Journal of Asset Management and Public Economy (JAMPE)
Vol. 5, No. 1, pp. 40-60
DOI : 10.1298/jampe.v3i2.13816
E-ISSN 2827-9816

Estimation of Rental Rates of Assets in Public Service Agencies Using Alternative Methods

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Abstract.
Asset optimization in Indonesia's Public Service Agencies (PSAs) requires fair and transparent rental valuation of state-owned assets (SOAs). This study develops an alternative rental-pricing framework for recreational sport facility assets using a mini soccer field at the Polytechnic of State Finance STAN (PKN STAN) as a case study. Survey data from 117 respondents are used to compare three valuation approaches: the Contingent Valuation Method (CVM), a cost-based approach, and a market-based benchmark. CVM-derived willingness to pay (WTP) is estimated using OLS-based models that relate bid acceptance to bid levels and demographic characteristics, and the predicted acceptance probability is used to derive the implied rental value. The results show that CVM-based rental estimates are broadly consistent with cost-based estimates, while the market approach provides external validation for defining a fair rental range. The findings further support differentiated pricing strategies (e.g., higher rates during weekends and peak afternoon periods) to improve revenue optimization and facility utilization. This study contributes by demonstrating that CVM can be practically adapted to valuation and pricing of small-scale sport facility assets within PSA asset management, offering a methodological alternative to strengthen evidence-based decision-making and inform future improvements in SOA rental valuation guidelines.

Article history
Received 2025-06-29
Revised 2025-11-07
Accepted 2025-12-07

Keywords
Contingent valuation method
Public service agencies
Rent value

JEL Classification*:
C51, H57, H82

Introdution

The optimization of state-owned assets (SOAs) has become an increasingly prominent issue in Indonesia's public financial management discourse (Fitri & Triono, 2020), reflecting global trends in central government property asset management reforms (Kaganova & Telgarsky, 2018). This is

driven either by motivations to enhance state revenues (Basri et al., 2025; Manganelli et al., 2022; Negara et al., 2023) or to formulate national policies that may result in idle SOAs (Kaganova & Amoils, 2020). In Indonesia, idle SOAs have drawn growing government attention, particularly those involving land and building assets. This challenge is echoed internationally, where governments worldwide recognize underutilized public properties as hidden assets (Ball et al., 2024; Phelps, 2012) for revenue generation through better management and valuation practices (Ball et al., 2024; Kaganova & Amoils, 2020).

The optimization of idle SOAs constitutes one component of the SOA management cycle during the utilization phase. Ideally, SOA optimization entails deploying SOAs for government operational activities and the delivery of public services. However, not all SOAs can be utilized for government operations; thus, the government may optimize SOAs' usage to augment non-tax state revenues (Negara et al., 2023) through specific schemes. Among government institutions, several work units are designated as Public Service Agencies (PSAs), entities granted financial flexibility to deliver public services while generating self-managed revenue. Asset management within PSAs is governed by Article 131 of Ministry of Finance Regulation Number 129 of 2020, as amended by Regulation Number 202 of 2022, on the Guidelines for the Management of Public Service Agencies. Despite regulatory progress, performance remains uneven. The Directorate General of Treasury (DJPB, 2022) reports that approximately 75 percent of PSAs have not yet fully realized their optimization potential, despite 77 percent having developed the corresponding blueprints. Key areas requiring improvement include the formulation of fair and transparent rental pricing strategies and the dissemination of such information to potential users. Two factors are particularly influential: the affordability and appropriateness of SOA rental rates and the effectiveness of communication with the public. Rental or service pricing is a critical variable in asset optimization, directly influencing non-tax state revenue (NTR). Overpricing discourages utilization, while under-pricing may undermine cost recovery. For non-PSAs entities, rental rates are stipulated under Article 15 of Ministry of Finance Regulation Number 115 of 2020 on the Utilization of State Property. PSAs, meanwhile, are authorized under Articles 30–31 of Regulation Number 129 of 2020 to independently set service tariffs based on total service-delivery costs, which may be adjusted upward or downward according to community purchasing power. At several institutions, SOAs may also cover assets in the form of tourism and sports facilities.

For such economically significant service assets, valuation methods grounded in WTP principles can serve as alternatives to conventional cost-based or market-based pricing (Avenzora et al., 2016; Platania et al., 2022). Among these, the Travel Cost Method (TCM) and CVM are most widely applied to estimate a user's WTP for recreational or public service amenities (Shrivastava & Mukhopadhyay, 2022; Sriastiti et al., 2020). However, in many contexts, particularly when the analysis focuses on tariff determination, the assessment of service quality improvements, or the estimation of total economic value for tourism destinations, CVM is often regarded as superior (Jahandideh-Kodehi et al., 2021; Saptutyningsih & Selviana, 2017). CVM's primary advantage lies in its capacity to estimate total economic value, encompassing both use and non-use values (Teshome, 2019; Zandersen et al., 2012). Whereas TCM is limited to recording observed visitor behavior through travel costs, CVM captures a broader range of values, including existence, option, and bequest values, which are particularly relevant for destinations of cultural, environmental, or conservation significance (Groß et al., 2023; Saptutyningsih & Selviana, 2017).

Additionally, CVM offers flexibility in evaluating hypothetical scenarios that have yet to occur or may never materialize (Chintantya & Maryono, 2018; Saptutyningsih & Selviana, 2017). This enables researchers to gauge visitor responses to service quality changes, facility renovations, conservation programs, or new tariff policies. In contrast, TCM, as a revealed preference approach, is confined to observed actual conditions and cannot assess prospective policy changes (Chintantya & Maryono, 2018; Zandersen et al., 2012). From a policy implementation standpoint, CVM provides advantages

by yielding direct WTP estimates (Teshome, 2019). These values can be readily interpreted by tourism managers for ticket pricing, revenue planning, and economic feasibility evaluation. Conversely, TCM entails more complex formulation of recreation demand functions, and its results are not always directly applicable to optimal tariff setting (Zhang, 2019). Thus, for tourism asset valuation requiring comprehensive estimates and direct managerial decision support, CVM proves the more appropriate and informative method (Jahandideh-Kodehi et al., 2021).

The post-COVID-19 era has ushered in novel lifestyle trends, with heightened emphasis on healthy living (Keshkar et al., 2021; Xie & Bing, 2022). Prevailing healthy practices include exercise regimens and mindful consumption. Sports facilities have seen surging public patronage. Demand for sports infrastructure escalates alongside lifestyle shifts and population growth; theoretically, constrained supply amid rising demand elevates prices (Mankiw & Taylor, 2020). Comparable post-pandemic surges in demand for fitness and recreational facilities have been observed globally, prompting a re-evaluation of pricing strategies (Ong et al., 2021).

Research determining rental rates for sports facilities predominantly adopts cost-based approaches, such as activity-based costing (ABC) to accurately allocate municipal costs and enhance efficiency (Hidayati et al., 2017; Kosmas & Dimitropou, 2014; Madaniah, 2023; Prabandini, 2016; Putri et al., 2020), or performance models under operate-transfer finance focusing on cost recovery and sustainability (Fang, 2020). For example, ABC has been applied to municipal athletic services in Greece (Kosmas et al., 2014), while another cost model was explored in Taiwan (Fang, 2020). These methods provide advantages like full cost recovery and effective cost control (Kosmas et al., 2014), but they fall short in adequately considering market purchasing power or WTP.

In contrast, market-based valuations, drawing from comparable rentals or economic pricing principles, are less common due to the scarcity of direct comparables for public assets (Berrett et al., 1993). Relevant examples include economic analyses of pricing public facilities (Berrett et al., 1993) and estimations of sport facility indicators (Hanák et al., 2020), that more closely reflect actual market values (Berrett et al., 1993). However, limitations persist, as comparable data remains scarce for unique or public assets (Hajdu & Hajnal, 2018; Hanák et al., 2020). Nevertheless, direct comparisons between market and cost approaches for PSA-owned sports facility rental rates remain rare, especially in Indonesia, where tariff studies predominantly adopt cost-based paradigms without exploring alternatives like WTP, marking a significant research gap.

Accordingly, the objectives of this research are to propose and empirically evaluate the CVM as a viable alternative for determining rental values of SOAs, particularly high-utilization sports facilities under PSAs, and to demonstrate CVM's applicability as a complementary tool to traditional cost- and market-based valuation models through the case of a mini soccer field at the Polytechnic of State Finance STAN (PKN STAN), a facility exhibiting relatively high usage compared to other campus assets, addressing a key gap in Indonesian studies dominated by cost-oriented approaches without WTP integration (Kurniawan & Lutfi, 2025; Tangvitoontham, 2018). The findings furnish empirical evidence for equitable, demand-responsive rental pricing and offer preliminary groundwork for regulatory refinements, promoting WTP-informed policies that address rising post-pandemic demand by enhancing economic efficiency and sustainability through improved asset management.

Literature Review

State-Owned Assets

Pursuant to Law Number 1 of 2004, SOAs are defined as all goods acquired with State Budget funds or through other forms of acquisition, which are used for operational activities in carrying out official duties and functions, and which originate from goods expenditure or capital expenditure appropriated in the budget documents. Accordingly, SOA comprises all items procured through

goods expenditure or capital expenditure financed by the State Budget or other legitimate sources of funding.

In managing SOA, the government applies the principles of functionality, legal certainty, transparency, efficiency, accountability, and value certainty. These principles are stipulated in Government Regulation Number 23 of 2014 concerning the Management of State/Regional Assets, as amended by Government Regulation Number 28 of 2020.

The principle of functionality requires that decisions concerning the management and issues of SOAs be made in accordance with the functions, authorities, and responsibilities of the officials in charge of managing SOAs. The principle of legal certainty requires SOA management to be based on the prevailing laws and regulations. The principle of transparency entails providing the public with openness regarding the management of SOAs. The principle of efficiency mandates that the management and utilization of SOAs generate optimal benefits for the government. The principle of accountability implies that all SOA management activities must be justifiable to the public. Finally, the principle of value certainty indicates that BMN management must be supported by reliable and clearly determined values in the government's financial reporting.

Public Service Agency

A PSA is a government entity established to provide services through the provision of goods and/or services offered for sale. Although PSAs charge users for these goods or services, their primary objective is not profit maximization. Rather, PSAs are intended to enable governments to deliver public services more efficiently and to enhance productivity in fulfilling their service functions to society (PSA Manual).

In carrying out its functions, a PSA is supported by the assets under its control. Pursuant to Law Number 1 of 2004 on State Treasury, these assets are classified as non-segregated state assets. The Guidelines for the Management of PSA (Minister of Finance Regulation Number 129 of 2020), particularly Article 34, stipulate that:

> *"Public Service Agencies may utilize PSA assets that are not used in the provision of public services in order to enhance the efficiency and effectiveness of State-Owned Asset (SOA) management, with due regard to the provisions of laws and regulations governing SOA management"*

In the process of asset optimization, a PSA may charge fees to the public for the use of such assets as a form of service provision. The determination of these fees, referred to as service tariffs, is carried out by the service units (Article 9 of Government Regulation Number 74 of 2012). In setting these tariffs, a PSA must consider several aspects as stipulated in Article 9 of Government Regulation Number 74 of 2012, namely: 1) continuity and development of services; 2) the purchasing power of the public; 3) the principles of fairness and propriety; and 4) sound competition. This study incorporates the concept of public purchasing power by proxying it with service users' WTP for the services provided. In Indonesia, government institutions that optimize their assets by leasing them to the public may employ several possible methods to determine rental or service tariffs, including cost-based pricing or market-based pricing approaches.

Market-Based Pricing

For government institutions acting as asset managers (the Ministry of Finance) and asset users (ministers or heads of agencies), rental rates for SOAs are determined by multiplying a basic rental rate by an adjustment factor. The basic rental rate is based on the fair market rental value, as assessed by an appointed valuer or valuation team. Rental rates are not uniform for all tenants. According to the applicable regulations, the rental amount is influenced by adjustment factors such as the type of activity and the rental period or frequency. These two elements constitute the basis for determining

the percentage applied in the rental adjustment factor. The specific values for these adjustment factors are stipulated in the Minister of Finance Regulation Number 115 of 2020.

Cost-Based Pricing

Under Minister of Finance Regulation number 128 of 2020, PSAs are granted flexibility to charge fees in the form of service rates to the general public, the magnitude of which is based on the calculation of the cost per unit of service. In setting these rates, a PSA may apply price discrimination by imposing rates higher than, equal to, or lower than the full cost incurred to deliver the service. However, this flexibility must take into account (1) service continuity and development, (2) the public's purchasing power, (3) the principles of fairness and propriety, and (4) sound competition. Similar to the rental tariff formula applied in non-PSA institutions, the service rate formula may take the form of a rate amount and/or rate structure expressed in nominal terms and/or as a percentage. The key conceptual distinction, however, lies in the fact that PSA service rates are determined on a cost basis.

Contingent Valuation Model

The concept of WTP can be described as an individual's readiness to pay under a given set of conditions. In the context of environmental services, it refers to the willingness to pay for a particular environmental state or for the outcomes of an assessment of environmental resources or services undertaken for improvement purposes. WTP represents an aggregate value derived from individuals' readiness to spend money to improve a service's condition, thereby reflecting the utility value of that service. In the context of sports facility rentals, WTP reflects the extent to which individuals or groups are prepared to pay to use such facilities. Identifying users' WTP helps sports facility managers set rental tariffs that are consistent with the value perceived by consumers, thereby enabling revenue maximization without diminishing user interest. Previous studies suggest that willingness to pay (WTP) for renting sports facilities is influenced by facility location (Joshi et al., 2018; Richard & Faircloth, 1995) as well as individual characteristics such as age (Fang et al., 2023; Joshi et al., 2018), gender (Joshi et al., 2018; McGinnis & Gentry, 2006), and income (Joshi et al., 2018; McGinnis & Gentry, 2006).

To measure WTP, the Contingent Valuation Method (CVM) is commonly employed, which involves directly surveying consumers to elicit their willingness to pay a specified amount for a given good or service. Understanding WTP in the context of sports facility rentals is crucial for managers in setting rates that align with consumers' expectations and payment capacity, while maintaining accessibility and the operational sustainability of the facilities.

When a PSA service has no observable market value or when the cost of providing the service is difficult to ascertain, the CVM becomes an alternative approach for tariff setting based on the WTP concept (Wilker & Gruehn, 2017). This method is commonly used to value environmental services, which are typically characterized by non-market values (Crooker & Herriges, 2004; Platania et al., 2022; Watanabe & Asano, 2008). To conduct the valuation, relevant information must be gathered through a questionnaire. In general, a CVM questionnaire is structured into three main sections, namely: (1) questions describing the service or good being valued to ensure respondents clearly understand the object of valuation, (2) questions eliciting respondents' WTP as the dependent variable in the valuation design, and (3) questions capturing respondents' demographic and socio-economic characteristics, such as gender, age, education, and other attributes, which serve as independent variables in the empirical analysis.

While research on PSAs and asset management is relatively extensive, studies that specifically address rental rates and service charges associated with asset utilization remain limited. Existing research has focused on themes such as the role of asset managers (Sriastiti et al., 2020), asset development strategies (Asfahani et al., 2023), and PSAs performance (Indratni, 2024). At the global

level, research examining pricing mechanisms and service rate determination is available, as evidenced by studies such as Kosmas et al. (2014) and Fang (2020). Several of these studies examine the methodologies used to set tariffs or service charges, with a noticeable emphasis on cost-based approaches. For instance, Madaniah (2023) and Prabandini (2016) both adopt cost-based frameworks in analyzing service rate structures, reflecting a broader trend in the literature to prioritize internal cost considerations over market-driven or value-based pricing models. Putri et al. (2020) conducted an evaluation of service rates at the PSA of Universitas Islam Negeri Imam Bonjol Padang. The approach employed is the same as that used by Madaniah (2023) and Prabandini (2016), namely a cost-of-service approach using the activity-based costing method. The study concludes that the cost of providing the services is lower than the prevailing tariffs and thus recommends a rate adjustment. The same concept or method is proposed by Prabandini (2016) for application at the State Polytechnic of Finance. Appendix 1 provides an overview of key studies related to tariff determination.

Method

This research focuses on one of the assets managed by the Public Service Agency of PKN STAN. Among the institution's rentable facilities, the mini soccer field was selected as the research object due to its high rental frequency, which indicates significant public utilization and economic relevance. The research adopts a quantitative design grounded in microeconomic theory, particularly the estimation of users' WTP as a proxy for perceived service value.

The research population comprised residents within the Pondok Aren District, where PKN STAN is located, totalling 418,420 individuals according to the South Tangerang City Statistics Agency (BPS, 2019). The sample size was determined using Yamane (1973) formula:

$$n = \frac{N}{1+N(e)^2} \quad (1)$$

where n is the sample size, N is the population (418,420), and e is the precision level (10%). The resulting minimum sample requirement was approximately 100 respondents. A purposive sampling technique was employed, targeting individuals who had rented or used the PKN STAN mini soccer field at least once. This criterion was selected to ensure that respondents possessed relevant experience and realistic price perceptions. Questionnaires were distributed online through user communities and booking networks between June and August 2024.

Primary data were collected using a structured questionnaire consisting of three main parts:

1. Respondent profile: demographic characteristics including age, gender, education, occupation, income, and distance from residence to the facility.
2. Perception and facility use: frequency of use and satisfaction with current infrastructure and amenities.
3. Willingness to Pay (WTP): elicited through a bidding game within a single-bounded dichotomous choice format.

In the WTP section, respondents were presented with a series of hypothetical bid values (Rp25,000 to Rp200,000, increasing in increments of Rp25,000) for the rental of an upgraded mini soccer field (with improved turf, changing rooms, toilets, canteen, and parking). Each respondent was asked a yes/no question:

"*Would you be willing to pay Rp X per session to rent the upgraded mini soccer field?*"

The WTP estimation followed the CVM commonly used in environmental and public service valuation research. To determine WTP, this research employed a linear probability model using Ordinary Least Squares regression, where the dependent variable is binary (1 if willing to pay the

offered bid, 0 otherwise) and the primary independent variable is the bid amount (Watanabe et al., 2008). The model specification is as follows:

$$AWTP_i = \alpha + \beta_1 Bi_i + \beta_2 D_{1i} + \cdots + \beta_1 D_{ni} + \mu_i \quad (2)$$

where: $AWTP_i$ = respondent i's stated WTP per bid, Bi_i = bid value (Rp25,000 to Rp200,000), D_{ni} = demographic control variables, μ_i = error term. The variables used and their operational definitions can be seen in Appendix 2. The equation was estimated using OLS regression. Although logit or probit models are conventionally recommended for binary outcomes to address heteroskedasticity and ensure probabilities remain within bounds, OLS offers strong advantages in this context. First, OLS provides consistent estimation of mean WTP without requiring specific distributional assumptions on the underlying WTP, as shown by distribution-free approaches based on linear projection (Watanabe et al., 2008). Second, empirical evidence indicates that simple misspecified models, including those akin to OLS interpretations, yield relatively unbiased mean WTP estimates (Creel, 1998). Additionally, OLS is computationally simpler, avoids convergence issues in maximum likelihood estimation, and features easily interpretable coefficients. Comparative studies find that WTP estimates from OLS are often comparable to those from logit/probit (Creel & Loomis, 1997; Crooker et al., 2004).

The mean WTP was calculated using the ratio of the intercept (α) to the bid coefficient (β1):

$$E(WTP) = \frac{-\alpha}{\beta_1} \quad (3)$$

All respondents participated voluntarily after receiving a clear explanation of the research's purpose and confidentiality policy. Informed consent was obtained digitally before the questionnaire distributed. No personally identifiable data were collected, and all responses were anonymized. This research adhered to the ethical research standards of the Ministry of Finance's academic institutions.

Result and Discussion

This research explores the valuation of the PKN STAN mini soccer field, one of several rentable assets managed by the institution's PSA. A total of 117 valid responses were collected through an online contingent valuation survey distributed among users of the facility, primarily drawn from local soccer communities. The respondent group consisted entirely of male users aged between 19 and 50 years, with the majority employed as civil servants, police officers, or military personnel. This demographic profile reflects a user base with stable income and structured leisure time, characteristics commonly associated with middle-income, public-sector households.

The descriptive findings suggest that the mini soccer field serves a specific socioeconomic segment that values organized recreation and community-based sporting facilities (Deelen et al., 2018). Likewise, the uniformity of the respondent profile further reinforces the appropriateness of applying an economic valuation framework such as the CVM, as respondents are relatively homogenous in both experience and ability to evaluate the hypothetical market scenario presented in the survey (Johnson et al., 2012; Sardana et al., 2021).

Operationally, the facility incurred a total cost of approximately IDR 248.2 million in 2023. These costs, calculated referring to the research conducted by Dolcini et al. (2025) and Hassin et al. (2022), encompass personnel payments, maintenance materials, electricity, waste management, fuel for grass-cutting equipment, and depreciation of supporting infrastructure such as fences, stands, and changing rooms. A substantial component, over two-thirds of the cost, was attributed to grass renovation and fencing repairs, scheduled respectively every three years according to Santos et al. (2020) and every two years according to Cevenini et al. (2016). When annualized, these renovations represented IDR 57.3 million for grass replacement and IDR 20 million for fence maintenance.

The utilization analysis further revealed three levels of capacity, encompassing design, effective, and efficient (Fang, 2020; Iversen, 2017). The design capacity, representing theoretical maximum

usage, was calculated at 677 rental sessions per year (assuming one rental unit per weekday and four per weekend). After adjusting for public holidays and the fasting month, the effective capacity was reduced to 624 sessions. In contrast, the actual number of rentals recorded in 2023 amounted to 300 sessions, corresponding to a capacity utilization rate of only 48 percent (Hassin et al., 2022). This relatively low utilization points to operational inefficiencies that directly affect revenue optimization and cost recovery (Fang, 2020; Hassin et al., 2022; Iversen, 2017).

Such underutilization is consistent with the broader phenomenon observed in public-sector asset management, where demand-responsive scheduling and dynamic pricing are often absent. As Iversen (2017), Soongsawang & Rawangkarn (2023), and Yu et al. (2020) emphasize, low-capacity utilization in public sports facilities typically represents insufficient differentiation in tariffs, limited marketing outreach, and the absence of time-segmented rental strategies. In the context of PSA asset management, this inefficiency translates into lost NTR potential, contradicting the Ministry of Finance's directive for productive asset use under Minister of Finance Regulation number 129 of 2020.

Cost Based and Capacity Analysis

Applying the cost-based approach, this research calculated the average unit cost per rental under three capacity assumptions. In the cost calculation, several assumptions were applied, including a three-year turf renovation cycle based on maintenance experience in tropical climates and supported by international studies (Nascimento et al., 2021; Santos et al., 2020). Research indicates that natural grass fields in humid environments generally require comprehensive renovation every two to three years due to soil compaction, pest exposure, and intensive use (Santos et al., 2020; Wolski et al., 2023). The estimated costs per two-hour rental are approximately IDR 167,600 at full design capacity, IDR 181,900 at effective capacity, and IDR 378,400 at efficient capacity. Since the field's current rental rate is fixed at IDR 550,000 per session, this indicates that the existing tariff only covers operational costs when the field operates near its maximum realistic capacity. However, with current utilization below half of effective capacity, much of the overhead remains uncompensated.

This finding reveals a structural imbalance between fixed maintenance costs and variable rental revenues. Increasing efficient capacity, through extended operating hours and improved demand management, could reduce the per-unit cost significantly (Fang, 2020; Iversen, 2017). For instance, the introduction of floodlights for evening sessions is projected to raise design capacity from 677 to approximately 938 rental sessions annually, which would reduce the cost per session to around IDR 818,000 at design capacity and IDR 888,000 at effective capacity after renovation. Although the cost is higher than the current unit cost, it represents a sustainable level when accounting for depreciation and higher service quality (Findlay-King et al., 2018).

Market Data Approach

One of the methods that can be used to establish rental rates for sports facilities is the market-based comparative approach. This approach is based on the principle that the economic value of a sports facility is reflected in relevant and comparable market transactions. Through market data analysis, it is necessary to identify the variables that influence rental rates, such as location, facility quality, the type of sport supported, rental duration, and the patterns of demand and supply. These variables are used to adjust prevailing market rates to ensure their relevance to the object context.

The comparable data used in this research were aligned with the hypothetical market value developed in the questionnaire aimed at estimating WTP, as discussed in the following subsection. The developed hypothesis involves facility renovations, particularly of the field surface, under two scenarios: synthetic turf and natural grass. The determination of market rental values refers to the methodology outlined by French & Gabrielli (2018). This approach consists of the following steps: (1) collecting market data; (2) identifying and analyzing comparable properties; (3) adjusting for

differences between the comparables and the PKN STAN mini soccer field; (4) computing the average rental rate; and (5) conducting a simple demand analysis to further refine the estimated rental rate.

A total of three comparable data were collected for each type of property. The profiles of the comparables analyzed are presented in Table 1. The market rental value calculations are based on conditions as of November 2024. Data were collected from fields commonly used by PKN STAN mini-soccer field renters located within the South Tangerang City area. Data on natural grass fields were used to compare with the existing rental rates, while data on synthetic turf fields were compared with the average cost per rental unit. Data collection was conducted by the Household Subdivision of PKN STAN.

The amounts of adjustments were determined by considering the differences in field characteristics and relevant literature. Adjustments were made for location (Chica-Olmo et al., 2021; Sirmans et al., 2005), facilities (Iqbal & Wilhelmsson, 2018; Sirmans et al., 2005), field type (Chikish et al., 2019), and property (field) size (Sirmans et al., 2005). The adjustment amounts are presented in Table 1. Adjustments were conducted under two scenarios. The first scenario assumes optimal facility conditions under rental, reflecting the value that visitors would experience with improved facilities. The second scenario reflects existing conditions, providing an estimate of the current market rental value.

Table 1. Adjustment Table

Object	PKN STAN Mini Soccer Field	DAF Sports Center	The Forum Sports Hub	DM Sport Ciledug	Pordas Soccer Fields	Marabunta Soccer Fields	Rengas Soccer Fields
Location	2 access roads	district/ city roads	residential road/ shophouse	residential road/ shophouse	alternative district road	village road	alternative district road
Location Adjustment		-	5%	5%	0%	0%	0%
Type of Soccer Fields	natural grass	synthetic turf	synthetic turf	synthetic turf	natural grass	natural grass	natural grass
Condition	damaged	very good	very good	very good	pretty good	pretty good	poor
Current Condition		-	-	-	-15%	-15%	-10%
Synthetic Grass Renovation		-	-	-	-	-	-
Field Size	5.289	2.200	3.900	5.600	4.100	5.040	6.000
Adjustment		10%	5%	-	-10%	-	5%
Facilities	2	8	8	8	3	5	3
Adjustment		0%	0%	0%	-	-5%	-
Total Adjustment		10%	10%	5%	-25%	-25%	-5%

The adjustment amounts were then converted into market rental rates by averaging the values after adjustments (Walacik et al., 2013). Rental rate adjustments were made by considering several key aspects. For fields with superior facilities, a 10% upward adjustment was applied (Molina et al., 2021). Additionally, rental rates for fields in the premium condition received a further 5% increase (Gerretsen, 2018). Conversely, for fields in existing conditions where the facilities and field quality were assessed to be lower, a 25% downward adjustment was applied (Ebisu & Asahi, 2023). These adjustments aim to account for differences in field quality and condition, thereby producing a more accurate estimate of market value (Gerretsen, 2018).

The market rental rate of the PKN STAN mini soccer field was estimated using a market data approach, wherein the market data utilized included rental rates for fields under two different conditions, renovated fields with synthetic turf and complete facilities, and existing conditions. This

analysis covered various usage periods, namely weekday mornings and afternoons, weekday evenings and nights, weekend mornings and afternoons, and weekend evenings and nights. As previously discussed, adjustments to the rental rates were made. The analysis results indicate that the average adjusted rental value under the renovated condition is Rp630,833 for weekday mornings and afternoons, Rp1,573,333 for weekday evenings and nights, Rp1,716,667 for weekend mornings and afternoons, and Rp1,985,000 for weekend evenings and nights. Meanwhile, the average rental value under existing conditions is Rp658,333 for weekday mornings and afternoons, Rp783,333 for weekday evenings and nights, Rp753,333 for weekend mornings and afternoons, and Rp878,333 for weekend evenings and nights. These results demonstrate that the field under the renovated condition, with synthetic turf and complete facilities, commands higher rental values compared to the field under existing conditions. The detailed calculations are presented in Table 2.

Table 2. Average Market Rental Rate

Rental Unit		Rental Rate PKN STAN mini soccer field (Rp)	Rental Market Rate (Rp)	
			Natural Grass Soccer Fields	Synthetic Turf Soccer Fields with Complete Facilities
Weekday	Morning – Noon	555.000	658.333	630.833
	Noon - Evening	555.000	783.333	1.573.333
Weekend	Morning – Noon	555.000	753.333	1.716.667
	Noon - Evening	555.000	878.333	1.985.000

Willingness to Pay Estimation

To examine the determinants of user's WTP, this research applied an Ordinary Least Squares (OLS) regression model 1. This model tested the bid and demographic predictors of "yes/no" responses to the offered rental rate resulting R^2 = 0.3749, which indicates that approximately 37 percent of the variance in WTP responses was explained by the independent variables. The bid amount and income were statistically significant ($p < 0.05$), implying that higher bid rates lowered the likelihood of a "yes" response, while higher income increased WTP.

Diagnostic tests confirmed the robustness of the regression models. Variance Inflation Factor (VIF) values averaged 2.63, indicating no multicollinearity. The Breusch–Pagan test yielded a p-value of 0.377, confirming homoscedastic residuals. Normality testing was omitted based on the Central Limit Theorem (Turney, 2022), given the sample size (>100) ensures an approximately normal distribution of residuals. The absence of autocorrelation testing is justifiable, as the dataset contains no time-series dimension (Gujarati & Porter, 2009; Wooldridge, 2012).

These results collectively confirm that the model satisfies the primary assumptions of OLS estimation and that the identified relationships between bid level, income, and age provide a statistically reliable foundation for interpreting the WTP behaviour of PSA service users.

Using the regression coefficients, the mean WTP was computed via Watanabe et al. (2008) approach as the negative ratio of the constant to the bid coefficient. The resulting value was approximately IDR 67.961 per respondent, equivalent to a collective rental willingness of IDR 2,04 million for a two-hour session assuming 30 users per rental unit. This amount is strikingly close to the cost-based value of IDR 2.03 million per session and lies within the upper range of the market-based rental estimates (IDR 0.63–1.98 million) derived from comparable facilities across South Tangerang. The convergence among the three valuation methods, CVM, cost-based, and market-based, indicates a high level of internal validity and strengthens the case for using CVM to estimate public-sector asset values. The comparison of these results is illustrated in Table 3, which depicts the

values generated by the three methods fall within a similar range, demonstrating consistency across approaches.

Table 3. Comparison of Rental Rate Options

	PKN STAN mini soccer field Rental Rate (Rp)	Market Rental Rate (Renovation) (Rp)	Costing (Rp)	WTP (Renovation) (Rp)
Weekday Morning – Noon	555.000	630.833	2.034.513	2.038.818
Weekday Noon - Evening	555.000	1.573.333		
Weekend Morning – Noon	555.000	1.716.667		
Weekend Noon - Evening	555.000	1.985.000		

The high degree of alignment between perceived value and cost also reveals latent pricing potential. The current uniform rental tariff of IDR 550,000 per session is substantially below both market benchmarks and users' WTP. Although this under-pricing promotes social inclusivity, it constrains cost recovery and undermines long-term sustainability. Implementing a time-segmented tariff system, featuring higher rates during peak periods (e.g., evenings and weekends) and lower rates during off-peak hours, would enable PSA management to capture consumer surplus more efficiently without compromising accessibility.

Therefore, the findings also demonstrate that users perceive significant added value from facility upgrades, particularly the installation of synthetic turf, lighting, and improved amenities. Respondents' willingness to pay a nearly fourfold higher rate after renovation signals both strong latent demand and confidence in the quality of the institution's services. Comparable studies in public recreation economics (Chica-Olmo et al., 2021; Iqbal et al., 2018) have indicated that user-driven valuation methods yield pricing strategies that not only reflect market dynamics but also strengthen user satisfaction and facility reputation.

Policy and Managerial Implications

From a policy perspective, the results yield substantive implications for the Ministry of Finance's asset-management framework. Under Minister of Finance Regulation number 115 of 2020, rental rates for SOA are typically derived from market or cost-based approaches. However, these methods frequently overlook user perceptions and broader social benefits, particularly in cases where comparable market data are scarce. Integrating CVM as an alternative or complementary valuation method would enable PSAs to set tariffs that are more aligned with both market conditions and public preferences (Tangvitoontham, 2018; Tsai, 2024).

At the institutional level, PKN STAN's asset managers could adopt a value-based pricing strategy grounded in the empirical WTP findings. For example, setting evening and weekend rates around IDR 1.5–2.0 million per session (close to market and CVM values) while maintaining off-peak rates near the current tariff could optimize revenue without excluding price-sensitive users. Moreover, transparent communication regarding how rental income is allocated to facility maintenance and educational programs may enhance community acceptance of rate adjustments.

From an operational standpoint, enhancing capacity utilization efficiency is equally crucial. The low efficient-capacity ratio of 48 percent highlights the need to extend operating hours, strengthen booking management systems, and promote the field to external communities. Similar to the asset-optimization framework proposed by French et al. (2018), aligning maintenance scheduling, pricing, and marketing can transform idle state assets into productive revenue streams while retaining their public service orientation. For the Ministry of Finance, this case provides empirical evidence

supporting regulatory flexibility. The inclusion of CVM in forthcoming revisions to Minister of Finance Regulation number 115 of 2020 would institutionalize a mechanism for demand-responsive tariff determination across all PSA entities managing public assets (Hajdu et al., 2018). This would align Indonesia's regulatory approach with international standards in public-sector valuation, such as those adopted by the UK's HM Treasury (Hajdu et al., 2018) and the OECD (2025) on public-asset efficiency. The findings contribute to the evolving theoretical discussion on public asset optimization and valuation efficiency.

The low utilization rate illustrates the classical problem of under-used public goods described by Jakar (2020), where the absence of price differentiation leads to allocative inefficiency. By introducing CVM, this research bridges the theoretical divide between public-good provision and market-based valuation, aligning with the principles of co-produced governance in common-pool resource management proposed by Ling et al. (2020). Furthermore, the finding that WTP closely approximates cost-based value supports efficiency-equity equilibrium theory in public pricing (Mankiw et al., 2020). When perceived benefit equals marginal cost, social welfare is maximized, a desirable outcome for publicly funded service entities like PSAs.

Thus, the CVM approach operationalized in this research not only offers empirical insights but also advances normative understanding of how government institutions can reconcile economic efficiency with equitable access. The empirical results demonstrate that the CVM yields credible and policy-useful estimates of user valuation for public assets (Subedi & Shahi, 2022; Tangvitoontham, 2018). The close alignment of CVM results with both cost-based and market-based estimates validates its methodological soundness (Hajdu et al., 2018). Notably, this research highlights three interrelated insights. First, the low-capacity utilization of the field (48% of effective capacity) indicates operational underperformance that could be addressed by extending operating hours, improving scheduling, and strengthening promotional strategies (Dai & Liu, 2019). Second, the existing uniform tariff appears to underestimate users' perceived value; therefore, adopting time-segmented and value-based pricing may increase revenue while maintaining equity considerations (Dai et al., 2019; Subedi et al., 2022). Third, institutionalizing the Contingent Valuation Method (CVM) within the Ministry of Finance's regulatory framework would facilitate evidence-based tariff setting and align Indonesia's public asset management practices with international standards (Tangvitoontham, 2018; Wilker & Gruehn, 2017).

These findings align with the global discourse on value-for-money in public asset management, emphasizing transparency, efficiency, and responsiveness to user needs. As French et al. (2018) argue, public asset managers must transition from static custodianship to dynamic value creation. CVM offers a mechanism for this transition by quantifying the public's willingness to finance quality improvements (Wilker & Gruehn, 2017). This research extends the application of CVM beyond environmental valuation to the domain of public-sector asset management (Tangvitoontham, 2018). It empirically demonstrates that user-based valuation not only produces economically consistent results but also provides actionable insights for managerial decision-making and policy reform (Walker & Mondello, 2007; Wilker & Gruehn, 2017).

The PKN STAN case illustrates how an educational institution functioning as a PSA can apply rigorous economic methods to achieve both fiscal responsibility and social relevance. The integration of CVM findings into PSA pricing decisions represents a concrete step toward more data-driven governance of SOAs. By combining cost-efficiency analysis, user perception, and regulatory alignment, this research contributes to the evolving paradigm of "collaborative accountability" between public institutions and their communities, ensuring that asset optimization serves not only revenue goals but also the broader mandate of equitable public service delivery (Bakhsh et al., 2022; Dai et al., 2019). Evidence from public-sector financial evaluations suggests that efficiency remains a persistent concern in local government budgeting, highlighting the importance of adopting value-for-money principles in revenue-related decisions such as SOA rental pricing (Erica et al., 2025).

Moreover, the use of a market-based benchmark is supported by evidence that asset price movements reflect broader economic conditions, reinforcing the relevance of market information in valuation exercises (Abasimi et al., 2025).

Conclusion

This research explored the applicability of the CVM as an alternative approach for determining the rental value of SOAs. It used a mini soccer field managed by a PSA as case research. By comparing CVM-derived estimates with those from cost-based and market-based approaches, the analysis reveals that CVM offers reasonable and consistent results. The result affirms its potential validity in public-sector asset valuation. This research contributes to the literature by introducing perception-based valuation as a viable complement to conventional methods. This is particularly valuable in contexts where market benchmarks are scarce or cost information is incomplete. Its findings carry important policy implications. CVM can support more transparent, demand-responsive, and socially equitable tariff setting. It can strengthen evidence-based decision-making within the SOA management framework. CVM can also enhance community engagement. Notably, it can potentially improve non-tax-state revenue (NTR) performance through optimized asset utilization. Although limited by a single case and a relatively small respondent pool, this research highlights the demand for broader, multi-context applications of CVM. These would validate its robustness across asset types and regions. Overall, this research offers both conceptual and practical insights for PSA managers, the Ministry of Finance, and policymakers seeking adaptive, data-informed strategies for public asset management.

Acknowledgment

This research was made possible with the permission and support of the Polytechnic of State Finance STAN (PKN STAN). I sincerely thank the institution for granting access, facilitating the research process, and providing a conducive academic environment. I also extend my gratitude to all individuals and units within PKN STAN who contributed their time, insights, and cooperation. Their support has been invaluable in ensuring the successful completion of this research.

Declarations

Author contribution	:	All authors were responsible for the entire research project. All authors approved the final manuscript.
Funding statement	:	This research did not receive any funding.
Conflict of interest	:	All authors declare that they have no competing interests.
Ethics declaration	:	We as authors acknowledge that this work has been written based on ethical research that conforms with the regulations of our university and that we have obtained the permission from the relevant institute when collecting data. We support *Journal of Asset Management and Public Economy* (*JAMPE*) in maintaining high standards of personal conduct, practicing honesty in all our professional practices and endeavors.
Additional information		No additional information is available for this paper.

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Appendix 1. Comparison between Studies

No	Researcer/ Year	Objective of the study	Method	Object
1	Prabandini (2016)	Recommended method for rate determination	activity-based costing	South Tangerang, Indonesia
2	Hidayati et al. (2017)	Rate recommendation	cost plus pricing	East Java, Indonesia
3	Putri et al. (2020)	Rate Evaluation	activity-based costing	Sumatera, Indonesia
4	Madaniah (2023)	Rate recommendation	cost plus pricing	East Java, Indonesia
5	Kosmas et al. (2014)	Cost recovery	activity-based costing	Greek
6	Fang (2020)	Cost recovery	cost pricing	Taiwan
7	Berrett et al. (1993)	Rate recommendation	Market	Dummy
8	Hanák et al. (2020)	Cost Estimation	Price Change Index	Czech Republic

Appendix 2. Variables and Operational Definitions

No	Variable	Type	Measurement / Coding	Literature
1	Age	Demographic	Years	Barlow and Forrest (2015), Akbarzadeh et al. (2024), Deelen et al. (2018), Fang et al. (2023), Joshi et al. (2018)
2	Gender	Demographic	0 = Female; 1 = Male	Akbarzadeh et al. (2024), Sarlab (2022), Joshi et al. (2018), McGinnis and Gentry (2006)
3	Income	Demographic	< Rp4,000,000; Rp4,000,000–10,000,000; > Rp10,000,000	Sarlab (2022), Joshi et al. (2018), McGinnis et al. (2006)
4	Education	Demographic	Secondary (SMA); Bachelor; Master; Doctorate	Herens et al. (2015), Elasri-Ejjaberi and Ivern (2020), Gasparetto and Rodríguez (2019)
5	Occupation	Demographic	Civil servant/Military/Police; SOE employee; Private sector; Others	Sarlab (2022)
6	Distance from residence to facility	Demographic	< 1 km; 1–5 km; 5–10 km; >10 km	Wicker et al. (2016), Joshi et al. (2018). Richard and Faircloth (1995)
7	Bid value (B)	Independent	Offered rental rate (Rp25,000–Rp200,000)	Barlow et al. (2015), Akbarzadeh et al. (2024), Akbarzadeh et al. (2024,
8	Willingness to Pay (WTP)	Dependent	Binary response: 1 = Yes, 0 = No	Barlow et al. (2015), Akbarzadeh et al. (2024)

Source: literature review (2024)