

## The Effect of Education on Income Inequality in Indonesia

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Article Info	ABSTRACT
<b>Keywords:</b> Education, Income, Income Inequality, Indonesia.	Indonesia underwent an economic recession as a result of the Covid-19 pandemic. This study seeks to assess the degree to which education contributes to income disparity in Indonesia. This research utilizes data acquired from the Central Statistics Agency (BPS). The Gini coefficient measures economic inequality, whereas average years of schooling and participation rates for individuals under 19 and those aged 19-23 assess education. The average years of education did not substantially influence the Gini coefficient. Simultaneously, the engagement rate for individuals aged 19-23 exhibited a beneficial impact. A higher participation rate correlates with a larger income disparity. This supports the idea that educational attainment will enhance inequality to a specific extent.
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### INTRODUCTION

In 2020, Indonesia underwent an economic recession as a result of the Covid-19 pandemic. The economic recession was precipitated by restricted human movement, leading to less economic transaction activity (Budastra, 2020). In 2020, the economic growth rate was -2.07%. Following the decline of Covid, the Indonesian economy gradually rebounded. In 2021, the GDP expanded by 3.7%. In 2022, the economy expanded by 5.31%, akin to the pre-pandemic years (Marrero & Servén, 2022). The robust economic performance was supported by a comparatively constant degree of income disparity from 2020 to 2022. Indonesia's Gini coefficient remained stable at 3.81. Nonetheless, a notable distinction emerges when examining the fluctuations of the Gini coefficient in urban vs rural regions. Gini coefficient in urban regions exhibited an upward trend from March 2020 to September 2022, whereas in rural areas, it demonstrated a downward trend.

A number of economists are investigating the impact of income and expenditure disparity on economic performance, specifically economic growth. Multiple studies have contended that income inequality fosters economic growth. Lazear and Rosen (1981) contend that elevated income inequality incentivizes individuals to exert greater effort, increase investments, and undertake risks to attain higher profits. Bourguignon (1981) contends that elevated levels of inequality enhance capital accumulation, hence fostering economic growth. The affluent exhibit a less propensity to consume, resulting in elevated savings, which consequently enhances aggregate savings and fosters capital growth (Asian Development Bank, 2015).

Nonetheless, extensive literature and empirical research indicate that inequality hampers economic growth (Alesina & Rodrik, 1994; Bertola, 1993). They contend that severe economic inequality will prompt voters to advocate for increased taxes on the affluent or to promote additional controls on businesses. This will diminish incentives for investment. In severe instances, inequality may result in political and social instability, adversely affecting economic progress (Cingano, 2014).

In 2017, The Jakarta Post stated that the wealthiest 1% of Indonesians possessed 50% of all assets, while the wealthiest 10% held 77% of total assets. The author seeks to investigate the determinants of income inequality in Indonesia, given the significant level of disparity that is anticipated to result in social repercussions and political instability. Multiple variables contribute to income disparity. A research by the International Monetary Fund (IMF) identifies access to financing, technical advancement, economic openness, specialized skills, education, and government redistribution programs as factors contributing to income inequality (IMF, 2013).

A key element considered to significantly contribute to income inequality is education. Glewwe (1986) asserted that disparities in educational attainment constituted 20% of the expenditure disparity in Sri Lanka. Estudillo (1997) shown that disparities in educational attainment accounted for 20-30% of the overall income disparity in the Philippines. Research conducted by (Akita, 2003; Akita, Lukman, & Yamada, 1999; Akita & Miyata, 2008) in Indonesia found that disparities in educational attainment account for 30% of economic disparity. Consequently, academics seek to ascertain the degree to which education influences economic disparity in Indonesia.

This study seeks to assess the degree to which education contributes to income disparity in Indonesia. The data utilized spans from 2016 to 2023, encompassing four years prior to the pandemic and four years subsequent to it. By comprehending the role of education on income inequality in Indonesia, the government can devise educational policies aimed at mitigating income disparity in the country.

## METHODS

This research utilizes data acquired from the Central Statistics Agency (BPS). The Gini coefficient measures economic inequality, whereas average years of schooling and participation rates for individuals under 19 and those aged 19-23 assess education. The participation rate for individuals under 19 indicates the extent of community involvement in education prior to college. The participation rate for individuals aged 19-23 indicates the proportion of high school graduates who pursue further education.

Data was gathered from 2016, four years prior to the epidemic, to 2023, four years subsequent to the pandemic. The choice of these four years, together with the subsequent four years post-pandemic, aimed to elucidate the pandemic's impact on the correlation between education and wealth inequality. The pandemic affected the relationship between education levels and economic disparity.

The data underwent processing by panel data regression. Panel data integrates time series and cross-sectional data. One purpose of utilizing panel data is to get a sufficiently extensive dataset to enhance its unpredictability.

The procedures involved in data processing utilizing panel regression are as follows:

### Model Selection Test

The first stage in data processing using panel regression is the model selection test. The purpose of this test is to determine the most appropriate model. In this stage, the Chow test, the Hausman test, and the Lagrangian multiplier test are used to determine whether the common effects, fixed effects, or random effects model is most appropriate for the study.

### Classical Assumption Test

One of the advantages of using panel data is that the likelihood of multicollinearity between variables is low, so multicollinearity tests can be omitted. However, other classical assumption tests, namely autocorrelation and heteroscedasticity tests, are still performed. If autocorrelation or heteroscedasticity is present in the panel data, the data must be adjusted first.

### Variable Significance Test

After the most appropriate model is selected and is free from multicollinearity, autocorrelation, and heteroscedasticity, a variable significance test is performed. This test examines whether the education variable, measured by average years of schooling or enrollment rate, has an effect on the level of inequality (Gini coefficient) in Indonesia.

Gini =  $\beta_0 + \beta_1\text{APS} + \beta_2\text{APU} + \beta_3\text{LS} + \varepsilon$

Gini = Gini coefficient

$\beta_0, \beta_1, \beta_2$  = Coefficient

LS = Average length of schooling

APS = Average school participation rate for children aged < 19 years

APU = School participation rate for 19-23 year olds

$\varepsilon$  = error

## RESULTS AND DISCUSSION

### Descriptive Statistics

#### 1. Gini Coefficient

During the 2017-2018 era, the Bangka and Belitung Islands Province recorded the lowest Gini coefficient of 0.245 in 2023, whereas the Special Region of Yogyakarta (DIY) Province exhibited the highest Gini coefficient of 0.459 in 2022. The Gini coefficient for each province in 2023 is illustrated in Figure 1.

Figure 1 illustrates that in 2023, the Bangka Belitung Islands Province exhibited the lowest Gini coefficient, whereas DIY recorded the highest.

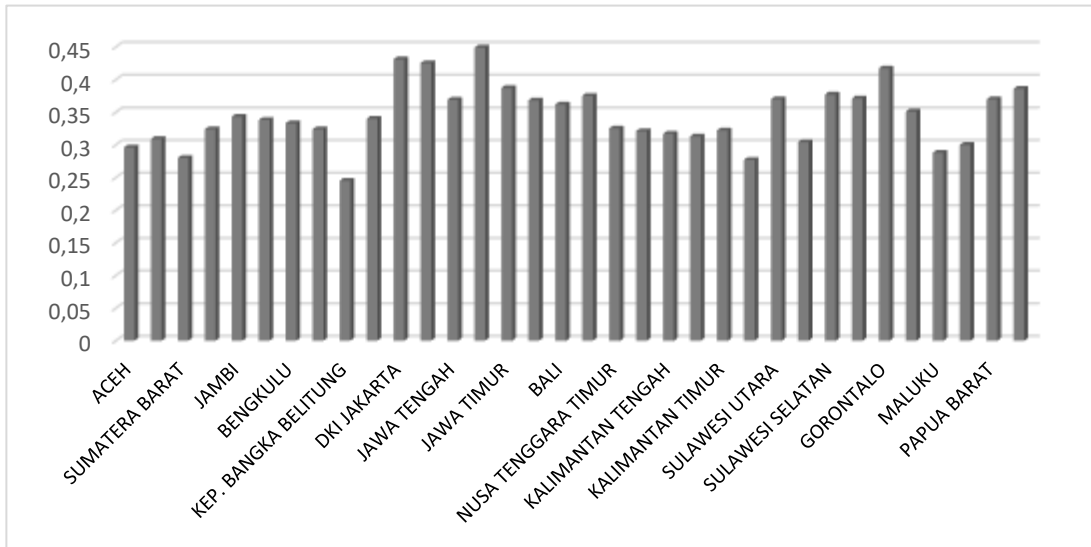


Figure 1. Gini coefficient in 2023 per province

## 2. Average Length of Schooling

The Special Capital Region of Jakarta possesses the greatest average educational attainment at 11.2 years, whereas Papua exhibits the lowest at 6.1 years. Sixteen provinces exhibit an average educational duration beyond 8.75 years, whilst the remaining eighteen provinces demonstrate an average educational duration below 8.75 years, suggesting that the average child in these eighteen provinces fails to complete junior high school (SMP). Figure 2 illustrates the average duration of education for each province.

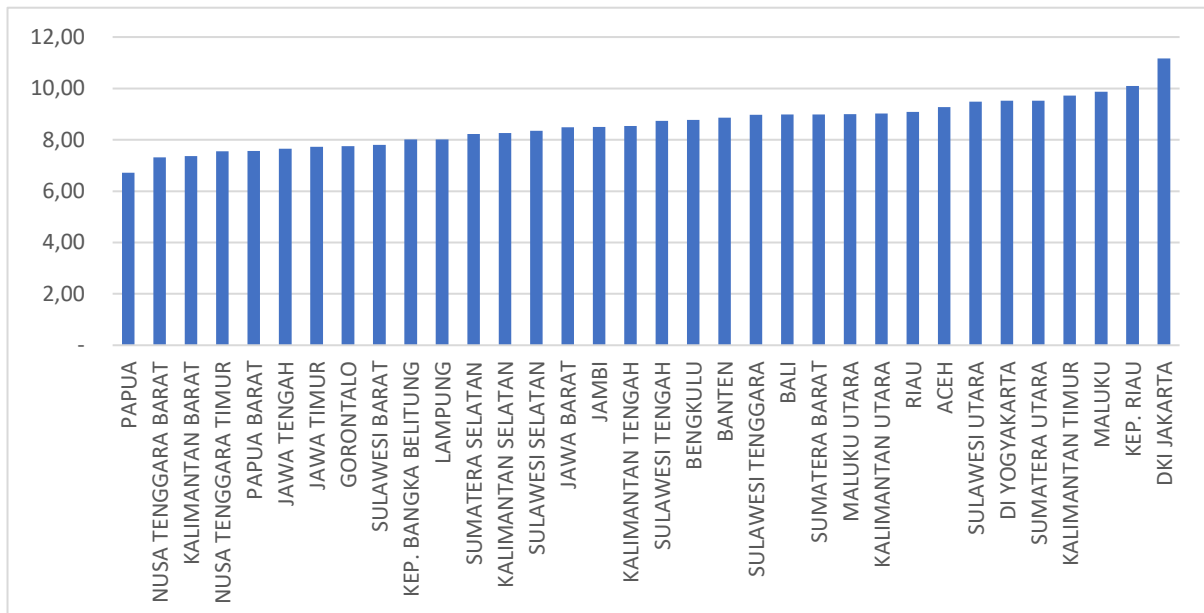


Figure 2. Average length of schooling per province

### 3. Participation Rate 19-23

The participation rate for individuals aged 19–23 is defined as the proportion of high school graduates who pursue higher education or university studies. Figure 4.3 illustrates the average participation rate for individuals aged 19 to 23 from 2017 to 2023. Figure 3 indicates that the highest proportion of high school graduates pursuing university education is in DKI Jakarta at 56.5%, whereas the lowest is in Papua at 18.7%. It is noteworthy that only DKI Jakarta has more than 50% of its high school graduates proceeding to university, but in other regions, the percentage of high school graduates advancing to higher education is below 50%. In only 9 provinces do more than one-third of high school graduates pursue university education.

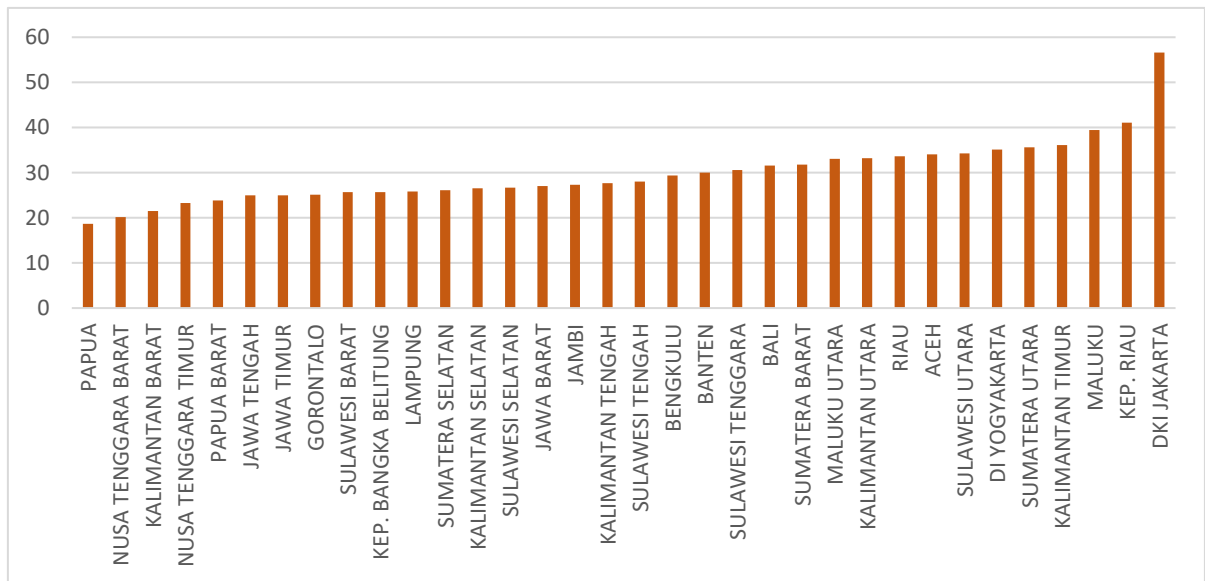


Figure 3. Average participation rate of 19-23 year olds from 2017 to 2023

### Regression Results

Following the execution of the Chow, Hausman, and Lagrangian Multiplier tests, the Fixed model was chosen. This model exhibited autocorrelation and necessitated modification. The modification employed Lag. Upon modification, the resulting equation was:

$$\text{Gini ratio} = 0.57 - 0.0027 \text{ APS} + 0.0021 \text{ APU} - 0.0051$$

The regression findings indicate that the average years of education do not have a substantial impact on the Gini coefficient. Simultaneously, the participation rate for individuals aged 19–23 positively influences the Gini ratio, whilst the participation rate for those under 19 negatively impacts it. The R-squared value for this model is 0.92, suggesting that 8% of the variation in the Gini ratio is likely attributable to factors not included in the model.

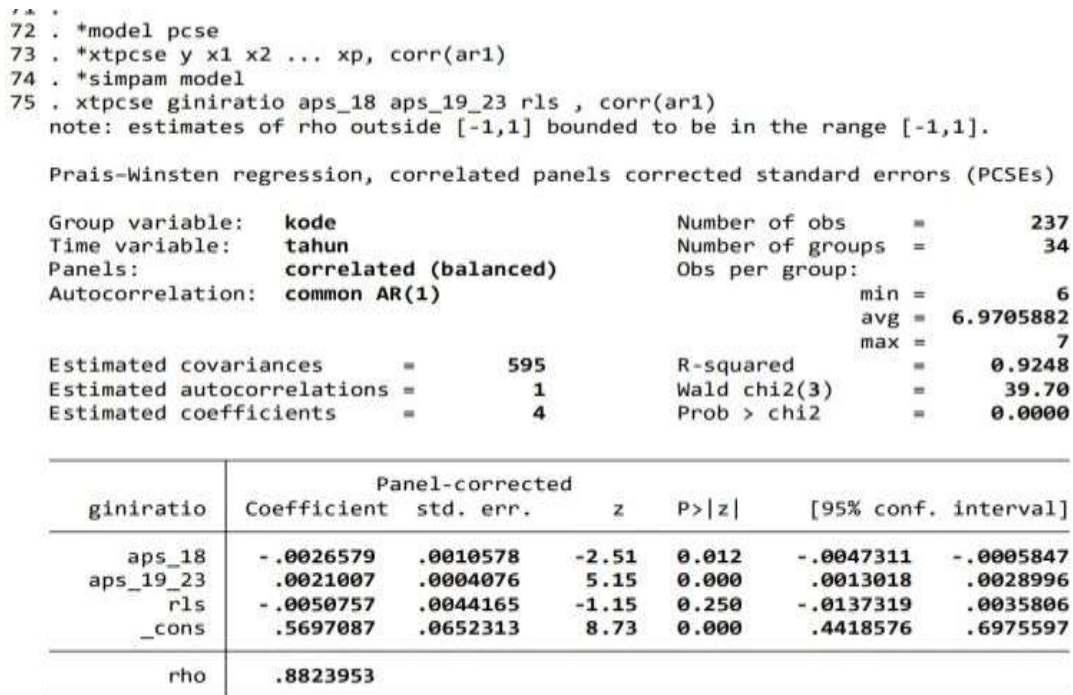


Figure 4. Mean years of education the regression outcomes

## Discussion

The regression findings indicate that a 1% rise in primary and secondary school attendance rates will lead to a 0.002% reduction in the Gini coefficient. A 1% rise in tertiary education enrollment rates will lead to a 0.002% increase in income disparity. The low participation rate among individuals aged 19-23 contributes to both issues, indicating that enhanced community engagement in higher education will result in heightened income inequality. Certain specialists argue that this escalation will continue until the enrollment rate attains a specific threshold. It is anticipated that a significant increase in the population's higher education attainment will lead to a reduction in economic disparity (Walujadi, Indupurnahayu, & Endri, 2022).

## CONCLUSION

The average years of education did not substantially influence the Gini coefficient. Simultaneously, the engagement rate for individuals aged 19-23 exhibited a beneficial impact. A higher participation rate correlates with a larger income disparity. This supports the idea that educational attainment will enhance inequality to a specific extent. As access to advanced education becomes increasingly equitable, the disparity will progressively diminish. The proportion of high school graduates pursuing higher education remains significantly low. Consequently, the government must implement measures to enhance this. Potential approaches encompass offering scholarships or partnering with the commercial sector to invest in education, especially higher education.

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