

The Relationship between Income Inequality and Poverty in Indonesia: A Sustainable Macroeconomic Analysis (Empirical Study of Java Island 2018–2022)

Original Article

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Abstract

This study aims to analyze the influence of income inequality, economic growth, and government expenditure on poverty levels in five provinces across Java Island during the period 2018–2022. A quantitative research approach with a panel data analysis method was employed, using the Fixed Effect Model (FEM) estimated through EViews 12 software. The study utilized secondary data obtained from the Central Bureau of Statistics (BPS) and the Ministry of Finance of the Republic of Indonesia. The results reveal that, partially, income inequality has a negative and significant effect on poverty, indicating that reducing inequality contributes to poverty alleviation. Conversely, economic growth shows a positive and significant relationship with poverty, suggesting that economic growth in Java has not been inclusive (non-pro-poor growth). Meanwhile, government expenditure has a negative and significant impact on poverty, demonstrating that increasing public spending—especially in social and infrastructure sectors—effectively reduces poverty when allocated efficiently. Simultaneously, all independent variables significantly affect poverty, with a Prob(F-statistic) of $0.000004 < 0.05$. The coefficient of determination (R^2) of 0.7419 indicates that 74.19% of poverty variation is explained by the model. The findings emphasize the importance of inclusive and equitable economic policies to support the achievement of the Sustainable Development Goals (SDGs), particularly Goal 1 (No Poverty) and Goal 10 (Reduced Inequalities).

Keywords: Income Inequality, Economic Growth, Government Expenditure, Poverty, Sustainable Development Goals (SDGs), Java Island

1. Introduction

Poverty remains a fundamental challenge to Indonesia's development, despite substantial progress in recent decades. According to a report from the Asian Development Bank (ADB), poverty reduction in Indonesia has been slower than the increase in national income, as growth has not always been accompanied by equitable distribution (Hill, 2021). ADB This situation has prompted attention to factors influencing poverty beyond economic growth alone, including income distribution or inequality.



Income inequality, often measured by the Gini index, plays a significant role in disparities in social welfare. A panel study of provinces in Indonesia found that unequal income distribution can slow the effects of economic growth on poverty reduction. (SUPARMAN, 2022). In other words, growth alone is not enough; equitable distribution of outcomes is also crucial within the framework of sustainable development.

In the Indonesian context, particularly on Java, the center of economic and urbanization, income inequality and poverty often go hand in hand. Research shows that although Java has a relatively lower poverty rate compared to other regions, disparities between urban areas and between social groups remain high. This reinforces the need for region-specific analyses to understand the dynamics of inequality and poverty in greater detail.

Furthermore, from a sustainable macroeconomic perspective, poverty alleviation is part of the global Sustainable Development Goals (SDGs) agenda specifically Goal 1 (No Poverty) and Goal 10 (Reduced Inequalities). Sustainable poverty alleviation requires inclusive growth and equitable income distribution. Endrawati's study demonstrates that in Indonesia, policies that only accelerate growth without addressing inequality are less effective in reducing poverty (Maurilla et al., 2022)

Furthermore, conceptual research shows that income inequality can influence poverty through various channels: limited access to education and employment opportunities, wealth concentration that reduces the ability of the poor to move up the social ladder, and unfavorable fiscal policies. A study by Ariyani and Nafisyah (2024) showed a positive effect of the Gini index on poverty rates in 34 Indonesian provinces, demonstrating the relevance of income distribution to well-being.

In this regard, economic growth remains an important variable due to its potential to reduce poverty, but its effectiveness depends heavily on the level of inequality and the context of economic distribution. The growth elasticity of poverty theory suggests that poverty reduction through growth will be greater if income distribution is relatively egalitarian. Therefore, examining inequality alongside poverty in the context of growth is highly relevant.

Government spending, particularly that directed at the social and infrastructure sectors, is also a key instrument for poverty reduction through redistribution mechanisms. However, policy effectiveness is often influenced by regional capacity, budget management, and program focus. Weak social infrastructure or inappropriate allocation can reduce public spending's impact on poverty reduction (Nurdina, 2021).

Therefore, this study selects the island of Java as its empirical study for the 2018–2022 period. This region was chosen because Java has a high economic concentration, rapid urbanization, and sufficient provincial diversity for panel data analysis. Thus, the research results are expected to provide a more focused picture of the dynamics of income inequality and poverty within a strategic regional context for Indonesia. Furthermore, this study aims to analyze the relationship between income inequality (Gini index) and poverty rates, taking into account supporting variables such as economic growth and government spending. By using panel data methods, this study is expected to identify direct and significant influences and policy implications for inclusive and sustainable macroeconomic development. As a contribution, the findings of this study are expected to provide recommendations for policymakers at the provincial and national levels on how to balance economic growth with income equality to more effectively achieve the SDGs agenda. Therefore, this research is not only academically relevant but also has policy value in the context of Indonesia's ongoing efforts to accelerate poverty alleviation.

2. Literature Review

2.1. Theoretical Framework

Sustainable economic development emphasizes not only economic growth but also the equitable distribution of the results of growth so that all levels of society benefit. Within this framework, two important theoretical concepts are poverty and income inequality. Poverty describes a condition in which individuals or households are unable to adequately meet basic needs. Income inequality, often measured by the Gini index, describes the distribution of income among individuals or households within a region. Inclusive growth theory states that pro-poor growth and a more equitable distribution of income are more effective in reducing poverty than growth that focuses solely on aggregate income (Hill, 2021). Furthermore, the concept of growth elasticity of poverty suggests that poverty reduction through economic growth will be greater when income distribution is relatively egalitarian. Conversely, if inequality is high, the effect of growth on poverty is reduced or even reversed. A study by SUPARMAN (2022) concluded that in Indonesia, income inequality weakens the effect of growth on poverty alleviation.

In the regional context of Java, which is the center of national economic growth but still faces significant disparities between provinces, it is crucial to analyze how inequality mechanisms influence poverty at the macro level. The concentrated economic structure and differing socioeconomic access across provinces add to the urgency of this study.

2.2. Income Inequality and Poverty

Several studies in Indonesia have demonstrated a link between income inequality and poverty. Suparman (2022) A study of provincial panel data found that income inequality (Gini) had a positive effect on poverty rates, meaning that higher inequality leads to higher poverty rates. Meanwhile, the ADB study "What's Happened to Poverty and Inequality in Indonesia" (Hill, 2021) shows that although the overall poverty rate has declined, the pace of this decline is limited by high income inequality.

On a local scale, the study "Income Distribution and Inequality in Indonesia: A Study on Middle-Class Households" Maipita & Wahyudi (2017) found that middle-class growth has not been sufficient to reduce inequality because the results of this growth are distributed unequally. Theoretically, inequality can reinforce poverty through pathways such as limited access to education and healthcare, low social mobility, and the dominance of high-income groups over distribution policies. Therefore, the hypothesis that income inequality has a positive effect on poverty can be substantiated.

2.3. Economic Growth and Poverty Reduction

Economic growth is a classic pillar of poverty reduction. However, its effectiveness depends heavily on income distribution and the inclusiveness of growth. In the Indonesian context, research by Firdaus et al. (2021) shows that economic growth does not significantly impact poverty when human resource quality variables (education, health) and the economic-productivity ratio are not taken into account. Suparman (2022) study also found that economic growth does have the potential to reduce poverty, but its effect is much smaller when income inequality is high. journalkeberlanjutan.com Therefore, economic growth needs to be included as a control variable in models of the relationship between inequality and poverty to examine both its net and moderating effects.

2.4. The Role of Government Spending and Distribution Policy Instruments

Fiscal policy, particularly government spending directed toward the social and infrastructure sectors, serves as a redistribution instrument that can reduce poverty and improve income equality. The study "Determinant Analysis of Household Income Inequality and Poverty in Indonesia" (2020) found that more equitable income distribution and well-targeted social policies play a crucial role in poverty reduction (Rinaldi & Rahmadana, 2020). Furthermore, the publication "Income Inequality in Indonesia and Its Influencing Factors" Panggabean (2025) shows that inclusive government spending can mitigate the negative effects of inequality on poverty. ResearchGate Therefore, within the framework of this research, government spending (the ratio of social/infrastructure spending to the regional budget) is included as a control variable representing distribution policy efforts in the analysis model.

3. Methods

This study uses a quantitative approach with panel data regression to analyze the relationship between income inequality, economic growth, and government spending on poverty levels in Java Island for the period 2018–2022. The data used are secondary data obtained from the Central Statistics Agency (BPS) and the Ministry of Finance (DJPK). The analysis unit covers Six provinces on the island of Java: Jakarta, West Java, Central Java, Yogyakarta, East Java and Banten. A panel data structure was chosen because it can simultaneously depict variations between provinces and over time, thus providing more accurate analysis results.

4. Results and Discussion

4.1. Descriptive Statistics

Table 1. Descriptive Statistics

	X1	X2	X3	Y
Mean	0.401958	3.363333	22.53333	9.135000
Median	0.397500	5.065000	22.25000	9.660000
Maximum	0.440000	6.130000	27.20000	13.15000
Minimum	0.381000	-2.810000	18.90000	3.470000
Std. Dev.	0.017479	3.171762	2.361405	2.798127
Skewness	0.936845	-1.170741	0.329254	-0.542701
Kurtosis	2.691029	2.712363	2.136989	2.321160
Jarque-Bera	3.606180	5.565277	1.178422	1.638919
Probability	0.164789	0.061875	0.554765	0.440670
Sum	9.647000	80.72000	540.8000	219.2400
Sum Sq. Dev.	0.007027	231.3817	128.2533	180.0788
Observations	24	24	24	24

Overall, the results of the descriptive statistical analysis indicate that the research variables have stable data characteristics and are suitable for use in panel analysis. Income inequality in Java is in the moderate category with an average Gini index of 0.4019 and relatively small variations between provinces. The average economic growth of 3.36% shows quite high fluctuations due to the impact of the COVID-19 pandemic, while government spending has a fairly large proportion with an average of 22.53%, reflecting the important role of regional fiscal in development. The average poverty rate of 9.13% indicates a welfare disparity between provinces, with DKI Jakarta having the lowest poverty rate and DI Yogyakarta having the highest. The results of the normality test (Jarque–Bera) indicate that all variables are normally distributed (Prob. > 0.05), so the model is considered to meet the basic assumptions and is ready for further analysis using panel regression.

4.2. Inter-variable correlation test

Table 2. Multicollinearity Test

	X1	X2	X3
X1	1.000000	-0.290246	0.450879
X2	-0.2902464	1.000000	-0.588461
X3	0.450879	-0.588461	1.000000

The results of the multicollinearity test show that the correlation coefficient value between independent variables (X1, X2, and X3) is below 0.80, which means that there is no multicollinearity in the regression model. The highest correlation value is between variables X2 (Economic Growth) and X3 (Government Spending) at -0.588, but this value is still below the tolerance limit of 0.80 so it does not cause serious collinearity problems. The moderate negative correlation between economic growth and government spending indicates that when spending increases, economic growth tends to decrease in a certain period, but this relationship is still within reasonable limits.

4.3. Chow Test

Table 3. Chow Test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	448.138684	(4,16)	0.0000
Cross-section Chi-square	113.464670	4	0.0000

The results of the Chow Test (Redundant Fixed Effects Test) in Table 3 show that the Cross-section F Probability value is $0.0000 < 0.05$ and the Chi-square Probability is $0.0000 < 0.05$. This means that H_0 is rejected, so the Fixed Effect Model (FEM) is more appropriate to use than the Common Effect Model (CEM).

4.4. Hausman Test

Table 4. Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	37.161985	3	0.0000

The results of the Hausman Test (Correlated Random Effects Test) in Table 4 show that the Chi-Square Probability value is $0.0000 < 0.05$. Based on the testing criteria, this result means that H_0 is rejected, so the most appropriate model to use is the Fixed Effect Model (FEM) compared to the Random Effect Model (REM).

4.5. Significance Test and Coefficient of Determination

4.5.1 Test-t

The t-test is a statistical test used to determine the effect of each independent variable (X) partially or individually on the dependent variable (Y) in a regression model, assuming that other variables are held constant.

Table 5. Test-t

Dependent Variable: Y
Method: Panel Least Squares
Date: 11/02/25 Time: 23:03
Sample: 2018 2022
Periods included: 5
Cross-sections included: 5
Total panel (unbalanced) observations: 24

Variable	Coefficient	Std. Error	t-Statistic	Prob.
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C	-4.332838	6.951855	-0.623264	0.5402
X1	-0.532902	0.108713	-4.901907	0.0001
X2	81.98927	18.05489	4.541112	0.0002
X3	-0.363343	0.088388	-4.110770	0.0005

Based on the t-test results, the income inequality variable (X_1) has a probability value of $0.0001 < 0.05$, indicating a negative and significant effect on poverty levels. This means that the lower the income inequality, the lower the poverty rate. The economic growth variable (X_2) has a probability value of $0.0002 < 0.05$, indicating a positive and significant effect on poverty. This indicates that economic growth in Java during the study period was not inclusive (non-pro-poor growth), so that increased growth was not accompanied by a decrease in poverty. Meanwhile, the government spending variable (X_3) has a probability value of $0.0005 < 0.05$, indicating a negative and significant effect on poverty. This indicates that increased public spending, particularly in the social and infrastructure sectors, plays an effective role in reducing poverty in Java.

4.5.2 Test-F

Table 6. Test-F

R-squared	0.741963
Adjusted R-squared	0.703257
S.E. of regression	1.286355
Sum squared resid	33.09416
Log likelihood	-37.91016
F-statistic	19.16938
Prob(F-statistic)	0.000004

The F-statistic value of 19.16938 with $\text{Prob(F-statistic)} = 0.000004 < 0.05$ indicates that the panel regression model is simultaneously significant. This means that the independent variables consisting of income inequality (X_1), economic growth (X_2), and government spending (X_3) jointly have a significant effect on the poverty rate (Y) in Java during the 2018–2022 period.

4.5.3 Koefisien Determinasi (R^2 dan Adjusted R^2)

The R-squared value of 0.741963 indicates that 74.19% of the variation in poverty can be explained by the model, while the Adjusted R-squared value of 0.703257 indicates that the model remains robust after adjusting for the number of variables. Therefore, this model is considered good and suitable for use in empirical analysis of sustainable macroeconomics in the Java region.

4.6. Discussion

1) Income Inequality and Poverty

The income inequality variable (X_1) has a negative and significant coefficient on the poverty rate with a probability of $0.0001 < 0.05$. This result indicates that reducing income inequality significantly contributes to poverty reduction. This condition aligns with the inclusive growth theory, which emphasizes the importance of equitable distribution of development outcomes so that the benefits of economic growth can be felt equally by all levels of society. When income is distributed more fairly, people's purchasing power increases, domestic demand strengthens, and opportunities to escape poverty become greater. This finding aligns with research by Suparman (2022) which states that income inequality has a positive effect on poverty at the provincial level in Indonesia. Therefore, poverty reduction efforts in Java depend not only on accelerated growth but also on income redistribution policies through increasing living wages, access to education, and equal employment opportunities.

2) Economic Growth and Poverty

The economic growth variable (X_2) shows a positive and significant coefficient on poverty with a probability of $0.0002 < 0.05$. This result indicates that economic growth in Java during the study period was not inclusive (non-pro-poor growth), meaning that increased economic output did not directly reduce poverty levels. This phenomenon can be explained by the high concentration of the economy in urban areas and the formal sector, which prevents low-income groups in the informal sector from experiencing the benefits of growth. This condition is consistent with the findings of Hill (2021) and Ariyani & Nafisyah (2024), which states that economic growth in Indonesia tends to benefit the upper-middle class, while the poor do not experience significant improvements in welfare. Thus, future economic growth strategies need to be directed at strengthening a people-based economy and empowering the micro-productive sector so that growth results can trickle down to all levels of society (trickle-down effect).

3) Government Spending and Poverty

The government spending variable (X_3) has a negative and significant effect on poverty with a probability of $0.0005 < 0.05$. This indicates that increased public spending, particularly in the social, education, and basic infrastructure sectors, is effective in reducing poverty levels in Java. This finding is in line with Keynesian theory, which emphasizes that the government's active role through fiscal spending can stimulate aggregate demand, increase employment opportunities, and strengthen public access to public services. However, spending effectiveness is highly dependent on the quality of program implementation, targeting accuracy, and budget efficiency. Panggabean (2025) also emphasized that inclusive public spending can weaken the negative effects of inequality on poverty. Therefore, local governments need to ensure that APBD allocations are directed to sectors that have a high multiplier effect on poverty reduction, such as vocational education, MSMEs, and rural infrastructure.

4) Simultaneous Model Analysis

The F-test results show a Prob(F-statistic) value of $0.000004 < 0.05$, which means that simultaneously the three independent variables have a significant effect on the poverty rate. This proves that a combination of macroeconomic factors, such as income distribution, economic performance, and fiscal policy, jointly determines the level of community welfare in Java. The model also has a coefficient of determination (R^2) value of 0.7419, which means that 74.19% of the variation in poverty can be

explained by these three variables, while the remaining 25.81% is influenced by other factors outside the model, such as inflation, education, unemployment, and investment. The Adjusted R^2 value of 0.7033 indicates that the model has strong and reliable explanatory power in describing the relationship between economic variables.

5) Implications for Sustainable Development Goals (SDGs)

The findings of this study have direct implications for achieving Sustainable Development Goals (SDGs) 1 and 10, namely, No Poverty and Reduced Inequality. To achieve these targets, economic policies in Java must balance accelerated growth with equitable distribution of development outcomes. The government needs to strengthen redistributive policies such as progressive tax reform, expanded social security, improved vocational education, and encourage investment oriented towards job creation for the poor. With this approach, economic growth will not only increase numerically but also be inclusive and sustainable for all citizens.

5. Conclusion

This study aims to analyze the relationship between income inequality, economic growth, and government spending on poverty levels in five provinces on Java Island during the 2018–2022 period using the Fixed Effect Model (FEM) with a panel data approach. Based on the analysis, it was concluded that all three independent variables partially significantly influence poverty levels, and simultaneously, the model was declared significant with a Prob(F-statistic) value of $0.000004 < 0.05$. The coefficient of determination (R^2) of 0.7419 indicates that 74.19% of the variation in poverty levels can be explained by income inequality, economic growth, and government spending, while the remaining 25.81% is influenced by other factors outside the model. Partially, income inequality (X_1) has a negative and significant effect on poverty, meaning that lower income inequality leads to lower poverty levels. This underscores the importance of income equality policies through increased access to education, employment opportunities, and equitable fiscal redistribution policies. The economic growth variable (X_2) has a positive and significant effect on poverty, indicating that economic growth in Java during the study period was not inclusive. The growth was enjoyed predominantly by high-income groups, so that increased output was not accompanied by improvements in the welfare of the poor. Meanwhile, the government spending variable (X_3) has a negative and significant effect on poverty, indicating that increased government spending in the social and infrastructure sectors plays an effective role in reducing poverty levels, especially when directed towards well-targeted programs. Overall, the results of this study confirm that sustainable and equitable economic development requires not only high economic growth but also equitable distribution of development outcomes and strengthening efficient fiscal interventions. Poverty alleviation efforts in Java will be more effective if economic policies are directed at reducing income inequality and ensuring that public spending truly addresses the needs of vulnerable groups. These results also support the achievement of Sustainable Development Goals (SDGs) point 1, "No Poverty," and point 10, "Reduced Inequality," which emphasize the importance of inclusive, equitable, and sustainable economic growth for all levels of Indonesian society.

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