

Using Study of *Assessment-Sales Ratio (ASR)* for Estimating of the Potential Loss of Property Tax in the Jakarta Greater Area

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Abstract- Assessment-Sales Ratio (ASR), which is the ratio between NJOP (assessment) of the Market Value, will be used to analyze the performance of NJOP determination, and to test the level of assessment and the level of equity. Assessment performance can be expressed as good performance if it meets the following criteria:

- a. the level of assessment is approaching 100% of the market value, not over-assessment nor under-assessment.
- b. the variability of Coefficient of Dispersion (COD) and Coefficient of Variation (COV) are not exceeded 20% and 25%.
- c. the level of equity is independent, not progressive nor regressive.

This study aims to analyze the performance of NJOP (the Tax Object Sales Value) determination, looking for solution for poor performance as well as propose an appropriate model for measuring the tax potential loss in the Jakarta Greater Area (Jabodetabek).

Based on testing the level of assessment, 13 cities / municipalities across the Jakarta Greater Area (Jabodetabek) are proven by performance of under-assessment, with a central tendency ranged from 0.610 to 0.888. The variability performance of COD, only in 4 (four) municipalities / cities was below 20%, as did the variability of COV only in 4 (four) municipalities / cities was below 25%, whereas the others exceeded that limit. Testing the level of equity proved that in the NJOP determination, 9 cities/municipalities performing regressive, a city performing progressive, and only in 3 municipalities/cities performing independent. For municipalities / cities which are underperforming (poor) need improvement or correction through reappraisal, reassessment or simply by NJOP adjustment.

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With the proposed model, the potential loss of property tax (PBB P2) in 2012 is estimated to Rp1.384 billion or 24.3% of the tax potential which should be at Rp5.698 billion. 14.6% of the tax potential has been lost as a consequence of the application of mass appraisal, while 9.7% of tax potential is lost due to poor performance, including the potential loss due to the opening of the rent-seeking opportunities.

Keyword: *Assessment-Sales Ratio, Tax Object Sales Value (NJOP), Over-assessment, Under-assessment, Progressivity, Regressivity, Land and Building Tax in Rural and Urban.*

JEL Code: H21, H71

INTRODUCTION

Background

In a state, state revenue coming from taxation sector reflects the independence of a nation in terms of state funding. Compared to other sources of revenue such as making loans, state revenue from taxation sector is considered of low-risk state revenue. The development of Indonesian tax-ratio which is the ratio of tax revenue and gross domestic product (GDP) in 2009-2013 has ranged from 11.3% - 12.2%. As it is compared with the other ASEAN countries, it was found that the tax-ratio of Indonesia in 2009 was low. Indonesian tax-ratio was lower than the tax-ratio most of the ASEAN countries, although still considered as higher than Laos (10.8%), Cambodia (8.0%) and Burmese (4.9%).¹

The role of state revenue from taxation sector to the national state budget in 2009 to 2013 has ranged between 72.2% - 76.5%. Despite the increase of income coming from taxation sector in every year, the economic and taxation observers have stated that during this time there has been a leak in tax revenue. According to the International Monetary Fund (IMF), a conservative estimation of the tax potential loss in Indonesia reaches up to 40% (Berdikari Online, March 14, 2012). The unoptimal tax revenue may be caused by under-

¹ Directorate General of Taxes, Report, 12 August 2013.

assessment, tax evasion, tax avoidance, corruption and / or other rent-seeking activities.

Assessment Sales Ratio (ASR) or often known as Assessment Ratio is the ratio between the assessment (assessed value) for indicators of market value of a property². The market value is the representation of the exchange rate or the amount of money that can be obtained, over a property if the property is offered for sale on the (open) market on the valuation date and in accordance with the requirements of condition definition of Market Value³. Tax Object Sale Value (NJOP) or Assessment is a value set by the government for the collection of Property Tax Rural and Urban sectors (PBB P2), as well as taxes / related levies. NJOP constitute Assessed Value or Assessment, which will be compared with the value of the sales transactions that represent fair market value, so that a comparison or ratio of ASR is utilized in the study. ASR is an assessment of performance analysis tools recommended by the International Association of Assessing Officers (IAAO) in order to measure and improve the performance of the property tax assessment based on the market value.

There are some research problems in this study:

- a. Is the performance of NJOP determination in 13 municipalities / cities in the Jakarta Greater Area relatively good or bad?
- b. If the performance of NJOP determination is considered as poor, what are the solutions and how to improve the assessment equity and optimal according to its potential?
- c. How big is the potential loss of tax and what are the causes?

Research Objectives

The objectives of this research are:

- a. To measure the performance of NJOP determination in 13 municipalities / cities in the Jakarta Greater Area or Jabodetabek.
- b. To provide alternative solutions to improve the performance of NJOP determination.
- c. To measure the potential loss of property tax and the recommendations to eliminate the loss.

Research Contributions

This research is expected to provide academic contributions as follows:

1. To provide contributions in order to measure the assessment performance, testing the level of assessment (equal to market value/over/under-assessment) and the level of equity (independent/progressive/regressive) in each municipality / city in the Jakarta Greater Area or Jabodetabek.
2. To provide contribution in broader analysis perspectives in tax determination by employing *Assessment-Sales Ratio* (ASR).
3. To propose opportunity for further studies or analyses by the future prospective researchers, both in taxation sectors as well as property appraisal sectors.

RESEARCH METHOD

Research Setting

The research was conducted in Jakarta, Bogor, Depok, Tangerang and Bekasi (Jabodetabek). Interviews were conducted with the informants, the taxpayers, officers / employees of agencies from taxes (central government and municipality / city) and practitioners (notaries, PPAT and developers) who served and / or are in the Jakarta Greater Area in 2012 and 2013. This study used historical secondary data in the form of Tax Object Sale Value (NJOP) and the sales transactions during the year 2012.

Data Collection

The type of data used in this study was both primary data and secondary data. The primary data were market price information and other information associated with the transfer of property. Primary data was used to test whether the transaction price reported by authorities / associations concerned is the fair market price or unfair, because of association or a special relationship between the seller and the buyer or other possible factors. Secondary data were in the form of assessment (NJOP) and the price of the transfer of the property, they would be used to analyze assessment performance in the Jakarta Greater Area.

Data Analysis

The tool to be used for analyzing of assessment performance is Assessment-Sales Ratio (ASR) Study. ASR is an analytical tool for assessment (NJOP) recommended by the International Association of Assessing Officers (IAAO) to measure and improve the assessment performance based on market value. Good performance of assessment may be identified level of assessment through measures of central tendency (Mean, Median and Weighted Mean) that are approaching to 100% (not over-

² Joseph K. Eckert *et al.* 1990. *Property Appraisal and Assessment Administration*. Chicago: IAAO. pp. 633.

³ Komite Penyusun Standar Penilaian Indonesia (KPSPI). 2007. *Standar Penilaian Indonesia* (SPI). pp.1.

assessment/underassessment), variability (COD and COV) does not exceed reasonable limits, as well as level of equity (independent / progressive / regressive).

The formula for *Assessment Sales Ratio* (A/S) is:

$$A_i/S_i = \text{Assessed Value/Market Value, or}$$

$$A_i/S_i = \text{Assessment/Sale price}^4.$$

In relation to the research concerning in property tax (PBB), the formula can be interpreted as follows:

$$A_i/S_i = \text{NJOP}_{it}/\text{Sale price}_{it}$$

Where:

NJOP = the Tax Object Sales Value or Assessment of *i* in year of *t*.

Sale price = market value represented by reasonable transaction value

The data of properties transfer transactions sorted and selected by seeing reasonable transactions (an arm's length transaction) are not affected by any subjective factors, such as special transactions due to family connections or the sale with the certain requirements. Assessment (NJOP) of the transferred property was collected from relevant agencies, such as municipality / city and / or Tax Office in Jakarta Greater Area. Comparison of assessment (NJOP) and price of property transfer was used for assessment sales ratio study. The assessment performance is generally analyzed by using:

- a. Central tendency: *mean, median* dan *weighted mean*; and
- b. Variabilities; *Coefficient of Variation* (COV) or *Coefficient of Dispersion* (COD).

The next analysis is testing for level of assessment and testing for level of equity, sequently:

- a. Testing the normality of data; *binomial test* or *chi square test*.
- b. Testing the level of assessment; *t-test* or *binomial test*.
- c. Testing the level of equity; *regression analysis* or *Spearman rank test*.

If assessment performance is underperforming, thus the taxation becomes unfair and not optimal. The performance must be improved through a reappraisal / revaluation, reviewing the NJOP determination (reassessment), or simply by NJOP adjusting in order to be fair and tax potentials to be optimal.

FINDINGS AND DISCUSSIONS

Assessment (NJOP) Performance

The performance of assessment (NJOP) determination is generally able to provide primary information for the decision makers in managing Property Tax Rural and Urban sectors.

⁴ IAAO, 2013. *Standard on Ratio Studies*. Chicago: IAAO. pp.39.

Table 1 Central tendency and variabilities of assessment (NJOP) in Municipalities / Cities in the Jakarta Greater Area (Jabodetabek) in 2012

No.	Municipalities / Cities	Sampels (n)	Central Tendencies			Variabilities	
			Mean	Median	W- Mean	COD (%)	COV (%)
1	Central Jakarta	540	0.791	0.804	0.634	26.063	29.965
2	West Jakarta	535	0.782	0.805	0.689	21.337	27.998
3	North Jakarta	612	0.746	0.794	0.651	13.586	21.683
4	East Jakarta	164	0.837	0.868	0.726	29.035	35.799
5	South Jakarta	2,000	0.707	0.766	0.716	34.442	40.679
6	City of Bekasi	1,569	0.853	0.870	0.836	13.810	18.193
7	Municipality of Bekasi	847	0.876	0.883	0.888	25.281	33.153
8	City of Bogor	874	0.804	0.839	0.778	20.232	26.977
9	Municipality of Bogor	3,188	0.679	0.689	0.669	33.026	39.883
10	City of Depok	2,234	0.733	0.816	0.710	21.667	31.339
11	City of South Tangerang	1,432	0.696	0.610	0.620	39.788	45.477
12	City of Tangerang	458	0.729	0.725	0.717	8.771	14.359
13	Municipality of Tangerang	2,776	0.781	0.797	0.729	16.982	22.724

Sources:

1. Local Government/Regency/City, Tax Service Office, Land Service Office and / or PPAT in Jakarta Greater Area (compiled and processed), August 2013.
2. Appendix .

The faster the performance is generally known, the sooner appraisers could evaluate, and the sooner policy makers decide the solution to improve the performance of NJOP determination. Assessment performance can be evaluated by descriptive statistics as well as recommended standards on ratio studies published by IAAO (2013). Central tendency and assessment variability presented in Table 1 is the transaction data of transfer of property that is relatively fair/reasonable after trimming outliers conduct in accordance with the Standard on Ratio Studies published by the IAAO.

The performance of NJOP determination indicates that the central tendency; mean (0.876 to 0.679), median (0.610 to 0.868), and the weighted mean (0.620 to 0.888). Variability performance in COD, 4 (four) municipalities / cities are below 20% and 9 (nine) municipalities / cities are over 20%, as

well as variability performance in COV, 4 (four) municipalities / cities is below 25% and 9 (nine) municipalities / cities is over 25%.

Testing for assessment (NJOP) Performance

Assessment Sales Ratio (ASR) which is the NJOP ratio of the selling price of fair transactions should be tested first of which whether or not the data is normally distributed. Under the normality test, only the City of Tangerang that has normally distributed data, while ASR data distributions in other 12 municipalities / cities is not normal. Henceforth, testing for assessment (NJOP) level as well as testing for the level of equity in 12 municipalities / cities will use a non-parametric test, whereas the data for ASR in the city of Tangerang will use parametric test.

Table 2 Testing for assessment level and assessment (NJOP) fairness in municipalities / cities in the Jakarta Greater Area (Jabodetabek) in 2012

No	Municipalities / cities	Data (n)	Binomial test (median = 1) [t-test (Mean=1)]		Spearman Rank Test ¹ [Regression Analysis]		
			z-value (t-value)	Under/Over- Assessment	t-value	Progressive / Regressive / Independent	
1	Central Jakarta	540	(9.941)	Under Ass	(4.839)	***	Regressive
2	West Jakarta	535	(18.245)	Under Ass	(11.129)	***	Regressive
3	North Jakarta	612	(23.324)	Under Ass	(9.337)	***	Regressive
4	East Jakarta	164	(4.919)	Under Ass	(6.333)	***	Regressive
5	South Jakarta	2,000	(26.587)	Under Ass	(1.039)		Independent

6	City of Bekasi	1,569	(31.305)	Under Ass	(12.361)	***	Regressive
7	Municipality of Bekasi	847	(11.545)	Under Ass	(4.687)	***	Regressive
8	City of Bogor	874	(24.388)	Under Ass	(4.180)	***	Regressive
9	Municipality of Bogor	3,188	(47.200)	Under Ass	(0.121)		Independent
10	City of Depok	2,234	(44.874)	Under Ass	4.764	***	Progressive
11	City of South Tangerang	1,432	(23.968)	Under Ass	(14.011)	***	Regressive
12	City of Tangerang ²	458	(39.381)	Under Ass	(1.242)		Independent
13	Municipality of Tangerang	2,776	(42.496)	Under Ass	(15.503)	***	Regressive

Notes:

¹ *Two tailed test*. Asterics show significantly at ***0.001, **0.01, *0.05

² Data in the City of Tangerang was normally distributed, thus the *parametric test* was employed

Sources:

Local Government/Municipality/City, Tax Service Office, Land Service Office and / or PPAT in Jakarta Greater Area (compiled and processed), August 2013

Testing proved that the level of assessment (NJOP) to market value in 13 municipalities / cities in the Jakarta Greater Area performed under-assessment, because the z-value or t-value exceeded ± 1.96 . Table 2 shows that the level of assessment in Jabodetabek was proven to perform under-assessment.

Table 2 shows that the ASR in the 9 (nine) municipalities / cities proved to be regressive, 1 (one) city was progressive, and 3 (three) municipalities / cities proved to be independent. Assessment regressivity is high-valued properties are assessed with lower assessment ratios than low-valued properties; otherwise if assessment progressivity, it means that high-valued properties are assessed with higher assessment ratios than low-valued properties.

Improving the performance of assessment (NJOP)

From the 13 municipalities / cities in the Jakarta Greater Area where the area for the research, it was only the city of Tangerang that has ASR data which is normally distributed. The data which are not normally distributed should only be tested with non-parametric test; otherwise if the data are normally distributed can be tested both parametric test and non-parametric test. In order to provide accurate and uniform recommendations, then the picture of the performance of ASR in uniform for all municipalities / cities in the Jakarta Greater Area need to be recapitulated by measure and non-parametric tests; median, COD, the level of assessment and level of equity as the table below.

Table 3 Recapitulation of assessment performance based on data and non-parametric test as well as recommendation for follow-up of NJOP correction in the Jakarta Greater Area (Jabodetabek) in 2012

No.	Kabupaten/ Kota	Median	COD	Binomial test (median = 1) <i>Under/over/neutral Assessment</i>	Progressive / Regressive / Independent	NJOP correction	
						Reassessment/ Reappraisal	Unfairness Adjusting
1	Central Jakarta	0.804	26.063	<i>Under Assessment</i>	Regressive	Reappraisal	<i>Adjusting</i>
2	West Jakarta	0.805	21.337	<i>Under Assessment</i>	Regressive	Reappraisal	<i>Adjusting</i>
3	North Jakarta	0.794	13.586	<i>Under Assessment</i>	Regressive	<i>Reassessment</i>	<i>Adjusting</i>
4	East Jakarta	0.868	29.035	<i>Under Assessment</i>	Regressive	<i>Reappraisal</i>	<i>Adjusting</i>
5	South Jakarta	0.766	34.442	<i>Under Assessment</i>	<i>Independent</i>	<i>Reappraisal</i>	-
6	City of Bekasi	0.870	13.810	<i>Under Assessment</i>	Regressive	-	<i>Adjusting</i>
7	Municipality of Bekasi	0.883	25.281	<i>Under Assessment</i>	Regressive	<i>Reappraisal</i>	<i>Adjusting</i>
8	City of Bogor	0.839	20.232	<i>Under Assessment</i>	Regressive	<i>Reappraisal</i>	<i>Adjusting</i>
9	Municipality of Bogor	0.689	33.026	<i>Under Assessment</i>	<i>Independent</i>	<i>Reappraisal</i>	-
10	City of Depok	0.816	21.667	<i>Under Assessment</i>	Progressive	<i>Reappraisal</i>	<i>Adjusting</i>
11	City of South Tangerang	0.610	39.788	<i>Under Assessment</i>	Regressive	<i>Reappraisal</i>	<i>Adjusting</i>
12	City of Tangerang	0.725	8.771	<i>Under Assessment</i>	<i>Independent</i>	<i>Reassessment</i>	-

13	Municipality of Tangerang	0.797	16.982	<i>Under Assessment</i>	Regressive	<i>Reassessment</i>	<i>Adjusting</i>
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Sources: Local Government/Regency/City, Tax Service Office, Land Service Office and / or PPAT in Jabodetabek (compiled and processed), August 2013

Based on the data presented on the Table 3 above, there are some follow-up steps in order to improvement or correction for performance of NJOP determinations in the short term as follows:

1. Reappraisal; through data collection activities in the area of the property that has variability beyond the specified tolerance. IAAO (2013) recommends reassessment activities (or in other word is reappraisal) in the region that has exceeded the 15% of COD and / or COV exceeds 20%. Regarding that Indonesia uses mass appraisal and NJOP classification of land in 100 classess and buildings in 40 classes, the limits of acceptable variability was 20% for COD and / or 25% for COV. Reappraisal, at once, can fix the central tendencies; mean and / or median.
2. Reassessment; appraisal activities that do not have to perform data collection as reappraisal, but it is enough through verification on a number of specific properties or certain areas based on the needs. This activity aims to improve / increase NJOP in mass, and at the same time it also increases central tendency of ASR; mean and median, so that taxes can be levied as optimum as possible. Optimum mean and median were around 85%-100%. If it is less than 85%, it can be concluded that the tax potential will be lost; otherwise if it is equal to or exceeds 100%, it is believed to increase the number of taxpayers who will submit an objection.
3. Adjusting for inequity; the adjustment activity to the inequity of NJOP determination in the short term, in order to be fair and does not lead to performance become regressive or progressive.

Model and estimations for the loss of tax potentials

In order to reveal the loss of the tax potentials, the curve below will illustrate the central tendency (A/S mean) and the unfair line in determining the NJOP / assessment (independent / progressive / regressive).

Illustration of analysis curve of the performance of NJOP determination; the last year was under-performance, while the current year's performance is poor.

NJOP_{t-1} : Last year's performance was under-performance;

A/S_{mean} > 0.85 and < 1.00 (good), but the level of equity is regressive (poor).

NJOP_t : Current year's performance is poor;

A/S_{mean} < 0.85 (poor), and the level of equity is regressive (poor)

A-D = If assessment (NJOP) is equal to 100% from market value of property

NJOP_{t-1} = Last year's performance is under-performing (less good).

B-E = Under-performing (less properly) performance, A/S_{mean} > 0.85, and

The level of equity is regressive

NJOP_t = Current year's NJOP

C-F = Poor performance, A/S_{mean} < 0.85 (*under-assessment*) and

the level of equity is regressive

An overview of space of property tax potency, potential loss, and the rest of the property value for the base of tax calculation in the current year (year-t).

Room ADHG = Total of property value property potentials that are supposed to be bases to determine property tax (PBB P2).

Room CFHG = Total of property value potentials that are used as main calculation for property tax (PBB P2) determination in the current year

Room ADJIB = The decrease of property value as the basis of the loss of property tax (PBB P2) potency , as the consequence of the utilization of mass appraisal method.

Room BIJFC = The reduced property values as the basis for the calculation of the loss of property tax (PBB P2) potency, due to:

a. poor management, in example updating data and value (NJOP) is not fulfilled and/or not properly scheduled.

b. The restrictions of value (NJOP) increase, because considering the ability of the community which is still low, rent seeking in property tax assessment, and/or rent seeking for political support.

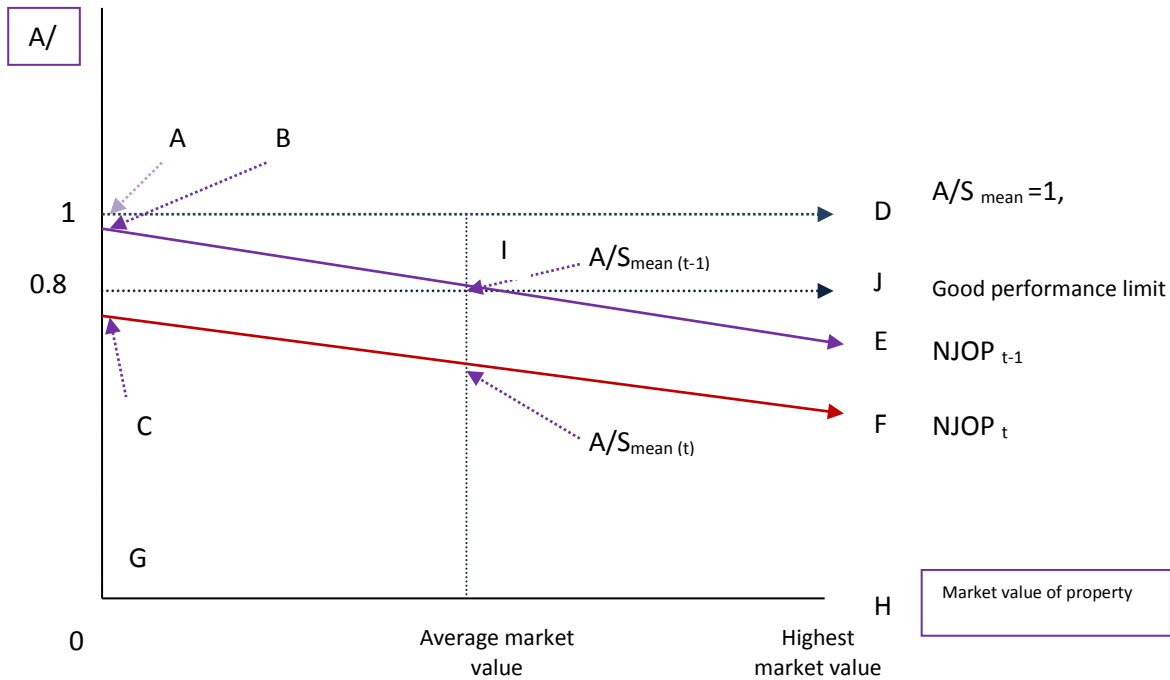


Figure 1 Illustration of the assessment (NJOP) performance from “under-performing” to “poor”

Model to estimate the loss of property tax potentials (PL-PT) in one tax-year can be calculated by using the following formula:

$$\text{PL-PT} = [(1 - A/S_{\text{mean}}) / A/S_{\text{mean}}] \times \text{Total Property Tax Assessment}$$

where:

PL-PT = the potential loss of Property Tax, Rural and Urban sectors

A/S_{mean} = mean or average of Assessment Sales Ratio (ASR). Total Property Tax Assessment

= The property tax assessment in a fiscal year (current year) that can be billed to taxpayers and becomes income (tax revenue) for local and state budget.

The potential loss of property tax was due to the consequences of the application of mass appraisal, approximately of 15%, while the rest because of mismanagement; updating data and

NJOP which not optimal, and restrictions/limiting of increasing NJOP including rent-seeking. Restrictions to the rise of NJOP was due to some considerations, the ability of society to pay taxes was still low, smuggling tax payment, as well as limiting the assessment (NJOP) increase indirectly contains elements of political support in the local elections.

The loss of total potency of property tax (PBB) was estimated at Rp1,384 billion or 24.3% of the number that should be collected in 2012 in the Jakarta Greater Area of Rp5,698 billion. The loss of this potential can be broken down by cause, i.e. the consequences of the application of mass appraisal which reduces the potential for around Rp833 billion or 14.6% of the total property tax, while the rest because of mismanagement, delaying in the data and NJOP update as well as restriction/limiting the assessment (NJOP) increase including rent-seeking, resulting in a potential loss of around Rp 551 billion or 9.7% of the total property tax in 2012. (Appendix 1).

CONCLUSION AND RECOMMENDATIONS

Conclusion

1. Based on the results of testing the level of assessment for 13 (thirteen) municipalities / cities across the Jakarta Greater Area or Jabodetabek were proven performing in under-assessment, with *t-values* was below (-1.96) as

well as the central tendency ranged from 0.610 to 0.888. If the determination of (NJOP) assessment performing under-assessment, the tax potential that will be received become not optimum.

2. Variability performance of COD was only in 4 (four) municipalities / cities which was still below 20%, as well as the variability of COV only in 4 (four) municipalities / cities below 25%. Variability in the NJOP determination in 9 (nine) municipalities / cities are relatively high and indicates that assessment performance was (horizontal) inequity. Based on the result of testing the level of equity, assessment performance in 9 (nine) municipalities / cities performing in regressive, 3 (three) municipalities / cities performing independent, and a municipality/city, the city of Depok, performing in progressive. Therefore, determination of (NJOP) assessment in 10 (ten) municipalities / cities proved to be (vertical) inequity/unfair (progressive or regressive).
3. Revenue of property tax, rural and urban sectors is not optimal or there have been some losses on the potentials were due to following causes:
 - a. The consequence of using mass appraisal method.
 - b. Classification of NJOP in 100 classes for land and 40 classes for buildings.
 - c. The constraint of human resources as well as funding/money for updating data and NJOP regularly.
 - d. The limitation of the increase of assessment (NJOP) due to considering the community's ability to pay taxes is still low.
4. The constraint of human resources and funds for updating data or NJOP become one of the reason why Indonesia does not use individual valuation method, but using mass appraisal method. As the consequence of the use of mass appraisal method, the performance of NJOP is considered good if central tendency A/S_{median} or A/S_{mean} reaches 85-95% of its market value. Thus, if the central tendency is lower than 85%, then assessment performance of central tendency needs to be improved in order to reach 85-95%. Central tendency that is equal to 100% is not the target to be achieved by mass appraisal, even if it reaches 100% of the market value, the taxpayers will certainly raise objections and are reluctant to pay taxes, so would complicate the management of the property tax (PBB P2).

5. Model for estimating the loss of property tax potentials (PL-PT) in one tax-year can be calculated by using the following formula:

$$PL-PT = [(1 - A/S_{mean})/A/S_{mean}] \times \text{Total Property Tax Assessment}$$
 The loss of total potency of property tax (PBB) was estimated at Rp1,384 billion or 24.3% of the number that should be collected in 2012 in the Jakarta Greater Area of Rp5,698 billion.

Recommendations

In order to obtain good performance of (NJOP) assessment, and the potentials are optimal as well as equity/fair taxation, there are some recommendations as follows:

1. Property tax (PBB P2) business, needs to measure the performance of assessment (NJOP) determination with Assessment Sales Ratio Study (ARS) should be scheduled / routine at least once a year, in order to map the performance earlier, so that corrective action can be done as soon as possible. It will be more effective, if measuring of assessment performance and the balance of the NJOP inter-municipalities / cities conducted by the provincial government. The application of performance measurement is needed to help the assessors speed up the task as well as time efficiency in monitoring the performance and speed up corrective action; through reappraisal, reassessment, or adjusting of inequity assessment.
2. Updating data and NJOP should be conducted on an ongoing basis, to be able to support the increase of tax potential, while reducing the potential loss of tax including minimizing rent-seeking.
3. Need to review some management policies after decentralization of property tax from central taxes to local taxes.
 - a. To minimize the potential loss of tax assessment as a consequence of mass appraisal, then the potential tax objects need to be appraised by the individual appraisal, in order to be closer to the market value.
 - b. To minimize dispersion (COD and COV), the classification grade of the land and buildings is outlined more details/smaller, from 100 to 200 classes of the land, and from 40 to 80 classes of the building,
 - c. Considering the community's ability to pay taxes is still low, then to reduce the burden on the community, reduction policy needs to be given for tax payers who could not afford, rather than restriction/minimizing of the increase assessment (NJOP).

4. The model estimated loss of property tax potential and map of assessment performance need to be optimized for management policies, such as schedule of updating data/NJOP.

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