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THE INFLUENCE OF EDUCATION AND ECONOMIC GROWTH ON INCOME INEQUALITY IN INDONESIA

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Abstract:
The purpose of this study is to examine and analyze the influence of education and economic growth on income inequality in Indonesia, both partially and simultaneously. The type of research is associative with the object of research being Indonesia. The type of research data is time series data for the period 1961 - 2023, collected from the World Bank. The data collection technique was carried out using documentation techniques. The dependent variable is income inequality, namely, Income inequality refers to differences in income received by individuals or groups in a society, where some groups may have much higher incomes than others. The first independent variable is education, namely the level of education measured in percent. The second variable is economic growth, namely the level of economic growth measured in percent. The data analysis technique uses multiple regression. The variables of education and economic growth do not have a significant effect on income inequality. Education does not have a significant effect on income inequality at a significance level of 10% (probability 0.3617). Economic growth does not have a significant effect on income inequality at a significance level of 10% (probability 0.96). The R-squared value of 0.01 (or 1%) indicates that only about 1% of the variation in income inequality can be explained by the Education and Economic Growth variables in this research model.

Keywords: Education, Growth, Economy, Income Inequality, World Bank

INTRODUCTION

Income inequality is a highly complex structural problem and remains a major challenge to economic development, particularly in developing countries like Indonesia. According to the Big Indonesian Dictionary (KBBI), inequality is defined as a condition that is not as it should be, such as unfair or disorderly. Income inequality is defined as an imbalance in the distribution of income within a region, where some groups receive a significantly larger share of income than others. Glaeser (2006) in Rambey (2018) defines income inequality as a condition of unequal income distribution determined by various factors such as the level of development, ethnic heterogeneity, and the poor governance system's ability to protect property rights.

One important factor influencing income inequality is the quality of and access to education. According to the KBBI (2008), education is the process of changing individual attitudes and behavior through teaching and training aimed at human maturity. Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System defines education as a conscious and planned effort to create a learning environment that allows students to develop their potential actively. Branata (1988) and Purwanto (1987) state that education is a form of guidance from adults to foster children's physical and spiritual growth and contribute to society. Similarly, Mulyadi (2008) in Syafri et al. (2019) states that education is an investment in human resources that can increase achievement motivation, reduce economic backwardness, and ultimately increase individual income.

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In the context of welfare, high income inequality indicates that development has not been equitable. Social welfare can be achieved if income inequality is minimized, as unequal distribution leads to social disparities, limited access to education and health care, and economic injustice. According to Bandyopadhyay (2017) and Banerjee (2010), income inequality is measured using the Gini index, which is widely used to assess the extent to which income distribution in a country or region is equitable. The closer the number is to 0, the more equitable the income is; conversely, the closer the number is to 1, the greater the inequality. Arsyad (2017) stated that the Gini index in countries with low inequality ranges from 0.20 to 0.35.

In Indonesia, income inequality remains an unresolved issue. According to data from the Central Statistics Agency (BPS), in 2014, the Gini index reached its highest level at 0.414, indicating a serious level of inequality. Although it has decreased in subsequent years, the figure remains above 0.35, indicating that Indonesia has not yet achieved the ideal level of income equality (Hindun et al., 2019; Istiqamah et al., 2018). The decline in the Gini index in recent years is inseparable from the government's role in efforts to achieve equitable development through various policies, but these improvements have not been evenly distributed across all regions.

Income inequality also reflects the gap between high-income and low-income groups. Ardyansyah et al. (2022) explain that excessive inequality can negatively impact the social and economic life of society, even leading to prolonged social conflict. This is exacerbated by uneven development across regions, resulting in varying levels of inequality in each region. In this context, inequality can contribute to the emergence of structural poverty, which is difficult to overcome (Pendapatan et al., 2023).

Furthermore, data show that economic growth in Indonesia is not always directly proportional to income equality. Economic growth that focuses on macro indicators such as Gross Domestic Product (GDP) often benefits only a select few elite groups without significantly impacting the welfare of society in general (Lala et al., 2023); (Istiqamah et al., 2018). Furthermore, according to (Oksamulya & Anis, 2020), economic development without equity actually widens the inequality gap and worsens the distribution of welfare.

Education is one of the most essential solutions to addressing unequal income distribution. According to Sari et al. (2021), quality education can improve an individual's skills and capabilities, enabling them to obtain higher-paying jobs. Similar findings were also presented by Aini & Nugroho (2023), who confirmed that education has a significant negative impact on inequality, meaning that the higher the education level in a region, the lower the inequality. This finding is supported by research (Anshari et al., 2018), which shows that provincial minimum wages and capital expenditures, if properly managed and accompanied by improvements in education quality, can reduce income inequality between regions in Indonesia.

Therefore, to create equitable and sustainable economic development, a strategy is needed that focuses not only on growth but also on the equitable distribution of development outcomes. Income inequality must be reduced through improvements in the education system, strengthening local economies, equitable distribution of infrastructure, and increasing community participation in economic activities. (Fiskal, 2024) states that economic development ideally encompasses economic growth, inequality reduction, and poverty alleviation as a single goal. Thus, equitable education, improved quality of life, and equal income will be the main foundations for realizing equitable prosperity in Indonesia.

Various studies have examined the relationship between education, economic growth, and income inequality. The phenomenon of income inequality, which indicates an unequal distribution of wealth within society, is a major concern in a country's economic development. One factor often

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identified as playing a crucial role in addressing or exacerbating this inequality is education. Quality education can provide more equitable access to economic opportunities and better employment, potentially increasing individual income and reducing inequality.

(Romadona et al., 2024) found that economic growth had no significant effect on income inequality in Indonesia. However, education and investment showed a significant effect on income inequality. Similarly, Handayani & Hanifa (2024) also concluded that economic growth had no significant effect on income inequality in Jambi Province. These results demonstrate the complexity of the relationship between macroeconomic growth and income distribution at the regional level.

However, several other studies have found different results. (Ariska Putri, 2023) Showed that education and economic growth had a positive and significant effect on income inequality in South Sumatra. These findings indicate that in some regions, improvements in education and economic growth can correlate with increased inequality.

Other factors also influence income inequality. (Nadya & Syafri, 2019) Revealed that the Human Development Index (HDI) and the Gini Index have a negative and significant relationship, indicating that improvements in overall quality of life can contribute to reduced inequality. Meanwhile, Gross Regional Domestic Product (GRDP) per capita actually has a significant positive effect on income inequality in East Kalimantan Province. This suggests that high regional economic growth is not always accompanied by equitable income distribution. (Boari et al., 2024) found that inflation and the minimum wage have no significant effect on income inequality, but education and economic growth have a positive and significant effect on income inequality in Indonesia.

(Riyadi & Ghuzini, 2021) showed that average years of schooling do not significantly affect income inequality in Indonesia. However, government spending and the open unemployment rate do significantly influence income inequality. Wahyuni & Utami (2024) also confirmed that economic growth has no significant effect on income inequality in Indonesia. Meanwhile, Wahyuni & Monika (2016) found that economic growth has a positive and significant effect on income inequality in South Sulawesi.

Other studies also offer varying perspectives. Hindun et al. (2019) argue that economic growth and education separately have no significant effect on income inequality. On the other hand, Manik et al. (2023) found that both education and economic growth have a positive and significant effect on income inequality in Indonesia.

These studies demonstrate a variety of results, indicating that the relationship between education, economic growth, and income inequality is complex and can be influenced by various contextual and regional factors. These differing findings emphasize the importance of further research to understand the dynamics of income inequality in Indonesia.

METHODS

This type of research is associative. The object of research is in Indonesia, which consists of 38% of the provinces. This study uses a time series period 1961 - 2023 obtained from World Bank data. The dependent variable is income inequality (Y), which is a condition where the distribution of income in a society is uneven, resulting in significant differences between high and low income groups. The Gini index is often used to measure the level of this inequality, with a value of 0 indicating perfect equality and 1 indicating total inequality. Moreover, the independent variable is Education (X1), namely, Education, in general, is the process of changing the attitudes and behavior of a person or group of people in an effort to mature humans through teaching and training efforts. Education can also be interpreted as a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential. Moreover, economic growth

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(X2) is one of the benchmarks used to measure the success of a country's economic development. In a country, economic growth can be calculated from the increase in output reflected in Gross Domestic Product (GDP). GDP is one of the best indicators used to measure a country's economic performance. A country's economic growth rate can be measured using the Gross Domestic Product (GDP) growth rate at constant prices. The data analysis technique uses time series data, which is data recorded or collected sequentially at specific time intervals.

RESULT AND DISCUSSION

This study examines the effects of education and economic growth on income inequality in Indonesia from 1961 to 2023. The results of the descriptive analysis for each variable are presented in the following table.

Table 1. Descriptive Results

	KP	EDUCATION	PE
Mean	-15.95513	87.72430	5.110462
Median	7.007787	93.61081	5.557264
Maximum	225.9962	98.05198	10.91518
Minimum	-653.5264	70.05028	-13.12673
Std. Dev.	119.7493	10.89592	3.355407
Skewness	-3.448416	-0 831475	-2.817074
Kurtosis	17.65931	1.895021	15.47173
Jarque-Bera	688.9621	10.46425	491.6304
Probability	0.000000	0.005342	0.000000
Sum	-1005.173	5526.631	321.9591
Sum Sq. Dew	889073.1	7360.705	698.0429
Observations	63	63	63

Based on the descriptive analysis, it is known that income inequality in Indonesia from 1961 to 2023 was -15.95, with a maximum value of 225.99 and a minimum value of -653.52. Indonesia's education score from 1961 to 2023 was 87.72, with a maximum value of 98.05 and a minimum value of 70.05. Indonesia's economic growth from 1961 to 2023 was 5.11, with a maximum value of 10.91 and a minimum value of -13.12.

Before testing the hypotheses, a stationary test was performed, as shown in the following table:

Table 2. Stationary Test Results

Group root unit tests: Summary
Series. KP, EDUCATION, PE
Date. 07/02/25 Time. 11:35
Samples. 1961 2023
Exogenous variables. Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: O to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Crosssections	Obs
Null: unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.30644	0.0105	3	185
Null: unit root (assumes individual unit root process)				

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I am Pesaran and Shin W-stat	-6.23432	0.0000	3	185
ADF - Fisher Chi-square	54.8436	0.0000	3	185
PP - Fisher Chi-square	55.8151	0.0000	3	185

**Probabilities for Fisher tests are computed using an asymptotic chi-square distribution. All other tests assume asymptotic normality,

Based on the results of the stationary test, it was found that the variables for income inequality, education, and economic growth were stationary at the first difference level. The hypothesis was then tested using multiple regression, as presented in the following table.

Table 3. Results of the multiple regression analysis

Dependent Variable: KP
Method: Least Squares
Date: 07/02/25 Time: 11:46
Sample: 1961 2023
Included observations: 63

Variable	Coefficient	Std. Error	t-Statistic	prob.
C	96.77146	127.4590	0. 759236	0.4507
EDUCATION	-1.295565	1.409560	-0.919127	0.3617
PE	0.181 181	4.577226	0.039583	0.9686
R-squared	0.013959	Mean dependent var		-15.95513
Adjusted R-squared	-0.018909	S.D. dependent var		119.7493
S.E. of regression	120.8762	Akaike info criterion		12.47386
Sum squared resid	876662.8	Schwarz criterion		12.57591
Log likelihood	-389.9265	Hannan-Quinn criterion		12.51400
F-statistic	0.424688	Durbin-Watson stat		1 .778606
Prob(F-statistic)	0.655924			

Based on the results of the data analysis, a multiple regression equation can be created as follows:

$Yt = \alpha + \beta X_{1t} + \beta X_{2t}$
$Y = 96.77146 + -1.295565 + 0.181181$

The meaning of the obtained multiple regression equation is as follows:

1. The constant (α) value of 96.77146 indicates that the magnitude of income inequality is independent of education and economic growth. If the education and economic growth variables are equal to 0, then the income inequality variable is 96.77146.
2. The coefficient value of the education variable (β1) is -1.295565, which is negative, indicating that the direction of the influence of education on poverty is negative or not unidirectional. A one-unit increase in education will increase income inequality by -1.295565 per unit, assuming the other variables are constant.
3. The regression coefficient value of the economic growth variable (β2) is 0.181181, which is positive, indicating that the direction of the influence of economic growth on poverty is positive or unidirectional. A one-unit increase in economic growth will increase economic growth by 0.181181 per unit, assuming the other variables are constant.

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4. The R-square value of 0.01 indicates that the influence of the education and economic growth variables on inequality is 10%, while the remaining 90% is influenced by other variables.
5. The calculated f-value of 0.42> 3.35 (F TABLE) with a sig value of 0.655924 > 0.05 (alpha) indicates that the education and economic growth variables together are not significant on income inequality, thus it can be said that the resulting regression model does not fall into the category of fit or not fit.
6. The calculated t-value for the education variable is -0.91 < 1.671 (T TABLE), and the sig value is 0.3617 > 0.1 (alpha), meaning that education does not have a significant effect on income inequality.
7. The t-value for the economic growth variable is 0.03 < 1.671 (T-TABLE), and the sig. Value is 0.96 > 0.1 (alpha), indicating that economic growth does not significantly influence income inequality.

This study demonstrates that education does not significantly influence income inequality in Indonesia at the 10% significance level (probability 0.3617). Although not significant, the direction of the effect is negative (coefficient -1.295565), meaning that higher levels of education tend to reduce income inequality slightly. This finding aligns with several previous studies showing that education does not always significantly influence income inequality or exhibits a complex and varied relationship (Hindun et al., 2019; Riyadi & Ghuzini, 2021).

This study also demonstrates that economic growth does not significantly influence income inequality in Indonesia at the 10% significance level (probability 0.96). The direction of the effect found was positive (coefficient 0.181181), meaning that higher economic growth tends to increase income inequality slightly. This study's findings differ and demonstrate complexity compared to several previous studies that may have found a significant or positive effect (Manik et al., 2023; Wahyuni & Monika, 2016) or are consistent with studies that found that economic growth does not significantly affect income inequality (Handayani & Hanifa, 2024; Romadona et al., 2024; Wahyuni & Utami, 2024). These results indicate that during the observation period, economic growth was not a statistically significant factor in influencing income inequality in Indonesia, and that other factors likely played a more significant role.

Overall, the calculated F-value of 0.42 with a significance value of 0.655924 (>0.05) indicates that, together, the Education and Economic Growth variables do not significantly influence income inequality. Furthermore, the R-squared value of 0.01 indicates that only 1% of the variation in income inequality can be explained by this model, with the remaining 99% influenced by factors outside the model. This confirms that the resulting regression model is neither suitable nor unsuitable for comprehensively explaining the phenomenon of income inequality in Indonesia based on these variables alone.

CONCLUSION

Based on the results of research on the influence of Education and Economic Growth on income inequality in Indonesia, using time series data for the period 1961-2023, the following conclusions can be drawn:

1. The F-test results indicate that, collectively, the Education and Economic Growth variables do not have a significant effect on income inequality. This is indicated by the Prob(F-statistic) value of 0.655924, which is greater than the 0.05 significance level.
2. The partial test results (t-test) for the Education variable indicate that Education has no significant effect on income inequality at the 10% significance level (probability 0.3617).

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However, the direction of the effect of Education is negative, meaning that an increase in Education tends to reduce income inequality slightly.

3. The partial test results (t-test) for the Economic Growth variable indicate that Economic Growth has no significant effect on income inequality at the 10% significance level (probability 0.96). The direction of the effect of Economic Growth is positive, indicating that increased Economic Growth tends to increase income inequality slightly.
4. The R-squared value of 0.01 (or 1%) indicates that only about 1% of the variation in income inequality can be explained by the Education and Economic Growth variables in this research model. The remaining 99% is explained or influenced by other variables not included in this research model.

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