



Analysis of Poverty, Labor Force Participation Rate, and Unemployment on Income Inequality in Java Island (2019-2023)

Edwin Dermawan Sudarma^{1*}, Ida Nuraini²

^{1,2} University of Muhammadiyah Malang

Article Information

History of article:
Received March 2025
Approved March 2025
Published March 2025

ABSTRACT

Income inequality remains a major issue in many developing countries, including Indonesia. This study aims to analyze income inequality across six provinces on the island of Java, as measured by the Gini ratio. Using secondary data from the Central Statistics Agency of Indonesia, the study employs panel data regression with a fixed effect model to examine the effects of poverty, Labor Force Participation Rate (LFPR), and unemployment on income inequality. The empirical results reveal that both poverty and LFPR have a significant positive impact on income inequality, indicating that increases in these variables are associated with a wider income gap. In contrast, unemployment shows a significant negative effect on income inequality, suggesting that higher unemployment levels are associated with a more equal income distribution. This finding may reflect the prevalence of uniformly low incomes during periods of high unemployment. These results imply that increasing LFPR or reducing unemployment could paradoxically increase income inequality if economic gains are not evenly distributed. Therefore, inclusive employment programs, along with expanded access to education and healthcare, are essential to mitigate both poverty and income disparities. The study recommends that policymakers focus on enhancing job quality and accessibility to ensure that improvements in employment translate into more equitable economic outcomes.

Keywords: Income Inequality; Poverty; The Labor Force Participation Rate; Unemployment

JEL Classification Code: D63, I32, J21, J64

INTRODUCTION

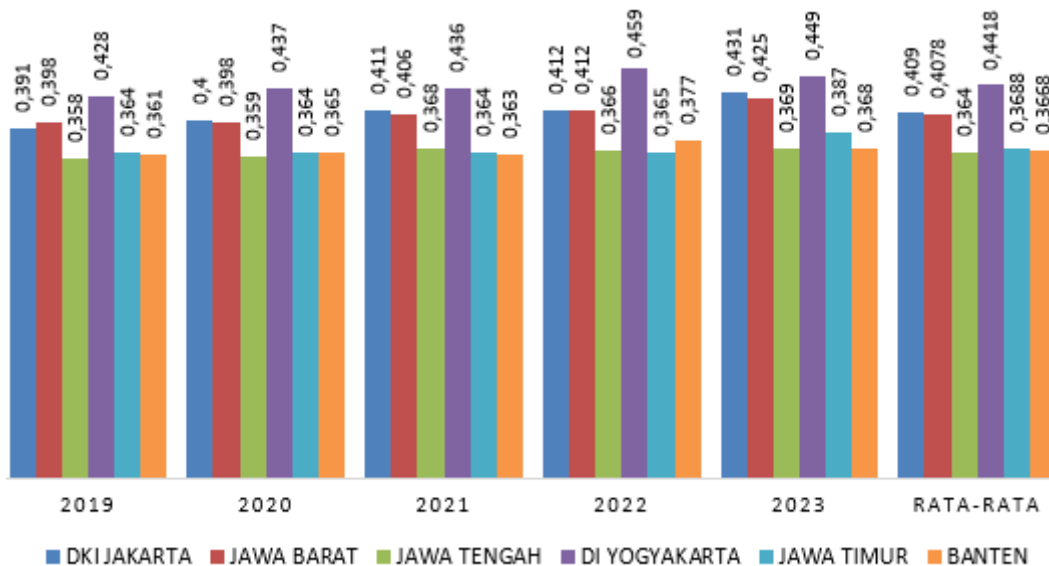
Income inequality is one of the structural problems faced by many developing countries, including Indonesia. This inequality describes the unequal distribution of income between groups of people, and is usually measured using the Gini ratio indicator. The Gini ratio shows the level of income inequality in a region, the higher the value, the greater the inequality (Kebalo & Zouri, 2024). Income inequality not only reflects welfare disparities, but also impacts social stability, economic mobility, and the effectiveness of fiscal policies.

In the context of development, inequality can hinder sustainable economic growth and widen the gap between regions and between individuals (Yu & Xu, 2023). This inequality is often correlated with poverty and low access to education, health, and decent work. Governments often try to address this through income redistribution with the aim of leveling income across all regions (Saleh & Rizkina, 2021).

Income inequality in Indonesia cannot be separated from its geographical characteristics which consist of thousands

of islands. Interestingly, Java Island, as the region with the largest contribution to the national economy at 56.58% in 2022 (Wijayanti & Putri, 2023). The island of Java, which is an economic center for the government, still faces the issue of income inequality in the 2019 - 2023 period. Data shows that in that year, income equality in most areas of Java Island was at a moderate level, with figures ranging from 0.30 to 0.40. This indicates that the equitable distribution of income in all areas of Java Island in the 2019 - 2023 period is still not sufficiently evenly distributed (Gusmianto, 2023; Saleh & Rizkina, 2021; Wardhana et al., 2023).

Based on the figure 1, it shows the development of Gini Ratio in six provinces on the island of Java from 2019 to 2023. The Gini Ratio is used to measure the level of income inequality, where a value closer to 1 indicates higher inequality. Based on the graph, the Special Region of Yogyakarta consistently has the highest level of inequality with a Gini Ratio value of 0.449 in 2023. In contrast, Central Java recorded the lowest inequality with a value of 0.368



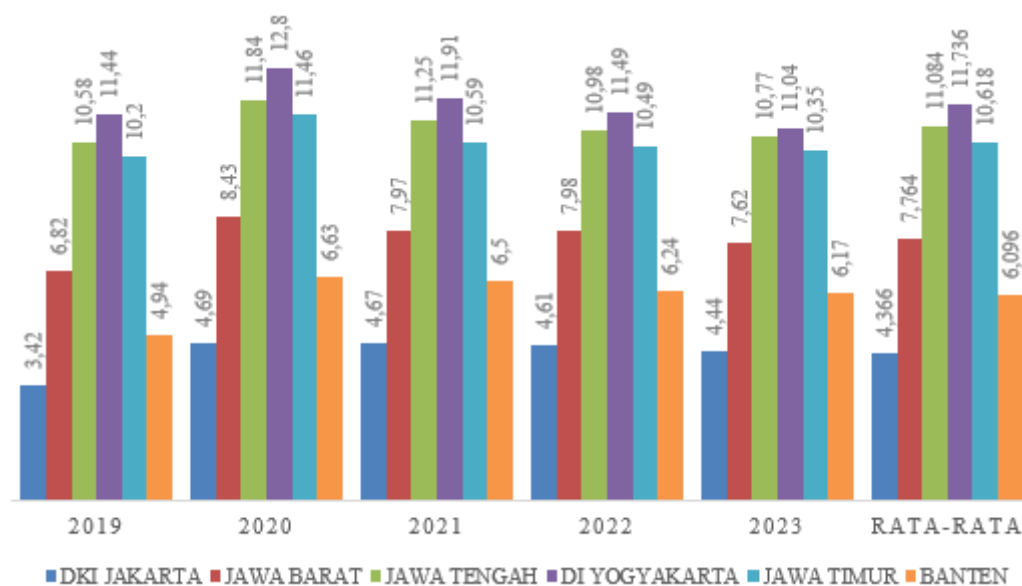
Source: BPS, 2023

Figure 1.
Gini Ratio of Java Island 2019-2023

in the same year. DKI Jakarta and West Java show an increasing trend in the Gini Ratio, indicating that inequality is widening inequality, while Banten has fluctuated, with an increase in 2022 which then decreased again in 2023. In general, income inequality in Java over the past five years has been in the medium category (0.36 – 0.44), reflecting that the distribution of income in this region is still not optimally evenly distributed (Farhan & Sugianto, 2022).

to all levels of society

Generally, poverty is measured using macro indicators such as Gross Domestic Product (GDP) per capita, but these indicators have limitations because they often do not reflect the real conditions faced by the poor. According to Muhammad & Azis (2015) Structural poverty is caused by limited access to means of production, such as land, technology, and quality human resources, which is commonly experienced by the majority of the population.



Source: BPS, 2023

Figure 2.
Poverty in Java Island 2019-2023

The condition of income inequality does not occur suddenly, but is influenced by various economic and social factors. One of the main factors that contributes greatly is the poverty rate. Figure 2 shows the poverty levels in six provinces on the island of Java from 2019 to 2023. Individuals living in poverty are often trapped in a circle that is difficult to break, such as limited access to education, health care, and decent employment. Therefore, the measure of per capita income alone is not enough to describe the welfare conditions of a region. What is more important is that national income can be distributed equally

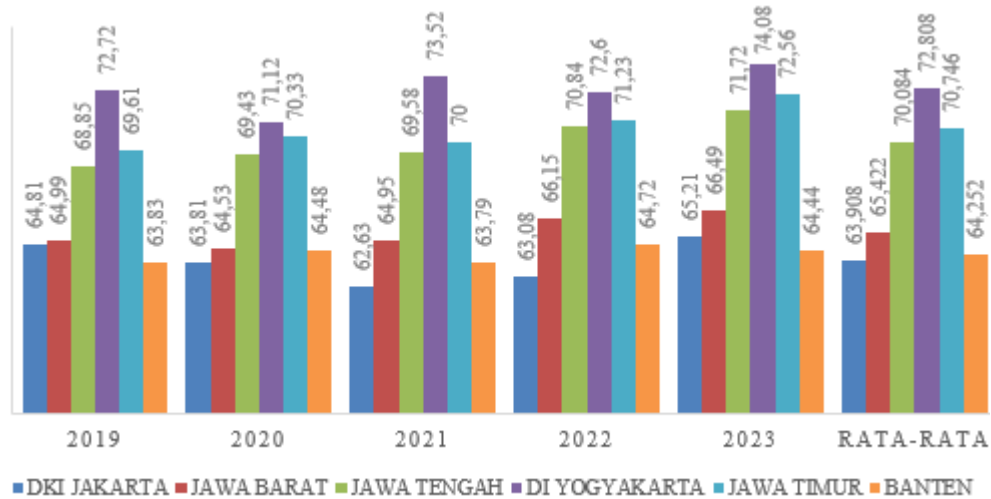
Figure 3 shows data on the Labor Force Participation Rate (TPAK) in six provinces on the island of Java during the period 2019 to 2023. TPAK measures the percentage of the working-age population who are economically active, both working and looking for work. Data shows that in general, TPAK on the island of Java is relatively stable from year to year, with slight fluctuations in some provinces. DI Yogyakarta and East Java are recorded to have a fairly high TPAK, reflecting greater economic participation than other provinces. In contrast, provinces such as DKI Jakarta and Banten show lower participation rates,

which may indicate structural barriers such as limited formal employment, unequal labor skills, or preference for the informal sector.

This phenomenon is in line with the view Hapsari & Nurhayati (2021) which states that low TPAK can be caused by a lack of job opportunities and inadequate labor qualities. In addition, Porretti et al. (2024) highlight the importance of labor specialization in increasing competitiveness in the free market. Therefore, increasing TPAK needs to be focused not only on quantity, but also on quality and access to decent work.

in the study of development and inequality because it is directly related to access to sources of income. Data shows that most provinces experienced a spike in unemployment in 2020, which is in line with the impact of the COVID-19 pandemic on economic activity and employment. After that year, there was a downward trend in almost all provinces, reflecting a gradual economic recovery.

DKI Jakarta is recorded to have a relatively high unemployment rate compared to other provinces, which can be attributed to the high concentration of urban population and dependence on the formal



Source: BPS, 2023

Figure 3.
TPAK in Java Island 2019-2023

However, it is important to note that increasing TPAK without being supported by the creation of quality jobs can actually exacerbate income inequality, as found in the results of this study's regression analysis. Thus, employment policies that are aimed at improving the quality of human resources and creating productive jobs are very important in order to realize inclusive economic growth (Putriana & Aji, 2022).

Figure 4 shows the open unemployment rate in six provinces on the island of Java during the period 2019 to 2023. Unemployment is a crucial indicator

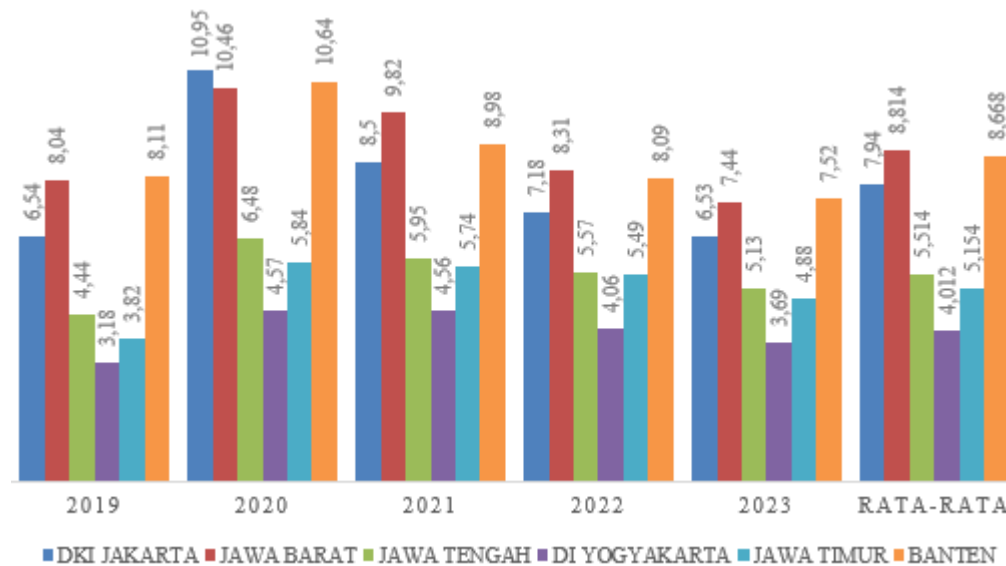
sector that is directly affected by the crisis. In contrast, provinces such as Central Java and Yogyakarta show lower unemployment rates, likely due to their economic structures that are more informal or agrarian sector-based, which are more flexible to economic shocks.

According to Windari et al. (2023) unemployment can be interpreted as people who are in the labor force and are looking for a job but have not yet found a job. When many people do not work, they lose their source of income which makes the purchasing power of the community de-

crease. As a result, income inequality has become worse because only a small part of society can access economic resources. This close relationship can be explained in part, by the fact that higher unemployment rates result in a lower proportion of the labor force and those receiving lower incomes.

create a more equitable and inclusive economic development strategy (Anwar, 2023; Tregenna, 2011).

This study makes a unique contribution by highlighting an independent variable that differs from most previous studies, namely the Labour Force Participation Rate (TPAK), as one of the determinants of



Source: BPS, 2023

Figure 4.
Unemployment in Java Island 2019-2023

The level of income inequality in Indonesia is still relatively high, with the Gini Ratio reaching around 0.38 based on the latest data from the Central Statistics Agency. This figure confirms that, despite various equitable policies that have been launched by the government, economic inequality remains a serious challenge in the context of national development. In this context, it is important to understand how poverty, TPAK, and unemployment are interconnected and affect the Gini Ratio, so that the measures taken are more targeted. This research on the relationship between poverty, TPAK, and unemployment to the Gini Ratio is expected to provide clearer insights into the root of the problem of economic inequality in Indonesia. Thus, the results can be an input for policymakers to

income inequality. Although the research location remains focused on the Java Island region, this study remains relevant to the previous literature because it uses the same dependent variable, namely income inequality as measured through the Gini Ratio. This similarity provides an opportunity for researchers to compare current research results with previous findings, as well as enrich discussions in the context of economic development and equity in Indonesia.

The main objective of this study is to analyze how poverty, TPAK, and unemployment affect income inequality in Java. With this approach, it is hoped that the research will be able to provide a deeper understanding of the dynamics of income distribution, as well as empirically explain

the role of each variable in shaping economic inequality. The findings of this study are expected not only to expand the academic understanding of the causes of inequality, but also to serve as a basis for more effective and evidence-based public policy formulation. The policy aims to reduce income inequality and improve the overall well being of the community, especially through interventions that target access to jobs, improving the quality of human resources, and reducing poverty rates in a sustainable manner.

METHODOLOGY

This study uses a quantitative approach with panel data regression analysis, which allows simultaneous observation of time series and cross-provincial data. The analysis unit consists of six provinces on the island of Java, namely DKI Jakarta, Banten, West Java, Central Java, East Java, and DI Yogyakarta, with secondary data collected from the Central Statistics Agency (BPS) for the period 2019 – 2023.

The panel data regression model was used to analyze the influence of independent variables on income inequality (measured using the Gini ratio). The independent variables in this study are:

X1 (Poverty): The percentage of poor people in each province.

X2 (Labor Force Participation Rate/TPAK): The percentage of the working-age population who are actively working or looking for work.

X3 (Unemployed): The percentage of open unemployment in the relevant province.

The econometric regression model used in this study is as follows:

$$Y_{it} = \beta_0 + \beta_1 x1_{it} + \beta_2 x2_{it} + \beta_3 x3_{it} + e$$

where Y is income inequality (gini ratio), β_0 is constanta, β_1 , β_2 , β_3 is coefficients, X1 is poverty (%), X2 is labor force participation rate (TPAK) (%), X3 is unemployment (%) and e is error term

To determine the best panel model, three stages of model testing are performed:

1. Chow test: to compare Common Effect Model (CEM) and Fixed Effect Model (FEM) models.

2. Hausman test: to compare FEM with Random Effect Model (REM).

3. FEM (Fixed Effect) test: to estimate the parameters of the model by taking into account the interprovincial fixed effect.

The test results show that the FEM model is the most appropriate to use in this study. In addition to being statistically significant in the Chow and Hausman tests, FEM was also chosen for its ability to capture unobserved heterogeneity between provinces that may affect income inequality but is constant during the observation period. Thus, FEM provides more accurate estimates than other models in the context of data panels of provinces on the island of Java.

RESULTS AND DISCUSSION

In table 1, the results of the chow test show a probability value of < 0.05 , then H_0 minus H_1 is accepted. The results reject the Zero Hypothesis, meaning that the Fixed Effect (FEM) model is more appropriate than the Common Effect (CEM) model in explaining the variation in income inequality between provinces. The Chow test is used to determine whether the Fixed Effect (FEM) model is more appropriate than the Common Effect Model (CEM).

In table 2, the Hausman Test Results reject the zero hypothesis, which suggests that FEM is the most suitable model for this study. The results of the Hausman Test have a prob value of 0.0307, which means that it is smaller than 0.05, so H_0 minus H_1 is accepted. This shows that the Fixed Effect Model (FEM) is the most appropriate model to use compared to the Random Effect Model (REM), because it is able to capture the specific influences of

Table 1.
Chow Test Results

Effects Test	Statistic	D.F.	Prob.
Cross-section F	60.474105	(5,19)	0.0000
Cross-section Chi-square	79.188361	5	0.0000

Source: Eviews 12 data processed

Table 2.
Hausman Test Results

Test Summary	Statistic	d.f.	Prob.
Cross-section random	8.894006	3	0.0307

Source: Eviews 12 data processed

each province more accurately. The Hausman test is used to choose between the Fixed Effect Model (FEM) and the Random Effects Model (REM).

Thus, the regression results of the Fixed Effect Model can be incorporated into the following regression equations:

$$KTPN = -0.061030 + 0.009309 \text{ KMKM} + 0.0000593 \text{ TPAK} - 0.003903 \text{ PGRN} + \varepsilon_t$$

The Fixed Effect Model (FEM) was chosen as the best model in this study based on the results of the Chow test and the Hausman test. Both tests show that FEM is more suitable than Common Effect Model (CEM) and Random Effect Model (REM). Therefore, the analysis of the relationship between poverty, labor force participation rate (TPAK), and unemployment to income inequality in Java was carried out using the Fixed Effect model.

Based on the regression output, the constant coefficient is -0.061030, which suggests that when all independent variables are equal to zero, the mean value of the income inequality variable (measured by the Gini Ratio) would be -0.061. However, this coefficient is not statistically significant, as indicated by its probability value of 0.6342. In contrast, the poverty variable (KMKM) has a coefficient of 0.009309 and a probability value of 0.0171 (< 0.05), indicating a positive and significant relationship with income inequality. This means that a 1% increase in the poverty rate will increase the Gini Ratio by approximately 0.009309%.

Similarly, the Labor Force Participation Rate (TPAK) exhibits a positive and significant effect on income inequality, with a coefficient of 0.0000593 and a probability value of 0.0026. A 1% rise in TPAK is

Table 3.
FEM Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Note
KTPN	-0.061030	0.126210	-0.483559	0.6342	Rejected
KMKM	0.009309	0.003563	2.612613	0.0171	Accepted
TPAK	0.0000593	0.0000171	3.459284	0.0026	Accepted
PGRN	-0.003903	0.001724	-2.264060	0.0355	Accepted
R-Squared	:0.947697				
WO R-squared	: 0.925675				
F-Statistics	:43.03372				
Sig(F-statistics)	:0.000000				
Durbin-Watson stat	: 1.855231				

Source: Eviews 12 data processed

estimated to increase the Gini Ratio by 0.0000593%. On the other hand, the unemployment variable shows a negative and significant relationship with income inequality. The coefficient of -0.003903 and a probability of 0.0355 imply that a 1% increase in unemployment could reduce the Gini Ratio by 0.003903%, suggesting that higher unemployment may be associated with lower levels of income inequality in the context of this model.

The model's explanatory power is quite high, as reflected by the R-squared value of 0.947697, meaning that 94.77% of the variation in income inequality can be explained by the independent variables included in the model: poverty, labor force participation, and unemployment. The adjusted R-squared, which accounts for the number of variables in the model, is slightly lower at 0.925675, but still indicates a strong fit. Moreover, the F-statistic value of 43.03372 with a corresponding probability of 0.0000 confirms that the model is statistically significant at the 1% level, suggesting that the independent variables collectively have a meaningful impact on income inequality. Finally, the Durbin-Watson statistic of 1.855231, which is close to the ideal value of 2, suggests that there are no serious issues related to autocorrelation in the residuals, thus reinforcing the reliability of the model.

The three independent variables, namely poverty, labor force participation rate (TPAK), and unemployment, have been shown to have a significant effect on income inequality. Poverty and TPAK contribute positively, while unemployment has a negative influence. The model used has a high degree of accuracy, as indicated by the large R-squared value. In addition, the results of the Durbin-Watson and F-statistic tests show that the model is free of autocorrelation and is suitable for use by analysts.

The Effect of Poverty on Income Inequality

The results of regression estimation using the Fixed Effect Model (FEM) show that poverty has a positive and significant effect on income inequality on the island of Java ($0.0171 < 0.05$). This means that the higher the poverty rate, the greater the income distribution inequality. These findings are consistent with development economics theory which states that limited access to basic needs such as education, health, and employment drive an economic gap between the lower and upper income groups.

Previous studies by Hindun et al. (2019) also supported these findings, showing that increased poverty correlates with increased inequality. In this context, poverty is not only the result of inequality, but also a factor that exacerbates it, especially when the basic needs of society are not met equally.

This indicates the importance of policy interventions that are not only curative, but also preventive. Poverty reduction programs should be directed at increasing the capacity of the poor to access economic resources, for example through job training, entrepreneurship, and skills education. In addition, equitable distribution of infrastructure and public services in disadvantaged areas can reduce disparities between regions, while structurally narrowing income gaps.

Thus, effective poverty alleviation policies can contribute directly to reducing income inequality, as long as the intervention is able to reach the most economically and socially vulnerable groups.

The Effect of Labor Force Participation Rate (TPAK) on Income Inequality

The results of the estimation with the Fixed Effect model show that the Labor Force Participation Rate (TPAK) has a positive and significant effect on income

inequality on the island of Java ($0.0026 < 0.05$). These findings indicate that the higher the labor force participation, the greater the income inequality that occurs. Theoretically, this can be explained by an imbalance between the increase in the number of labor force and the availability of quality jobs. Many workers end up in the informal sector, which tends to offer low wages and no social security, widening the income gap.

Study by Wistiasari et al. (2023) supports these findings by emphasizing that labor force growth can indeed increase production and aggregate income, but it does not necessarily guarantee an equitable distribution of income. This is because the increased productivity is only felt by some groups who have access to formal and high-skilled jobs, while the rest of the group remains economically behind.

The implications of these findings emphasize the importance of policy interventions that not only encourage work participation, but also ensure the quality of available work. The government needs to expand access to vocational education and training so that the new workforce can enter the formal sector that is more productive. In addition, empowering MSMEs and providing entrepreneurial facilities can also create decent and sustainable jobs. Thus, increasing TPAK can be directed to support inclusive economic growth and reduce income inequality structurally Astuti & Hukom (2023).

The Effect of Unemployment on Income Inequality

The results of the fixed effect regression showed that unemployment had a negative and significant influence on income inequality in Java ($0.0355 < 0.05$). These findings seem to contradict the general view, where increased unemployment is usually associated with worsening inequality. However, in the context of Java, the increase in unemployment is actually correlated with a decrease in income in-

equality.

This can be explained by the structure of the labor market in the region, which is heavily dependent on the informal sector. When there is an increase in unemployment in the formal sector, most of the workforce tends to shift to jobs that have a more even distribution of income, albeit at lower income levels. As a result, income distribution tends to become more compressed, or in other words, more even in low economic conditions.

These results are in line with the study of Yusuf & Resosudarmo (2007) which showed that an increase in unemployment does not necessarily increase inequality, especially in areas with high levels of informality. Similarly, research by Putri (2024) reveals that non-native regions tend to have higher unemployment rates, but this does not necessarily have a negative impact on income distribution, especially if the informal sector is able to absorb most of the affected workforce.

These findings highlight the importance of understanding the job market segmentation between the formal and informal sectors affects income inequality. Unemployment cannot be seen as a loss of jobs, but also as an indicator of shifts in the employment structure that can affect income distribution patterns indirectly.

In terms of policy, efforts to reduce unemployment must be accompanied by the creation of quality jobs and the improvement of labor skills. In addition, strengthening the small and medium enterprises (SMEs) sector plays an important role as a support for labor absorption and economic equity. By encouraging the transition of the workforce from the informal sector to the more productive formal sector, the government can reduce income inequality more effectively and sustainably.

CONCLUSIONS

The results of this study analysis show that the variables of poverty and the

Labor Force Participation Rate (TPAK) have a positive and significant effect on the variables of income inequality. This means that the increase in these two variables tends to widen income inequality on the island of Java. On the other hand, the unemployment variable shows a negative and significant influence on the variable income inequality, which means that an increase in the unemployment rate can actually contribute to a decrease in income inequality. On the other hand, the income inequality variable has no contribution or does not play an important role in explaining the relationship between variables. The variable of income inequality does not have a contribution needs to be clarified, because it is the main dependent variable in this study which is actually influenced by independent variables, so it has a central role in model analysis.

These findings confirm that the factors of poverty, the Labor Force Participation Rate (TPAK), and unemployment have different roles in influencing income inequality.

Therefore, the results of this study need to be the basis for policy formulation to reduce income inequality. The government can focus on progressive taxes, social assistance, subsidies for the poor, and improved education and job training. Job creation through infrastructure and equitable distribution of assets through agrarian reform are also important. A minimum wage policy must be implemented to guarantee a decent income. All of these steps are aimed at realizing social justice and economic equity.

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