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THE ASSESSED VALUE CONUNDRUM: A STUDY ON THE ACCURACY AND FAIRNESS OF PROPERTY TAXATION IN SOUTH TANGERANG CITY, INDONESIA

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Abstract

The Land and Building Tax for the Rural and Urban sector (PBB-P2) is a cornerstone of fiscal decentralization in Indonesia, yet many local governments experience suboptimal revenue performance since its administrative transfer in 2014, largely due to inaccurate property value assessments. Although national regulations mandate property reassessment every three years, limited resources have hindered compliance, causing growing disparities. This study examines the accuracy and fairness of property taxation in the high-growth context of South Tangerang City using quantitative ratio analysis recommended by the International Association of Assessing Officers (IAAO). Analysis of seven districts found a severe fiscal deficit, evidenced by an average Assessment-Sales Ratio (ASR) of 42%, indicating that assessed property values remain systematically undervalued. Assessment fairness, however, revealed a nuanced conundrum: the Price-Related Differential (PRD) (0.96–1.00) suggested neutral assessment behaviour with no significant evidence of regressivity. But the Coefficient of Variation (CoV) exceeded the ideal 14% in several sub-districts, notably Cilenggang, signalling localized administrative capacity failure and significant non-uniformity in high-growth zones. The findings provide a practical, data-driven framework for local governments to overcome assessment lag. By identifying specific CoV hotspots, this study enables targeted reassessment efforts to improve valuation accuracy and strengthen regional fiscal capacity. Policy implications stress the immediate importance of systematic data updates and equity-oriented, phased tax adjustments to achieve a fairer and more sustainable local taxation system in rapidly urbanizing Indonesian regions.

Keywords: Land and Building Tax; Assessment Accuracy; Mass Valuation

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INTRODUCTION

In the global context, fiscal decentralization has been widely recognized as a key instrument in public governance reform. Governments in many jurisdictions extend fiscal authority to regions with the aim of improving public service efficiency, strengthening accountability, and ensuring that policies are more responsive to the needs of local communities ([Affroumou, 2025](#); [Rodríguez-Pose & Vidal-Bover, 2024](#)). While classical Fiscal Federalism argues that the proximity of local governments to citizens allows for more targeted fiscal decisions ([Neyapti & Aslim, 2022](#)), contemporary scholarship emphasizes that the success of this autonomy hinges on the region's capacity to manage own-source revenue ([Likwelile & Assey, 2023](#)). Within this framework, property tax serves as the backbone of local fiscal independence. However, its efficacy is strictly bound by the accuracy of property valuation; without accurate assessment, the tax becomes an instrument of inequity rather than a tool for development ([Affroumou, 2025](#); [Grote & Wen, 2024](#)).

The theoretical imperative of property tax systems rests on two pillars of fairness: horizontal and vertical equity ([Borg & Borg, 2023](#); [Totanan et al., 2024](#)). Horizontal equity mandates that properties of similar market value bear equivalent tax burdens ([Durankev, 2019](#)), while vertical equity requires a progressive structure where higher-value property owners contribute proportionally more ([Totanan et al., 2024](#)). Achieving both horizontal and vertical equity is a universal goal for property tax systems across the globe, yet it often presents significant challenges in practice ([Borg et al., 2023](#); [Chmielewska et al., 2025](#)). Accurate valuation is fundamental to ensuring fair assessment of property owners, as inaccuracies can lead to discrepancies in tax burdens and even impact tax collection efficiency ([Bidanset & Rakow, 2022](#)).

Many countries utilize mass appraisal systems, where the responsibility for property valuation typically rests with ministries of finance, land administration authorities, or municipalities ([Kim & Hong, 2024](#)). Mass appraisal is the process of valuing a group of properties as of a given date and using common data, standardized methods, and statistical testing ([IAAO, 2025b](#)). Mass appraisal requires the integration of three core components: (1) accurate and current market data, (2) appropriate valuation models, and (3) consistent application across property classes to ensure accuracy, uniformity, equity, and reliability ([IAAO, 2025b](#)). The IAAO framework emphasizes that assessment quality should be evaluated through statistical indicators such as the Assessment–Sales Ratio (ASR), Price-Related Differential (PRD), Coefficient of Dispersion (COD), and Coefficient of Variation (CoV) ([IAAO, 2025a](#)). These metrics measure both accuracy (the ASR) and uniformity (COD and CoV) of assessments, as well as equity performance across property value ranges (PRD) ([IAAO, 2025a](#)). The adoption of these international standards is essential for

countries applying mass appraisal for property tax, where uniformity and equity in valuation practice becomes a precondition for both fiscal fairness and administrative efficiency ([Borg et al., 2023](#); [Totanan et al., 2024](#)).

However, empirical evidence across numerous countries shows that assessment inaccuracies frequently undermine these principles, leading to systemic regressivity, distorted tax burdens, and weakened fiscal capacity ([Amornsiripanitch, 2020](#); [Rakow, 2023](#)). The failure to perform regular revaluations is a common issue worldwide that compromises the accuracy and equity of assessments over time ([Hou et al., 2021](#); [Zulkifli et al., 2021](#)). These valuation issues contribute to widespread problems, including what has been termed "pervasive regressivity" in assessments, where less expensive properties are often over-assessed relative to more valuable ones, leading to higher effective tax rates for their owners ([Amornsiripanitch, 2020](#); [Rakow, 2023](#)).

Comparative analysis reveals that while this challenge is global, its manifestation varies by economic context. In mature markets like the United States, low-value properties are often assessed at disproportionately higher ratios than high-value properties, resulting in marked regressivity that burdening low-value property owners with effective tax rates nearly 50% higher than high-value property owners ([Amornsiripanitch, 2020](#); [Berry, 2024](#)). Conversely, Asian economies face distinct structural hurdles. Taiwan struggles with market volatility and land speculation, forcing the government to implement complex progressive taxes to curb unaffordability ([Galland & Stead, 2022](#); [Tsai & Wang, 2022](#)). Similarly, Malaysia, which shares a comparable developing context with Indonesia, grapples with assessment bias and intolerable disproportionality caused by delayed revaluations and arrears ([Bin-Bustamin et al., 2023](#); [Senawi & Osmadi, 2022](#)). The international cases highlight the crucial fact that property tax systems can drift towards inequity without rigorous, regular, and accurate mass appraisal.

This global challenge finds a direct echo in the Indonesian context. Following the transition of the Land and Building Tax for the Rural and Urban sector (Pajak Bumi dan Bangunan Sektor Perdesaan dan Perkotaan or PBB-P2) from central to local administration, local governments gained full authority over tax revenues to strengthen regional fiscal capacity ([Von Haldenwang, 2017](#)). The PBB-P2 is one of the most important locally administered revenue sources and a key instrument supporting fiscal decentralization ([Rosdiana & Irianto, 2018](#)). The basis for this taxation is the Tax Object Sale Value (Nilai Jual Object Pajak or NJOP), which, by Law Number 1 of 2022, must reflect reasonable market transactions and be reassessed at least every three years. Yet, a significant gap exists between this legal mandate and administrative reality. Limited technical capacity, a scarcity of certified assessors, and inadequate data infrastructure have hindered many Indonesian regions from conducting these mandatory periodic

revaluations ([BKF, 2015](#); [BPK, 2015](#); [Hernandi et al., 2025](#); [Wahyudi et al., 2022](#)). Consequently, static NJOP values fail to capture dynamic market appreciation, leading to systematic undervaluation, contributes to inequitable tax burdens and potential revenue loss ([Hernandi et al., 2025](#)). From a theoretical standpoint, Indonesia's challenges can be linked to the broader literature on administrative capacity and valuation governance in developing economies. [Slack and Bird \(2014\)](#) emphasize that the quality of property tax administration is fundamentally shaped not only by technical valuation capacity but also by the political economy environment in which assessments occur. Their comparative analysis shows that jurisdictions with weak administrative systems, outdated cadastres, and limited data interoperability consistently struggle to implement regular and credible revaluations, leading to entrenched inequities and systematic undervaluation.

South Tangerang City provides a particularly compelling case for examining these issues. As a satellite city bordering the Special Region of Jakarta, South Tangerang experiences some of the highest regional growth in Indonesia, with the real estate sector contributing a dominant 17.47% to the Gross Regional Domestic Product ([BPS South Tangerang City, 2023](#)). Despite this booming property market, there is a paucity of empirical evidence evaluating whether the city's tax assessments have kept pace with market realities. This leads to an important research gap: in a satellite city with high-growth property market, to what extent does the lack of frequent reassessment distort tax equity?

To address this gap, this study applies ratio analysis based on the International Association of Assessing Officers (IAAO) standards to evaluate assessment accuracy and tax equity in South Tangerang City. Specifically, the study investigates: (1) the extent to which NJOPs approximate market values across districts; (2) whether assessment patterns indicate horizontal inequity or vertical inequity (regressivity); and (3) how the results can inform reassessment priorities and improvements in local fiscal capacity. This study contributes to the literature in three ways. First, it provides the first systematic, district-level assessment ratio analysis of PBB-P2 in a major Indonesian metropolitan area using internationally recognized IAAO metrics. Second, it advances the theoretical discourse on property tax fairness in developing countries by linking empirical evidence with the broader mass appraisal and fiscal decentralization literature. Third, it offers actionable policy insights for local governments seeking to improve valuation accuracy, equity, and revenue performance. The study presents South Tangerang City as an illustrative case of the valuation challenges faced by rapidly urbanizing regions under decentralization, and provides an analytical framework that can be replicated in other Indonesian cities.

DATA DESCRIPTION AND RESEARCH METHODOLOGY

Study Area

The locus of this research is South Tangerang City, located in Banten Province, Indonesia. The city forms part of the Greater Jakarta metropolitan region and lies approximately 30 km west of Jakarta. The city encompasses a relatively flat topography covering a total area of about 147.19 km². Administratively, South Tangerang is divided into seven districts (kecamatan), with the central government administration located in the Ciputat District.

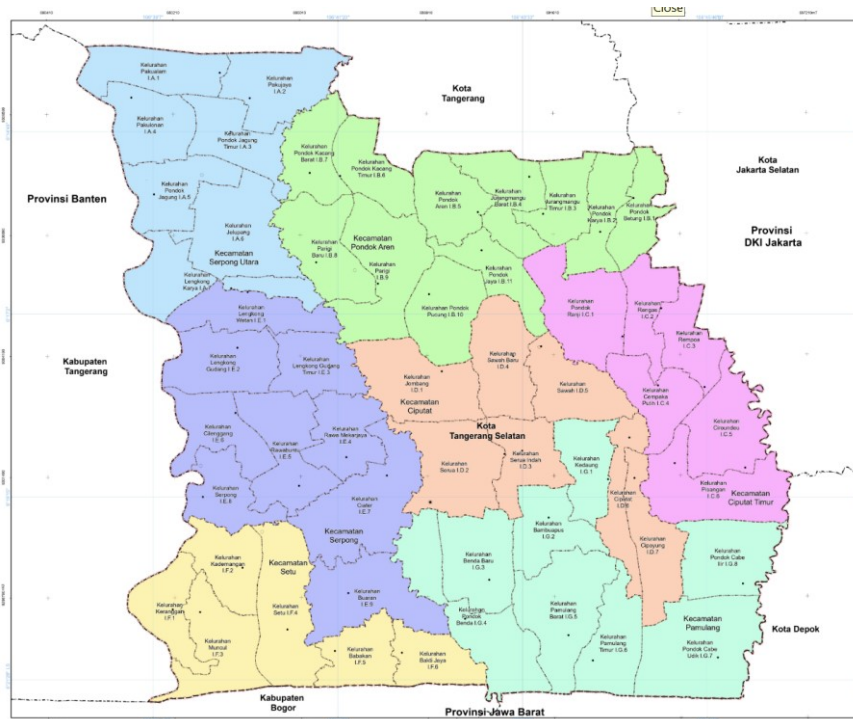


Figure 1. Study Area: Administrative Boundaries and District Divisions of South Tangerang City

Source: South Tangerang City Government (2023)

Data Description

This study utilizes a secondary dataset comprising Market Value and Assessed Value (NJOP) data obtained from the South Tangerang City Regional Revenue Agency (Bapenda). A unique characteristic of South Tangerang's urban landscape is the dualistic nature of its residential development, which is categorized by the local government as 'Kompleks' (Planned Estates) and 'Non-Kompleks' (Unplanned/Organic Settlements) zones. The term 'Kompleks' refers

to residential areas developed by real estate developers, characterized by orderly spatial configurations, exclusivity, and uniformity, and equipped with comprehensive infrastructure such as high-quality water systems, worship facilities, electricity, and road networks. Conversely, 'non-Kompleks' comprise land zones outside developer-built estates, generally characterized by more organic development patterns and limited direct intervention from real estate developers.

Table 17 presents district-level details relevant to this classification.

Table 17: District Data of South Tangerang City

No.	District	Area (Km ²)	%	Number of Samples		
				Non-Kompleks	Kompleks	Total
1.	East Ciputat	15.43	10.5%	269	175	444
2.	Pamulang	26.82	18.2%	431	240	671
3.	Pondok Aren	29.88	20.3%	402	170	572
4.	Serpong	24.04	16.3%	224	115	339
5.	North Serpong	17.84	12.1%	138	91	229
6.	Setu	14.8	10.1%	153	68	221
7.	Ciputat	18.38	12.5%	274	117	391
	Total	147.19	100%	1.891	976	2.867

Source: South Tangerang City Government (2023)

The study population comprises approximately 497,075 land parcels in South Tangerang City ([ATR/BPN, 2025](#)), from which a sample of 2,867 properties was selected. A purposive sampling technique was employed to select cases most relevant to the research objectives, allowing for an in-depth examination of the specific phenomena under investigation ([Andrade, 2021](#)). This non-probability sampling method prioritizes the selection of cases based on their relevance rather than randomness. The rationale is to enhance the rigor and trustworthiness of outcomes by ensuring alignment between the sample and the research objectives ([Campbell et al., 2020](#)). Unlike probability sampling, purposive sampling does not require statistical formulas to determine sample size ([Ahmed, 2024](#)). Instead, adequacy is assessed based on the sample's ability to provide rich and detailed information relevant to the research questions ([Campbell et al., 2020](#)). For this study, the sample size of 2,867 properties is considered sufficient to enable a robust analysis of the accuracy and fairness of property taxation in South Tangerang City.

The primary dataset was obtained from Bapenda in 2023 and subsequently reverified by the researchers between June and July 2024 to ensure its accuracy and relevance. It is important to note that findings derived from purposive sampling are typically generalizable only to the specific sub-population represented by the sample ([Andrade, 2021](#)).

Analysis Method

To achieve the research objectives, a quantitative ratio analysis was conducted based on the standards set by the International Association of Assessing Officers (IAAO). The analysis proceeds in two stages:

1) Analysis of Assessment-Sales Ratio

According to the IAAO, mass appraisal accuracy is evaluated using ratio studies, which assess the accuracy of assessed values relative to market values ([IAAO, 2025b](#)). The Assessment–Sales Ratio (ASR) is calculated as:

$$ASR = \frac{A_i}{S_i} \dots \dots \dots \text{Formula 1}$$

where A_i is the assessed value (NJOP) and S_i is the market value of the subject property. ASR results were subsequently used to compute the Price-Related Differential (PRD), a measure of assessment equity. A regressive assessment occurs when high-value properties are underappraised relative to low-value properties, while progressive assessments occur when high-value properties are overappraised ([IAAO, 2025a, 2025b](#)). Regressive assessments are particularly problematic because they impose a disproportionately lower tax burden on owners of high-value properties ([Prabu, 2021](#)). PRD is calculated by dividing the mean of ASR by the weighted mean. The PRD formula is as follows:

$$PRD = \frac{\overline{ASR}}{\overline{A_i/S_i}} \dots \dots \dots \text{Formula 2}$$

A PRD above 1.00 indicates regressivity (high-value parcels underappraised), whereas a PRD below 1.00 indicates progressivity (high-value parcels overappraised). For consistency and accuracy, assessment levels should generally fall within the legally acceptable range of 0.90 to 1.10 ([IAAO, 2025a](#)).

2) Analysis of Assessment Uniformity

This stage evaluates the uniformity of land assessments used to calculate the property tax (the PBB-P2). Two indicators were employed: the Coefficient of Dispersion (CoD) and the Coefficient of Variation (CoV). Both measure variability as a percentage, facilitating comparisons across property groups ([IAAO, 2025a](#)). In ratio studies, the Coefficient of Dispersion (CoD) represents the most prevalent measure of uniformity, as suggested by [IAAO \(2025a\)](#). The CoD is calculated using the formula:

$$COD = \frac{100 (AAD)}{\overline{ASR}} \dots\dots\dots \text{Formula 3}$$

where AAD is the average absolute deviation, and $\widetilde{ASR}$ is the median.

The Coefficient of Variation (CoV) is another widely used measure, based on the standard deviation of ASR ([IAAO, 2025a](#)). The CoV can be used as a tool to assess the degree of uniformity in the assessment of properties with similar characteristics. A lower CoV indicates better uniformity. [Harjanto \(2011\)](#) suggests an optimal CoV value below 14%. The CoV is computed using the formula:

$$COV = \frac{100.(s)}{\overline{ASR}} \dots\dots\dots \text{Formula 4}$$

where $\overline{ASR}$ is the mean of ASR and s represents the standard deviation of the ratios

ANALYSIS AND DISCUSSION

Analysis of Assessment-Sales Ratio

The Assessment–Sales Ratio (ASR) was computed to examine the relationship between the assessed value (NJOP) per square metre and the market value per square metre. The results show that, at the district level, the average ASR is 0.42 (42%) with a standard deviation of 0.06. This finding underscores that NJOP—used as the basis for the property tax (PBB-P2) imposition—remains substantially below prevailing market prices. On average, the assessed values represent less than half of the actual property market values. This systematic undervaluation indicates a substantial fiscal capacity loss for the local government ([Hernandi et al., 2025](#)). Among districts, Serpong exhibits the highest ASR at 0.45 (45%), whereas North Serpong records the lowest ASR at 0.39 (39%). Detailed descriptive statistics are presented in Table 18 below.

Table 18: ASR Statistic Descriptives at the District Level

District	Total Sample	Mean	Standard Deviation	Min	Max
Ciputat	391	0.40	0.05	0.17	0.73
East Ciputat	444	0.44	0.05	0.21	0.79
Pamulang	671	0.42	0.04	0.23	0.59
Pondok Aren	572	0.40	0.06	0.23	0.88
Serpong	339	0.45	0.09	0.21	0.89
North Serpong	229	0.39	0.07	0.19	0.72
Setu	221	0.42	0.09	0.23	0.69
	2,867	0.42	0.06	0.17	0.89

Source: ASR Data Analysis (2024)

At the subdistrict level, the lowest ASR is observed in Pakulonan (0.35 or 35%). This result aligns with the district-level analysis, where North Serpong—of which Pakulonan is a part—also records the lowest district-level ASR. The highest ASR at the subdistrict level is found in Babakan (0.48 or 48%). However, this does not correspond with district-level results, as Setu District (which includes Babakan) is not the district with the highest ASR.

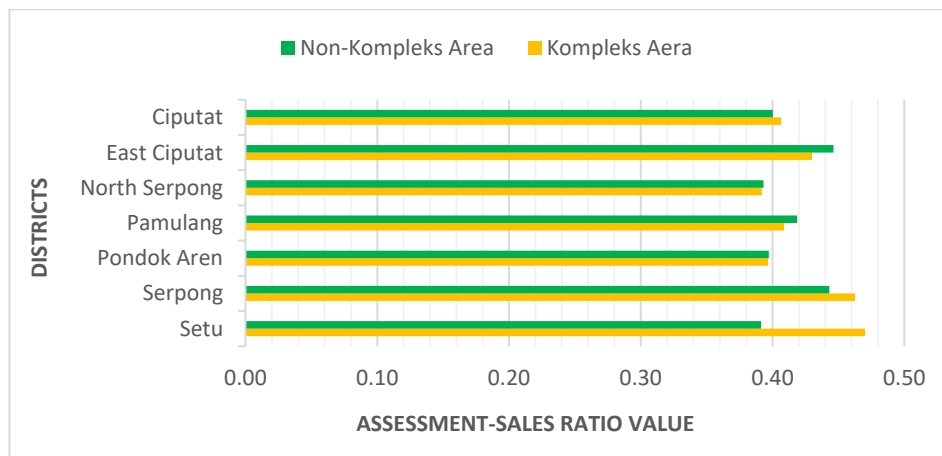


Figure 1: ASR Comparison between ‘Kompleks’ and ‘Non-Kompleks’ Area of Each District in South Tangerang City

Source: ASR Data Analysis (2024)

Figure 1 illustrates the comparative ASR values between ‘Kompleks’ (Planned Estates) and ‘Non-Kompleks’ (Organic Settlements) areas. The study found wide variability in ASR discrepancies between ‘Kompleks’ and ‘Non-Kompleks’ across districts. In Serpong, Setu, and Ciputat, ‘Kompleks’ areas show higher ASR values, while in East Ciputat, Pamulang, Pondok Aren, and North Serpong, ‘Non-Kompleks’ areas have slightly higher ratios. The discrepancy in the ASR between the two areas within each district is relatively insignificant except for Setu district, where the ASR of ‘Kompleks’ areas is considerably higher than in ‘Non-Kompleks’ areas, indicating a clear lack of uniformity in the NJOP determination between the two development types. Non-uniformity is a common indicator of assessment biasinequity ([Bin-Bustamin et al., 2023](#)), which is precisely what periodic reassessment processes aim to mitigate to maintain fairness ([Senawi et al., 2022](#)). The lack of timely revaluations, as seen in many contexts ([Bin-Bustamin et al., 2023](#); [Senawi et al., 2022](#)), can lead to "stale assessed values" and systematic valuation errors, which are known contributors to assessment regressivity, where lower-value properties

end up over-assessed relative to higher-value properties ([Amornsiripanitch, 2020](#)).

Setu is the smallest in terms of both area and population in South Tangerang City ([BPS South Tangerang City, 2023](#)). Located on the southwestern edge of the city, it borders Bogor Regency to the south and Tangerang Regency to the west. Two plausible explanations account for the stark ASR disparity between ‘Kompleks’ and ‘Non-Kompleks’ areas in this district. First, Setu is located far from the city’s main economic activity centers. This reduces developers’ incentives to invest in the area. With limited development and fewer reliable transaction records in ‘Non-Kompleks’ areas, re-assessments are less likely to occur, resulting in persistently low ASR values. Second, the ‘Kompleks’ areas that do exist in Setu have been developed by real estate firms whose transaction prices are more easily captured by the government. This enables NJOP adjustments that more accurately reflect market changes, leading to higher ASRs in ‘Kompleks’ areas.

Figure 2 below highlights the ten subdistricts with the widest ASR disparities between ‘Kompleks’ and ‘Non-Kompleks’ areas. The sub-district of Babakan in Setu district stands out as the one exhibiting the most pronounced divergence in ASR between the two groups, reaching nearly 20%.

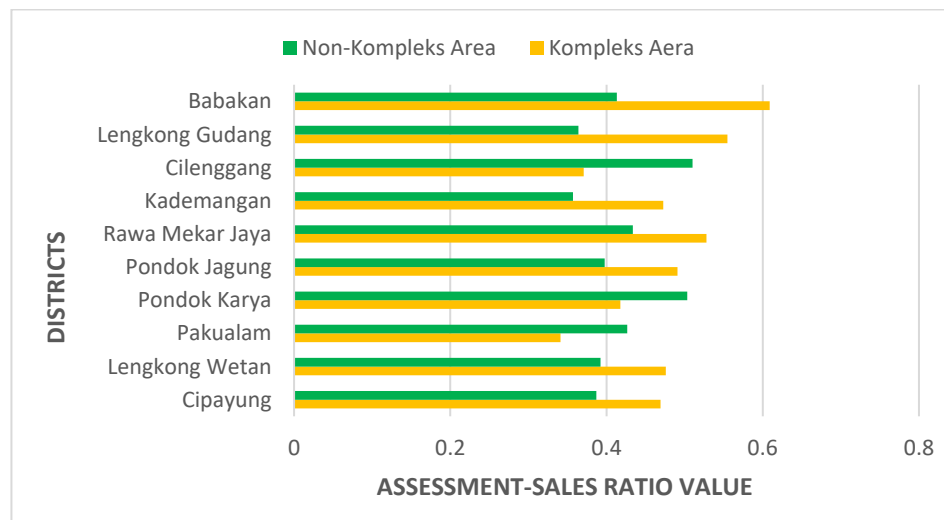


Figure 2: Top Ten Sub-District with The Highest ASR Disparities Between Groups in South Tangerang City
Source: ASR Data Analysis (2024)

Although ‘Kompleks’ areas generally yield higher ASR values, three subdistricts—Cilenggang, Pondok Karya, and Pakualam—display the opposite

pattern. The anomalies in these neighbourhoods can be attributed to two factors. First, the ‘Kompleks’ areas in these three neighbourhoods are small and limited area housing that were not developed by major real estate developers. Second, property sales in these areas occur primarily in the opaque second-hand market, where market prices are more difficult to ascertain than in newer developer-led projects. In such cases, the lack of transparent and timely transaction data constrains the ability of local governments to adjust NJOP in line with market dynamics, resulting in lower ASR values.

This study applies Price-Related Differential (PRD) analysis to assess horizontal and vertical equity and evaluate the presence of regressivity in the imposition of the property tax (PBB-P2). According to [Eckert et al. \(1990\)](#) and [\(IAAO, 2025a\)](#), a fair assessment system for property tax should produce PRD values within the acceptable range of 0.90 to 1.10.

Table 19: PRD Analysis at District Level

District	Mean	Weighted Mean	PRD
Ciputat	0.40	0.41	0.99
East Ciputat	0.44	0.44	1.00
Pamulang	0.42	0.42	0.99
Pondok Aren	0.40	0.40	0.98
Serpong	0.45	0.47	0.96
North Serpong	0.39	0.40	0.99
Setu	0.42	0.43	0.96

Source: ASR Data Analysis (2024)

The PRD values across all districts range from 0.96 to 1.00 (**Table 3**). The highest PRD is observed in East Ciputat (1.00), while Setu and Serpong record the lowest PRD values (0.96). These results indicate no evidence of regressivity or progressivity in property tax (PBB-P2) imposition in South Tangerang City. This finding creates a nuanced "conundrum" for the local government. Although the ASR demonstrates a profound fiscal potential loss (average undervaluation of 58%), the near-neutral PRD suggests that this administrative failure is being applied uniformly across all value tiers; thus, the system achieves proportional equity in its undervaluation. This uniformity is a positive technical outcome, contrasting with studies in other developing contexts like Malaysia, which often find regressive assessment biases ([Bin-Bustamin et al., 2023](#)). The challenge for South Tangerang is not equity distribution, but rather

raising the entire assessment level (ASR) and cutting down on non-uniformity assessments.

Analysis of Assessment Uniformity

To assess the uniformity of property assessments, this study employs the Coefficient of Dispersion (CoD). A low CoD value (below 15.0) generally indicates satisfactory uniformity in assessments. In addition to CoD, CoV is also used as a complementary indicator of uniformity (IAAO, 2025b). Table 4 below presents a comparison of the CoV and the CoD among districts.

Table 20: Comparison of Uniformity at the District Level

District	Sample Number	CoD	CoV
Ciputat	391	3.82	13.46
East Ciputat	444	3.28	10.63
Pamulang	671	3.28	10.12
Pondok Aren	572	3.77	14.20
Serpong	339	6.73	20.04
North Serpong	229	5.43	17.94
Setu	221	7.48	21.15

Source: Assessment Uniformity Analysis (2024)

The district-level CoD analysis shows that all districts in South Tangerang City exhibit a high degree of uniformity, with CoD values below 15.0. However, based on CoV values, three districts— Serpong (20.04), North Serpong (17.94), and Setu (21.15) —display relatively poor uniformity compared to the others. A more granular analysis at the subdistrict level reveals additional variation that warrants attention. Table 21 highlights selected subdistricts where CoD and CoV values are relatively high and thus merit closer scrutiny.

Table 21: Uniformity Comparison of Selected Neighbourhoods

District	Sub-District	Sampel Number	CoD	CoV
East Ciputat	Cempaka Putih	57	5.84	15.88
Pamulang	Bambu Apus	39	9.45	21.48
Pamulang	Pondok Cabe Ilir	43	12.31	17.56
Pondok Aren	Jurangmangu Barat	75	11.13	16.28
Pondok Aren	Pondok Jaya	31	15.29	15.49
Serpong	Cilenggang	17	8.38	16.38
Serpong	Lengkong Wetan	24	29.49	31.76
Serpong	Rawabuntu	37	10.88	26.82
Serpong	Serpong	35	8.97	21.39
North Serpong	Jelupang	36	6.61	27.21
North Serpong	Lengkong Karya	20	13.12	25.99

District	Sub-District	Sampel Number	CoD	CoV
North Serpong	Pakualam	29	13.09	17.42
North Serpong	Pakulonan	16	17.05	27.87
North Serpong	Pondok Jagung	44	7.88	20.76
North Serpong	Pondok Jagung Timur	37	8.76	22.82
Setu	Karanggan	28	16.04	30.41
Setu	Setu	20	15.44	27.13
Ciputat	Serua Indah	49	9.75	23.97
Ciputat	Sawah Baru	49	7.22	20.43
Ciputat	Sawah	69	8.14	21.30

Source: Assessment Uniformity Analysis (2024)

The analysis of sub-district data confirms that localized administrative failures are masked by the broad district averages. Notably, Lengkong Wetan (Serpong) exhibits an extremely high CoD of 29.49 and CoV of 31.76, figures dramatically exceeding the maximum recommended threshold of 15.0.

Table 22 further disaggregates the subdistricts that do not meet the desired uniformity criteria by distinguishing between ‘Kompleks’ and ‘Non-Kompleks’ zones. These results can help the South Tangerang City Government identify priority areas for reassessment. Rapid urban expansion has generated sharp fluctuations in market prices that are not always accompanied by timely updates to the assessed value (NJOP). In several subdistricts, accelerated development has occurred alongside persistent pockets of slower growth, which exacerbates disparities and reduces assessment uniformity. This reflects the theoretical concept of assessment lag, where rapid market value changes are not immediately reflected in the property tax base due to administrative constraints. This challenge is frequently linked to factors common in developing contexts, such as limited capacity, outdated cadastres, and political resistance to regular revaluations ([Almy, 2014](#); [Grote et al., 2024](#); [Slack and Bird, 2014](#)).

Table 22: Recommendation for Re-Assessment Priority

District	Sub-District	Zone	PRD	CoD	CoV
Ciputat	Cipayung	Kompleks	1.00	9.6	16.08
Ciputat	Cipayung	Non-Kompleks	1.01	10.8	15.94
Ciputat	Ciputat	Non-Kompleks	0.97	11.24	15.06
Ciputat	Sawah	Non-Kompleks	0.99	13.43	19.38
Ciputat	Serua Indah	Non-Kompleks	1.01	11.69	17.27
East Ciputat	Pondok Ranji	Kompleks	1.01	8.29	19.08
Pondok Aren	Perigi	Kompleks	0.97	14.22	18.06
Pondok Aren	Pondok Jaya	Non-Kompleks	0.95	10.23	17.46
Pondok Aren	Pondok Kacang Barat	Kompleks	0.97	19.45	20.87
Pondok Aren	Pondok Karya	Non-Kompleks	1.04	10.81	17.38

District	Sub-District	Zone	PRD	CoD	CoV
Serpong	Buaran	Kompleks	0.98	20.43	25.65
Serpong	Ciater	Kompleks	0.98	12.09	17.58
Serpong	Ciater	Non-Kompleks	0.96	18.18	24.57
Serpong	Cilenggang	Kompleks	0.94	45.18	44.1
Serpong	Cilenggang	Non-Kompleks	1.02	22.89	33.13
Serpong	East Lengkong Gudang	Non-Kompleks	0.97	10.43	16.68
Serpong	Rawabuntu	Non-Kompleks	0.95	18.35	24.74
Serpong	Serpong	Non-Kompleks	0.97	13.55	18.84
North Serpong	Pakualam	Kompleks	0.97	18.01	23.27
North Serpong	Pakujaya	Kompleks	0.99	10.84	16.32
North Serpong	Pakujaya	Non-Kompleks	0.98	15.77	22.99
North Serpong	Pakulonan	Kompleks	1.00	16.3	20.19
North Serpong	Pondok Jagung	Non-Kompleks	0.94	10.21	16.77
Setu	Babakan	Non-Kompleks	0.98	11.7	18.61
Setu	Bukti Jaya	Kompleks	0.98	10.63	16.37
Setu	Bukti Jaya	Non-Kompleks	0.95	14.09	19.63

Source: Data Analysis (2024)

Table 23 outlines several areas that go above the CoD and CoV values threshold. [Eckert et al. \(1990\)](#) or ([IAAO, 2025b](#)) recommended a maximum of 15.0 for uniformity indicator. There are 8 sub-districts that have CoD above the tresshold, such as Pondok Kacang Barat, Buaran, Ciater, Cilenggang, Rawabuntu, Pakualam, Pakujaya, and Pakulonan sub-districts.

Table 23: Sub-districts with the Highest CoD and CoV

No.	Sub-district	Zone	CoD	CoV
1	Cilenggang	Komplek	45.18	44.10
2	Cilenggang	Non-Komplek	22.89	33.13
3	Buaran	Komplek	20.43	25.65
4	Rawabuntu	Non-Komplek	18.35	24.74
5	Ciater	Non-Komplek	18.18	24.57
6	Kademangan	Non-Komplek	14.10	23.6
7	Pakualam	Komplek	18.01	23.27
8	Pakujaya	Non-Komplek	15.77	22.99
9	Pondok Kacang Barat	Komplek	19.45	20.87
10	Pakulonan	Komplek	16.30	20.19

Source: Data Analysis (2024)

CoD and CoV values can serve as practical benchmarks for prioritising reassessment efforts. This study identifies Cilenggang as a critical area requiring urgent attention, as both ‘Kompleks’ and ‘Non-kompleks’ zones exhibit the

highest CoD and CoV values. Considering the rapid expansion observed in parts of Cilenggang, a comprehensive re-assessment should be conducted in a timely manner. Upon field observation, the sporadic land value growth that fractures uniformity in these high-priority zones can be directly linked to specific local development factors, consistent with trends in rapidly urbanizing regions globally:

- (1) **Infrastructure Shock.** The variability in Cilenggang is primarily driven by the opening of the Serpong-Balaraja toll gates and economic activity surrounding the Rawa Buntu Electric Train Station. Similarly, the Serpong Kuciran Toll Road has influenced land value fluctuations in Pakujaya, Pakualam, Pakulonon, and Pondok Kacang Barat.
- (2) **Commercial Conversion.** The growth of Buaran is catalyzed by the presence of the Pamulang University campus, which rapidly shifts residential zones into commercial areas (rental housing, boarding houses, businesses).
- (3) **Administrative Lag.** This rapid, localized expansion, coupled with administrative limitations (lack of competent personnel, limited budgets, and slow approval processes), prevents the South Tangerang City government from promptly adjusting NJOPs, creating localized "inequity hotspots" ([Slack and Bird, 2014](#)).

The rapid urban expansion and resulting significant fluctuations in market prices observed here are consistent with challenges faced by many rapidly urbanizing regions globally, where property tax systems struggle to keep pace with dynamic land value changes ([Chmielewska et al., 2025](#)). The CoD and CoV values presented here provide a practical, evidence-based framework for the South Tangerang government to prioritize resource allocation for immediate reassessment efforts.

CONCLUSION

The core finding of this study is the Assessed Value Conundrum in South Tangerang City: the property tax system is characterized by a significant fiscal deficit combined with a high degree of proportional equity.

The analysis revealed a profound level of systematic undervaluation, with an average Assessment-to-Sales Ratio (ASR) of 42%, demonstrating that the assessed tax base captures less than half of the prevailing market values. This indicates persistent undervaluation and suggests that existing assessment practices do not accurately capture real property values and substantially limits the local government's own-source revenue capacity.

However, Equity and uniformity indicators present a mixed picture. Price-Related Differential (PRD) ranges from 0.96 to 1.00, falling within the standard acceptable limits and indicating that the undervaluation is applied proportionally across different value tiers. This suggests neutral assessment behavior concerning vertical equity (not systematically regressive or progressive). While the Coefficient of Dispersion (CoD) meets the recommended threshold, the Coefficient of Variation (CoV) exceeds the ideal 14% in several districts, signalling substantial inconsistencies in value representation. Cilenggang sub-district shows the highest variability (CoV 44.10) in both Planned and Unplanned zones, demonstrating severe localized non-uniformity driven by uncaptured infrastructure-led market spikes.

Overall, these results highlight the urgent need for a shift from passive assessment to systematic and targeted revaluation to correct undervaluation patterns and ensure fairer tax burdens. By applying the IAAO ratio analysis as a diagnostic tool, this study provides a practical framework for local governments to correct valuation discrepancies and support stronger, more sustainable fiscal performance. Prioritizing equity-oriented adjustments based on CoV hotspots and regular valuation updates will be crucial in advancing a more reliable, transparent, and sustainable property taxation framework for South Tangerang and other rapidly urbanizing regions in Indonesia.

POLICY IMPLICATION

Addressing the challenges of property tax administration and ensuring fiscal equity are critical aspects of effective urban governance, a theme widely explored in academic literature ([Chmielewska et al., 2025](#)). While legal mandates, such as Law Number 1 of 2022, require local governments to update and re-assess property data regularly (at a maximum interval of three years), many Indonesian regions (e.g., as noted by [BKF \(2015\)](#), [BPK \(2015\)](#), or [Wahyudi et al. \(2022\)](#)), struggle to comply due to limitations in budget, personnel, and technical competencies. This issue mirrors international observations regarding the failure to conduct regular revaluations, which compromises the accuracy and equity of assessments over time ([Hou et al., 2021](#); [Grote et al., 2024](#); [Slack and Bird, 2014](#); [Zulkifli et al., 2021](#)).

The OECD and UN-Habitat similarly emphasize that regular, data-driven revaluations are essential for ensuring the fairness, transparency, and revenue potential of property taxation systems, particularly in rapidly urbanizing contexts ([Grote et al., 2024](#); [Kelly et al., 2020](#)). When revaluations lag, systematic biases often emerge, including assessment regressivity, whereby lower-priced properties are over-assessed relative to higher-priced ones ([Amornsiripanitch, 2020](#); [Berry, 2024](#)).

The findings from South Tangerang City illustrate a profound fiscal deficit (ASR of 42%), but demonstrate a unique situation where equity is achieved in principle (PRD near 1.00) but lost in practice due to administrative capacity failure (high CoV in localized zones). This validates the theoretical link between administrative capacity and the health of the fiscal decentralization architecture ([Slack and Bird, 2014](#)).

In addition, political economy factors often discourage local governments from adjusting ASR values to reflect market dynamics, as concerns about public backlash may outweigh considerations of fiscal equity. In this context, the South Tangerang City Government may consider several policy strategies to strengthen assessment practices in a gradual, data-driven, and socially responsive manner:

1. **Prioritized and Phased Reassessment.** Given limited resources, reassessment efforts must be strategically prioritized based on assessment quality indicators. The simultaneous analysis of Price-Related Differential (PRD), Coefficient of Variation (CoV), and Coefficient of Dispersion (CoD) provides a data-driven framework to target areas of maximum administrative failure. The study strongly recommends that reassessment be initiated immediately in the nine sub-districts with the highest CoV values, including Cilenggang, Buaran, Rawabuntu, Ciater, Kademangan, Pakualam, Pakujaya, Pondok Kacang Barat, and Pakulonan. This approach maximizes the efficiency of resource allocation by focusing only on proven inequity hotspots.
2. **Mitigating Political Fallout via Targeted Adjustments.** The political economy of property tax reform dictates that increasing assessed values (ASR) to reflect market reality can cause voter backlash. To minimize potential social disruption, the government should adopt a gradual, phased approach to tax increases. The initial burden of the ASR adjustment should primarily target commercial property and upper middle-class residential areas, typically in the 'Kompleks' zones, where the government has the highest data reliability. This strategy leverages the social perception that higher property values correspond to a greater ability to pay, while providing transitional relief or income-related credits in suburban or lower-middle-class residential areas ([Slack and Bird, 2014](#)).
3. **Institutionalizing Technical Capacity and Data Capture.** The pervasive lack of uniformity in some areas highlights the administrative struggle to capture fluid market data outside of developer transactions. To overcome this, the government must:

- a. **Modernize Assessment Systems.** Implement computerized mass appraisal (CMA) systems and utilize geospatial technology to regularly monitor rapid, sporadic changes in land use (e.g., near toll roads or university developments) and ensure that these market shocks are integrated into the tax base swiftly.
 - b. **Strengthen Data Integrity.** Establish mandatory protocols for property transfer reporting to capture second-hand market values accurately, thereby reducing the reliance on older, static NJOP data.
 - c. **Enhance Transparency.** Clearly communicate the link between property tax revenue and specific local service improvements to increase taxpayer acceptance of higher ASR values.
4. **Addressing Assessment Lag:** The overall low ASR is a symptom of chronic **assessment lag**. To maintain the fiscal integrity of the PBB-P2 system, the government must adhere strictly to the 3-year reassessment mandate. Failure to do so not only weaken revenue collection but structurally undermines the goals of fiscal decentralization.

COMPETING INTEREST STATEMENT

The authors declare that there are no known competing interests that could have appeared to influence the work reported in this paper.

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AUTHOR CONTRIBUTION STATEMENT

All authors contributed significantly to the development of this research. The first author was responsible for the conceptualization of the study, research design, data collection, and primary data analysis. The co-author contributed to the refinement of the methodology, validation of results, and critical revision of the manuscript. All authors participated in interpreting the findings, drafting the manuscript, and approving the final version for publication. All authors agree to be accountable for all aspects of the work.

REFERENCES

- Affroumou, T. A. (2025). (Re) understanding the relationship between fiscal decentralization and property tax revenue: insights from developing and developed countries. *Economic Change and Restructuring*, 58(3), 48. doi:<https://doi.org/10.1007/s10644-025-09883-2>
- Ahmed, S. K. (2024). How to choose a sampling technique and determine sample size for research: A simplified guide for researchers. *Oral Oncology Reports*, 12, 100662. doi:<https://doi.org/10.1016/j.oor.2024.100662>
- Almy, R. (2014). *Valuation and Assessment of Immovable Property*. Retrieved from <https://doi.org/10.1787/5jz5pzvr28hk-en>
- Amornsiripanitch, N. (2020). Why are residential property tax rates regressive? Available at SSRN 3729072. doi:<https://doi.org/10.2139/ssrn.3729072>
- Andrade, C. (2021). The inconvenient truth about convenience and purposive samples. *Indian journal of psychological medicine*, 43(1), 86-88. doi:<https://doi.org/10.1177/0253717620977000>
- ATR/BPN. (2025). Aplikasi Bhumi Kementerian ATR/BPN. Retrieved from <https://bhumi.atrbpn.go.id/peta>
- Berry, C. (2024). De jure and de facto property tax rates in large US cities. *Public Budgeting & Finance*, 44(4), 5-27. doi:<https://doi.org/10.1111/pbaf.12382>
- Bidanset, P., & Rakow, R. (2022). Survey on the use of automated valuation models (AVMs) in government assessment offices: An analysis of AVM use, acceptance, and barriers to more widespread implementation. *Journal of Property Tax Assessment & Administration*, 19(2), 3. doi:<https://doi.org/10.63642/1357-1419.1250>
- Bin-Bustamin, E., Alias, A., & Ahmad, R. (2023). Addressing the assessment bias in the Malaysian local property tax assessment. *Planning Malaysia*, 21. doi:<https://doi.org/10.21837/pm.v21i27.1287>
- BKF. (2015). *Evaluasi Pengelolaan PBB-P2 Pasca Pengalihan ke Pemerintah Daerah: Lesosn Learnt Sebelum Rencana Pengalihan PBB-P3 Bagian Permukaan*. Badan Kebijakan Fiskal, Pusat Kebijakan Anggaran Pendapatan dan Belanja Negara. Jakarta.
- Borg, M. O., & Borg, J. R. (2023). The Vertical and Horizontal Equity of Property Assessment Caps. *State and Local Government Review*, 55(3), 213-234. doi:<https://doi.org/10.1177/0160323x231168613>
- BPK. (2015). *Pendapat BPK*: Badan Pemeriksa Keuangan.
- BPS South Tangerang City. (2023). *Data Perekonomian Kota Tangerang Selatan*.
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., . . . Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of research in Nursing*, 25(8), 652-661. doi:<https://doi.org/10.1177/1744987120927206>
- Chmielewska, A., Walacik, M., & Grover, R. (2025). Property valuation principles – How policy changes can be detrimental to urban development. *Land Use Policy*, 150, 107474. doi:<https://doi.org/10.1016/j.landusepol.2025.107474>
- Durankev, B. (2019). *Taxation and social justice* (Vol. 22).

- Eckert, J. K., Gloudemans, R. J., & Almy, R. R. (1990). *Property appraisal and assessment administration*: International Association of Assessing Officers.
- Galland, D., & Stead, D. (2022). *Periodising planning history in metropolitan regions: An historical-discursive institutionalist approach*. Paper presented at the Association of Collegiate Schools of Planning (ACSP) Annual Conference 2022.
- Grote, M., & Wen, J.-F. (2024). *How to design and implement property tax reforms*. Retrieved from
- Harjanto, B. (2011). *Teori dan Berbagai Model Aplikasi Penilaian Massal*. BPFE, Yogyakarta.
- Hernandi, A., Meilano, I., Saptari, A. Y., Suwardhi, D., Abdulharis, R., Handayani, A. P., . . . Merdekawati, P. (2025). Fair Taxes, Better Revenue: A Case Study on Spatial Approaches to Land Taxation in Lebak Regency, Indonesia. *Land*, 14(1), 125. doi:<https://doi.org/10.3390/land14010125>
- Hou, Y., Ding, L., Schwegman, D., & Barca, A. (2021). Assessment frequency and equity of the real property tax: Latest evidence from Philadelphia. doi:<https://dx.doi.org/10.21799/frbp.wp.2021.43>
- IAAO. (2025a). *Ratio Studies: Exposure Draft*. Retrieved from https://www.iaao.org/wp-content/uploads/2025_Ratio_Studies_Exposure_Draft.pdf
- IAAO. (2025b). *Standard on Mass Appraisal of Real Property A criterion for measuring fairness, quality, equity and accuracy (Revised 2025)*. Retrieved from https://www.iaao.org/wp-content/uploads/Standard_on_Mass_Appraisal.pdf
- Kelly, R., White, R. Z., & Anand, A. (2020). *Property Tax Diagnostic Manual*.
- Kim, W., & Hong, J. (2024). Stacked Ensemble Model for the Automatic Valuation of Residential Properties in South Korea: A Case Study on Jeju Island. *Land*, 13(9), 1436. doi:<https://doi.org/10.3390/land13091436>
- Likwelile, S., & Assey, P. (2023). Fiscal Decentralisation as an Example of Institutional Ineffectiveness. *State and Business in Tanzania's Development*, 191. doi:<https://doi.org/10.1017/9781009285803.012>
- Neyapti, B., & Aslim, E. G. (2022). Fiscal Decentralization, Political Heterogeneity and Welfare. *Political Heterogeneity and Welfare* (July 8, 2022). doi:<https://dx.doi.org/10.2139/ssrn.4157918>
- Prabu, S. A. (2021). Uji Tingkat Kesesuaian Nilai Jual Objek Pajak dengan Menggunakan Assessment Sales Ratio. *Info Artha*, 5(1), 45-53.
- Rakow, R. (2023). Comparative measures of property tax equity in Suffolk County, Massachusetts. *Journal of Property Tax Assessment & Administration*, 20(1), 2. doi:<https://doi.org/10.63642/1357-1419.1254>
- Rodríguez-Pose, A., & Vidal-Bover, M. (2024). Unfunded mandates and the economic impact of decentralisation. When finance does not follow function. *Political Studies*, 72(2), 652-676. doi:<https://doi.org/10.1177/00323217221136666>
- Rosdiana, H., & Irianto, E. S. (2018). *Analyzing the determinant variables on the difficulty of transfer power of rural and urban property tax from central to regional government in Indonesia*. Paper presented at the E3S Web of Conferences.
- Senawi, A., & Osmadi, A. (2022). Intellectual capital and property tax reassessment performance of local authorities: The interrelationships analysis. *Frontiers in Psychology*, 13, 1060219. doi:<https://doi.org/10.3389/fpsyg.2022.1060219>

- Slack, E., & Bird, R. M. (2014). The political economy of property tax reform. doi:<https://dx.doi.org/10.1787/5jz5pzvzv6r7-en>
- Totanan, C., Jamaluddin, Muliati, Zahra, F., & Pakawaru, M. I. (2024). The complexity of tax regulations and principles of justice as determinants of taxpayer compliance: case of Indonesia. *Public and Municipal Finance*. doi:[https://doi.org/10.21511/pmf.13\(1\).2024.14](https://doi.org/10.21511/pmf.13(1).2024.14)
- Tsai, I.-C., & Wang, W.-K. (2022). The value of land redevelopment in different types of properties: Considering the effect of hold-out problems on the development probability. *Land Use Policy*, 119, 106188. doi:<https://doi.org/10.1016/j.landusepol.2022.106188>
- Von Haldenwang, C. (2017). The political cost of local revenue mobilization: decentralization of the property tax in indonesia. *Public Finance and Management*, 17(2), 124-151. doi:<https://doi.org/10.1177/152397211701700202>
- Wahyudi, E., Safitra, D. A., Juliarin, A., Prasetyo, K. A., Swasito, A. P., Riyanto, E., . . . Muamarah, H. S. (2022). Capacity Building Petugas Pendataan untuk Kepentingan Penetapan Pajak Bumi dan Bangunan Perdesaan dan Perkotaan. *Jurnal Nusantara Mengabdi*, 2(1), 45-53.
- Zulkifli, N. A. A., Azis, S. S. A., Saliman, N. S. S., & Maimun, N. H. A. (2021). Factors causing failure in completing reassessment work among appointed valuation firms. *Planning Malaysia*, 19. doi:<https://doi.org/10.21837/pm.v19i17.992>

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