Research Article

Analysis of Land Value Zones in the Determination of Tax NJOP in Indonesia

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Abstract.

This study examines the implementation of land value zones (Zona Nilai Tanah - ZNT) in determining the selling value of tax objects (Nilai Jual Objek Pajak - NJOP) for property taxation in Indonesia. NJOP plays a crucial role in tax policy, yet its frequent disparity with actual market values often results in tax injustice and impacts regional tax revenue. Through a quantitative approach combining descriptive and comparative analyses, this research evaluates the relationship between ZNT and NJOP, utilizing primary data from surveys and interviews with stakeholders and secondary data from policy documents. Findings reveal significant challenges in ZNT's ability to accurately reflect real market values, leading to notable discrepancies across regions. Statistical tests, including ANOVA and independent samples t-test, highlight how variations in NJOP over time and location contribute to inequities in tax burdens. These inconsistencies create both vertical and horizontal injustices, where vertical injustice refers to unequal tax burdens across different economic classes and horizontal injustice occurs when taxpayers with similar property conditions are taxed unequally due to inconsistencies in valuation. The study emphasizes the need to reform NJOP assessment methods through evidence-based approaches, such as geospatial technology, real-time data analysis, and statistical modelling, to enhance valuation accuracy. Periodic ZNT evaluations and integrating property transaction data can improve transparency, increase public trust, and support sustainable economic growth. By adopting innovative, data-driven land valuation methods, policymakers can foster a fairer and more credible tax system that better reflects dynamic market conditions. This research provides valuable insights for modernizing Indonesia's property taxation framework, ensuring equitable tax distribution, and bolstering confidence in the tax system.

Keywords: land value zone, NJOP, taxation, land valuation, public policy

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1. Introduction

Land valuation is crucial in property management and tax policy, especially in Indonesia. Analysis of the application of Tax Object Selling Value (NJOP) as the primary reference in land valuation, determined based on land value zones by local governments [1]. The use of land value zones affects the accuracy of NJOP determination [2]. In turn, it affects the tax burden of landowners. These findings highlight the importance of evaluating land valuation policies to improve fairness and transparency in the tax system [3]. Land valuation is a fundamental element in property resource management and tax

policy, especially in Indonesia, where the accuracy of the valuation can affect social and economic justice [4].

Land valuation generally uses the market comparison method, where the land value is determined based on the analysis of the selling price of similar properties in the same area [5]. Key variables, such as location, accessibility, and physical characteristics of land, significantly affect land prices in urban areas [6]. These findings underscore the urgency of applying systematic comparative analysis in land valuation to improve valuation accuracy and ensure fairness in property taxation policies [7]. Recent research shows that inaccurate use of land value zones has the potential to result in a disproportionate tax burden, which in turn can influence investment and property development decisions [8].

Land valuation methods in Europe have made significant progress, including using statistical model-based mapping that improves the uniformity of land data across countries [9]. Mass spectrometry is now also being used to measure soil pollution and its impact on ecosystems [10]. The harmonisation of data from various countries is done through the Wosis global system, which provides standardised soil quality information [11].

Meanwhile, land valuation in Indonesia still relies on a comparative approach to market data, cost, and income approaches [12]. The determination of the Selling Value of Tax Objects (NJOP) is based on the Land Value Zone (ZNT) set by the local government [13]. However, ZNT does not fully reflect real market conditions, so a more objective assessment method based on up-to-date data is needed [14].

The Selling Value of Tax Objects (NJOP) in Indonesia is determined based on the Land Value Zone (ZNT), which is designed to reflect the market value of the land [15]. The NJOP in Indonesia is designed to reflect the market value of land, but the reality on the ground shows a significant mismatch between the value set and the actual market conditions [16]. These differences will pose challenges in implementing fair tax policies [17]. The reality on the ground shows a discrepancy between the set value and the actual market conditions. This inaccuracy can impact the disproportionate tax burden for landowners and cause Injustice in the property taxation system.

On the other hand, more flexible and real-time data-based market comparison methods have been used in several countries, including innovations in statistical model-based soil mapping and chemical analysis technology, which have improved the accuracy of land valuation. Indonesia's lag in adopting a more dynamic and evidence-based approach can increase fairness and transparency in the land taxation system in Indonesia. Therefore, it is important to explore more innovative and evidence-based land valuation methods [18]. This condition raises critical questions: To what extent does the application of Land Value Zone (ZNT) as a reference in the determination of Nilai Jual Objek Pajak (NJOP) reflect the actual market value of land in Indonesia, and how can more innovative land valuation methods be integrated to improve fairness and transparency in the land taxation system?.

2. Methods

This study uses a quantitative approach with descriptive and comparative analysis methods; the quantitative research method is a research approach that uses numerical data and statistical analysis to test hypotheses and understand the relationship between variables, focusing on objectivity, standardised measurements, and generalising research results using techniques such as surveys, experiments, and descriptive and inferential statistical analysis to obtain Retestable conclusions, descriptive and comparative analysis is used to describe or describe systematically and factually and to emphasise the exposure of data as it is [19]. This study evaluated Indonesia's Land Value Zone (ZNT) application in determining the Selling Value of Tax Objects (NJOP). Primary data was obtained through surveys and interviews with local government officials responsible for determining the NJOP and with property owners affected by this policy. Meanwhile, secondary data is collected from tax policy documents, previous research reports, and official government publications on the land valuation system.

The analysis was carried out as a case study by comparing the NJOP value against the actual market price of land in several regional zones. Statistical techniques such as correlation and regression tests measure the degree of conformity between NJOP and market prices. The comparison aims to identify the weaknesses of the assessment system in Indonesia as well as explore the possibility of adopting more accurate and evidence-based methods.

Data triangulation was carried out by combining statistical analysis, policy studies, and in-depth interviews with stakeholders to increase the validity of the research results.

The evaluation of the NJOP system in Indonesia focuses on fairness and transparency in property taxation. The results of this study can provide recommendations for the government to develop a more accurate and fair land assessment policy, taking into account the experience of developed countries and the latest technological innovations in property valuation.

3. Results and Discussion

3.1. Accuracy of NJOP Determination Based on Land Value Zones (ZNT)

Land valuation is important in Indonesia's taxation policy and property management [20]. One of the main aspects of this assessment is the application of the Land Value Zone (ZNT) as the basis for determining the Selling Value of Tax Objects (NJOP). ZNT aims to reflect the market value of land in an area by considering the location, accessibility, and physical characteristics of the land [14]. However, this study found that the ZNT system in some regions still faces challenges in reflecting the actual land market conditions [21].

Land valuation is an important foundation in the property taxation system because it determines the NJOP as the basis for imposing the Land and Building Tax (PBB). Land valuation theory emphasises that the accuracy of land valuation affects social and economic justice [4]. In Indonesia, the NJOP is determined based on land zoning and is designed to estimate land market value regionally [15]. However, the mismatch between the NJOP and the market price can create an inequality in the tax burden. In this study, the comparison between the Selling Value of Tax Objects (NJOP) set by local governments and the actual market price in several zones in Indonesia shows a significant difference. Land market price surveys in various zones show that NJOP in some areas is still far from the real market value, and the ZNT method has limitations in capturing the dynamics of the rapidly changing land market [14].

ANOVA

The ANOVA analysis (Table 1) results show that the location (Land Value Zone/ZNT) and time period significantly influence land value. The location factor has an F value of 3.643 with $p < 0.001$, which indicates a significant difference between zones in determining land value. This variation illustrates the complexity of spatial characteristics such as access to infrastructure, land functions, proximity to economic centres, and the

Table 1: ANOVA analysis.

ANOVA - ln_nt					
Cases	Sum of Squares	Df	Mean Square	F	p
Sample	86.501	63	1.373	3.643	<.001
era	87.255	1	87.255	231.524	<.001
Sample * Period	24.795	63	0.394	1.044	0.411
Residuals	48.239	128	0.377		
Note. Type III Sum of Squares					

influence of local spatial planning. Zones with higher development rates or that are in strategic locations tend to have higher land values. Therefore, determining the Selling Value of Tax Objects (NJOP), referring to ZNT, should consider local dynamics and not simply use a stagnant historical approach. Spatial adjustment of NJOP needs to consider external variables such as regional spatial planning (RTRW), new infrastructure development, and regional investment potential. In this case, spatial technology such as the Geographic Information System (GIS) can be used to map land value zones more accurately and integrate spatial and economic variables that affect land values[22].

The period factor also significantly influences the value of the land, reflected in the value of F of 231.524 with $p < 0.001$. These results show that the value of the land has changed substantially over time. A consistent increase in land prices from year to year can reflect regional economic development, urbanisation, and changes in people's purchasing power. Therefore, if the NJOP is not updated periodically and accurately, there can be an inequality between the NJOP and the actual market value. This condition impacts two important things: first, the potential loss of regional tax revenue due to the NJOP being too low; and second, fiscal injustice if the NJOP is set too high without a strong market basis. NJOP assessments not responsive to land price dynamics can harm regional tax revenues and taxpayer compliance [3].

Meanwhile, the ANOVA results also showed that the interaction between the location factor (zone) and the period was insignificant, with an F value of 1.044 and $p = 0.411$. This shows that the trend of land value growth is relatively homogeneous in various zones. This means that although land values between zones differ in absolute terms, the increase in land values from year to year shows a similar trend. These findings indicate that macro factors affecting land value, such as inflation, national policy, or economic growth in aggregate, work uniformly across regions. Thus, local governments have the opportunity to simplify the NJOP evaluation process periodically through

predictive models that can be applied across zones. The homogeneity of land price growth is also the basis for developing zoning clusters with a commensurate value development pattern, so that NJOP updates can be carried out more efficiently and data-based. However, if the NJOP is still established based solely on historical data without considering actual market trends, its accuracy level will decrease significantly [22].

On the other hand, inaccuracies in the determination of the NJOP can also harm the principle of fiscal justice. If the NJOP is too low compared to the market value, the potential for tax revenue becomes less than optimal. Conversely, if the NJOP is set too high without a firm market footing, this can burden taxpayers and cause social discontent. Therefore, the NJOP valuation mechanism needs to consider changes in land values based on ZNT and actual land market dynamics, which are influenced by macroeconomic factors such as inflation, interest rates, and property sector growth [23].

3.2. Implications of NJOP Inaccuracy on Tax Justice

The Independent Samples T-Test is used to determine the effect of ZNT (Land Value Zone) on NJOP (Selling Value of Tax Objects) by looking at the t, df, and p-value values. The average difference is used to compare two paired data sets, namely the comparison between the NJOP set and the actual market value of a property and based on the Land Value Zone (ZNT), this test is to help evaluate whether there is a significant difference between the NJOP that determined based on market value and Land Value Zone.

Independent Samples T-Test

Table 2: Independent Samples T-Test.

							95% CI for Mean Difference	
	t	Df	p		Mean Difference	SE Difference	Lower	Upper
Sample	0.000	254	1.000		0.000	Nan	-4.565	4.565
year	-25.199	254	<.001	a	-2.500	0.099	-2.695	-2.305
Nt	-7.326	254	<.001	a	-345155.760	47114.932	-437941.435	-252370.084

Note. Student's t-test.

A Brown-Forsythe test is significant ($p < .05$), suggesting a violation of the equal variance assumption.

Assumption Checks

Descriptives

TABLE 3: Test of Equality of Variances (Brown-Forsythe).

	F	df1	DF2	p
Sample	$1.800\times^{10-30}$	1	254	1.000
year	4.988×10+30	1	254	<.001
Nt	31.058	1	254	<.001

Raincloud Plots

The statistical analysis (Figure 1) results show a significant difference in the Selling Value of Tax Objects (NJOP) based on the variation of the Land Value Zone (ZNT). The test showed that the value of t = -7.326, with a degree of freedom (df) = 254 and a significance level of $p < 0.001$, meaning there was a significant difference in NJOP between the ZNT categories. Furthermore, the mean difference was -345,155,760 with a 95% confidence interval (95% CI) in the range of -437,941,435 to -252,370,084. This shows a considerable difference in the average NJOP between groups of regions with different levels of ZNT. In other words, the regions with higher ZNT tend to have a higher NJOP as well. These results indicate that ZNT plays an important role in determining NJOP.

However, significant results of the Brown-Forsythe test ($p < 0.001$) indicate that the assumption of similarity of variance between groups is unmet. This requires a more careful interpretation of the comparison results between the ZNT groups, as differences in variability between groups can affect the strength and generalisation of the statistical test results. In the context of fiscal policy and tax governance, this is an important concern for local governments in maintaining the fairness and accuracy of the determination of NJOP.

To further understand the implications of this distinction, it is important to interpret the treatment factor more operationally. In this context, “treated” can be interpreted as a tax area or object that has undergone specific policy interventions related to adjusting the ZNT-based NJOP. Examples of such policies could include: (1) periodic revaluation of ZNT by the National Land Agency (BPN) or regional tax offices; (2) adjustment of NJOP after significant infrastructure development such as toll roads, transit oriented development (TOD) areas, or shopping centers; and (3) implementation of new zoning policies in regional spatial plans (RTRW) that cause changes in land use. Regions that received this treatment tended to show an increase in ZNT, which was then followed by a significant adjustment in NJOP.

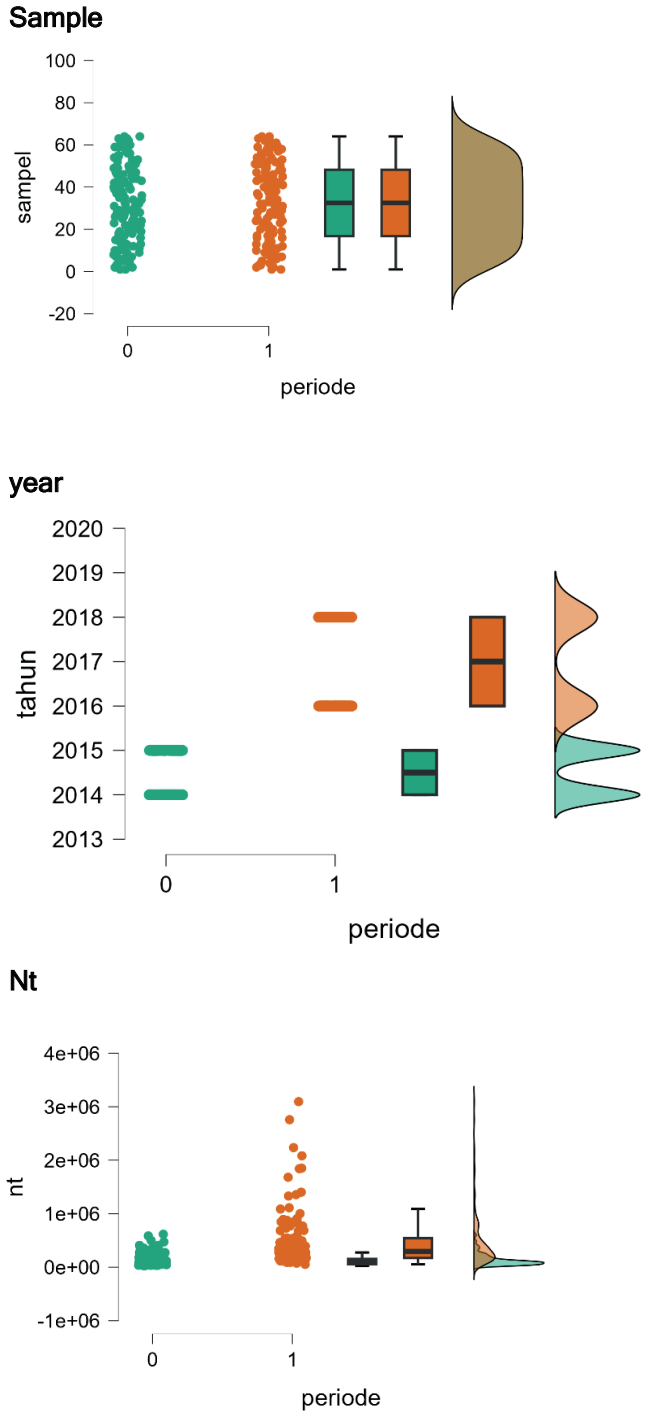

Figure 1: Sample, Year, and nt Analysis.

Although the results of statistical testing show that the determination of NJOP in the analysed sample is accurate based on ZNT, it is still necessary to be aware that inaccuracies in the determination of NJOP can seriously impact the principle of tax fairness. These inaccuracies can create vertical injustices, where taxpayers with high-value properties may pay lower taxes if the NJOP does not reflect the actual market

value. Conversely, horizontal Injustice can arise when properties with similar land values, within the same zone, are subject to different NJOP due to inconsistencies in assessment, resulting in unfair tax treatment between taxpayers. Inaccuracies can also cause tax uncertainty, where taxpayers do not know the amount of Land and Building Tax (PBB) that must be paid. This can reduce public trust in the tax system and cause resistance to tax obligations.

Understanding "treated" as a tax area or object subject to the NJOP adjustment policy is crucial to formulating a fair and data-based policy. Local governments need a more systematic mechanism for evaluating and updating the NJOP based on actual changes in the land market value and ensuring that the process is carried out transparently and in a participatory manner. Technology-based adjustments, such as integration with GIS and actual market data, are potential solutions to improve accuracy, efficiency, and fairness in determining NJOP.

Exploratory Factor Analysis

TABLE 4: Chi-squared Test.

	Value	Df	p
Type	0.000	0	

TABLE 5: Factor Loadings.

	Factor 1	Uniqueness
Sample	16.186	80.611
treated	-0.496	0.005
year		0.251

Note. The applied rotation method is Promax.

TABLE 6: Factor Characteristics.

		Unrotated solution			Rotated solution		
	Eigenvalues	SumSq. Loadings	Proportion var.	Cumulative	SumSq. Loadings	Proportion var.	Cumulative
Factor 1	342.776	262.223	0.764	0.764	262.223	0.764	0.764

Exploratory Factor Analysis (EFA) with the promax rotation method, the purpose of EFA is to find latent structures in the data and identify the main factors that affect the variables analysed. Dominant Factor Identification, factor 1 has an eigenvalue of 342,776, which means this factor explains the most significant proportion of variance in the data.

After rotation, this factor still has a sum of squared loadings of 262,223, with 76.4% of the total variance described. This means that these key factors greatly determine changes in the data and are most likely related to the ZNT and NJOP variables. 2) Interpretation of Loading Factor: the treated factor has a loading factor of -0.496, with a uniqueness level of 0.005. The year variable has a uniqueness of 0.251, which indicates that this variable is not unique and may have a relationship with the main factor. From the analysis results, if it is assumed that the main factor is related to ZNT, then the decrease in the treated value (e.g., certain policies towards ZNT) can negatively impact the NJOP. 3) The influence of ZNT on NJOP: ZNT is an indicator of land value based on regional characteristics. If the ZNT increases, the NJOP also tends to increase because the NJOP is determined based on the value of land and buildings. If the main factor in this analysis is related to changes in ZNT, then it can be concluded that the increase in ZNT significantly affects the NJOP. With a described proportion of variance of 76.4%, this factor has a dominant influence on changes in NJOP, which means that ZNT is likely to be the main factor in determining NJOP.

In the factor analysis, it was identified that a dominant factor had a significant contribution to the change in the selling value of tax objects (NJOP) represented by the "treated" factor with a loading factor of -0.496. This value shows a significant negative influence on NJOP, which shows unfair treatment of tax assessment based on specific policies.

Specifically, the "treated" factor can be attributed to the policy of imposing different tax rates based on the characteristics of the property's location. For example, in the context of land and building valuations, local governments may implement policies that provide tax incentives for property development in certain areas to encourage investment. This can result in properties that should have a higher market value equivalent to NJOP being valued lower because of the policy. For example, a commercial property in a city centre with high economic potential might get a tax rate reduction to attract more investment, resulting in an NJOP value that does not reflect actual market conditions.

The factor analysis results showed that the main factors explain most of the variation in the data. If this factor is related to ZNT, then the change in ZNT will significantly impact the NJOP. The treated variable has a negative correlation, meaning that specific ZNT policies can suppress the increase in NJOP. The year variable shows that the change in value from year to year also influences the main factor, indicating an upward trend in NJOP over time due to an increase in ZNT. The results of identifying one dominant factor explain most of the variation in the data. If we assume that this factor represents

the accuracy of determining the NJOP compared to the land value zone, then several interpretations can be attributed to tax fairness.

Further, this analysis notes that unfairness in determining NJOP can create conditions where taxpayers with properties that share the same characteristics pay different taxes. This creates a horizontal injustice, where taxpayers who should have an equal tax burden experience significant differences in their tax payments. For example, two identical property owners in the exact location may be subject to different tax rates due to inconsistent policies in the NJOP assessment.

In addition, vertical Injustice will also arise if property owners with high values benefit from NJOP that is rated too low, so they pay lower taxes than they should. This can hurt regional budgets that rely on fair tax revenues to finance public services,

Policies related to ZNT (Land Value Zones) also need to be considered, as changes in land values can affect the determination of the NJOP as a whole. If the ZNT increases but the NJOP does not undergo a proportional adjustment, then there will be distortions in the tax system. For example, if the ZNT is high due to infrastructure developments or government policies that increase the attractiveness of an area, but the NJOP does not reflect these changes, then there will be a mismatch between the market value and the tax value set.

NJOP as an Inaccurate Tax Determinant: If the dominant factor in this analysis indicates that NJOP is often different from the land value zone, then this indicates the potential for distortion in tax policy. Some properties can be over-assessed or under-assessed compared to the land value zone. Injustice in Tax Payment: if the NJOP variation does not follow a fair pattern, taxpayers with similar properties can pay different tax amounts, creating horizontal Injustice. In addition, taxpayers with expensive properties may benefit from an undervalued NJOP, thus paying less tax than they otherwise would (vertical Injustice). The “treated” factor has a negative contribution (-0.496), which may indicate that certain groups receive different treatment in determining the NJOP. This could indicate inconsistencies in the property valuation system, leading to unfair taxation. NJOP and Tax Model Accuracy, with a high proportion of variance (76.4%),

Therefore, the government needs to evaluate and revise the NJOP valuation policy periodically, considering the variables affecting land values and market characteristics. Through more appropriate adjustments to this policy, it is hoped that justice will be created in the distribution of tax burdens and that public trust in the existing tax system

will be restored. This analysis emphasises that the dominant factors related to ZNT and treatment in determining NJOP require special attention to ensure accuracy and fairness in the imposition of taxes. This analysis shows that one main factor can significantly influence the determination of NJOP. If this factor is an adjustment in market value, then it is likely that the current NJOP is still not accurate enough to reflect economic reality [24].

3.3. Potential Implementation of Evidence-Based Methods in Indonesia

There are many discrepancies between the NJOP and the actual land market price. This can cause tax inequality and hinder investment and property development. Therefore, applying evidence-based methods in ZNT-based NJOP assessment is important to improve accuracy, transparency, and fairness in the land taxation system in Indonesia—the importance of Land Value Zone-Based NJOP Assessment (ZNT) [3]. ZNT is designed to reflect the market value of land within an area based on various factors such as location, accessibility, and physical characteristics of the land. If the NJOP's determination does not follow the market value of the land in the zone, the property owner can experience a disproportionate tax burden. Therefore, adjusting the NJOP with the regularly updated ZNT condition is the leading solution to improving the accuracy of property tax assessment [25].

Mismatches between NJOP and market prices can result in Injustice in the tax system. For example, if the NJOP is too high compared to the actual market price, the landowner will be taxed more than they should be. On the other hand, if the NJOP is too low, state revenue from land taxes will not be optimal. With an evidence-based method, NJOP can be determined objectively based on real-time data on land prices in the zone [26]. Many people feel less confident in the NJOP assessment system because it is considered not to reflect the actual market value of land. By using evidence-based approaches—for example, with land mapping technologies based on geospatial and big data—governments can provide open information on how land value in each zone is determined. This will increase transparency and reduce potential disputes [27].

The use of geospatial technology and AI in land assessment is still limited. A significant investment is needed to develop GIS-based information systems and big data. Less Flexible Regulation: The current NJOP system is still based on a bureaucratic approach and is less responsive to market changes. It is necessary to revise the policy

to allow adjustments to the NJOP based on actual market data—lack of Competent Human Resources [23].

Comprehensive reforms are needed to improve the accuracy of determining the Selling Value of Tax Objects (NJOP) based on Land Value Zones (ZNT), including valuation methods, transparency, and the integration of technology and market data. Research shows that NJOP in some regions has not experienced significant changes from year to year, indicating a lack of responsiveness to the dynamics of the land market that continues to grow [3]. Therefore, a real-time data-driven approach must be implemented so that the NJOP can better reflect the actual market value [14]. Local governments should integrate property transaction data from various sources, including notaries, property agents, and tax records, to regularly validate and update the ZNT [25]. In addition, predictive models based on artificial intelligence (AI) and machine learning can be applied to project land price trends based on economic, demographic, and infrastructure development factors [6]. This step will help create a more objective and accurate NJOP valuation system, reducing the potential for Injustice in property taxation [6].

On the other hand, transparency in determining the NJOP must also be improved to reduce public distrust in the tax system. One of the solutions that can be applied is to build a public information system that allows the public to access NJOP data openly through online portals [26]. Through this system, the public can see the basis for calculating the NJOP in each zone and raise objections if they feel the value set is not following the actual market price [26]. The government also needs to involve property experts, academics, and the public in evaluating the NJOP to make the determination process more participatory and fair. In addition, applying geospatial technologies such as Geographic Information Systems (GIS) can help map soil values more precisely [22].

However, technological innovation and public engagement will not be effective without regulatory revisions. The current NJOP system is still based on a bureaucratic approach and is less responsive to market changes. More flexible policies are needed, such as the drafting of regulations that allow the use of real-time actual market data, recognition of non-traditional data sources (such as data from digital property platforms), and legal frameworks that support data disclosure. Canada, for example, through Property Assessment Services in the province of British Columbia, has established a legal system that allows for the adjustment of property values annually based on a combination of market data, GIS, and open public audits, thereby increasing public confidence in the valuation system

Finally, the modernisation of the NJOP system will not run effectively without increasing the capacity of human resources (HR) and adequate digital infrastructure [22]. Currently, the limitation of experts in geospatial analysis and market data is one of the main obstacles to implementing technology-based systems. Therefore, the government needs to hold training for tax officials and related agencies on the use of GIS, big data, and AI-based land value analysis [6]. In addition, investment in developing a cloud-based NJOP digitisation system must be prioritised so that land price data can be analysed in real-time and accessed by various stakeholders. More flexible regulations are also needed so NJOP adjustments can be made dynamically following market changes. With these various strategic steps, the NJOP assessment system in Indonesia can be more accurate, transparent, and fair, thereby creating a more credible and applicable tax policy for regional and national economic development [6]

4. Conclusion

The determination of the Selling Value of Tax Objects (NJOP) in Indonesia has a significant influence on tax fairness. Studies show a discrepancy between NJOP and actual land market prices, indicating the need for more accurate valuation methods. The results of statistical tests such as ANOVA and the Independent Samples T-Test show that the difference in NJOP values between zones and periods contributes to inaccuracies in the tax system. This inaccuracy can create a disproportionate tax burden for taxpayers and create inequality in the distribution of tax obligations.

The impact of NJOP inaccuracies on the tax system is very complex, covering both vertical and horizontal fairness aspects. Several factors, such as infrastructure development, spatial planning policies, and land market dynamics, are often not reflected in the determination of ZNT-based NJOPS that are less responsive to changes. As a result, some taxpayers get a higher or lower tax burden than they should, which can reduce public trust in the tax system. In addition, factor analysis shows that the use of technology and real-time data in determining NJOP is still minimal, which causes delays in adjusting land values to current market conditions.

To improve accuracy and transparency in the NJOP system, it is necessary to reform land valuation methods with an evidence-based approach. Using geospatial technology, statistical modelling, and big data analysis can help increase objectivity in determining NJOP more in line with the actual market price. In addition, regular ZNT evaluations and integration of property transaction data from various sources will help create a

fairer tax system. With the implementation of more innovative and real-time data-driven approaches, the NJOP valuation system in Indonesia can be more transparent and credible, thereby promoting fairness in taxation and supporting the sustainable growth of the property sector. Implementation strategies at the regional level also need to be directed at strengthening systems that can absorb data in real-time and ensure the credibility of the information used. The development of an integrated digital dashboard that can be accessed by regional tax authorities, accompanied by periodic verification of field data, will strengthen the accuracy and trust of the NJOP system. Thus, this reform effort is technical and strategic in strengthening fair, participatory, and data-based regional tax governance.

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