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THE EFFECT OF POPULATION SIZE AND NUMBER OF MOTOR VEHICLES ON LOCAL TAX REVENUE WITH GRDP AS A MODERATING VARIABLE

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Abstract
Local taxes play a crucial role in advancing a region. Besides financing local government expenditures, local taxes also enable regional governments to create greater fiscal autonomy, providing flexibility in fund allocation. However, the contribution of local taxes to regional revenue remains relatively small, at only 38%. Therefore, it is essential to identify factors influencing local tax revenues across all provinces in Indonesia to optimize local tax revenue. This research employs linear regression with generalized least square (GLS). The results indicate that the population size, the number of motorized vehicles, Gross Regional Domestic Product (GRDP), interaction between population size and GRDP, and interaction between the number of motor vehicles and GRDP, have a significant effect on local tax revenues simultaneously. However, partially, the population size does not affect local tax revenues. On the other hand, the number of motor vehicles and GRDP positively influence local tax revenues. Furthermore, the moderation regression analysis reveals that GRDP strengthens the influence of the population size on local tax revenues. Conversely, the interaction between GRDP and the number of motor vehicles shows that GRDP weakens the positive effect of the number of motor vehicles on local tax revenues
Keywords: Local tax revenue, Population size, Number of motor vehicles, GRDP

INTRODUCTION

The local tax plays a crucial role in advancing the respective region. Local taxes are the primary source of income for local governments to finance regional development (BPPKAD, 2014). The collected taxes become the backbone of progress and prosperity in a region. Through local taxes, local governments can gather funds to support infrastructure development, healthcare, education, and various other social programs aimed at improving the quality of life for the local population. Without local taxes, local governments would struggle to provide the facilities and services needed by the community, which could hinder growth and quality of life in that area.

Local taxes are a manifestation of fiscal decentralization policies implemented by the central government (Tommy, 2021). They also enable local governments to achieve greater fiscal autonomy, providing flexibility in fund allocation. With greater fiscal autonomy, local governments can make more precise decisions regarding budget allocation and management, aligning them with the priorities and needs of the local population. This fiscal autonomy allows local governments to respond quickly to changing circumstances and local needs without fully relying on funds from the central government.

Furthermore, local taxes can help reduce regional disparities and promote regional economic growth. Local governments can allocate revenue from local taxes to support the development of underdeveloped areas within the region, thereby creating equality among different areas within the region. The revenue from local taxes can also be invested in strategic and leading economic sectors. By supporting these sectors, it can accelerate economic growth in the region, create job opportunities, and enhance the purchasing power of the population..

Table 1. Provincial Government Revenues throughout Indonesia

TYPE OF INCOME	REALIZATION (Billion)	CONTRIBUTION (%)
	2021	2021
1. Locally-Generated Revenue	**166,453**	**46.47**

a. Local Tax	138,853	38.76
b. Local Retribution	1,360	0.38
c. Regional Wealth Managemen	3,897	1.09
d. Other LGR	22,343	6.24
2. Transfer Income	**189,279**	**52.84**
a. Central Goverment Transfers	189,224	52.82
b. Interregional Transfers	55	0.02
3. Other Legal Income	**2,487**	**0.69**
TOTAL	**358,219**	**100.00**

Source: (BPS, 2023)

Although local taxes are crucial, unfortunately, their contribution to regional revenue is relatively small, accounting for only 38%. Meanwhile, income derived from central government transfers reaches 53%. This means that the majority of provincial government revenue comes from the central government. This indicates that the exploration of local tax potential at the provincial level is still not optimal. Therefore, local taxes are an attractive subject for further research in order to maximize their potential and make a more significant contribution to regional income. This study will discuss the factors influencing local taxes, namely population size, the number of motor vehicles, and Gross Regional Domestic Product (GRDP).

The population size is one of the significant factors in a region's economy. Areas with a larger population tend to be more developed, resulting in higher local tax revenues. Research conducted by Yusuf (2022) in Malang Raya, consisting of three cities/districts, namely Malang City, Malang District, and Batu City, showed that the population size has a positive impact on local tax revenue. However, different results were shown by other studies, such as the one conducted by Gunawan et al. (2020), which stated that the population size has a negative effect on tax revenue. Another study by Sari & Ilyas (2016) indicated that the population size has no influence on local tax revenue. These three results highlight the inconsistency in research findings regarding the impact of population size on tax revenue.

Another factor that can affect local tax revenue is Gross Regional Domestic Product (GRDP). Research conducted by Lumy et al. (2018) showed that GRDP has a positive impact on local tax revenue in North Sulawesi. The same results were also found by Yusuf (2022) and Sari & Ilyas (2016). However, different results were reported by Helti (2010) in Karanganyar District and Gunawan et al. (2020) in the former Surakarta Residency, stating that GRDP does not affect local tax revenue. In other words, there is still inconsistency in research findings regarding the impact of GRDP on tax revenue.

The inconsistency in the results of these two factors is the reason for the researchers to conduct further investigations into the influence of these factors on local tax revenue. This study will encompass all provinces in Indonesia that have not previously been studied concerning the factors influencing their local tax revenue. Additionally, the study will examine the impact of the number of motor vehicles on local tax revenue. Moreover, GRDP will not only serve as an independent variable but also as a moderating variable. Previous research has not combined the impact of these three variables, along with GRDP as a moderating variable, on tax revenue, making it an intriguing area for further study.

Based on the background outlined above, the objectives of this research are to analyze how and to what extent the population size, the number of motor vehicles, and Gross Regional Domestic Product (GRDP) influence local tax revenue across all provinces in Indonesia during the period of 2018-2020. This study also aims to examine how GRDP moderates the impact of the population size and the number of motor vehicles on local tax revenue. The hope is that this

research can serve as a foundation for setting priorities in policy decisions related to increasing local tax revenue for provincial governments in Indonesia. Additionally, it aims to complement existing studies on local taxes and inspire further research in this area.

LITERATURE REVIEW

Local Tax

According to Riswati (2022), regional income can essentially be divided into two categories: income that originates from outside the local government and income that stems from within the region, which can be explored and managed by the local government itself. Local taxes fall into the second category, which can be harnessed by each local government (Riswati, 2022). Based on Law No. 28 of 2009, local taxes are defined as mandatory contributions to the region owed by individuals or entities, enforced by law without direct compensation, and used for the benefit of the region to maximize the welfare of the people. Mardiasmo (2011) also explains that a region is a legal community unit with defined boundaries, empowered to regulate and manage regional governance and the interests of the local community based on their own initiatives within the framework of the Unitary State of the Republic of Indonesia (Setiawan, 2015). In essence, local taxes are a type of tax imposed by local governments (regencies/cities or provinces) on residents or businesses located within their jurisdiction.

Based on the authority of collection, local taxes can be divided into two categories: provincial taxes and regency/city taxes. Provincial local taxes consist of five types: cigarette tax, motor vehicle tax (PKB), motor vehicle fuel tax, motor vehicle transfer of ownership tax (BBNKB), and surface water tax (Mahendra et al., 2022). Local taxes are regulated based on regional regulations that conform to applicable national laws and regulations. Each local government has the authority to determine the types and rates of local taxes according to the needs and potential resources in their respective regions.

Consumption Theory

Consumption theory is a popular theory and serves as the foundation for various studies in the field of economics (Benefita, 2017). Consumption theory plays a crucial role in economics because consumption is one of the key components of aggregate spending in an economy. A good understanding of consumption theory is essential when making economic policies and decisions in the face of economic changes. In Keynesian consumption theory, also known as the absolute income hypothesis, it is stated that an individual's consumption level is determined absolutely by their income level (Mankiw, 2006). Other factors that may affect income are considered to have an insignificant impact. There are three key points within consumption theory:

- Consumption levels increase as income levels increase. However, the increase in consumption is not as significant as the increase in income.
- The average propensity to consume decreases as income increases when the increase in income is greater than the increase in consumption. The difference between the increase in income and the increase in consumption will impact savings.
- Income is the primary factor in consumption, with other factors having a negligible impact.

The revenue of local taxes is highly dependent on the consumption levels of the community in that area, as local taxes are typically imposed on the consumption of goods and services within that region, both directly and indirectly. A direct relationship can be illustrated with motor vehicle tax (PKB) and vehicle ownership transfer tax (BBNKB), where tax revenue depends on the consumption of motor vehicles in that area. Increased consumption of motor vehicles can lead to higher PKB and BBNKB revenue. An indirect relationship can be explained

through advertising taxes, where promotions are considered successful if consumer purchases of promoted products increase.

Previous Research

There have been several previous studies that have examined the influence of the number of motor vehicles, Gross Regional Domestic Product (GRDP), and population size on local tax revenue. Specifically, regarding the impact of the number of motor vehicles on overall local tax revenue, there is limited research available. Here are summaries of the referenced studies. The first study is conducted by Juri et al. (2019) with research titled "Factors Affecting Regional Tax Revenue in East Kalimantan Province." This study examined the impact of inflation, GRDP, the number of motor vehicles, and population size on local tax revenue in East Kalimantan Province from 2007 to 2018. The results concluded that population size and GRDP did not significantly affect local tax revenue. However, the number of motor vehicles and inflation had a positive impact on local tax revenue.

The second study is conducted by Fridayani (2022) with research titled "The Influence of Increasing Motor Vehicle Numbers and Tax Compliance on Tax Revenue." This study investigated the influence of the number of motor vehicles and tax compliance on local tax revenue in Central Java Province from 2018 to 2020. The findings of this research indicated that the number of vehicles and tax compliance had a positive impact on local tax revenue.

The third study is conducted by Yusuf (2022) with research titled "The Influence of Population, Gross Regional Domestic Product, and Inflation on Local Tax Revenue in Malang Raya." This study explored the impact of population size, GRDP, and inflation on local tax revenue in the Malang Raya area, including Malang City, Malang District, and Batu City, from 2010 to 2019. The results of this study suggested that population size and GRDP had a positive effect on local tax revenue, while inflation did not significantly affect it.

The fourth study is conducted by Gunawan et al. (2020) with research titled "Analysis of Factors Affecting Local Taxes in Former Surakarta Residency Districts." This study investigated the impact of GRDP, population size, inflation, and the number of industries on local tax revenue in six regencies and one city within the former Surakarta Residency from 2014 to 2018. The findings of this research concluded that GRDP did not significantly affect local tax revenue, while inflation and population size had a negative impact on it.

The fifth study is conducted by Sari & Ilyas (2016) with research titled "Analysis of Factors Affecting Local Tax Revenue in Bengkulu Province." This study examined the impact of per capita income, population size, and inflation on local tax revenue in Bengkulu Province from 2009 to 2013. The research results showed that per capita income and inflation had a positive influence on local tax revenue, while population size did not significantly affect it.

The sixth study is conducted by Helti (2010) with research titled "Analysis of Factors Affecting Local Taxes and Efficiency and Effectiveness in Collection (Case Study in Karanganyar Regency)." This study investigated the impact of inflation, population size, and GRDP on local tax revenue in Karanganyar Regency from 2002 to 2008. The findings of this research revealed that population size had a positive impact on local tax revenue, while inflation and GRDP did not significantly affect it.

The seventh study is conducted by Lumy et al. (2018) with research titled "Analysis of Factors Affecting Local Tax Revenue in North Sulawesi Province Government." This study explored the impact of population size, GRDP, and inflation on local tax revenue in North Sulawesi Province from 2005 to 2016. The results of this research indicated that population size, GRDP, and inflation had an impact on local tax revenue.

Hypothesis Formulation

The Influence of Population Size on Local Tax Revenue

The taxation theory introduced by Musgrave & Musgrave (1989) states that the magnitude of tax revenue is heavily influenced by the population size. The larger the population, the more economic activities are conducted, leading to a greater potential for local tax revenue. According to Susanto (2014), an increasing population has a positive impact on the tax revenue received by local governments, especially when there is an addition of productive individuals in the economy. This is supported by Yusuf (2022), who states that an increasing population will have a positive effect on local tax revenue if the population in that area remains productive. Additionally, a growing population can attract investments, thereby enhancing the potential for local tax revenue (Yusuf, 2022). The theory of secular stagnation introduced by Hansen suggests that an increase in the population can boost aggregate demand, particularly in terms of aggregation (Lumy et al., 2018). The population size can also influence the level of advertising and promotion in the area. The more businesses advertise, the greater the revenue generated from advertising taxes. From various studies and theories mentioned above, it can be concluded that a larger population in an area corresponds to higher local tax revenue.

H1: population size has a positive effect on local tax revenues

The influence of Number of Motor Vehicles on Local Tax Revenue

An increasing number of motor vehicles will lead to an increase in local tax revenue related to motor vehicles, such as motor vehicle tax, vehicle ownership transfer tax (BBNKB), and motor vehicle fuel tax, ultimately boosting local tax revenue. This is supported by research conducted by Fridayani (2022), which states that a growing number of motor vehicles will result in higher motor vehicle taxes, consequently increasing local tax revenue.

Another study by Juri et al. (2019) indicates that the number of motor vehicles has a positive impact on local tax revenue. An increase in the number of motor vehicles will raise the payments for motor vehicle tax and BBNKB, which can influence the magnitude of local tax revenue (Juri et al., 2019). However, it's important to note that the influence of the number of motor vehicles on local tax revenue also depends on other factors such as local government policies related to local taxes and the level of tax compliance among the population.

H2: Number of motor vehicles has a positive effect on local tax revenues

The Influence of GRDP on Local Tax Revenue

The higher the Gross Regional Domestic Product (GRDP) in an area, the larger the potential source of local tax revenue in that area will be (Simanjuntak, 2001). A higher GRDP in a region signifies a more advanced economy, leading to increased income for its residents (Yusuf, 2022). In other words, a larger GRDP reflects increased consumer spending and the community's ability to pay taxes. According to Simanjuntak (2001), GRDP tends to increase alongside economic activities, subsequently improving the well-being of the population, which, in turn, enhances their ability to pay taxes. Of course, the rise in income must be accompanied by the availability of goods and services to avoid causing inflation, which can affect people's consumption capacity and tax payments (Simanjuntak, 2001). Therefore, a high GRDP contributes to increased local tax revenue, indicating a robust economic growth and higher income levels among the population.

H3: GRDP has a positive effect on local tax revenues

The Moderating Effect of GRDP on the Influence of Population Size on Local Tax Revenue

Local tax revenue is highly dependent on the level of consumption within a given region. In line with the consumption theory explained by Keynes, an increase in the population can boost consumer spending if the population is prosperous, as indicated by the Gross Regional Domestic Product (GRDP). If the population increases but the purchasing power of the

community is low, consumption will not rise, and consequently, local tax revenue will not increase either. Therefore, GRDP can determine whether the population in a region can influence local tax revenue. Additionally, GRDP can also indicate the productivity of the population. As described by Yusuf (2022), population growth can have a positive impact on local tax revenue if the population in the region is consistently productive, as reflected in GRDP. This aligns with the opinion of Susanto (2014), who states that a productive population can influence local tax revenue.

H4: The moderating variable of GRDP strengthens the positive influence of the population size on local tax revenue

The Moderating Effect of GRDP on the Influence of the Number of Motor Vehicles on Local Tax Revenue

The tendency towards increasing the use of private cars is one form of irrational consumption to meet one's existential needs (Fridayani, 2022). Furthermore, owning a private motorbike has become somewhat of an obligation for everyone in Indonesia. Therefore, the number of motor vehicles tends to increase every year in line with the growing population. However, this largely depends on the income of the population in that area. If the GRDP in that area is sufficiently high, indicating prosperity among the population, the number of motor vehicles is likely to increase, ultimately boosting local tax revenue. This is because the number of motor vehicles directly influences local tax revenue (Fridayani, 2022).

H5: The moderating variable GRDP strengthens the positive influence of the number of motor vehicles on local tax revenue

Conceptual Framework

Based on the explanations discussed in the theoretical framework and the review of previous studies, a conceptual framework can be depicted as follows:

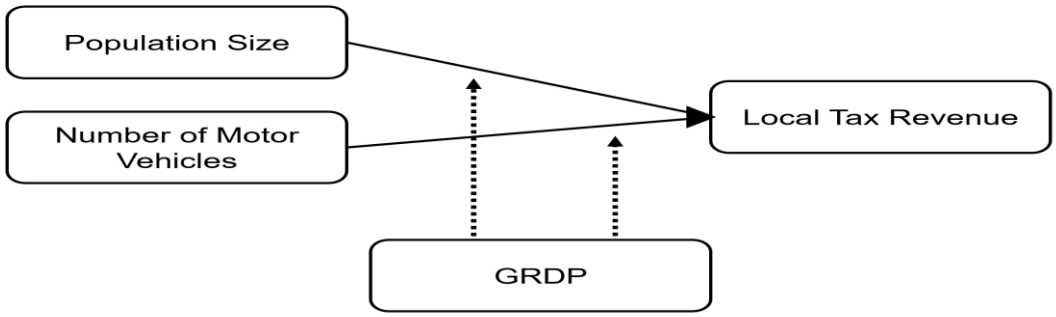

Figure 1. Conceptual Framework

METHODS

In this research, the author employs a quantitative approach. The quantitative approach is an objective approach that analyzes numeric data and utilizes statistical testing methods. The scope of this research encompasses all 34 province in Indonesia from 2018 to 2020. There is data from 34 province observed over 3 years. Therefore, the total number of observations for each variable is a total of 102 observations.

Table 2. Variables Used

Type	Variable	Unit
Dependent	Local Tax Revenue	Rupiah
Independent	Population Size	Thousand of People
	Number of Motorized Vehicles	Unit
Moderating	GRDP	Billion Rupiah

The data used is secondary data sourced from the Central Bureau of Statistics (BPS) reports. The type of data used is panel data from 34 provinces during the period 2018 - 2020. The analytical method used consists of descriptive analysis with tables and graphs, as well as inferential analysis with panel data regression. The dependent variable tested is the local tax revenue variable, while the independent variables tested are the population size and the number of motor vehicles. The moderation variable used is GRDP. The multiple regression equation in this research takes the following form:

$PD_{it} = \beta_0 + \beta_1 * POP_{it} + \beta_2 * MTR_{it} + \beta_3 * GRDP_{it} + \beta_4 * POP_{it} * GRDP_{it} + \beta_5 * MTR_{it} * GRDP_{it} + \varepsilon_{it}$

Keterangan :

PD_{it} = Local Tax Revenue
POP_{it} = Population Size
MTR_{it} = Number of Motorized Vehicles
$GRDP_{it}$ = GRDP

The results of this regression analysis were conducted to analyze the influence of the variables of population, the number of motor vehicles, and GRDP on local tax revenue across all provinces in Indonesia. Data processing was carried out using Microsoft Excel 2021 and the statistical software STATA/MP 17.

RESULT AND DISCUSSION

Before hypothesis testing, there are several steps that need to be taken, including standardizing units, conducting descriptive statistical analysis, selecting the appropriate model, and performing classic assumption tests. The first step to be taken is standardizing the units of each variable. The four variables under study have different units. Tax revenue is measured in Rupiah, population is in thousands of people, the number of motor vehicles is in units, and GRDP is measured in billions of Rupiah. Therefore, it is necessary to standardize the units by using the natural logarithm for all four variables.

Table 3. Descriptive Statistics

Variable	Mean	St. Dev	Min	Max
Local Tax Revenue	28,173	1,207	26,313	31,327
Population Size	15,289	1,015	13,433	17,718
Number of Motorized Vehicles	14,402	1,246	11,869	16,906
GRDP	33,052	1,140	31,227	35,573

As seen in Table 3, none of the four variables under study have a standard deviation higher than the mean. Additionally, the range, which is the distance from the lowest value (min) to the mean (mean) and from the mean (mean) to the highest value (max), still appears reasonable. Both of these factors indicate that there are no noticeable outliers in the data range of the four variables being examined. This means that the data is sufficiently good and can proceed to the next step, which is model selection.

Table 4. Chow Test, LM Test, and Hausman Test Result

Test	**Prob**	**Model Comparation**	**Choosen Model**
Chow Test	0,000	PLS vs FE	FE
LM Test	0,000	PLS vs RE	RE
Hausman Test	0,002	FE vs RE	FE

Chow test, Lagrange Multiplier (LM) test, and Hausman test were conducted to choose the best panel model among pooled least square, fixed effect, and random effect. The Chow test was used to determine the best model choice between pooled least square and fixed effect. The Chow test result yielded a probability value of 0.000, which is below the 5% alpha level, so H1

is accepted, meaning that the fixed effect model is better than pooled least square. The LM test was used to determine the best model choice between pooled least square and random effect. The LM test result showed a probability value of 0.000, which is below the 5% alpha level, so H1 is accepted, meaning that the random effect model is better than pooled least square. The Hausman test was used to determine the best model choice between fixed effect and random effect. The Hausman test result showed a probability value of 0.002, which is below the 5% alpha level, so H1 is accepted, meaning that the fixed effect model is better than random effect. From these three tests, it is concluded that the best model choice is the fixed effect model.

Table 5. Classic Assumption Test Results

Gauss-Markov	Test	Prob
Normality Test	Skewness and Kurtosis Test	0,0700
Heteroskedastisity Test	Modified Wald test	0,0094
Multikolinearity Test	Variance Inflation Factors Test	8,64
Autocorrelation Test	Wooldridge Test	0, 8835

The classic assumption test or Gauss-Markov consists of a set of assumptions that must be met for the results of the linear regression model to have BLUE (Best Linear Unbiased Estimators) parameter estimates. These assumptions are the basis for many statistical methods in linear regression analysis and have several important implications for the interpretation and reliability of results. There are four tests performed, namely the normality test, heteroskedasticity test, multicollinearity test, and autocorrelation test.

The normality test in regression aims to check whether the residuals from the regression model have a distribution that is close to or approximates a normal distribution. This test is important because many statistical methods used in regression analysis assume that the residuals have a normal distribution. In a regression model, data can be said to pass the normality test or have a normal distribution when the chi-square probability value is above 5%. If the normality test is not met or fails, the resulting regression coefficients can be biased, and the errors will be larger. Based on the test results using the "sktest" syntax, a probability value of 0.0700 was obtained, which is above 5%, meaning that H0 is accepted, indicating that the data is normally distributed.

Heteroskedasticity test in the regression model aims to examine whether the variance of residuals in the regression model changes systematically across the range of independent variables. In other words, heteroskedasticity occurs if there is a pattern of changing residual variances that are not constant. Heteroskedasticity is a violation of the classical assumption or Gauss-Markov assumption in regression models. The assumption of homoskedasticity is required, which states that the variance of residuals must be constant at all levels of independent variables. The presence of heteroskedasticity will result in inaccurate p-values, inaccurate confidence intervals, and inefficient estimators, where the regression coefficient parameters can be underestimated and overestimated. Heteroskedasticity testing in the model with the "hettest" syntax yielded a chi-square probability value of 0.0094, which is below 5%, meaning that H0 is rejected, indicating that the data exhibits heteroskedasticity.

The multicollinearity test in regression aims to check whether there is high correlation between two or more independent variables in the regression model. Multicollinearity occurs when independent variables are strongly related, causing problems in regression analysis. If data exhibits multicollinearity, it can lead to problems such as unstable regression coefficients and very large standard errors of regression coefficients. Both of these issues can lead to less valid interpretations of the results. In the multicollinearity test using the "vif" syntax, the VIF values were below 10, indicating that the data did not exhibit multicollinearity. However, the two interaction variables had values above 10, which could raise doubts in the test results. Nevertheless, multicollinearity testing on these interaction variables can be disregarded. This is

explained by Nugroho (2015) as quoted in Hidayati (2019), stating that with the presence of moderating variables in research, there will be correlations between one independent variable and another independent variable in the research model. In this case, multicollinearity is expected to occur, so multicollinearity testing can be ignored (Hidayati, 2019).

Autocorrelation test, also known as serial dependence test, is used to check whether there is dependence or a specific pattern in the residuals of the regression model on consecutive time observations. In this context, "serial" refers to the dependence of residuals on previous time periods. Serial dependence or autocorrelation occurs when there is a linear relationship between residuals in one period and residuals in the previous period. Autocorrelation can be a serious issue in the analysis of time series data because it can lead to several problems, including the invalidity of hypothesis tests, inaccurate p-values, and inefficient coefficient estimations. In the autocorrelation test with the "xtserial" syntax applied to the model, the F probability value was 0.8835, which is above 5%, indicating that the data does not exhibit autocorrelation.

From the four classic assumption tests, it can be concluded that the model only exhibits heteroskedasticity. Generalized Least Squares (GLS) is a regression method used when the assumption of homoskedasticity is not met, and there is heteroskedasticity in the data. In GLS, optimized weights are used to give different influences to observations with different variances. This method takes into account covariances and correlations between residuals to improve coefficient estimates. In Stata, GLS is used by applying the "xtgls" syntax. By performing hypothesis tests using "xtgls" on the model, it can be concluded that the data in the model meets the BLUE criteria and can proceed to the next step.

Table 6. Results of Panel Data Regression Analysis

Variable	Coefficient	Std. Error	Two-tailed Prob	One-tailed Prob
Cons	2,8178	1,0494	0,007	0,003
POP	0,0533	0,0583	0,361	0,180
MTR	0,4281	0,0510	0,000	0,000
GRDP	0,5588	0,0497	0,000	0,000
POP*GRDP	0,0035	0,0015	0,021	0,010
MTR*GRDP	-0,0039	0,0013	0,004	0,002

Prob (F-statistic)	0,0000

The regression results contain several important statistical tests to evaluate the quality and significance of the regression model. Three main statistical tests commonly used are the F-test, the coefficient of determination test (R-squared), and the partial test (t-test). Specifically, in generalized least squares, the coefficient of determination test is not applicable.

The F-test is used to examine whether independent variables together contribute significantly to the dependent variable in the regression model. With a probability value of 0.0000 below the 5% alpha level, H1 is accepted, meaning that the independent variables, namely the population size, the number of motor vehicles, GRDP, the interaction between population size and GRDP, and the interaction between the number of motor vehicles and GRDP, collectively have a significant influence on the dependent variable, which is local tax revenue.

The coefficient of determination test is a concept from OLS that is useful for providing information about how well the model can explain the independent variables. When estimating model parameters using GLS, the total sum of squares cannot be divided in the same way, making the R-squared statistic less useful as a diagnostic tool for GLS regression. Therefore, in this study, the coefficient of determination test (R-squared) is not used.

The Partial Test, also known as the t-test, is used to test whether each independent variable individually contributes significantly to the dependent variable in the regression model. The output from the testing through the Stata application shows significance in two-tailed or bidirectional (Rahayu, 2021). However, the hypothesis used in this study is one-tailed or unidirectional, which is whether the independent variables have a positive effect on the dependent variable. Therefore, the p-value generated by the Stata application needs to be divided by two to produce a one-tailed significance level.

The first hypothesis test is conducted to examine the influence of the population size on local tax revenue. From the first hypothesis test, it is found that the population size variable has a coefficient of 0.0533 with a probability of 0.180. The probability value indicates a figure above alpha 5%, so the hypothesis test results show that the population size does not have a significant impact on local tax revenue. This result is in line with the findings of Sari & Ilyas (2016) but contradicts Yusuf (2022) and Gunawan et al. (2020). This means that an increase in the population may not necessarily have a positive or negative effect on local tax revenue. This is because the productivity of the population in each province varies widely, so an increase in the population may not affect local tax revenue.

The second hypothesis test is conducted to examine the influence of the number of motor vehicles on local tax revenue. From the second hypothesis test, it is found that the number of motor vehicles variable has a coefficient of 0.4281 with a probability of 0.000. The probability value is below alpha 5%, indicating that the number of motor vehicles has a positive and significant effect on local tax revenue. This means that the higher the number of motor vehicles in an area, the higher the local tax revenue obtained by that area. This result is consistent with Helti (2010) and Juri et al. (2019), which state that the number of motor vehicles has a positive impact on local tax revenue. This is because an increase in the number of motor vehicles directly affects the revenue from the vehicle tax, vehicle transfer fees, and motor vehicle fuel tax, thus increasing local tax revenue. Based on its coefficient, a 1% increase in the number of motor vehicles will increase local tax revenue by 0.43%.

The third hypothesis test is conducted to examine the influence of GRDP on local tax revenue. From the third hypothesis test, it is found that the GRDP variable has a coefficient of 0.5588 with a probability of 0.000. The probability value is below alpha 5%, indicating that GRDP has a positive and significant effect on local tax revenue. This means that the higher the GRDP in an area, the higher the local tax revenue obtained by that area. This result is consistent with the findings of Lumy et al. (2018), Yusuf (2022), and Sari & Ilyas (2016) but contradicts Gunawan et al. (2020) and Helti (2010). This result indicates that GRDP will increase with the growth of economic activity, thereby increasing local tax revenue. Based on its coefficient, a 1% increase in GRDP will increase local tax revenue by 0.56%.

The fourth hypothesis, which is the moderation of GRDP on the influence of the population size on local tax revenue, yields results where the interaction variable POP*GRDP has a coefficient of 0.0035 with a probability of 0.010. The probability level is below alpha 5%, and the coefficient is positive, indicating that GRDP strengthens the influence of the population size on local tax revenue. This means that the population size, which previously did not have a significant effect on regional tax revenue, becomes positive when GRDP in that region increases. This suggests an influence of the population's productivity, as indicated by GRDP, on local tax revenue. If the productive population increases, it will have a positive impact on local tax revenue. On the other hand, if the non-productive population increases, it will not affect local tax revenue. GRDP, as a significant interaction variable and independent variable, indicates that in this relationship, GRDP plays the role of quasi moderation (pseudo-moderator). This means that GRDP becomes an independent variable while moderating the relationship

between the population size and local tax revenue by interacting with the independent variable (population size).

The fifth hypothesis, which is the moderation of GRDP on the influence of the number of motor vehicles on local tax revenue, yields results where the interaction variable MTR*GRDP has a coefficient of -0.0039 with a probability of 0.002. The probability level is below alpha 5%, and the coefficient is negative. This indicates that GRDP weakens the positive influence of the number of motor vehicles on local tax revenue. This suggests that when GRDP and the number of motor vehicles in an area are already very high, the people in that advanced area prefer to use public transportation rather than buying private vehicles. This is also due to the fact that in advanced areas, there are already many public transportation options such as MRT, KRL, and Jaklingko in DKI Jakarta. People avoid buying private vehicles and prefer public transportation to avoid traffic congestion. GRDP, as a significant interaction variable and independent variable, indicates that in this relationship, GRDP plays the role of quasi moderation (pseudo-moderator). This means that GRDP becomes an independent variable while moderating the relationship between the number of motor vehicles and local tax revenue by interacting with the independent variable (the number of motor vehicles).

CONCLUSION

The population size does not significantly affect local tax revenue. The productivity of the population in each province in Indonesia varies widely, so an increase in the population may not necessarily have the same effect on local tax revenue in every province. The number of motor vehicles has a positive impact on local tax revenue. The more motor vehicles there are, the larger the tax base from motor vehicle tax, vehicle transfer fees, and motor vehicle fuel tax, thus increasing local tax revenue. GRDP (Gross Regional Domestic Product) has a positive effect on local tax revenue. GRDP increases with economic activity, thereby increasing local tax revenue.

GRDP strengthens the influence of the population size on local tax revenue. The population size, which initially had no significant effect on local tax revenue, becomes positively influential after being moderated by GRDP. This indicates the influence of population productivity, as indicated by GRDP, on local tax revenue. In this relationship, GRDP acts as a pseudo-moderator. GRDP weakens the positive influence of the number of motor vehicles on local tax revenue. People in areas with high GRDP and a high number of motor vehicles prefer to use public transportation rather than buying private vehicles. This is because advanced areas already have adequate public transportation options and face traffic congestion. In this relationship, GRDP acts as a pseudo-moderator.

Suggestion

In order to maximize the potential of local tax revenue, provincial governments across Indonesia need to focus their policies on improving population productivity and the number of motor vehicles. Regions with low GRDP should concentrate on boosting economic activities and the productivity of their population so that an increase in the population will have a positive impact on local tax revenue. For future research, it is hoped that researchers can introduce additional variables, whether as independent, moderating, or intervening factors, to make the study more comprehensive.

REFERENCES

Benefita, D. F. (2017). *Analisis Faktor Yang Memengaruhi Tingkat Konsumsi Mahasiswa Pada E-Commerce (Studi Kasus Mahasiswa Fakultas Ekonomi dan Bisnis Universitas Brawijaya Malang)* [Skripsi]. Universitas Brawijaya.

BPPKAD. (2014). *Pendapatan Asli Daerah Sebagai Cerminan Ekonomi Daerah*. Badan Pendapatan Pengelolaan Keuangan Aset Daerah Kabupaten Grogoban.

BPS. (2023). *Statistik Keuangan Pemerintah Provinsi 2021-2022*.

Fridayani, D. (2022). *Pengaruh Peningkatan Jumlah Kendaraan Bermotor dan Kepatuhan Pajak Terhadap Penerimaan Pajak* [Tugas Akhir]. Universitas Kristen Satya Wacana.

Gunawan, S. A., Harimurti, F., & Sunarti. (2020). Analisi Faktor-Faktor Yang Pengaruhi Pajak Daerah Kabupaten Eks-Karesidenan Surakarta. *Jurnal Akuntansi Dan Sistem Teknologi Informasi*, *16*(2), 130–141.

Helti, K. A. (2010). *Analisis Faktor-Faktor Yang Mempengaruhi Pajak Daerah Serta Tingkat Efisiensi Dan Efektivitas Dalam Pemungutan (Studi Kasus Di Kabupaten Karanganyar)* [Skripsi]. Universitas Sebelas Maret.

Hidayati, N. (2019). *PENGARUH MODERASIAN CHARTER VALUE DAN CORPORATE GOVERNANCE PADA HUBUNGAN KOMPENSASI DAN PENGAMBILAN RISIKO EKSEKUTIF (STUDI PADA PERUSAHAAN PERBANKAN YANG TERDAFTAR DI BEI PERIODE 2016)* [Skripsi]. Universitas Muhammadiyah Yogyakarta.

Juri, M., Rudzali, A., & Verawati. (2019). FAKTOR-FAKTOR YANG MEMPENGARUHI PENERIMAAN PAJAK DAERAH PROVINSI KALIMANTAN TIMUR. *EKSIS*, *15*(1).

Lumy, D. G., Kindangen, P., & Engka, D. S. M. (2018). Analisis Faktor-Faktor Yang Mempengaruhi Penerimaan Pajak Daerah Pada Pemerintah Provinsi Sulawesi Utara. *Jurnal Pembangunan Ekonomi Dan Keuangan Daerah*, *19*(2).

Mahendra, C. I., Masnila, N., & Dwitayanti, Y. (2022). Pengaruh & Kontribusi Penerimaan Pajak Daerah Terhadap Pendapatan Asli Daerah Pada Provinsi Sumatera Selatan. *Jurnal Accounting and Finance*, *6*(2).

Mankiw, N. G. (2006). *Pengantar Teori Ekonomi Makro* (Edisi Ketiga). Salemba Empat.

Mardiasmo. (2011). *Perpajakan* (Revisi 2011). Andi.

Musgrave, R. A., & Musgrave, P. B. (1989). *Public Finance in Theory and Practice* (5th Edition). McGraw-Hill.

Rahayu, F. D. (2021). *Pengaruh Agresivitas Transfer Pricing, Penggunaan Negara Lindung Pajak, dan Kepemilikan Institusional terhadap Penghindaran Pajak dengan Pemeriksaan Pajak sebagai Pemoderasi* [Skripsi]. PKN STAN.

Riswati. (2022). ANALISIS KEBIJAKAN PENGELOLAAN PAJAK DAERAH DALAM MENINGKATKAN PAD DI KABUPATEN BANDUNG. *JEKP*, *9*(1).

Sari, D. P., & Ilyas, F. (2016). Analisis Faktor-Faktor Yang Mempengaruhi Penerimaan Pajak Daerah Di Provinsi Bengkulu. *Jurnal Akuntansi*, *6*(1).

Setiawan, Y. G. (2015). *ANALISIS PEMUNGUTAN PAJAK KENDARAAN BERMOTOR DALAM UPAYA PENINGKATAN PENERIMAAN PENDAPATAN ASLI DAERAH PADA UPTD SURABAYA TIMUR* [Tugas Akhir]. Universitas Hayam Wuruk.

Simanjuntak, T. (2001). *Analisis Potensi Pendapatan Asli Daerah. Bunga Rampai*. UPP AMP YKPN.

Tommy. (2021). *Apa Itu Desentralisasi Fiskal?* Pajakku.

Yusuf, A. (2022). Pengaruh Jumlah Penduduk, Produk Domestik Regional Bruto Dan Inflasi Terhadap Pendapatan Pajak Daerah Di Malang Raya. *Jurnal Ilmiah Mahasiswa FEB UB*, *10*(1).