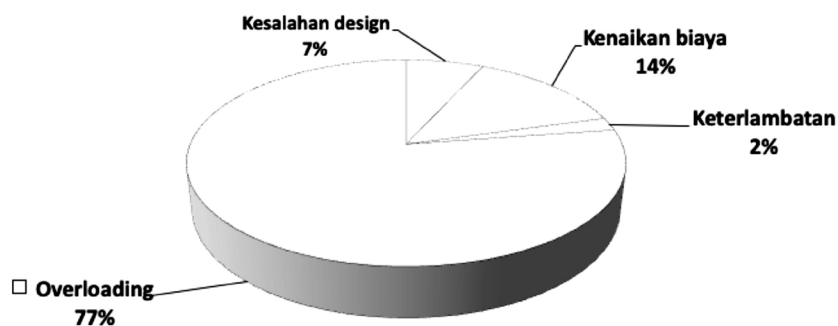


Figure 2. The contribution of the evaluated risk to the total cost of risk in the case sample

Table 1. Scenarios for risk mitigation allocation and capability

Risk	Risk mitigation capabilities $S_{i,j}$		Risk allocation $w_{i,j}$ (%)					
	$j=1^*$	$j=2$	Scenario-I		Scenario-II		Scenario-III	
			$j=1$	$j=2$	$j=1$	$j=2$	$j=1$	$j=2$
Design error	2	4	0	100	100	0	0	100
Increase in construction costs	2	4	0	100	100	0	0	100
Delay in completion of construction	2	4	0	100	100	0	0	100
Overloading	2	1	0	100	100	0	100	0

Notes ^{*} $j = 1$ is government, $j = 2$ is business entities

In accordance with information from Table 1, business entities are better than the government for the first three risks only and worse for risk overloading in the context of the ability to mitigate risks. Scenario I risk allocation patterns are inefficient. With the ability to better mitigate the risk of overloading, the government should get a greater portion of this risk. Inefficiency occurs in Scenario II where the government has to bear all risks as is the case with the state budget project while business entities have better risk mitigation capabilities for some risks. Scenario III is an ideal scenario that adheres to the principle of efficient risk allocation.

Figure 3 displays the effectiveness of risk mitigation curves that tend to have logistical curves. More detailed information about the effectiveness of this risk mitigation curve will be conveyed in another manuscript currently being prepared by the author. Table 2 shows the calculation results for the three defined scenarios. As expected, Scenario I and Scenario II both do not apply the principle of efficient risk allocation resulting in negative VfM while Scenario III produces positive VfM. Figure 4 presents a diagrammatically all costs incurred and VfM from Scenario III.

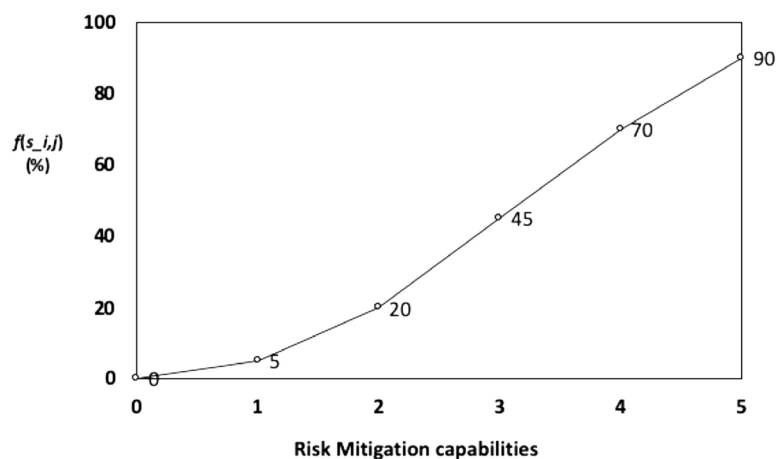


Figure 3. The risk mitigation effectiveness curve used in the calculation

Table 2. Calculation results for value for money for the three risk allocation scenarios (in million rupiah)

Risk	State budget	PPP		
		Scenario-I	Scenario-II	Scenario-III
Raw cost	21.072.515	21.072.515	21.072.515	21.072.515
Retained risks	6.357.093		6.357.093	4.915.862
Transferred risks		6.357.093		1.441.231
AP		27.972.424	21.511.789	22.134.837
Total*	27.429.608	27.972.424	27.868.882	27.050.699
Value for money		-542.815	-439.274	378.909

Notes *) The results of the sum of the APs and retained risk that describe the payments that must be made by the Government

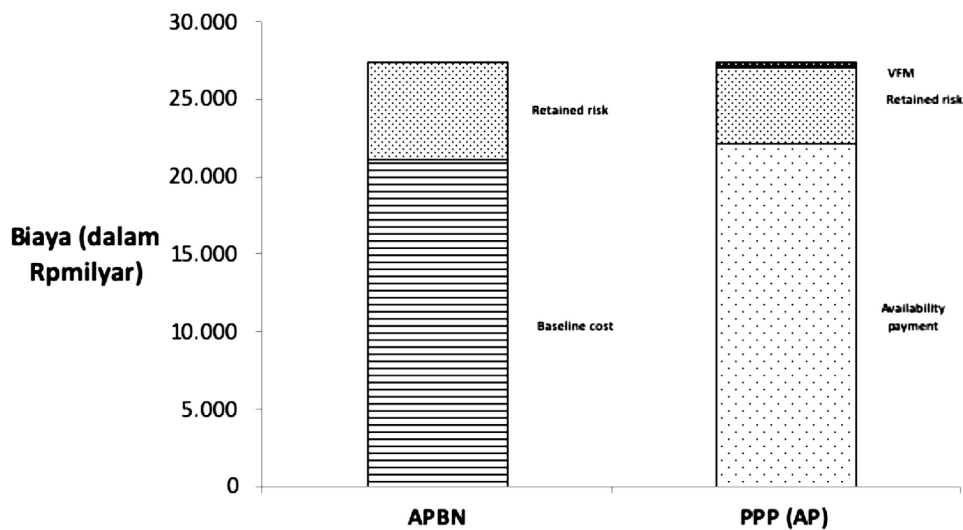


Figure 4. The results of the calculation of value for money for Scenario-III

RELEVANT ISSUES

Risk overestimation

Issues regarding assessment and risk allocation associated with PSC calculations are very relevant in the Indonesian context and are still very limited. As far as the author's knowledge is concerned, there are only two studies that discuss this. Pangeran (2011) calculated the PSC for a drinking water investment project and found that the risk costs borne by the government were 38% of the raw cost, shared by 82%, and transferred to the government by 110% so that as a whole amounted to 230% of the raw cost. This amount is certainly difficult to be accepted.

Wibowo (2007) - one of the preliminary studies on PSC in Indonesia - uses Technical Guideline No. Pd.T.01.2005.B regarding guidelines for risk assessment of toll road investments issued by the Ministry of Public Works (now the Ministry of Public Works and Public Housing) to estimate the magnitude of risk for PSC of a toll road project. Wibowo gets the risk costs transferred and borne by the government respectively 54% and 44% of the raw cost. Although the cost is low and not as fantastic as the findings of Prince (2011), the magnitude of this risk is still beyond

normal limits.

In Australia, the value of transferred risk is on average only 8% and in the UK between 10 and 15% and an average of 12% (Grimsey & Lewis, 2005). There are at least two reasons that can explain the excess cost of risk is the assumption used: each risk is assumed to occur independently and overestimates the probability and impact if a risk occurs.

Discount rate

Determination of the discount rate for PPP projects is still a complicated issue (read, Gray et al. (2010); Grimsey & Lewis (2004)). Infrastructure Australia (2008) has provided guidance on how discount rates are determined for PSC calculations. In principle, the discount rate is determined based on the Capital Asset Pricing Model (CAPM).

In general, risks can be categorized into project-specific non-systematic risks (idiosyncratic risks) and systematic risks (or market risks). The first risk is often assumed to be eliminated through diversification of assets while not for the second risk. Therefore, the CAPM used by

Infrastructure Australia (2008) only provides compensation for systematic risks.

If non-systematic risk is calculated as retained risk and transferred risks, systematic risk is calculated in the discount rate so how much systematic risk will be transferred by the government to business entities will affect the amount of the discount rate used. This understanding is important to avoid the mismatch of adjusting the discount rate and the type of risk to be transferred. Discourse about the discount rate is still and will continue but the solution to this issue is outside the scope of this paper.

Inaccurate determination of the discount rate can have an impact on the net present cost offered by prospective entities, especially if their cash flow profiles differ from one another. This paper assumes the same discount rate for government and business cash flows. This assumption is based on the understanding that VfM is evaluated *ex-ante* with only one representative business entity considering the objectives to be achieved are still limited to making decisions on two modalities for infrastructure provision: state/local budget or PPP.

Competitive Neutrality Valuation

The competitive advantages of the government are one of the elements in the PSC that needs to be reasonably determined to make the VfM assessment comparable (like-with-like VfM assessment). One form of government competitive advantage is tax that is only imposed on business entities. In addition to profits, what needs to be realized is that the government also has competitive disadvantages

that need to be taken into account in calculating PSC. Australian Infrastructure (2008) provides several examples of competitive advantages and disadvantages. There are two issues. The first issue is the method for valuation of both which is not described more clearly than the other PSC elements. The second issue is related to its application in the Indonesian context. As with the determination of the discount rate, a more detailed discussion of the valuation of competitive advantages and disadvantages of the government does not form part of this paper.

CONCLUSION

This paper offers an alternative quantitative VfM assessment methodology to determine the best ex-ante modality option between conventional procurement using the state/local budget and PPP using a payment model for availability for infrastructure provision. The proposed methodology considers the allocation and capability of risk mitigation by the government and business entities. The principle if risk is allocated efficiently will produce the best VfM fully used in this methodology. However, besides the advantages offered, the methodology in this paper has many limitations. Some of the inputs used and concepts introduced are still hypothetical. This methodology is still under development and improvements to this methodology are still being carried out by the author by conducting several supporting studies. Some of the issues raised in this paper can also be interesting domains for future research, including the definition of a mitigation curve, the determination of the discount rate, and the valuation of competitive advantages and disadvantages of the government for PSC calculations.

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