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Analysis of the Effect of GRDP per Capita, Open Unemployment Rate, and Provincial Capital Dummy on Poverty Levels in Regency/City in Java Island in 2023

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Abstract: Poverty is a fundamental challenge that hinders national progress, negatively affecting social and economic aspects. This study analyzes the effect of Gross Regional Domestic Product (GRDP) per capita, Open Unemployment Rate, and provincial capital status on the poverty rate in regencies/municipalities in Java Island in 2023. Using cross-sectional data from 119 districts/municipalities and the Ordinary Least Squares (OLS) regression method with robust standard errors, it is found that GRDP per capita and provincial capital status have a negative and significant effect on the poverty rate. In contrast, Open Unemployment Rate has a positive and significant effect on the poverty rate. The logarithmic model used shows consistency with economic theory and explains 52.22% of the variation in poverty rates. The findings suggest that inclusive economic growth, job creation, and equitable development outside provincial capitals are essential to reduce poverty in Java.

Keywords: *Poverty, GRDP per Capita, Open Unemployment Rate, Provincial Capitals, Java Island*

Introduction

Poverty is a fundamental challenge to the progress of a nation. This phenomenon not only has a negative social impact, but also significantly hampers economic development. The increased burden of financing development due to poverty has the potential to slow or even halt overall economic growth. Furthermore, poverty directly causes a decline in people's productivity, low income levels, and the low quality of human resources. It also contributes to other social problems, such as the low quality of health services and rising crime rates, especially in urban areas. Therefore, poverty alleviation requires a comprehensive and integrated approach that involves various aspects of community life (Setiawan et al., 2024).

Although Indonesia's national poverty rate has shown a downward trend from 9.57% in September 2022 to 9.36% in March 2023, Java, as the region with the largest concentration of population and center of economic activity in Indonesia, still faces serious challenges related to this issue. With around 56% of the national population living in Java and a very high population density, this region is the main focus of poverty alleviation strategies. On the other hand, Java's contribution to the national Gross Domestic Product (GDP), which reached 57.05% in 2023, underscores Java's strategic role in the national economy. Thus, the dynamics of poverty at the district/city level in Java Island have direct implications for the achievement of national development targets as a whole (Ministry of Finance, 2023).

Gross Regional Domestic Product (GRDP) per capita is widely recognized as a key indicator for assessing regional economic performance and the average well-being of the population. An increase in GRDP per capita is theoretically negatively correlated with the poverty rate through an increase in people's income, job creation, and increased government fiscal capacity. However, this relationship is not always linear and can exhibit complex dynamics. Previous studies have shown that GRDP per capita has a negative effect on income inequality, indicating the potential to reduce poverty.

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However, this is highly dependent on the effective utilization of regional resources so that economic growth can be enjoyed equally (Dewi & Sutrisna, 2014).

The Open Unemployment Rate is an important indicator that reflects the absorption capacity of the labor market in a region. A high Open Unemployment Rate directly implies an increased risk of poverty, as more people do not have access to decent work and adequate income. This condition can push households into a cycle of poverty. Other factors such as low education levels and limited skills exacerbate the situation by preventing people from securing stable employment. The dynamics of Open Unemployment Rate are therefore an important aspect of poverty analysis at the local level (Parulian & Hukom, 2023).

Provincial capitals generally serve as the center of government and the center of regional economic growth, characterized by a concentration of population, infrastructure, and productive activities. This strategic position creates agglomerations that can encourage job creation, expand market access, and increase community productivity. However, the intensity of urbanization in big cities also risks creating inequality, congestion, pressure on basic services, and poverty in peripheral areas. A study by Chaniago and Hanri (2021) confirms that the agglomeration effect in Java is stronger than outside Java, but does not explicitly examine the role of administrative status, such as provincial capital, in determining welfare distribution. Therefore, this study fills this gap by incorporating a dummy variable for provincial capitals into the model, to see whether these agglomeration centers also affect poverty rates in different regions in Java (Chaniago & Hanri, 2021).

Given the urgency of poverty alleviation as a national development challenge (Setiawan et al., 2024), this study focuses on districts/cities in Java Island in 2023. The selection of this region is based on its role as the demographic and economic center of the nation, so that the dynamics of poverty in the region greatly determine Indonesia's macro conditions. In addition, the use of 2023 data allows for a contextual analysis of current socioeconomic conditions post-pandemic and various global pressures. As such, this study aims to provide new insights and fill gaps that have not been addressed by previous studies, especially those identified by Chaniago and Hanri (2021). The special focus on the local context of Java and the inclusion of provincial capital dummy variables are expected to capture the influence of agglomeration in more detail, thus contributing to the formulation of more effective poverty alleviation policies in this strategic region.

Literature Review and Hypothesis

Poverty Concept

Poverty is the inability of a person or household to adequately fulfill basic needs. In general, poverty is classified into two types, namely absolute poverty, which refers to the inability to meet the minimum standard of living based on the poverty line, and relative poverty, which is a person's position in the distribution of community welfare. In addition, poverty is also understood in a multidimensional way, covering economic, social, and political aspects, such as limited access to education, health, clean water, and social participation. In Indonesia, the Central Bureau of Statistics (BPS) measures poverty using a basic needs approach, through indicators such as the Head Count Index (P0), Poverty Gap Index (P1), and Poverty Severity Index (P2), which are based on data from the National Socioeconomic Survey (Susenas) (Hendra, 2010).

Gross Regional Domestic Product (GRDP) and Poverty

Economic ability of the average population in a region to produce goods and services. GRDP is calculated from the sum of gross value added generated by all units of production in a region within a certain period, then divided by the total population to obtain the per capita value. This indicator is often used to assess the level of community welfare and as a reference in the formulation of regional development policies. Theoretically, an increase in GRDP per capita is expected to reduce the poverty rate, as it reflects an increase in people's income and productivity.

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However, the impact of GRDP per capita on poverty is not always direct and equitable, because it depends on the distribution of income and people's access to the benefits of economic growth (BPS Penajam Paser Utara, 2024).

Open Unemployment Rate and Poverty

The Open Unemployment Rate is the percentage of the labor force that is actively seeking work but does not yet have a job. Open Unemployment Rate is used as an indicator to measure the efficiency of the labor market and reflects the imbalance between supply and demand for labor. Theoretically, the open unemployment rate has a positive relationship with the poverty rate. The higher the unemployment rate, the more likely a person is to lose a stable source of income, which in turn increases the risk of poverty. In addition, factors such as low education, lack of job skills, and job mismatch contribute to the worsening impact of unemployment on people's welfare (Corolina, 2020).

Provincial Capitals and Poverty

Provincial capitals often act as regional centers of economic growth due to agglomeration, which is the concentration of economic activities in an area, leading to efficiency in production, distribution, and information exchange. Economic agglomeration enables labor mobility, investment absorption, and economies of scale, thereby promoting job creation and economic growth. However, agglomeration can also have negative consequences if not managed properly, such as uncontrolled urbanization, pressure on infrastructure, congestion, and increased urban poverty. Empirical studies in Jakarta show that production agglomeration has a positive impact on economic growth and poverty reduction, while population agglomeration increases social pressure if not balanced with equitable distribution of public services (Mauleny, 2015).

Review of Previous Research and Research Position

Previous research conducted by Setiawan, Muchtar, and Sihombing (2024) analyzed the influence of the Village Fund, GRDP, Open Unemployment Rate, and Human Development Index (HDI) on the number of poor people in Indonesia in 2022. Using OLS regression, they found that GRDP had a significant effect on poverty, while Open Unemployment Rate was not significant (Setiawan et al., 2024).

Meanwhile, Chaniago and Hanri's (2021) study examines the effect of economic agglomeration on labor welfare and shows that agglomeration only has a positive impact on wages in Java, especially in the tertiary sector and among the highly educated group. Both studies have not specifically examined the effect of a region's administrative status as a provincial capital on the poverty rate. Therefore, this study aims to fill this gap by analyzing the effect of GRDP per capita, Open Unemployment Rate, and provincial capital status (dummy variable) on poverty rates in districts/municipalities in Java Island using data for 2023.

Methods

This study uses secondary data obtained from various official publications of the Central Bureau of Statistics (BPS) of the Republic of Indonesia. The data collected covers the year 2023. The type of data used is cross-sectional data, which is data collected at one specific time or period for various observation units. The unit of analysis in this study is all regencies and cities in Java Island, totaling 119 observation units. The research variables used in this study consist of one dependent variable and three independent variables, namely:

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Dependent Variable:

Poverty Level (KM): This variable is measured as the percentage of the population living below the poverty line in a district/city. Poverty Level data was obtained from BPS publications.

Independent Variable:

GRDP per Capita (GRDPpc): This variable represents an indicator of economic value added per individual in a region. GRDP per capita is measured in Rupiah at current prices. This data is sourced from BPS 2023.

Open Unemployment Rate: This variable measures the percentage of the labor force that is unemployed or looking for work. Open Unemployment Rate is measured in percentage and the data is sourced from BPS 2023.

Provincial Capital Dummy (DUMMY_CAPITALCITY): This is a dummy variable used to identify the status of the district/city. This variable takes the value of 1 if the district/city is a provincial capital, and 0 if it is not. This variable is constructed based on administrative identification of provincial capitals in Java Island in 2023.

This study uses the Ordinary Least Squares (OLS) estimation method to analyze the effect of the independent variables on the poverty rate in districts/municipalities in Java Island. The OLS approach was chosen because of its ability to estimate linear relationships between variables with certain assumptions.

The econometric model used in this study is as follows:

$$PovertyRate_i = \beta 0 + \beta 1 GRDPpc_i + \beta 2 OpenUnemploymentRate_i + \beta 3 CapitalCity_i + \varepsilon_i$$

Where:

PovertyRate_i	: Poverty Rate in the i-th district/city
GRDPpc_i	: GRDP per Capita in the i-th district/city
OpenUnemploymentRate_i	: Open Unemployment Rate in the i-th district/city
CapitalCity_i	:Dummy variable for provincial capital in the i-th regency/city
β0	: Constant (intercept)
β1,β2,β3	: Regression coefficient that measures the effect of each independent variable on the dependent variable
ε_i	: Error term (random error term)

As a second estimation to test the robustness of the results and see the interpretation of elasticity, this study will also estimate the model in the form of natural logarithm for certain variables, Where ln is the natural logarithm of the variable in question:

$$1n(\text{PovertyRate})_i = \beta 0 + \beta 11n(GRDPpc)_i + B21n(OpenUnemploymentRate)_i + \beta 3(CapitalCity) + \varepsilon_i$$

Hypothesis

Based on the theoretical basis and review of previous research, the hypotheses proposed in this study are as follows:

H1: GRDP per capita has a negative and significant effect on the poverty rate in regencies/municipalities in Java Island in 2023.

H2: The Open Unemployment Rate has a positive and significant effect on the Poverty Rate in districts/municipalities in Java Island in 2023.

H3: Provincial Capital Dummy has a negative and significant effect on the Poverty Rate in districts/municipalities in Java Island in 2023.

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Testing

The test tools used to analyze the data and test the hypotheses in this study are:

F Test (Simultaneous Significance Test): The F test is conducted to determine whether all independent variables simultaneously have a significant effect on the dependent variable. The statistical hypothesis for the F test is:

H0:β1=β2=β3=0 -(Simultaneously, all independent variables have no significant effect on the poverty rate).

H1:At least one βk≠0 -(Simultaneously, at least one independent variable has a significant effect on the poverty rate).

T-test (Partial Significance Test): The t-test is used to evaluate the significance of the effect of each independent variable partially (individually) on the dependent variable. The error rate (α) used in this study is 5%. The statistical hypothesis for the t-test for each regression coefficient (βk) is:

H0:βk=0(Independent variable k has no significant effect on the poverty rate).

H1:βk≠0(Independent variable k has a significant effect on the poverty rate).

Classical Assumption Test: To ensure that the OLS regression model fulfills the basic assumptions, the classical assumption tests will be conducted, including:

Heteroskedasticity Test:Testing whether the variance of the residuals is constant (homoscedasticity).

Multicollinearity Test:Testing whether there is a high correlation or perfect linear relationship between independent variables.

Autocorrelation Test: Test whether there is a correlation between residuals on one observation and residuals on other observations. To overcome potential violations of classical assumptions such as residual abnormalities and heteroscedasticity, this study will use robust standard errors in the regression estimation process. The use of robust standard errors ensures that the resulting standard errors are consistent and the statistical conclusions (t-test and F-test) remain valid even if these assumptions are violated.

Software Used:

All data processing, model estimation, and econometric analysis in this study will be conducted using STATA statistical software. STATA was chosen for its comprehensive capabilities in econometric analysis, flexibility in data processing, and strong support for classical assumption testing and estimation of complex regression models.

Results

Descriptive Statistics Test Results

This study uses cross-sectional data from 119 districts/cities in Java Island for the year 2023. Understanding the basic characteristics of the data is essential before conducting inferential analysis. Table 1 presents the descriptive statistics of the dependent and independent variables used in the model:

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Table 1. Descriptive Statistics of Research Variables (N=119)

No	Variable	Label/Description	Number of Samples	Mean	Standard Deviation	Minimum	Maximum
1	Poverty	Poverty Level	119	2.112	0.287	1.351	2.802
2	GRDP	Gross Regional Domestic Product (per capita)	119	16.719	0.49	15.688	17.753
3	Open Unemployment Rate	Open Unemployment Rate	119	1.954	0.38	0.833	2.946
4	Provincial Capital	Provincial Capital Dummy	119	0.058	0.235	0	1

Source: STATA Data Processing Results, 2025

Based on Table 1, the main characteristics of the research variables can be seen. The Poverty Rate (KM) in districts/municipalities in Java Island in 2023 shows an average of 10.15% with a standard deviation of 3.99%. This indicates that the poverty rate varies greatly between regions, ranging from a low of 4.67% to a high of 24.32%. This difference needs to be considered in the analysis. Meanwhile, GRDP per capita (GRDPpc) shows an average of 55.23 million Rupiah, but with a very large standard deviation of 53.64 million Rupiah, which indicates that there is a considerable difference in economic capacity per capita between districts/municipalities. The lowest per capita GRDP was IDR 16.54 million and the highest reached IDR 291.56 million, further strengthening indications of economic disparities between regions. The Open Unemployment Rate has an average of 5.89% with a standard deviation of 2.21%, indicating varied labor market conditions, with unemployment rates ranging from 2.01% to 12.87%. Finally, the Provincial Capital Dummy variable has an average of 0.13, indicating that approximately 13% of the 119 sample districts/cities are provincial capitals. This variable has been correctly coded as a binary variable with a minimum value of 0 and a maximum of 1.

Evaluation of the Classical Assumptions of the Regression Model

Before interpreting the regression results, a classical assumption test is conducted to ensure that the estimated model is a Best Linear Unbiased Estimator (BLUE) and the resulting statistical conclusions are valid. The classical assumptions tested include residual normality, heteroscedasticity, and multicollinearity.

Residual Normality Test for Logarithmic Model

Residual normality testing is done using the Jarque-Bera test (combined Skewness and Kurtosis). The test results show a Prob> chi2 (combined) value of 0.0000. Because the p-value (0.0000) is smaller than the 5% significance level ($\alpha = 0.05$), the null hypothesis (H0) which states that the residuals are normally distributed is rejected. This means that the residuals of the logarithmic model are not normally distributed.

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Heteroscedasticity Test for Logarithmic Model

Heteroscedasticity test is conducted using Breusch-Pagan/Cook-Weisberg test. The test results show a Prob> chi2 value of 0.0000. Because the p-value (0.0000) is smaller than the 5% significance level (α = 0.05), the null hypothesis (H0) which states that there is no heteroscedasticity (the residual variance is fixed) is rejected. This indicates the presence of heteroscedasticity in the logarithmic model.

Multicollinearity Test for Logarithmic Model

Multicollinearity test is conducted using Variance Inflation Factor (VIF). The test results show that the VIF values for all independent variables are below 10 (VIF ln(GRDPpc)=1.10, VIF ln(Open Unemployment Rate)=1.10, VIF DUMMY_CAPITALCITY=1.00). The average VIF is 1.10. Since all VIF values are far below the threshold of 10, it can be concluded that there is no serious multicollinearity problem among the independent variables in the logarithmic model.

Regression Analysis Results and Coefficient Interpretation

Although the logarithmic model exhibits problems of residual non-normality and heteroscedasticity, these problems can be overcome by using robust standard errors in the regression estimation. The use of robust standard errors ensures that the resulting standard errors are consistent and the statistical inferences (t-test and F-test) remain valid even if these assumptions are violated. Based on the estimation results presented in Table 2, the regression equation for the logarithmic model can be written as follows:

$$\ln(\boldsymbol{PovertyRate})_i = 13.56578 - 0.6010074 \times ln(GRDPpc)i + 0.3015694 \times ln(OpenUnemploymentRate)_i - 0.062086 \times CapitalCity$$

Table 2. OLS Regression Estimation Results (Robust Standard Errors) Dependent Variable: (lnpoverty)

Variable	Coefficient	Std. Error	T-Stat	Prob.
Constant	13.56578	1.036904	13.08	0
lnpdrbpc	-0.6010074	0.0768911	-7.82	0
lntpt	0.3015694	0.076882	3.92	0
capital	-0.062086	0.0210214	-2.95	0.004

R-squared	0.5222
Adj. R-squared	0.51
F-statistic	42.6
Prob (F-statistic)	0
N (Number of Observations)	119

Source: STATA Data Processing Results, 2025

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Simultaneous Significance Test (F-test)

The F-statistic value of the logarithmic model is 37.89 with a Prob (F-statistic) of 0.0000. Since the p-value (0.0000) is much smaller than the 5% significance level (α = 0.05), the null hypothesis (H0) stating that all independent variable coefficients are simultaneously equal to zero is rejected. This means that GRDP per capita, Open Unemployment Rate, and Provincial Capital Status together have a significant effect on the Poverty Rate in districts/municipalities in Java Island in 2023.

Coefficient of Determination (R-squared)

The R-squared value (Coefficient of Determination) of the model is 0.5222, and the Adjusted R-squared is 0.5100, as also listed in Table 2. The R-squared value of 0.5222 indicates that 52.22% of the total variation in the Poverty Level in districts/municipalities in Java Island in 2023 can be explained by the variables GRDP per Capita, Open Unemployment Rate, and Provincial Capital Dummy. This shows that the model has a fairly good explanatory power. The remaining 47.78% is explained by other factors outside the model that are not included in this study, such as other infrastructure quality, education level, health access, regional poverty budget allocation, or other socio-demographic factors. The Adjusted R-squared value that is very close to the R-squared also confirms that the addition of independent variables in this model is relevant and contributes meaningfully in explaining the variation in the dependent variable

Interpretation of Partial Regression Coefficients (t-test)

The t-test is conducted to evaluate the significance of the effect of each independent variable separately on the dependent variable, while controlling for the influence of other variables in the model. In this study, all variables show a partially significant effect.

1. **Effect of GRDP per Capita (ln(GRDPpc)) on Poverty Level (ln(PovertyRate)):** The variable GRDP per capita (ln(GRDPpc)) has a regression coefficient of -0.6010074 with a T-Stat value of -7.82 and a Prob. value of 0.000. Since the Prob. value (0.000) is much smaller than the 5% significance level (α=0.05), it can be concluded that GRDP per Capita has a negative and significant effect on the Poverty Rate in districts/municipalities in Java Island in 2023. The interpretation of this coefficient is: Every 1% increase in GRDP per capita will reduce the Poverty Rate by an average of 0.601%. This negative relationship is in accordance with economic theory, which states that an increase in the economic activity and productivity of a region as reflected in an increase in GRDP per capita will increase people's income and create more jobs, thus reducing the number of poor people. Rationally, higher GRDP per capita allows regions to have greater resources for investment in education, health, and infrastructure, which indirectly contributes to poverty reduction. This result is in line with previous research which found that GRDP has a significant effect on poverty (Suastika et al., 2015).
2. **Effect of Open Unemployment Rate (ln(OpenUnemploymentRate)) on Poverty Level (ln(PovertyRate))**: The Open Unemployment Rate variable (ln(Open Unemployment Rate)) has a regression coefficient of 0.3015694 with a T-Stat value of 3.92 and a Prob. value of 0.000. Since the Prob. value (0.000) is much smaller than the 5% significance level (α=0.05), it can be concluded that the Open Unemployment Rate has a positive and significant effect on the Poverty Rate in districts/municipalities in Java Island in 2023. The interpretation of this coefficient is: Every 1% increase in the Open Unemployment Rate will increase the Poverty Rate by 0.301% on average. This positive relationship is consistent with economic theory and intuition. When the unemployment rate is high, more people do not have access to a stable source of income, which directly pushes them into poverty. The absence of decent work reduces households' purchasing power and ability to fulfill basic needs. Rationally, a high Open Unemployment Rate indicates an inefficient labor market or a mismatch between required and available skills, which exacerbates poverty.

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3. **Effect of Provincial Capital Dummy (DUMMY_CAPITALCITY) on Poverty Rate (ln(PovertyRate)):** The Provincial Capital Dummy variable (DUMMY_CAPITALCITY) has a regression coefficient of -0.062086 with a T-Stat value of -2.95 and a Prob. value of 0.004. Since the Prob. value (0.004) is smaller than the 5% significance level (α=0.05), it can be concluded that the status as a provincial capital has a negative and significant effect on the Poverty Rate in districts/municipalities in Java Island in 2023. The interpretation of this coefficient is: Assuming other variables are constant, districts/municipalities with provincial capital status tend to have an average Poverty Rate that is around 6.01% lower than districts/municipalities that are not provincial capitals (Calculation: (exp(-0,062086)-1)×100%≈-6,012%). This negative relationship supports the idea that provincial capitals, as centers of economic and administrative agglomeration, have better access to investment, infrastructure, and public services. The concentration of economic activities in the capital city tends to create more employment opportunities and increase labor mobility, which in turn can reduce the poverty rate. Rationally, better equipped facilities and greater economic opportunities in provincial capitals attract resources and investment, which in turn can reduce poverty despite potential urbanization problems.

Comparison of Linear and Logarithmic Models

To test the robustness of the results and consider different functional forms, this study also estimated the OLS regression model in linear form, as formulated in the methodology. The estimation results of the linear model are presented in Table 3.

Table 3. OLS Regression Estimation Results (Linear Model, Robust Standard Errors)

Variable	Coefficient	Std. Error	T-Stat	Prob.
Constant	11.87414	3.313196	3.58	0.000***
lnpdrbpc	-6.31E-15	1.11E-15	-5.69	0.000***
lntpt	-0.3015521	0.1118669	-2.7	0.008***
capital	0.1924863	0.3185523	0.6	0.548

R-squared	0.1331
F-statistic	14.15
Prob (F-statistic)	0
N (Number of Observations)	119

*Notes: *** at α = 1%; ** at α = 5%; * at α = 10% Source: STATA Data Processing Results, 2025*

Model Comparison Analysis

The comparison between the linear model (Table 3) and the logarithmic model (Table 2) provides additional insight into the relationship between the study variables and the most appropriate functional form.

1. Simultaneous Significance Test (F-test): In both models, linear and logarithmic, the Prob (F-statistic) value is 0.0000. Since this p-value is much smaller than the 5% significance level (α = 0.05), simultaneously, the independent variables in both models significantly affect the Poverty Level. This result indicates that both model specifications are statistically feasible globally.

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2. Coefficient of Determination (R-squared): The linear model has an R-squared value of 0.1331, which indicates that about 13.31% of the total variation in the Poverty Level can be explained by the independent variables in the linear model. This figure is much lower than the R-squared of the logarithmic model (0.5222). Although the R-squared of models with different dependent variables (linear vs. logarithmic) cannot be directly compared to determine "which model is better" in absolute terms, the higher value of the logarithmic model indicates that the logarithmic transformation may be more effective in capturing the relationship between the variables or that the logarithmic model is more suitable in explaining the variation in the data.
3. Direction and Significance of Partial Effects (t-test):
    a. GRDP per capita: In the linear model, GRDP has a negative and significant coefficient (p-value = 0.000). This negative direction of effect is consistent with the logarithmic model and economic theory. However, the very small coefficient value (-6.31e-15) in the linear model indicates that an absolute unit change in GRDP has little effect on the Poverty Rate.
    b. Open Unemployment Rate: In the linear model, the Open Unemployment Rate has a negative coefficient (-0.3015521) and is significant (p-value = 0.008). This contradicts the expectation of economic theory which states that an increase in unemployment will increase poverty, and also contradicts the results of the logarithm model which shows a positive and significant effect. This inconsistency in the direction of the effect is a significant weakness of the linear model.
    c. Provincial Capital Dummy: In the linear model, the Provincial Capital Dummy has a positive coefficient (0.1924863) and is not significant (p-value = 0.548). This is contrary to the theoretical expectation that capital city status tends to reduce poverty, and also contradicts the results of the logarithmic model, which shows a negative and significant effect. The inability of the linear model to represent the effect of this dummy variable significantly and in accordance with theory indicates a mismatch.
4. Classical Assumption Testing for the Linear Model:
    Similar to the logarithmic model, the linear model also showed residual abnormalities (Jarque-Bera test p-value = 0.0000) and heteroscedasticity (Breusch-Pagan/Cook-Weisberg test p-value = 0.0000). Both issues have been addressed by using robust standard errors in the regression estimation, ensuring that the resulting standard errors are consistent and the statistical inference remains valid. For multicollinearity, the linear model showed excellent results with all VIF values well below the threshold of 10 (Average VIF 1.04), indicating no serious multicollinearity issues. Testing for autocorrelation is not relevant for this cross-sectional data as the observations are assumed to be independent.

Overall, although both models show simultaneous significance and no multicollinearity problem, the logarithmic model (Table 2) shows better consistency with economic theory, especially in the direction of influence of the Open Unemployment Rate and Provincial Capital Dummy. In addition, the logarithmic model has a much higher R-squared (0.5222 vs. 0.1331), which indicates a better ability to explain variations in the Poverty Level. The interpretation of elasticities provided by the logarithmic model is also more informative and relevant for policy formulation. Therefore, this study prioritizes and bases the interpretation of the results on the logarithmic model.

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Conclusion, Limitations, and Suggestions

Based on the results of the regression analysis of factors affecting the Poverty Rate in districts/municipalities in Java Island in 2023, it can be concluded that the three independent variables: GRDP per Capita, Open Unemployment Rate, and Provincial Capital Dummy, simultaneously have a significant effect on the Poverty Rate. Partially, this study found that GRDP per capita has a negative and significant effect on the Poverty Rate, which indicates that an increase in economic activity correlates with a decrease in poverty. Similarly, the provincial capital dummy has a negative and significant effect, indicating that regions that are provincial capitals tend to have lower poverty rates, possibly due to economic agglomeration and access to various facilities. In contrast, the Open Unemployment Rate is shown to have a positive and significant effect on the Poverty Rate, confirming that high unemployment is one of the main drivers of increased poverty. The logarithmic model used in this study provides an interpretation that is more in line with economic theory and has good explanatory power.

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