

Value-for-Money Drivers in Public-Private Partnerships in Affordable Housing in Indonesia: An Analytic Network Process Perspective

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Abstract: This study aimed to identify the factors expected to drive value-for-money (VfM) when using public-private partnerships (PPPs) for affordable housing in Indonesia. Utilising economy, efficiency and effectiveness as the VfM criteria, the study employed the analytic network process to determine the relative importance of 13 factors compiled from the literature review. The factors were then grouped into five clusters: private sector capacity, transparent and competitive procurement, risk and reward allocation, public sector capacity and the nature of the long-term contract. The data were gathered through a survey of 20 experts with hands-on experience in Indonesia's PPPs. Effectiveness was identified as the most critical VfM criterion, implying that bringing other VfM aspects into public decisions is indefensible if the outcome, providing low-income customers with suitable housing at rents they can afford, is not achieved. The justified scope and size of the project, clear output-based specifications, quality project planning and preparation and long-term service delivery emerged as the most critical factors enhancing VfM, each with a different focus on a specific VfM criterion based on local weights. At the cluster level, risk and reward allocation ranked the highest. This study also acknowledges several limitations and provides directions for future research.

Keywords: Affordable housing, Analytic network process, Public-private partnerships, Value-for-money drivers, Indonesian housing

INTRODUCTION

The government of Indonesia (GoI) announced an ambitious infrastructure development plan for 2015 to 2019 to boost the country's economic growth. The plan required substantial capital investment, estimated to be around IDR4,796 trillion or USD320 billion on a short scale (with USD1 = IDR15,000). However, the GoI's funding capacity was approximately half of what was required, leaving a considerable funding gap. In the 2020–2024 Mid-Term National Development Plan, the GoI continues to prioritise infrastructure development on a larger scale. The required total funding is expected to rise by about 35% from the previous five-year plan to USD430 billion, with the GoI only meeting about 37% of the need, indicating a greater reliance on alternative public infrastructure funding.

In the housing sector, the GoI allocates USD52 billion between 2020 and 2024 to build rental apartment projects for low-income households, reducing the housing backlog from 10 million units (its current level) to five million. As with other

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governments, the GoI resorts to public-private partnerships (PPPs) to help with the funding. At the time of writing this article, the GoI is preparing ten PPP housing projects worth USD600 million. Aside from funding, another reason for using PPPs is value-for-money (VfM). The VfM requirement becomes more stringent when the proposed PPP projects entail a long-term implication for public funding, such as government subsidies and other government financial obligations.

One of the most researched areas in PPPs is how PPP projects can achieve the intended VfM. Identifying the factors that contribute to the achievement of VfM is critical (Ismail, 2013). Prior works on VfM in PPPs are numerous, including those devoted to investigating factors that contribute to VfM enhancement. While many studies on the use of PPPs in housing have been conducted (Guarani and Battisti, 2017; Qin, Soliño and de Albornoz, 2017; Kavishe, Jefferson and Chileshe, 2018), analyses that identify VfM drivers in this sector are relatively scarce. This article filled this knowledge gap by identifying the factors expected to foster VfM when using PPPs in housing in Indonesia.

This study contributed to both theory and practice in the PPP areas. First, it added to the existing literature by providing VfM factors relevant to PPPs in affordable housing, which can differ from other infrastructures. Second, this evaluation argued that the VfM is a construct that must be operationally measured through the economy, efficiency and effectiveness (3Es) criteria. The novelty of this article in this regard is that it is one of the first attempts to investigate the importance of VfM factors on the 3Es criteria-wise and overall, taking into account the interrelationships between the factors, which are generally not considered in existing analyses. Among the few works that have addressed VfM factor interactions were Almarri (2023) for smart cities, Cui et al. (2019) and Henjewe, Sun and Fewings (2012) for general PPP projects. These studies employed a correlation-based statistical approach. Third, the current analysis identified factors the GoI should prioritise when aiming to reap VfM in PPP housing projects. Given this study's context, the extent to which the results can be generalised might be limited. However, it sheds some light on the VfM factors in using PPPs in housing, which can benefit other governments facing similar challenges.

VfM

The definition of VfM is not universal and may differ depending on the organisation. However, it can be narrowed down into the 3Es aspects (Cui et al., 2019; Penyalver, Turró and Williamson, 2019; Warsen, 2021). Economy refers to reducing the cost of resources used for an activity for a given output or quality. Efficiency refers to increasing output or quality for a given input and effectiveness refers to achieving the intended outcomes successfully from an activity (Jackson, 2012). In simple terms, economic means spending less, whereas efficiency means spending well and wisely.

Many published publications on VfM in PPPs have demonstrated the relevance and importance of this topic. Some studies concentrate on the methodologies for evaluating VfM in practice (Grimsey and Lewis, 2005; Eadie, Millar and Toner, 2013; DeCorla-Souza, 2014). On the other hand, several works focus on measuring performance against VfM, but the results remain elusive (Visconti, 2014; Tingting and Wilkinson, 2015; Wu et al., 2016). Some examples were relevant to this article's attempt to identify factors affecting the pursuit of VfM creation in PPP projects. These studies are outlined below.

A survey conducted in Hong Kong and Australia by Cheung et al. (2009) studied 18 measures that could improve the VfM in PPP projects. They conclude that the most critical factors are efficient risk allocation, output-based specification, competitive tenders, private management skills and private-sector technological innovations. Chan et al. (2010) proposed 15 drivers for infrastructure development in China and Hong Kong using the PPPs. They discover that the most critical factors include a restrained government budget, integrated solutions, the reduction of public money tied up in capital investment and creative and innovative approaches. Soomro and Zhang (2015) have identified 19 VfM drivers in the PPP transportation sector from their analyses and case studies and classified them as feasibility, financial, procurement, project and partnership and long-term project issues.

Henjewe, Sun and Fewings (2014) categorise the importance of VfM drivers of the UK's private finance initiative healthcare and transport projects as internal, external and other factors. According to their survey, client-driven internal factors had a more significant impact on the VfM than external ones, with design changes and requests for additional work emerging as the most significant factors during the development and operational phases. Ismail (2013), investigating VfM factors in Malaysian PPP projects, concludes that private-sector technical innovations, competitive tenders and efficient risk allocations are critical. However, Ismail also found significant differences in perceptions of the importance of VfM measures between public and private sector respondents for 10 of the 20 factors.

Hu, Chen and Zhang (2014) conducted a statistical analysis of 207 of Japan's PPP projects and concluded that the project sector, project profitability, level of independence and investment scale heavily influence VfM. Ameyaw, Adjei-Kumi and Owusu-Manu (2015) proposed a VfM assessment framework, which suggests that the VfM is a result of VfM attained during the developmental, procurement, construction and operation phases, each of which has specific key drivers. Clear output specifications, fair competition, specified contract duration, as well as the project's scope, minimum bidding costs, proper risk identification and allocation, contract flexibility, technical innovation, client management skills, clear criteria for performance measurement and project affordability are found essential for VfM achievement. Zhang and Yu (2016) compiled 15 VfM drivers in China's PPP projects from extensive literature reviews and interviews. They conclude that the most significant drivers are reasonable risk allocation, minimum lifecycle cost consideration and attention to output-oriented services.

Furthermore, Wu et al. (2018) investigated the impact of contractual flexibility and conflicts on the success of megaprojects. They believe that rigid and flexible contractual terms should coexist in the contract document. Cui et al. (2019) identify 19 VfM drivers, which are classified into five variables: the participant's ability and characteristics, the consumer's demand achievement, the cooperation of public and private sectors, cost and effectiveness and the cooperative environment. Almarri (2023) categorises 11 VfM factors into three interrelated latent variables for smart infrastructure projects, that are economic sustainability, integration drive and optimised and smart technology. Some of the identified VfM factors are similar to previous studies, while others are novel, such as the multi-benefit objectives of all stakeholders, economic sustainability, smart asset management and diffusion of smart technologies.

Based on the previous literature, at least two conclusions can be drawn. First, some factors appear in multiple studies. Fair risk allocation, transparent and competitive procurement, innovation, clear output specification, the private sector's skills and knowledge, public sector capacity, early and quality service, long-term contractual agreement and flexibility are some of these. However, the contextual interpretation should still apply due to the nature of infrastructure projects. Second, as this study suggests, the significance of the identified factors has frequently been determined without considering the relationship between one factor and another.

RESEARCH METHODOLOGY

Driving Factor Identification and Interdependencies

The first step was conducting an extensive literature review on VfM drivers and critical success factors (CSFs) to identify candidate factors that improve VfM. Some factors driving the VfM were also classified as CSFs because the factors can play multiple roles. Furthermore, according to Ishawu et al. (2020), creating VfM is critical to assist practitioners in identifying the CSFs of PPP projects.

A total of the 23 factors most relevant to PPPs in affordable housing were established after initial identification. Multiple ones that conveyed the same meaning were combined into a single factor, while others were merged to form a higher factor. This approach was used to reduce the number of variables without losing important information. After several structuring iterations, 13 factors were chosen as VfM second-tiered drivers, clustered into five first-tiered drivers (as shown in Figure 1).

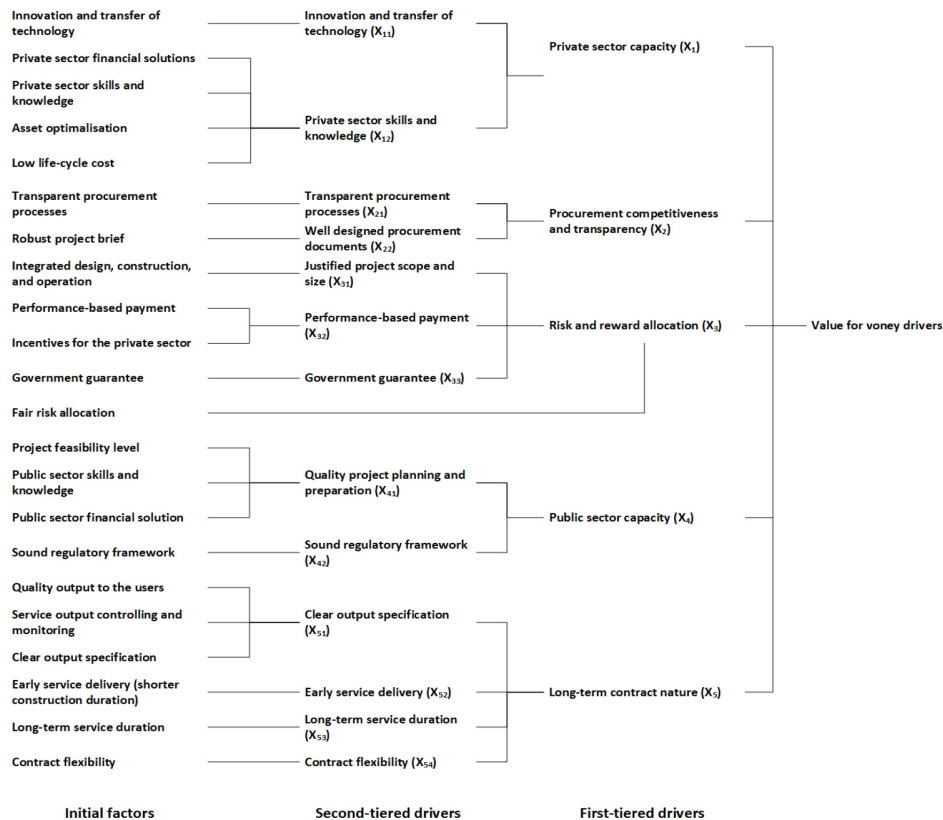


Figure 1. Selection of VfM drivers

Analytic Network Process (ANP)

The ANP was used to determine the relative importance of the selected drivers. Figure 2 depicts the ANP structure of the VfM drivers. Straight lines connecting VfM criteria and drivers represent the relationships between clusters (outer dependence) and curved lines illustrate the relationships between nodes within the cluster (inner dependence). The second-tiered factors are referred to as nodes in ANP terminology, while the first-tiered factors are referred to as clusters. The ANP, a generalised form of the analytic hierarchy process, structures the decision problem as a feedback network with inner and outer dependencies among its elements (Saaty and Vargas, 2013). The ANP is not the only option to deal with component dependencies. For example, structural equation modelling (SEM) can also investigate factor interrelationships. However, there are two issues with using SEM for this study. First, as previously stated, this article seeks to identify the most influencing VfM factor for a specific criterion. In the context of this analysis, the ANP is a more straightforward and effective method than SEM due to its ability to directly measure the importance of drivers for a specific VfM criterion and vice versa. Second, SEM is a large-sample technique with a median sample size of

about 200. One below 100 could make an SEM-based model untenable unless a very simple model is analysed, but models this basic would be uninteresting (Kline, 2016). Although Indonesia is one of the most active PPP markets, the number of experts possessing knowledge and experience with PPP projects is limited. As a result, the SEM is not suitable for this study. The ANP, on the other hand, can be applied to judgements from both small and large respondents.

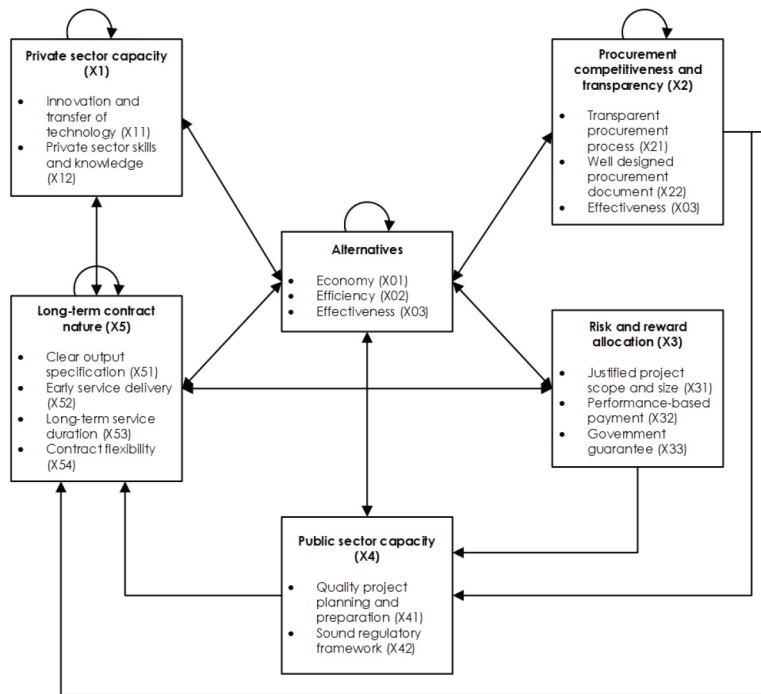


Figure 2. ANP structure of the VfM drivers

Pairwise Comparisons

The relative importance of VfM drivers was computed in ANP using pairwise comparison judgements based on the relationships among factors. For example, the importance of innovation and technology transfer is weighed against the importance of other economic drivers. In the opposite direction, the economy is pairwise compared with efficiency and effectiveness concerning innovation and technology transfer. The pairwise comparisons are expressed on a 1 to 9 scale, with 1, 3, 5, 7 and 9 denoting equal, moderate, strong, very strong and extreme importance, respectively, and 2, 4, 6 and 8 indicating intermediate values between the two adjacent judgements (Saaty and Vargas, 2013). The reciprocal of the corresponding value is used for the reverse comparison. The geometric mean is also employed to synthesise multiple experts' judgements, as suggested by Saaty and Vargas (2013).

Pairwise comparison matrices are combined to form a synthesised supermatrix, which determines the inner and outer dependencies of the components (Deniz, 2017). ANP has three supermatrices: the unweighted, weighted and limit types. The unweighted supermatrix contains pairwise importance weights, in which the weighted supermatrix is obtained by multiplying the unweighted supermatrix by the cluster priority weights and the limit supermatrix is obtained by raising the resulting weighted supermatrix to powers by multiplying it by itself until a stable result is achieved (Saaty and Vargas, 2013). The data analysis was performed with SuperDecisions® (Creative Decision Foundation, n.d.), a free software tool.

Except for the VfM criteria, no pairwise comparisons between clusters were conducted in this study since it made little sense to evaluate the relative importance between the VfM and a specific driver from the perspective of another driver. Therefore, it was also assumed that the influencing clusters were equally important; if there are n influencing clusters, the cluster weight equals $1/n$.

Questionnaire Survey

There is no hard and fast rule governing the minimum sample size for ANP applications. In construction research, sample sizes can range from as few as three (Dikmen et al., 2010) to as many as 117 (Li, Wang and Lei, 2020). While the sample size is essential, the quality of information the respondents provide is no less critical and may even take precedence.

A questionnaire survey was used to elicit the required pairwise comparisons for the ANP input data. Given the specificity of the subject, the respondents were not drawn at random but were chosen after careful consideration of their knowledge and experience in Indonesian PPP and housing practices. Therefore, purposive sampling was employed. The data was also collected through PPP professional networks and the snowball technique.

A total of 20 out of 28 experts agreed to participate in the survey. A total of five experts had hands-on experience with Indonesia's PPPs for less than five years, nine experts had five to 10 years of hands-on experience and six had over 10 years of hands-on experience with PPPs. These experts came from a variety of (1) educational backgrounds: five had a bachelor's degree, 11 had a master's degree and four had a doctoral degree, (2) industries: 12 were based in the public sector and eight worked in the private sector, (3) organisations: seven from a line ministry, three from a coordinating agency, five were guarantors, one was a financier and four were PPP individual consultants, and (4) sectors: 16 were multisector, three were from the water sanitation sector and one was from the housing sector. They had hands-on experience, referring to their experience directly involved in the planning, preparation, or transactions of PPPs projects as either project coordinators, contracting agencies, project developers, or guarantors. The experience is needed to ensure that they have sufficient knowledge about PPPs, thus ensuring the validity of the responses because the survey is technical.

RESULTS AND DISCUSSION

Tables 1 and 2 show the relative importance of drivers based on the limit of supermatrix for different groups of respondents, that were public and private sector respondents, as well as the overall respondents and the weighted supermatrix

only for the overall respondents to save space. While the drivers for VfM can differ between public and private sector respondents, this study found a good agreement in the rank ordering of VfM drivers between the two groups (as shown in Table 1), suggesting that both groups the shared understanding and consensus on the importance of factors driving VfM and can be combined in a single analysis.

Table 1. Weights of VfM drivers based on the limiting supermatrix

Factor	Public Sector			Private Sector			Overall		
	Weight (%)		Rank	Weight (%)		Rank	Weight (%)		Rank
	Raw	Normalised		Raw	Normalised		Raw	Normalised	
X ₁₁	4.0	6.1	6	4.2	6.3	7	4.1	6.2	7
X ₁₂	3.9	5.9	8	2.9	4.5	9	3.8	5.8	8
X ₂₁	3.4	5.2	9	3.7	5.6	8	3.6	5.4	9
X ₂₂	5.0	7.6	5	4.6	7.0	6	4.9	7.5	5
X ₃₁	12.7	19.2	1	15.2	23.1	1	13.4	20.3	1
X ₃₂	3.9	6.0	7	4.8	7.2	5	4.2	6.4	6
X ₃₃	1.7	2.6	11	2.2	3.3	10	1.9	2.8	11
X ₄₁	10.3	15.6	3	9.7	14.8	3	10.0	15.1	3
X ₄₂	2.5	3.8	10	1.6	2.5	11	2.1	3.2	10
X ₅₁	11.6	17.6	2	10.7	16.2	2	11.2	17.0	2
X ₅₂	0.6	0.8	13	0.3	0.5	13	0.5	0.7	13
X ₅₃	5.1	7.8	4	5.4	8.3	4	5.2	7.8	4
X ₅₄	1.2	1.9	12	0.6	0.9	12	1.1	1.7	12

Table 2. Weights of VfM factors by the weighted supermatrix

Factor	VfM Criteria (%)			X ₁ (%)		X ₂ (%)		X ₃ (%)		X ₄ (%)		X ₅ (%)	
	Economy (X ₀₁)	Efficiency (X ₀₂)	Effectiveness (X ₀₃)	X ₁₁	X ₁₂	X ₂₁	X ₂₂	X ₃₁	X ₃₂	X ₄₁	X ₄₂	X ₅₁	X ₅₂
0.1	-	-	-	5.1	7.6	6.0	7.0	7.3	17.9	15.1	8.6	23.1	9.1
0.2	-	-	-	12.7	21.7	10.6	12.5	12.1	39.2	15.9	21.1	32.7	22.0
0.3	-	-	-	15.5	20.7	8.4	13.8	14.0	42.9	19.0	20.3	44.2	18.9
1.1	6.2	6.9	5.7	-	50.0	-	-	-	-	-	-	-	8.8
1.2	6.6	6.0	7.2	33.3	-	-	-	-	-	-	-	41.2	-
2.1	11.1	12.1	8.6	-	-	-	-	-	-	-	-	-	-
2.2	11.2	10.2	13.7	-	-	25.0	-	-	-	-	-	-	-
3.1	20.4	20.9	25.9	-	-	-	-	-	-	-	-	50.0	-
3.2	12.7	15.4	9.3	-	-	-	-	-	-	-	-	-	-
3.3	7.6	4.4	5.4	-	-	-	-	-	-	-	-	-	-
4.1	7.4	9.2	8.5	-	-	-	33.3	33.3	-	50.0	-	-	-
4.2	4.8	3.0	3.7	-	-	25.0	-	-	-	-	-	-	-
5.1	5.8	6.5	6.7	23.4	-	25.0	33.3	-	-	-	50.0	-	-
5.2	1.8	1.5	1.3	-	-	-	-	-	-	-	-	-	-
5.3	2.5	2.0	1.9	-	-	-	-	33.3	-	-	-	-	-
5.4	1.9	2.0	2.1	10.0	-	-	-	-	-	-	-	-	-

VfM Criteria

PPPs are usually used to address acute financial issues faced by a government. The *prima facie* observation suggests that the economy takes prominence over efficiency and effectiveness. This study found effectiveness (41.8%) to be the most important criterion, followed by efficiency (38.0%) and economy (20.2%), implying that the use of PPPs focuses on achieving performance outcomes than finding the cheapest and most efficient solutions. This is because many PPP projects fail to meet the expected outcomes, hence the service need is not sufficiently justified (Tingting and Wilkinson, 2015).

In light of this study, the respondents believed that providing long-term sustainable public housing services should be the basis for public decisions when deciding on a procurement route for affordable housing provision. This finding is intriguing compared to the current practice in Indonesia, where the GoI focuses on the economic criterion for VfM and imposes a requirement upon any proposed PPP projects to deliver positive VfM. However, the response often involves benchmarking the public sector's cost based on the public sector comparator (PSC) methodology with the cost when using PPP for the same project's scope. The PSC, developed in the UK and Australia, is now widely used. Indonesia is no exception as in most cases, if not all, the GoI overly relies on PSC to evaluate VfM, despite that PSC-based VfM evaluation emphasises economy and efficiency aspects over effectiveness.

Housing provision for low-income communities differs from other infrastructure services in many respects. Some issues extend beyond the economy and efficiency aspects and are frequently overlooked during VfM evaluations. A few compelling examples include sorting the suitable candidates for renters to avoid mistargeting, wherein a group of high-income people can obtain better access than those with low incomes and ensuring the sustainability of quality long-term services. The advantages of using PPPs to deal with the housing backlog problem will diminish if these issues are not well addressed. As Indonesia's PPP housing projects were still under development, no project reference could be used to test the extent to which the outcomes rather than the outputs were achieved when PPPs were chosen as the delivery system.

Figure 3 depicts the ranks based on the weight scores from the weighted supermatrix. It is worth noting that three factors consistently ranked among the top three affecting economy and effectiveness: a robust procurement document, the justified scope and size of the PPP project and performance-based payment. Concerning the efficiency criterion, the last two factors, which constitute the risk and reward allocation, were the most important, followed by a transparent and competitive procurement environment. Early service or a shorter construction duration was the least important factor contributing to the 3Es.

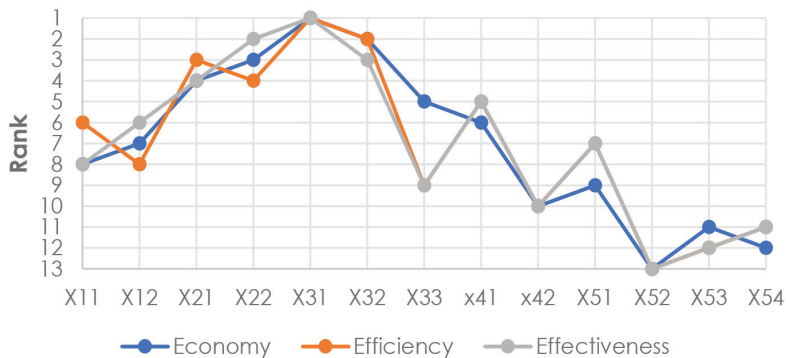


Figure 3. Ranks for VfM drivers by criterion

Cluster Analysis

At the cluster level (first-tiered drivers), the risk and reward allocation ranked first with a normalised weight of 29.5% based on the limit supermatrix, followed by the long-term contract nature (27.2%), the public sector capacity (18.3%), the private sector capacity (12.9%) and transparent and competitive procurement (12.0%).

Despite the use of different research methodologies and factor levels, the finding that risk and reward allocation emerged as the essential factor corroborates with the survey results of several earlier studies (Cheung, Chan and Kajewski, 2009; Ismail, 2013). Interestingly, the public sector's capacity to drive VfM outranked that of the private sector. This is surprising, as the motive for using PPPs is to leverage the private sector's skills and know-how to meet the public sector's needs. One reason for justifying this finding is associated with the fact that Indonesia's PPP housing projects are solicited where the Gol prepares the project developments.

The following section delves into the top four factors that rank highest for different groups of respondents: the justified scope and size of a PPP project, a clear output specification, quality project planning and preparation and long-term service delivery.

Justified Scope and Size of a PPP Project

Without comparing the importance of other factors that are the local priorities based on the unweighted matrix, the justified scope and size contribute to the economical aspect by 21.8% (in normalised terms), efficiency by 36.3% and effectiveness by 41.9%. Some studies have reported the project scale as one of the drivers but have rarely explicitly cited it as the most contributing factor. For instance, Zhang and Yu (2016) ranked the factor 10th out of 15. Hu, Chen and Zhang (2014) conclude that VfM tends to be more stable in large PPP projects and more diverse in small PPP projects, with a higher percentage of low VfM projects for higher investments than for lower investments.

Affordable housing projects, like other types of social infrastructure, are typically small-scale investments. However, a PPP project is complex and entails high transaction costs (Grimsey and Lewis, 2005; Reeves, 2008) that can deter potential bidders from participating in PPP biddings (De Schepper, Haezendonck

and Dooks, 2015). The costs can rise as projects become more complex (Lam, 2011). There are a limited number of published data or references on the transaction costs in Indonesia. Still, based on some feasibility studies, it is estimated that they range between 1% and 5% of construction costs. As a result, PPP projects' investment scale must be sufficient to offset these without jeopardising healthy competition, which is critical for promoting efficiency.

An investment scale that is too small is not appealing to private financing, while one that is too large can restrict competition. A trade-off decision must be made to balance the competition effect and scale economies. In the case of Indonesia's PPP project, the GoI only requires a minimum investment of IDR100 billion (USD6.7 million) for a PPP project to be eligible for obtaining a viability gap fund (VGF). It is unclear whether this requirement also applies to other PPP models, but this scale is too low to serve as a cut-off when considering the contract complexity, bidding and transaction costs and lengthy negotiation processes involved in PPP projects.

Bundling multiple affordable housing projects into a single contract could result in economies of scale and scope. The bundled PPP projects would result in higher cash flows to private partners and lower transaction costs to public partners (Van den Hurk and Verhoest, 2015). However, the extent of this horizontal integration must consider the private sector's appetite, specialisation requirements, availability of competence and the need for competition (Gangwar and Raghuram, 2015). Furthermore, bundling project phases and long-term contracting enable PPP arrangements to provide efficient long-term incentives and optimise the trade-off between investment and maintenance over the project's life (Iossa and Martimort, 2009).

Clear Output-Based Specification

A clear output-based specification has a relative importance of 18.3% (in normalised terms) for the economy, 44.0% for efficiency and 37.7% for effectiveness, indicating that respondents perceived that this factor promoted better service quality than the other two VfM criteria.

One distinguishing feature of PPPs from traditional procurements is that the former focus on the specification of project outputs rather than inputs (Ishawu et al., 2020). Early in the procurement process, output specifications must be well-defined (Javed, Lam and Chan, 2013). PPP procurement must be structured in such a way that the output required by the authority is identified, transparency is ensured and appropriate evaluation criteria that reflect the complexity of the authority's requirements are developed (Dolla and Laishram, 2018). Output-based specifications, as opposed to the rigid specifications used in traditional procurement, specify what is required from the project rather than how it should be delivered by the private sector (Lam and Javed, 2015). Furthermore, unstable output specifications adversely impact VfM because they often lead to lengthy development and procurement times (Henjewe, Sun and Fewings, 2012). As a result, preparing a good output specification could have wide-reaching targets, ranging from meeting the VfM to establishing performance criteria linked to the payment mechanism (Javed, Lam and Chan, 2013).

If the quality of service can be well specified in the initial contract and robust performance measures can be used to reward or penalise the service provider, the PPP is a good choice (Peng et al., 2014). Therefore, developing key performance

indicators (KPIs) is beneficial in further improving the mechanism for measuring the performance of PPP projects (Mohamad, Ismail and Said, 2018). A fair penalty mechanism against the private party's default must also be included in a PPP contract to protect the interests of the parties (Opawole, 2018). However, it should be noted that over-specification should be avoided in order to allow for greater innovation and competition from the private sector.

Some regulations concerning the minimum service levels have been issued in Indonesia. However, these regulations are frequently insufficiently detailed and require more operational translation in service-level agreements as part of PPP contracts, particularly when performance-based payments are used. In some cases, the public sector does not truly understand what it wants and cannot translate its needs into documented requirements.

Quality Project Planning and Preparation

The public sector's quality project planning and preparation have a more significant influence on efficiency (42.3%, in normalised terms) than on economy (17.2%) and effectiveness (40.5%).

The vital contribution of quality project planning and preparation by the public sector has been mentioned in several studies. Rothballer and Gerbert (2015) argue that common reasons for failed PPP projects are inadequate preparation, poor demand forecasts, delayed land acquisition and approvals, stakeholder opposition, insufficient funding sources and improper risk allocation. Kavishe, Jefferson and Chileshe (2018) state that adequate planning and preparation could minimise the need for negotiations, which can lead to corruption or unnecessary alterations. Furthermore, developing a high-quality project document requires formal planning and estimating processes (Patanakul et al., 2016). Empirical evidence from Nigeria's PPP mass housing programme shows that the aim of delivering affordable housing is challenging to achieve without adequate planning and implementation and capable private partners (Kavishe, Jefferson and Chileshe, 2018).

This finding is pertinent in Indonesia because the ongoing PPP projects in affordable housing are government-initiated proposals, indicating that the Gol prepares the strategic outline cases (SOCs), outline business cases (OBCs) and final business cases (FBCs). According to regulations, the preliminary study (PS) serves as the SOC and lays the foundation for the OBC and FBC, if the PS indicates that the PPP route offers the best value in comparison to traditional procurement. The PS report contains the need analysis, compliance criteria, VfM analysis, indicative revenues and costs and recommendations for future actions. The OBC and FBC documents further detail the SOC and form parts of the proposal request.

The quality of SOC, OBC and FBC affects the private sector's interest in infrastructure projects concerning their nature, typically characterised by long-term and immobile assets having slow recovery rates and high risks across the project life cycles. However, experience has shown that the failure to attract private interest in many of Indonesia's PPP projects is primarily due to poor-quality pre-feasibility studies (Wibowo and Permana, 2015). The Gol was also aware of this problem, hence establishing the Project Development Facility through the Ministry of Finance in 2015 to assist the public sector in preparing the OBCs and FBCs for its projects that were intended to be implemented with PPPs. Market sounding and consultation are now standard practices of PPP procurement. The involvement of reputable consulting firms with the support of multilateral development organisations can

improve the study quality, thereby increasing prospective investors' trust in the data and the information reliability presented in the studies.

High-quality project planning and preparation will affect the outcome's intended achievement, providing low-income households with affordable rental housing. Previous experiences demonstrate the many units remaining unoccupied in some low-cost public apartments despite the high demand in PPP projects. The projects must be well structured to attract more private sector while ensuring the affordability of targeted low-income renters. This includes selecting the best payment mechanism for the private sector from various options, such as tariff-based payments combined with a VGF, availability-based annuity payments, annuity payments together with a VGF, or tariff-based payments permitting mixed commercial and residential use to reduce rents.

The public sector must have sufficient skills and knowledge to help ensure the success of PPP projects. Inadequate PPP skills and expertise can lead to poor planning, application and preparation of PPP contracts and tender documents (Kavishe, Jefferson and Chileshe, 2018). The importance of public sector capacity in implementing PPP projects has been commonly identified in several previous studies (Henjewe, Sun and Fewings, 2012; Ishawu et al., 2020). This requirement is even more prominent in cases of PPPs used in housing. In these projects, the public sector will serve as an enabler rather than a supplier (Parashar, 2014). This remains a challenging issue in Indonesia, given the limited expert government officials in the PPP field. Heavy reliance on external resources is acceptable in the short run. However, the public sector must develop its capacity in the long run, from assessing VfM to monitoring the PPP project over its term (Padova, 2010). Umar et al. (2019; 2021) have also explored the public sector's skillsets for the effective contract management of PPP projects.

Long-Term Service Delivery

Under the long-term contract nature cluster, a long-term service duration follows the output-based specification in the order of importance. It ranks fourth out of 13 drivers. As expected, this factor supports effectiveness (48.1%, in normalised terms) more than economy (23.7%) and efficiency (28.2%).

A PPP project requires a long-term contract during which a private partner builds and manages services in the field of public competence under certain legal and economic conditions (Irún, Monferrer and Moliner, 2020), with the service contracts typically spanning from 20 to 30 years. The long-term contract demands sustained commitment from contracting parties to fulfil their obligations and make the project sustainable. Long-term service duration enables the public sector to provide low-income renters with long-term quality services, which would otherwise be difficult to obtain under conventional procurement. A long-term contract allows the private sector to profit from providing the public with specified services (Amram and Crawford, 2011).

Integrating the design, construction, operation and maintenance scope into a single, long-term contract for public housing development is a concept that is still relatively new in Indonesia. Thus, it requires a paradigm shift in the public and private sectors. For the public sector, the orientation must change from short-term asset procurement to long-term quality service provision. PPPs concern infrastructure, long-term service provision and strict performance regimes (Grimsey and Lewis, 2005; Chung, Hensher and Rose, 2010). For the private sector, the integrated scope

demands a mature management system to ensure sustainable performance from the start of the project (Pfauder, Schweigert and Hendricks, 2018). In addition, it induces them to examine the asset's long-term performance, which affects the incentives for investing in asset quality (Iossa and Martimort, 2009).

CONCLUSIONS, LIMITATIONS AND IMPLICATIONS

This study determined the relative importance of 13 factors driving the VfM of PPP affordable housing projects using the ANP method in Indonesia. The analysis suggests that effectiveness is the most important criterion, followed by efficiency and economy. The top three VfM drivers with interactions between drivers, having a justified project scope and size, clear output specification and quality project planning and preparation. Risk and reward allocations are also the most crucial factors at the cluster level.

There are several limitations to this study. The factors identified in this study were limited to those found in previous works, which might not be exhaustive. Second, the ANP framework's factor clustering was primarily subjective, necessitating further validation. Third, this analysis focuses on contractual governance factors while ignoring relational governance ones, which can significantly impact the analysis's VfM. Fourth, because this evaluation is country-specific, the generalisability of the findings may be limited. Nevertheless, the results can be a reference for other governments with similar characteristics when adopting PPPs for housing provision.

From a practical viewpoint, this study's findings can direct the GoI's attention to critical factors and assist them in developing actions to achieve VfM. These include determining the minimum investment size to attract private financing, developing output-based specifications and KPIs for service monitoring, preparing robust feasibility studies and planning long-term services. From a theoretical viewpoint, this study contributes to the knowledge gap and broadens the understanding of critical factors driving VfM in affordable housing using PPPs in Indonesia, which has been underexplored in the existing body of literature.

This study's findings and limitations point the way forward for future research. As this article suggests, there is a need to further investigate the economies of scale in an affordable housing project using PPPs, considering their effect on competition. It is worth looking into bundling several housing projects into a single contract. Moreover, the interplays between contractual and relational governances merit attention to expand existing works (Benítez-Ávila et al., 2018; Irún, Monferrer and Moliner, 2020), emphasising social infrastructure projects with unique characteristics, such as affordable housing. Other VfM factors and their interactions could be investigated in addition to those identified in this article.

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