



Determinants of Interprovincial Income Inequality in Indonesia: A Case Study of DIY Yogyakarta, DKI Jakarta, West Java, Gorontalo, and West Papua

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ABSTRACT

Income inequality is one of the critical issues encountered in the process of economic development in Indonesia. This study aims to evaluate the influence of Provincial Minimum Wage (PMW), Mean Years of Schooling (MYS), and Open Unemployment Rate (OUR) on the level of interprovincial income inequality in Indonesia during the period of 2015–2024. This research employs a panel data regression approach using the Common Effect Model (CEM) as the selected estimation model. The data analyzed cover five provinces with the highest levels of inequality based on the Gini ratio, namely the Special Region of Yogyakarta, DKI Jakarta, West Java, Gorontalo, and West Papua. The findings indicate that the Mean Years of Schooling (MYS) has a positive and significant effect on income inequality, whereas the Provincial Minimum Wage (PMW) and Open Unemployment Rate (OUR) exert a negative and significant effect. These results have important implications for policymaking, particularly in promoting equitable access to education, wage protection for workers, and unemployment reduction as measures to address income inequality in Indonesia.

INTRODUCTION

Income inequality remains one of the pressing economic challenges faced by many developing countries, including Indonesia. One of the main obstacles to achieving national welfare is the persistent disparity in income distribution. Income inequality refers to the unequal distribution of national income among household groups or segments of society masyarakat (Todaro & Smith, 2020). The gap between high-income and low-income individuals has the potential to result in uneven income distribution (Shinetiara & Adry, 2023).

According to Kuznets' theory (Kuznet, 1995), rising income inequality is closely related to the dynamics of per capita income growth during the early stages of economic development, until a certain threshold is reached. After surpassing this threshold, inequality tends to decline as economic growth continues, forming an inverted U-shaped pattern. This dynamic is shaped by various social, economic, and political factors, including the concentration of capital accumulation among high-income groups and the shift of labor from traditional agricultural sectors to modern industrial sectors (Shinetiara & Adry, 2023). Kuznets argued that in the early stages of development, rapid economic growth often leads to widening income inequality. However, as the economy matures, further growth tends to reduce inequality (D. Y. Putri & Aminda, 2024). According to Statistics Indonesia (BPS), one of the primary tools used to measure inequality is the Gini coefficient, which ranges from 0 to 1.



Figure 1. Indonesia's Gini Ratio

The graph above illustrates the trend of Indonesia's Gini ratio during the 2015–2024 period. Overall, income inequality in Indonesia has shown a declining trend in the long term. In 2015, the Gini ratio was around 0.41, gradually decreasing to its lowest point of approximately 0.378 in 2020. This decline suggests an improvement in income distribution, although it remains within the moderate inequality category. However, between 2021 and 2023, there was a slight increase in the Gini ratio, reflecting renewed socio-economic dynamics that widened the income gap, albeit not significantly. In 2024, the Gini ratio again declined to approximately 0.376. These fluctuations may be attributed to factors

such as wage regulations, employment structure changes, and national or global economic developments affecting household income.

Despite Indonesia's relatively stable economic growth over recent decades, income distribution across regions or provinces remains highly uneven. This disparity is evident from the Gini index and other inequality indicators, which highlight significant differences in welfare levels across regions.

Theoretically, income inequality is influenced by various structural and policy-related factors. Education, represented by the mean years of schooling, is one of the key determinants in enhancing labor quality. As a form of human capital investment, education plays a vital role in national development by improving individuals' skills and productivity, thereby increasing national income and reducing economic backwardness (Sari, Ahma, 2021). A higher level of education in a given area increases the likelihood of securing better-paying jobs, which in turn may reduce income inequality (Sukirno, 2008).

In addition to education, the provincial minimum wage is another factor affecting income inequality. The Provincial Minimum Wage (PMW) is a policy instrument aimed at protecting low-income workers. From a neoclassical economic perspective, the implementation of a minimum wage policy may exacerbate inequality. By setting a wage floor, such policies can raise wage levels, which may disrupt labor market equilibrium. As a result, firms may reduce labor demand, potentially increasing unemployment and widening the income gap (Al Aqilah et al., 2024).

The open unemployment rate is also a crucial indicator reflecting the mismatch between labor supply and demand. Such a mismatch may exacerbate income inequality when certain segments of society face limited job opportunities. Open unemployment refers to the proportion of the working-age population actively seeking but unable to obtain employment (Sugiarti & Erdkhadifa, 2023). According to (Kuncoro, 2010), the lack of suitable job opportunities—particularly in regions attracting internal migration—can increase open unemployment, especially when population inflows exceed job availability. This condition can further aggravate inequality.

Several prior studies have examined income inequality in Indonesia with varying results. Amali & Syafri (2023) found that the Human Development Index (HDI) and minimum wages have a positive relationship with income inequality, while the unemployment rate has a negative effect. In contrast, Ersad et al. (2022) observed that in the Southern Sumatra region, only the unemployment rate had a significant negative effect on inequality, while HDI and poverty were not significant. Cahyani (2024) introduced labor force participation and education variables, both of which were found to be significant. Research by I. D. N. Putri, (2023) shows that only the UMP and ICT index are significant on the island of Java, while GRDP and IPM are not significant. Lastly, Nadhifah & Wibowo (2021) reported that labor force size and disguised unemployment were significant in Yogyakarta. These differences in regions, variables, and findings indicate a research gap that warrants further exploration, particularly with a more comprehensive regional and variable-specific approach.

This study seeks to analyze the impact of Provincial Minimum Wage (PMW), mean Years of Schooling (MYS), and Open Unemployment Rate (OUR) on income inequality across Indonesian provinces. The findings are expected to provide empirical evidence identifying the key determinants of income inequality and serve as a basis for formulating more inclusive and equitable policies.

LITERATURE REVIEW

Income Inequality Theory

Income inequality refers to a condition in which income distribution within a society is uneven, characterized by a significant disparity between high-income and low-income groups (Septiadi & Fitri, 2023). According to the functionalist theory, inequality naturally arises due to differences in individual abilities, educational attainment, and roles within the economic system (Todaro & Smith, 2020). One of the most recognized frameworks is Kuznets' hypothesis (1955), which illustrates an inverted-U curve relationship between economic development and income inequality. In this model, inequality tends to increase during the early stages of development and subsequently decline as the benefits of growth become more evenly distributed (Kuznet, 1995).

Income inequality is commonly measured using the Gini Ratio and the Lorenz Curve. The Gini Ratio quantifies the extent of income disparity on a scale from 0 to 1, where higher values indicate greater inequality. The Lorenz Curve visually represents the cumulative percentage of income received by the cumulative percentage of the population, highlighting the deviation from perfect equality.

Education Theory (Mean Years of Schooling)

Education plays a strategic role in economic development by enhancing human capacity to adopt new technologies and increase productivity (Todaro, 2000). The Mean Years of Schooling (MYS), which represents the average number of years of formal schooling completed by those aged 15 and up, is a crucial measure of educational quality. Greater employment prospects and higher incomes are linked to higher education levels, which helps to lessen regional income gaps.

Minimum Wage Theory

The Provincial Minimum Wage (PMW) is set as a policy mechanism to ensure workers receive a fair and livable income. According to Anker (2011), a well-calibrated minimum wage serves as a redistributive tool to reduce income inequality. When implemented equitably and in line with labor productivity, an increase in the minimum wage can lower income inequality. However, its effectiveness may vary depending on the structure of local labor markets and the prevalence of the informal sector (Putri, 2023).

Unemployment Theory

The Open Unemployment Rate (OUR) indicates the proportion of the labor force actively seeking but unable to obtain employment. Classical economic

theory posits that unemployment results from imbalances in labor supply and demand. In contrast, the Keynesian perspective suggests that unemployment may persist even in equilibrium due to insufficient aggregate demand (Mankiw, 2001). High unemployment has a direct impact on income inequality, particularly when it disproportionately affects individuals with lower education levels or limited job skills.

METHODOLOGY

The impact of mean years of education, open unemployment rates, and provincial minimum wages on income disparity across Indonesian provinces is examined in this study utilizing a quantitative methodology and panel data regression. The choice of a quantitative method is predicated on its capacity to yield quantifiable and objective results when analyzing the correlations between variables.

Panel data regression, a statistical methodology that blends time series and cross-sectional data, was the data analysis method employed in this study. While the cross-sectional data includes the five provinces with the highest levels of income inequality – the Special Region of Yogyakarta, DKI Jakarta, West Java, Gorontalo, and West Papua – the time series data spans the years 2015–2024. Based on the criterion of having the highest levels of income inequality during the observation period, these provinces were chosen via purposive sampling. The following is the formulation of the estimated model utilized in this study:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + e_{it}$$

Description:

Y_{it} = Income inequality in province i at time t

X_{1it} = Mean years of schooling in province i at time t

X_{2it} = Provincial minimum wage in province i at time t

X_{3it} = Open unemployment rate in province i at time t

B_0 = Constant term

B_1, B_2, B_3 = Regression coefficients for the respective independent variables

e_{it} = Error term (residual)

The data used in this study are secondary data obtained from official documents published by Statistics Indonesia (BPS). According to (Sugiyono, 2016), secondary data refer to data that are not collected directly by the researcher but are acquired through intermediaries or have been compiled and documented by other parties. All data were subsequently analyzed using EViews 12 software, which allows for comprehensive and efficient processing of panel data.

RESEARCH RESULT

Classical Assumption Test

a. Normality Test

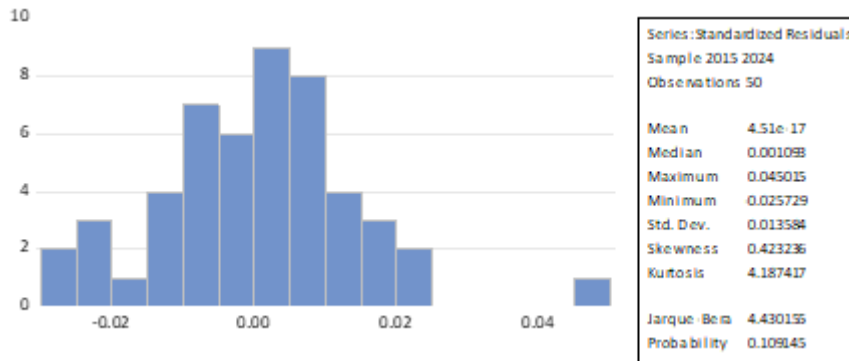


Figure 2. Normality Test Results

As needed by the classical assumption, the normality test seeks to determine if the regression model's residuals are regularly distributed. According to the findings, the Jarque-Bera probability value is 0.1091, over the 0.05 level of significance. The residuals are generally dispersed, according to this.

b. Multicollinearity Test

To find out if the independent variables in the regression model are related or dependent on one another, the multicollinearity test is used. The regression model is seen as less trustworthy if there is a high degree of correlation between the independent variables.

Table 1. Multicollinearity Test Results

	MYS	PMW	OUR
MYS	1.000000	0.497235	0.165786
PMW	0.497235	1.000000	0.175665
OUR	0.165786	0.175665	1.000000

The correlation coefficient between mean years of schooling (MYS) and provincial minimum wage (PMW) is 0.497235, between MYS and the open unemployment rate (OUR) is 0.165786, and between PMW and OUR is 0.175665. All of these values are below the commonly accepted threshold of 0.80. Based on these results, it can be concluded that there is no indication of multicollinearity among the independent variables used in the regression model.

c. Heteroskedasticity Test

The heteroskedasticity test is conducted to determine whether the regression model exhibits non-constant variance of the residuals across observations. If the residual variance is not constant, the regression model is said to suffer from heteroskedasticity.

Table 2. Heteroskedasticity Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.011824	0.008318	1.421521	0.1619
MYS	-0.000967	0.001035	-0.934623	0.3549
OUR	6.57E-06	0.000572	0.011501	0.9909
PMW	2.75E-09	1.44E-09	1.910831	0.0623

Based on the results of the heteroskedasticity test, the probability value exceeds the significance level of 0.05. This indicates that the regression model satisfies the assumption of homoskedasticity, and thus, there is no indication of heteroskedasticity.

Model Selection Test

Choosing the best regression model among three options – the Fixed Effect Model (FEM), the Common Effect Model (CEM), and the Random Effect Model (REM) – is the first stage in panel data regression analysis. A number of tests are used in this model selection process, such as the Lagrange Multiplier (LM), Hausman, and Chow tests.

a. Chow Test

The Fixed Effect Model and the Common Effect Model are compared for applicability using the Chow test. The test's findings are displayed in the table below:

Table 3. Chow Test Results

Redundant Fixed Effects Tests			
Equation: Untitled			
Test cross-section fixed effects			
Effects Test	Statistic	df	Prob.
Cross-section F	2.643241	(4,42)	0.0468
Cross-section Chi-square	11.226618	4	0.0241

The Chow test yielded a probability value of 0.0468, below the significance level of 0.05. This result suggests that the Common Effect Model and the Fixed Effect Model differ significantly. Consequently, the Fixed Effect Model (FEM) is the best model to use in this research.

b. Hausman Test

Whether the Fixed Effect Model (FEM) or the Random Effect Model (REM) is better suited for the analysis is ascertained using the Hausman test.

Table 4. Hausman Test Results

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	3.884107	3	0.2743

The test results show a probability value of 0.2743, which exceeds the significance level. Therefore, the Random Effect Model (REM) is considered more appropriate, as the underlying assumptions of REM are deemed more suitable and efficient than those of the Fixed Effect Model (FEM) in the context of this study. However, given the differing outcomes between the Chow test and the Hausman test in selecting the best model, an additional test—the Lagrange Multiplier (LM) test—is required to determine the most appropriate estimation model.

c. *Lagrange Multiplier (LM) Test*

Table 5. Lagrange Multiplier (LM) Test Results

Lagrange Multiplier Tests for Random Effects

Null hypotheses: No effects

Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	0.006340 (0.9365)	0.047043 (0.8283)	0.053383 (0.8173)

The Lagrange Multiplier (LM) test yielded a probability value of 0.9365, above the significance level of 0.05. This suggests that the Random Effect Model and the Common Effect Model are not significantly different from one another. Consequently, the Common Effect Model (CEM) is the best model to employ. The Common Effect Model (CEM) is the best appropriate panel data regression model for this investigation, according to the overall testing findings, which include the Chow test, Hausman test, and Lagrange Multiplier test.

Statistical Test Result

a. *Regression Equation Result*

Estimation Command:

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LS(?) GR C MYS PMW OUR

Estimation Equation:

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GR = C(1) + C(2)*MYS + C(3)*PMW + C(4)*OUR

Substituted Coefficients:

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$$GR = 0.37133922631 + 0.00968615480241 \cdot MYS - 1.18968009602e-08 \cdot PMW - 0.00251014143647 \cdot OUR$$

The constant value of 0.3713 in the regression estimation results indicates that when all independent variables are equal to zero, the dependent variable (Y) is at that level. The regression coefficient for the Mean Years of Schooling (MYS) is recorded at 0.0096 and is positive, suggesting that a one-unit increase in MYS will lead to an increase in Y by 0.0096 units. Conversely, the Provincial Minimum Wage (PMW) has a negative coefficient of -1.1896, indicating that a one-unit increase in PMW will reduce Y by 1.1896 units. Similarly, the Open Unemployment Rate (OUR) has a negative coefficient of -0.0025, implying that each one-unit increase in OUR will reduce Y by 0.0025 units. Therefore, MYS has a positive influence on the dependent variable, while PMW and OUR have negative effects.

b. T-Test

The t-test aims to determine the significance level of the influence of each independent variable on the dependent variable in the analyzed model (Salsabila et al., 2022).

Table 6. t-Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.371339	0.013350	27.81666	0.0000
MYS	0.009686	0.001661	5.831896	0.0000
PMW	-1.19E-08	2.31E-09	-5.156925	0.0000
OUR	-0.002510	0.000917	-2.735949	0.0088

The Mean Years of Schooling (MYS) variable has a t-statistic value of 5.831 with a probability value of 0.0000, which is less than 0.05, according to the findings of the partial significance test (t-test). Thus, it may be said that MYS affects income inequality in a statistically meaningful way. The Provincial Minimum Wage (PMW) variable likewise demonstrates a strong correlation between PMW and income inequality, with a t-statistic value of -5.1569 and a probability of 0.0000 (< 0.05). In contrast, the Open Unemployment Rate (OUR) variable is below the 0.05 significance level, with a t-statistic value of -2.7359 and a probability of 0.0088. This implies that OUR significantly affects income inequality as well.

c. F-Test

The purpose of the F-test is to examine the simultaneous significance of all independent variables on the dependent variable in the regression model (Violin & Lutfi, 2022).

Table 7. F-Test Results

Root MSE	0.013447	R-squared	0.513669
Mean dependent var	0.412220	Adjusted R-squared	0.481952
S.D. dependent var	0.019478	S.E. of regression	0.014020
Akaike info criterion	-5.620112	Sum squared resid	0.009041
Schwarz criterion	-5.467150	Log likelihood	144.5028
Hannan-Quinn criter.	-5.561863	F-statistic	16.19526
Durbin-Watson stat	1.219996	Prob(F-statistic)	0.000000

With a probability of 0.0000, the obtained F-statistic value is 16.1952, below the significance level of 0.05. This result shows that the dependent variable (Y) is significantly impacted by all independent factors at the same time.

d. Coefficient of Determination Test

The percentage of the dependent variable's change that can be accounted for by the independent variables in the regression model is shown by the coefficient of determination (R^2). When the R^2 value is close to one, it indicates that the independent variables in the model are significantly influencing how the dependent variable moves (Khoirudin & Musta'in, 2020).

Table 8. Coefficient of Determination Test Results

Root MSE	0.013447	R-squared	0.513669
Mean dependent var	0.412220	Adjusted R-squared	0.481952
S.D. dependent var	0.019478	S.E. of regression	0.014020
Akaike info criterion	-5.620112	Sum squared resid	0.009041
Schwarz criterion	-5.467150	Log likelihood	144.5028
Hannan-Quinn criter.	-5.561863	F-statistic	16.19526
Durbin-Watson stat	1.219996	Prob(F-statistic)	0.000000

With an Adjusted R-Square value of 0.481, all of the independent variables in the model can account for 48.1% of the variation in the dependent variable. Stated differently, this model's independent variables can explain almost half of the variations in the dependent variable. Other factors not included in the model have an impact on the remaining 51.9%.

DISCUSSION

The Effect of Mean Years of Schooling on Income Inequality

The results of this study indicate that the Mean Years of Schooling (MYS) variable has a significant Effect on income inequality, with a positive relationship. The t-statistic value of 5.831 and a probability of 0.0000 below the 0.05 significance level suggest that MYS significantly affects income inequality. The positive regression coefficient of 0.0096 indicates that a one-unit increase in MYS is associated with a potential increase in income inequality by 0.0096 units. Thus, an increase in mean years of schooling does not necessarily reduce inequality, instead, it is associated with a tendency for income inequality to rise.

This finding is consistent with the study by S. Dai et al. (2023), titled "*Analysis of the Influence of Mean Years of Schooling, Per Capita Expenditure, Life Expectancy, and Poverty Rate on Income Distribution Inequality in Western and Eastern Indonesia*". Their research also found that Mean Years of Schooling (MYS) contributes positively and significantly to the level of income distribution inequality. This suggests that higher MYS tends to be accompanied by an increase in income inequality.

The Effect of Provincial Minimum Wage on Income Inequality

The results of this study indicate that the Provincial Minimum Wage (PMW) variable has a significant effect on income inequality. This is evidenced by the t-statistic value of -5.1569 and a probability value of 0.0000, which is below the 0.05 significance threshold. Therefore, PMW is statistically proven to have a significant impact on income inequality (Y). The negative regression coefficient of -1.1896 implies that a one-unit increase in PMW would reduce income inequality by 1.1896 units. In other words, the higher the minimum wage set by the provincial government, the lower the tendency for income inequality to occur.

This finding is consistent with the study by Qarina (2021), which explains that relatively low wages can reduce labor productivity, while higher wages tend to promote increased productivity. The differences in wage levels among worker groups have the potential to affect income inequality within a region. From an economic perspective, this can be interpreted as follows: an increase in the provincial minimum wage may boost the income of lower-income groups, particularly low-level workers in the formal sector. As these groups experience income growth, the overall income distribution becomes more equitable, thereby helping to reduce income inequality across income groups.

The Effect of the Open Unemployment Rate on Income Inequality

The findings of this study indicate that the Open Unemployment Rate (OUR) has a significant effect on income inequality. This is evidenced by a t-statistic value of -2.7359 and a probability of 0.0088, which is lower than the 0.05 significance level. Statistically, this means that OUR has a significant influence on the dependent variable, income inequality (Y). Furthermore, the negative regression coefficient of -0.0025 suggests that a one-unit increase in the open unemployment rate is estimated to reduce income inequality by 0.0025 units. In other words, a higher open unemployment rate is associated with a decrease in income inequality.

Although, in theory, high unemployment is generally associated with increased inequality, this result may be explained by the possibility that under certain conditions, rising unemployment can lead to a decline in income across all socioeconomic groups—especially among the middle and upper classes—resulting in a relatively more equal distribution of income. However, this scenario does not reflect a favorable economic condition overall.

This result is consistent with previous research by Ersad et al. (2022), which focused on income inequality in the Southern Sumatra region. Their findings showed that the unemployment rate had a negative and significant effect on

income inequality in the area. In other words, under specific conditions, an increase in open unemployment may contribute to a reduction in income inequality, although it still reflects an underlying economic problem that requires serious attention.

CONCLUSIONS AND RECOMMENDATIONS

According to the study's findings, interprovincial income disparity in Indonesia is significantly impacted by the variables Mean Years of Schooling (MYS), Provincial Minimum Wage (PMW), and Open Unemployment Rate (OUR). While PMW and OUR show negative effects, MYS shows a positive association with inequality. With an Adjusted R-Square value of 0.481, the Common Effect Model (CEM) is the most suitable regression model for this investigation. This suggests that 48.1% of the variation in income inequality can be explained by the three variables taken together.

Based on these findings, it is recommended that the government broaden equitable access and improve the quality of education to ensure that increases in MYS do not exacerbate inequality. Additionally, the determination of minimum wages should be conducted fairly and consistently to support income growth among low-income groups. Efforts to reduce the unemployment rate should also be optimized through the creation of inclusive and sustainable employment opportunities across all provinces.

ADVANCED RESEARCH

Future research could extend this study by incorporating additional socio-economic and institutional variables, such as labor market informality, regional infrastructure disparities, and the effectiveness of social protection programs, to capture a more comprehensive picture of factors influencing interprovincial income inequality in Indonesia. Longitudinal or panel data with a broader time span could be employed to analyze the dynamic effects of education, wage policies, and unemployment over economic cycles, while spatial econometric models could help detect spillover effects between provinces. Moreover, integrating qualitative approaches, such as case studies of provinces with successful inequality reduction strategies, would enrich the quantitative findings and provide policy-relevant insights for sustainable and inclusive economic development.

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