Determinants of Tax Revenue: An Analysis Using Panel Data

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Abstract: This study aims to assess the Factors Influencing the Local Tax Revenue of 4 Cities in South Sumatra Province of Indonesia by using panel data of 4 Cities in South Sumatra Province of the year 2008-2001. The analytical method used a descriptive analysis and data panel regression analysis with Random Effects Model (REM). The Results of this study were (1) Number of Hotels, Number of Restaurants, and Gross Regional Domestic Product (GRDP) Positively And Significantly affected to Local Tax Revenue of Cities in South Sumatra province.; (2) Overall variation variables of Hotel Numbers, Restaurant Numbers and Gross Domestic Product (GDP) could explain how the local tax revenue in the 4 cities of South Sumatra Province reached to 89.7 percent.

Keywords: Local Tax Revenue, Number of Hotel, Number of Restaurants, and Gross Regional Domestic Product (GRDP).

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I. Introduction

South Sumatra Province of Indonesia comprises 13 Regencies with its own Capital Cities. The regencies are OganKomeringUlu, OganKomeringIlir, MuaraEnim, Lahat, MusiRawas, MusiBanyuasin, Banyuasin, South OKU, East OKU, OganIlir, EmpatLawang, Pali, and MusiRawas Utara. The 4 major cities among the regencies are Palembang, Prabumulih, Pagaralam, and LubukLinggau. This study examined only the city areas, for Hotels and Restaurants have grown in these cities.

Palembang is one of the cities transforming to a metropolitan city. Some developments of construction have been progressing such as newly constructed flyovers, underpasses, toll roads, LRT, Musi IV and VI bridges, and others. The developments have generally been funded by the Central Government, which means the fund was a part of National Budget. Meanwhile, other developments might be funded by Local Government, which means that the development was funded by the Local Government Budget.

Prabumulih has been under construction development phase, including the widening of the General Sudirman road which cost around 105 billion rupiah, the normalization of the Kelekar river which required 140 billion rupiah, the construction of the PatihGaluh Flyover which required to 170 billion rupiah (http://tribunsumsel.com, November 2018). Therefore, a billion – rupiah -development fund was gained from large amount of local government tax revenue.

Pagaralam is also one of the cities in South Sumatra Province. At the moment, Pagaralam has been carrying out the infrastructure developments such as the development of Tourismlodging and facilities, Sports Building (GOR), Rusunawas well as maintenances of bridges and roads. To realize the development and maintances, of course, required a significant amount of funds, and the source of these funds had come from the PAD (Local Government Revenue), where the biggest contribution was from the Regional Tax.

The next city is LubukLinggau. At the moment, LubukLinggau has been pushing the wheels of developments such as infrastructure development, trade, health, and tourism. One of the developments has currently undergone is the construction of a large and magnificent mosque, namely As Salam Mosque, Infrastructure development of Bukit Sulap Market and SimpangPeriuk Market. Development of the tourism sector is mainly to beautify and equip tourist attraction facilities such as the Hill of Magic, the Colorful Village, Temam Waterfall, and so on.
Based on Figure 1, it can be explained that the level of Local Tax targets in the cities of Palembang, Prabumulih, Pagaralam, and Lubuk Linggau for the period 2008-2017 used to increased, but the realization of their achievements experienced quite various fluctuations.

Hotel and Restaurant Tax are 2 (two) components forming Regional Tax in addition to other taxes. The size of the hotel and restaurant tax highly depended on how many hotels and restaurants were. So many hotels and restaurants will also affect how much hotel and restaurant tax will be generated. Furthermore, the sizes of the hotel and restaurant tax also affect the Local Tax. It illustrates that the number of hotels and restaurants also had an influence on the receipt of Local Taxes. The development of Hotels and Restaurants in each city was different, specifically for the city of Palembang, the number of Hotels and Restaurants had experienced quite rapid growth as well as Pagaralam that had experienced quite good growth, but the city of Prabumulih, the growth of Hotels and Restaurants had fluctuated. Meanwhile, Lubuk Linggau experienced the development of the hotel up and down, but the development of the restaurant was quite good.

The development of the number of Hotels and the number of Restaurants in each city in the Province of South Sumatra can be described as in Figure 2 below:

Figure 1: Target and Achievement of Local Taxes in the 4 cities of South Sumatera Province.
Source: Central Statistic Board, 2018

Figure 2: Numbers of Hotels and restaurants in the 4 Cities of South Sumatera Province.
Source: Central Statistic Board, 2018
Some researchers have conducted researches on the factors that influence Local Taxes, but there is still no agreement among researchers, what factors actually affect Local Taxes, and whether these factors have a significant effect on Local Taxes. Such as Djupiansyah’s research (2014), explained that the GRDP, the number of tourists, the number of hotels, and the number of residents had a significant effect on Local Tax Revenues. Aditia et al. (2014), explained that GRDP, population, number of tourists, number of hotels, number of restaurants had a significant effect on Local Taxes. Arshad (2016), got the results that the population, GRDP, number of hotels and the number of restaurants had a significant effect on Local Taxes.

Anatomy (2016), explained that the GRDP and the number of residents and the number of restaurants had a significant effect on Regional Taxes, while inflation is not significant on Regional Taxes. Anggit (2016), explained that the number of tourists, the number of hotels, and the number of restaurants had a significant effect on local tax revenues, while the number of industries was not significant. Yohanet. al. (2016), explained that the population and GRDP had a positive and significant effect on Regional Tax revenue, and inflation had a negative effect on Regional Tax revenue.

Devian (2016), explained that the GRDP, the number of tourist attractions, the number of hotels and the number of restaurants had a significant positive effect on Regional Taxes, while the inflation and population density variables had a non-significant negative effect on Regional Taxes. Deden (2017), explains that hotel tax and entertainment tax have a significant influence with a positive direction on local tax revenue. Zaimul and Ronny (2017) explained that: Hotel Tax, Restaurant Tax, and Entertainment Tax had a positive and significant effect on Local Revenue.

Denny et al. (2018), explained that the population, GRDP and inflation had a positive and significant effect on regional tax revenues. Nabila and Herry (2018), got the results: (1) They did not find any significantly positive effect on hotel tax collection on the increase of Medan’s original income, and (2) hotel tax collection had a significant effect on the increase in Medan’s original income.

Based on the results of studies mentioned above, it can be explained that there are many factors that can affect the Local Tax revenue, including: GRDP, hotel taxes, restaurant taxes, entertainment taxes, inflation rates, population, number of tourists, number of hotels, number of restaurants, and number of trading business licenses.

II. Literature Review

Neway G.et al. (2018), Determinants of Tax Revenue in Ethiopia. The purpose of this study was to identify the determinants of tax revenue in Ethiopia using data and several secondary regression model variables using the OLS method. A quantitative research method was using series of data for 1999-2016. Descriptive and econometric statistical tests were used to analyze and present data collected from the relevant institutions. The findings of this study revealed that: the industrial sector, GRDP, per capita income and trade openness had a positive and significant effect on tax revenue. While the agricultural sector on GDP and annual inflation had a significant and negative effect on tax revenue.

Corrado P. and Alberto Z. (2013), The Determinants of Local Tax Settings Under Reform: Evidence from the Italian Municipal Property Tax. This study examines the determinants of tax regulation by local governments. In particular the focus is on municipal property taxes on real estate in Italy in 2012. A cross-sectional data was set in all Italian cities. This study showed that the institutional profile of reforms had a significant effect on city government taxes.

Feiyang C. (2017), Local Tax Scale and Its Economic Effect in China. As the most important part of regional income, the scale of local taxes would have been an impact on the local economy. This paper took 343 cities in China as objects of research, making empirical studies of the impact of local taxes on economic growth. From the perspective of regional development, local taxes had a significant effect on economic growth.

John et. al. (2016), Regional Economic Integration and Tax Revenue: East African Community. Empirical research had been able to determine whether regional integration was improving or hampering tax mobilization. The data used was for the period 1980-2014, which estimated the tax model. The results of the study explained that regional integration had a significant impact on tax revenue.

A.G. Awan and A. Hannan (2014), The Determinants of Tax Evasion in Pakistan: A Case Study of Southern Punjab. The purpose of this study was to investigate the determinants (causes) of tax evasion in Pakistan from the perspective of taxpayers and taxpayers. In order to record the views of both the taxpayer and tax collector the author had collected data from 150 respondents through a questionnaire. Data were analyzed through statistical techniques. The results proved that the six main causes of unproductive expenditure / misuse of funds in tax collection, namely anti-tax culture, corrupt tax administration, high tax rates, complex tax systems, amnesty and incentives for taxpayers.

Bismark A. and Dominic D. (2016), Determinants of Tax Avoidance: Empirical Evidence from Ghana. The purpose of this study was for the adverse factors in tax fraud in Ghana. In coming out with such factors, this study used several regression techniques and factor analysis. Empirical results obtained from the analysis.
revealed taxation and fiscal, demographic, administrative and economic factors were the main factors that had a significant effect on tax evasion.

Entela V. and Liambi P. (2014), Tax Revenue - Determinants - Albania's Case. The purpose of this paper was to analyze the factors that determine tax revenue collected by the government. The variables issued were GDP, distribution, tax, payment, and import. Data sources were obtained from the Ministry of Finance, INSTAT, World Bank, and others. The results of the study proved the effects of GDP, donations, taxes, coverage and significant interest to local taxes.

Jaime V. and Anabel Z. (2017), Local Government Tax Efforts and Determinants: The Spanish Case. The purpose of this study was to try out local taxes and their determinants. The results showed that the Regional Government was quite responsible for tax collection on average between 72-85 percent, most Local Governments could increase taxes and used it more intensively, and increased the efficiency of tax collection.

Fasina H.T. (2016), Empirical Investigation of Determining Value Added Tax (VAT) in SouthWestern Nigeria. This study discussed the determinants of Value Added Tax (VAT) in West Nigeria and its effects on state income. The Panel Method was used for a period of ten (10) years, using a random sampling method, so that the sample used was 356 respondents. The results of research on VAT had a positive and significant effect on the country, increasing industrialization, increasing VAT, a negative amount, but significant to VAT Revenue.

Gulcin T. (2017), The Effects of Economic Growth and Direct Taxes on Tax Burden in OECD Countries. The purpose of this study was to analyze the effect of economic growth and direct tax on the tax burden in OECD countries from 2008 to 2014. Among the variables used in this study: economic growth was associated with annual GDP growth rates. Direct taxes were paid directly by individual or corporate taxpayers, including real property taxes, personal property taxes, income taxes or taxes on assets. Tax expense was defined as the ratio of tax revenue to GDP and referred to mandatory transfers to the central government. The panel regression method was used to analyze the relationship between variables. The results showed that direct taxation and economic growth had a positive and significant effect on the tax burden.

III. Methodology

This study examines the factors that influence Local Tax, including the number of Hotels, Number of Restaurants, and GRDP in cities of South Sumatra Province. They are Palembang, Prabumulih, Pagaralam, and LubukLinggau. Meanwhile, data on Regional Taxes, Number of Hotels, Number of Restaurants, and GRDP were taken from the period of 2008-2017.

Based on previous research, with tax revenue as the various social and economic variables. Then the researcher tried to integrate these variables in the equation model as follows:

\[ PD_{it} = α + β_1 H_{it} + β_2 R_{it} + β_3 PDRB_{it} + e_{it} \]

Keterangan:

- \( PD \) = Local taxes
- \( α \) = Constanta valore
- \( β_1 - β_3 \) = Regression Coefisien
- \( H \) = Number of Hotels
- \( R \) = Number of Restorants
- \( PDRB \) = ProductDomestikof Regional Bruto
- \( i \) = Local
- \( t \) = Year
- \( e \) = Error Term

There are several types of models that can be estimated with panel data. However, the most common are Pooled Regression model, Fixed Effect model, Random Effect model. In order to decide the model to be estimated, we performed the Breusch test -Pagan Lagrange multiply (LM) for random effects, the Hausman test was chosen if we usedFixed or Random effect model and the test of heteroscedasticity. The Hausman test was a useful device for determining the specification of the common effects model. The other essential ingredient for the test was the covariance matrix of the difference vector \([β-β]\) (Greene, 2012).

IV. Results

The choice of final model of this research was based on Chow test. HausmanandLagrange Multiplier (LM) tests showed that there were some differences among the tests. The best model determination was made from the result of statistical test. In general, the result of statistical determination said that the best model to statistically interpereate the analytical result was by Random effect Model.
### Tabel 4.8
The result of estimated regression by using Random Effect Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>11.42121</td>
<td>2.837927</td>
<td>4.024490</td>
<td>0.0003</td>
</tr>
<tr>
<td>LNJIH?</td>
<td>0.942515</td>
<td>0.191669</td>
<td>4.917419</td>
<td>0.0000</td>
</tr>
<tr>
<td>LNJR?</td>
<td>0.275256</td>
<td>0.098406</td>
<td>2.797146</td>
<td>0.0082</td>
</tr>
<tr>
<td>LNPDRB?</td>
<td>0.343870</td>
<td>0.165873</td>
<td>2.073091</td>
<td>0.0454</td>
</tr>
<tr>
<td>Random Effect (Cross)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>_PALEMBANG–C</td>
<td>-0.037854</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>_PRABUMULIH–C</td>
<td>-0.007458</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>_PAGARALAM–C</td>
<td>-0.001130</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>_LUBUKLINGGAU-C</td>
<td>0.046442</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Effects Specification

<table>
<thead>
<tr>
<th>S.D.</th>
<th>Rho</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section random</td>
<td>0.094283</td>
</tr>
<tr>
<td>Idiosyncratic random</td>
<td>0.516908</td>
</tr>
</tbody>
</table>

Weighted Statistics

| R-squared | Mean dependent var | 0.897279 | 20.52350 |
| Adjusted R-squared | S.D. dependent var | 0.888719 | 1.548239 |
| S.E. of regression | Sum squared resid | 0.516473 | 9.602811 |
| F-statistic | Durbin-Watson stat | 104.8218 | 0.354445 |
| Prob(F-statistic) |        | 0.000000 |        |

Unweighted Statistics

| R-squared | Mean dependent var | 0.916552 | 23.69281 |
| Sum squared resid | Durbin-Watson stat | 9.748887 | 0.349134 |

Sumber: Olahan Data, 2019

Based on the equation of the regression results above, it can be analyzed the effect of each independent variable on the dependent variable. The number of hotels, the number of restaurants and taxes has a positive effect on local taxes.

\[
	ext{LNPD} = 11.42121 + 0.942515 \times \text{LNJIH} + 0.275256 \times \text{LNJR} + 0.343870 \times \text{LNPDRB}
\]

The influence of Restaurant numbers toward local government tax revenue

The results of the study indicate that the number of restaurants has a positive effect on local tax revenue. In general, it can be interpreted that any increase in the number of restaurants will directly affect the increase of regional tax revenue. This condition is due to the number of restaurants which become a component of restaurant taxes, the more restaurants grow, the more tax revenue of local government from restaurant taxes will be collected.

This is regulated in the local government regulation of Perda No. 28 of 2009 Article 3 which stipulates that the tax subject is an individual or entity that makes payments to restaurants / restaurants, cafes, bars. Meanwhile the compulsory restaurant tax according to Perda No. 28 of 2009 Article 4 is that taxpayers are individuals or entities that run restaurants / restaurants, cafes, bars.

### V. Conclusion and Recommendation

#### Conclusion
1) In total, The number of Hotels, Restaurants, and Gross Regional Domestic Product (GRDP) has a significant effect on local tax revenue in the 4 cities of South Sumatra Province.
2) Partially, the number of Hotels, Restaurants, and Gross Regional Domestic Product (GRDP) has a positive and significant effect on regional tax revenue in the 4 cities of South Sumatra Province.
3) Coefficient R2 shows that the variation in the variable Number of Hotels, Restaurants, and Gross Regional Domestic Product (GRDP) can explain local tax revenue in the 4 cities of South Sumatra Province by 89.7 percent.

Recommendation
1) The results show that the number of hotels and restaurants has a positive and significant effect. It is recommended that government encourage the growth of restaurant and hotel investment in order to increase local tax revenue.
2) In addition to encouraging hotel and restaurant investment growth, it is hoped that the government will try to improve the distribution of the hotel and restaurant, trade business and to increase GRDP in all economic sectors in order to trigger the growth of regional tax revenue.

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