



## ANALYSIS OF INEQUALITY DEVELOPMENT OF THE EDUCATION SECTOR IN WEST SUMATRA

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### ABSTRACT

*This study aims to analyze the effect of government spending in the education sector, gender gap, poverty and life expectancy on education inequality. This type of research is associative research. The object of research is the Regency/City in the Province of West Sumatra. The data analysis technique is hypothesis testing, panel data regression analysis with t test. The results of this study found that: 1) Government spending in the education sector has a significant negative effect on educational inequality. 2) The gender gap has a significant positive effect on educational inequality. 3) The level of poverty has a significant positive effect on educational inequality. 4) Life expectancy has a significant positive effect on educational inequality.*

**Keywords:** *Education Inequality, Government Expenditures, Gender Gap, Poverty, Life expectancy*

### INTRODUCTION / PENDAHULUAN

Sustainable development with the ultimate goal of improving people's welfare (Hamzah et al., 2017). Development is a combination of a fundamental change process of the entire social system, such as politics, economy, infrastructure and others, to improve the quality of human life (Coady & Dizioli, 2017). The essence of economic development is to prosper and prosper the community. For this reason, it is necessary to have structured and mature planning in order to make the people of a country a prosperous, just, and prosperous society (Abdelbaki, 2012).

Human capital is one of the important factors in economic development. Because

the role of human capital is very important, it is necessary to increase the productivity and quality of human capital. One of the efforts that can be made to increase the productivity and quality of human capital is through education. Education is one way to guarantee and improve the quality of human life economically and socially, which is also a way to overcome inequality in an effort to achieve equality and create a prosperous life.

Education plays an important role in increasing the ability of a developing country to absorb modern technology and develop capacity for the realization of sustainable development (Hamzah et al., 2017). Building human capital is influenced by many factors, one of which is improving

the quality of education. If the education obtained is not optimal, then quality human capital will be difficult to obtain. Many factors can cause education can not be implemented optimally. This will lead to inequality in education. Many factors influence the occurrence of educational inequality, one of which is the government budget in the education sector. According to Banu & Rawal (2015) sources of education financing can be categorized into two, namely from the government and the community. The government can be grouped into central government and local government. Meanwhile, the community can be classified as the general public and parents of students.

In addition to the government budget in the education sector, the gender gap can also affect education inequality. The gender gap in education is the difference in access and completion of education between men and women. Gender disparities in education are especially common in less developed countries, where women's literacy rates are less than half of men's. School completion also shows the existence of gender inequality, and is very visible in rural areas (Saputra, 2015).

The level of poverty also affects the occurrence of educational inequality. People who can be said to be poor will find it difficult to get a proper education. Because, what is said by poverty is the inability of a person to fulfill his daily needs (Khusaini et al., 2020). It will be difficult for the poor to get a proper education, because their daily needs are very difficult to fulfill. Educational development is a form of productive and quality human capital development. Quality humans will be able to realize the creation of a conducive development. If the determinants of improving the quality of education cannot run as they should, then there will be inequality in education.

The level of education a person acquires though is influenced by many non-market government factors and supply such

as commodities and other services on the government side, the two main factors influencing the desired level of education are 1) Prospects of more educated students generating greater income through modern sector jobs in the future. front or personal or individual benefits, family from education, 2) education costs, directly or indirectly that must be borne by a student or his family. Thus the level of education demanded is actually a derived demand to get high-wage job opportunities in the modern sector (Suryanti & Sholikhah, 2021).

Education is the main indicator in the development of human resources (HR) which has implications for the quality of human resources. Education has a strategic position in regional and national development. Education is also an indicator of the progress of a nation because it has an impact on improving the quality of life and community welfare to create a prosperous and prosperous society (Randa & Ulfa, 2020).

The source of inequality comes not only from income distribution but also from education. Therefore, education is a fundamental development goal. Education is also an important factor in human capital investment. Therefore, the government seeks to achieve a more balanced development through government decentralization and in conjunction with direct cooperation between the central and regional governments (Abdelbaki, 2012). Education is a very useful investment for economic development. On the one hand, it takes time and money to get an education. In the next period after education is obtained, society and individuals will benefit. Individuals with higher education tend to earn higher incomes than those without education (Sholikhah et al., 2014). The higher the education, the higher the income earned. Improvements in education provide several benefits in reducing poverty levels and at the same time accelerating economic growth (Adiningtyas & Budyanra, 2020). Educational inequality is a discrepancy

between what should be or what is expected and what is happening. The development of education must be evenly distributed, so that people can enjoy a proper education (Cahyono et al., 2017).

If the poor are not able to take advantage of the opportunity to attend secondary and higher education for financial reasons or other reasons, the education system is actually only perpetuating and even increasing inequality within a generation and between generations in developing countries (Nisa & Samputra, 2020). Educational inequality can be measured from 4 indicators, namely: a) school participation rate, b) net enrollment rate, c) educational attainment, namely the number of students who complete several levels of education, d) literacy rate, the individual ability of students to read and write (Harahap et al., 2020). Educational Inequality can also be measured using the Lorenz curve. The Gini index can also be used to measure educational inequality. The Gini index of education ranges from 0 indicating equality and if it is close to 1, then inequality can be said to be high (Banunu, 2021).

So educational inequality is a discrepancy between what is expected and what is happening, so that educational development is uneven. There are many factors in it that can increase inequality in education. Educational inequality is a condition of inequality of education graduates from the population in an area. The measure of educational inequality is the education Gini index which measures the ratio of the average school year attainment of all residents. The Education Gini Index has a coefficient ranging from 0 to 1. The lower the coefficient index, the better the level of equity in educational attainment, and the higher the coefficient index, indicating the occurrence of inequality or inequality in education.

Inequality in educational attainment is a condition where there is an uneven distribution pattern of educational

attainment. The indicator to see the inequality of educational attainment between individuals in a region is the Gini Coefficient of Education (KGP) with the following formula (Coady & Dizioli, 2017):

$$KGP = \left(\frac{1}{\mu}\right) \sum_{i=2}^n \sum_{j=1}^{i-1} \rho_i |y_i - y_j| p_j$$

The above equation can be extended to:

$$KGP = \frac{1}{\mu} [P_2(y_2 - y_1)p_1 + [P_3(y_3 - y_1)p_1 + P_3(y_3 - y_2)p_2] + \dots + [P_6(y_6 - y_1)p_1 + P_6(y_6 - y_2)p_2 + P_6(y_6 - y_3)p_3 + P_6(y_6 - y_4)p_4 + P_6(y_6 - y_5)p_5]$$

Where :

- KGP = Gini coefficient of education
- $\mu$  = Average school years of the population
- $P_1$  = Proportion of population not in school
- $P_2$  = Proportion of population who have not/did not finish elementary school
- $P_3$  = Proportion of population graduated from elementary school
- $P_4$  = Proportion of population graduated from junior high school
- $P_5$  = Proportion of population graduated from high school
- $P_6$  = Proportion of population graduatedPT

While the formula for calculating years of schooling at the six levels is:

- No school :  $y_1 = 0$  years
- Haven't/didn't finish elementary school :  $y_2 = 0.5$  SD = 3 years
- Finished elementary school :  $y_3 = 6$  years
- High school graduate :  $y_4 = 9$  years

Finished high school  
:  $y_5 = 12$  years

College  
:  $y_6 = 16$  years

The inequality category is in accordance with the Gini Education Index (Todaro & Smith, 2006) namely (1) an index of 0.71 and above is an area with very high inequality, (2) an index of 0.5-0.70 is an area with high inequality, (3) index 0.36-0.49 is a region with moderate inequality, (4) an index of 0.21-0.35 is a region with low inequality, and (5) an index of 0.20 and below is a region with very low inequality (Coady & Dizioli, 2017).

The determinants of inequality in educational attainment can be seen from the demand side of education (Roza & Satrianto, 2021). The demand for education describes a person's need to attend school or be given a particular lesson. There are several factors that influence the demand for education, including: culture, politics, and socio-economics. Correspondingly, Suryanti & Sholikhah, (2021) suggested to the government to make policies related to the demand and supply of education in order to achieve equal distribution of education. Factors that affect a person's demand for education are related to household characteristics such as the last education of parents, characteristics of children, and quality of education.

This study aims to determine and analyze: 1) The effect of government spending in the education sector on educational inequality. 2) The effect of the gender gap on educational inequality. 3) The effect of the level of poverty on educational inequality. 4) The effect of life expectancy on educational inequality. The novelty of this research is to conduct an analysis at the provincial government level and at the district/city level.

**METHOD**

This type of research is quantitative research using associative methods. The

object of the research is the Regency/City in West Sumatra Province which consists of 12 Regencies and 7 Cities. The independent variables of this study are government spending in the education sector (X1), gender gap (X2), poverty (X3) and life expectancy (X4) and the dependent variable is education inequality (Y). This study uses panel data. The data analysis technique is hypothesis testing, panel data regression analysis with t test.

**RESULTS AND DISCUSSION**

Before analyzing the data with panel data regression, the Chow test was carried out first. Chow test is a test to determine the most appropriate fixed effect or common effect model used in estimating panel data. The results of the Chow test data analysis are as follows.

**Table 1. Chow Test Results**

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

| Effects Test             | Statistics | df | Prob.          |
|--------------------------|------------|----|----------------|
| Cross-section F          | 10.08766   | 9  | (18.72) 0.0000 |
| Cross-section Chi-square | 119.6055   | 21 | 18 0.0000      |

*Source: Data processed output, 2021*

Based on the results of data analysis for the Chow test, the cross section F value is 10.09 with a probability value of 0.00. The probability value is smaller than alpha ( $0.00 < 0.05$ ), so fixed effect method is better than *common effect*. Thus therefore, the best model in conducting data analysis is the model with the fixed effect method. Next, Hausman did. *Hausman Test* is a test used to determine the best method between fixed effects or random effects. Hausman test results are presented in the following table.

**Table 2. Hausman Test Results**

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

| Test Summary         | Chi-Sq. Statistics | Chi-Sq. df | Prob.  |
|----------------------|--------------------|------------|--------|
| Random cross-section | 4.363369           | 4          | 0.3591 |

**Source: Data processed output, 2021**

Based on the results of data analysis for the Hausman test, it is known that the value of the chi-square statistic is 4.36 with a probability value of 0.35. This probability value is greater than the significance level used ( $0.35 > 0.05$ ) so that random effect method is better than fixed effect. This means that the best method that should be used is the random effect. Based on the results of the chow test and the hausman test, different results were obtained where the chow test was recommended *fixed effect* while on *hausman test* random recommended *effects*, so it needs to be tested *lagrange multiplier*. The Lagrange Multiplier test is an analysis carried out with destination to determine the best method in panel data regression, whether to use the common effect or random effect. **Test results Lagrange Multiplier Test** presented in the following table.

**Table 3. Test results Lagrange Multiplier**

| Lagrange Multiplier Tests for Random Effects  |                      |                      |                          |
|---|----------------------|----------------------|--------------------------|
| Null hypotheses: No effects   |                      |                      |                          |
| Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives |                      |                      |                          |
|   | Hypothesis Test      |                      |                          |
|   | Cross-section        | time                 | Both                     |
| Breusch-Pagan   | 72.40987<br>(0.0000) | 0.011671<br>(0.9140) | 72.42154<br>(0.0000)     |
| Honda   | 8.509399<br>(0.0000) | -0.108034<br>--      | 5.940662<br>(0.0000)     |
| King-Wu   | 8.509399<br>(0.0000) | -0.108034<br>--      | 3.530699<br>(0.0002)     |
| Standardized Honda  | 9.709312<br>(0.0000) | 0.259919<br>(0.3975) | 3.456451<br>(0.0003)     |
| Standardized King-Wu  | 9.709312<br>(0.0000) | 0.259919<br>(0.3975) | 1.329676<br>(0.0918)     |
| Gourieriou, et al.*   | --                   | --                   | 72.40987<br>( $< 0.01$ ) |
| *Mixed chi-square asymptotic critical values:   |                      |                      |                          |
|   | 1%                   | 7.289                |                          |
|   | 5%                   | 4.321                |                          |
|   | 10%                  | 2.952                |                          |

**Source: Data processed output, 2021**

Based on the results of data analysis for the test *Lagrange Multiplier* it is known that the value of *Breusch-Pagan Cross-section* is 72.41 with a probability value of 0.00. This probability value is smaller than the significance level used ( $0.00 < 0.05$ ) so that random effect method is better than fixed effect. Thus, the best method that can be used in conducting data analysis is the random effect.

Based on the Chow Test, **Hausman Test**, and the Lagrange Multiplier Test, it is known that the best model used in panel data regression analysis is the random effect method. The results of panel data regression analysis are presented in the following table.

**Table 4. Results of Panel Data Regression Analysis**

Dependent Variable: KGP

Method: Panel EGLS (Cross-section random effects)

Sample: 2015 2019

Periods included: 5

Cross-sections included: 19

Total panel (balanced) observations: 95

Swamy and Arora estimator of component variances

| Variable | Coefficient | Std. Error | t-Statistics | Prob.  |
|----------|-------------|------------|--------------|--------|
| C        | 2.092527    | 0.614660   | 3.404364     | 0.0010 |
| GE       | -9.49E-05   | 4.72E-05   | -2.010174    | 0.0474 |
| GG       | -0.012435   | 0.006031   | -2.061701    | 0.0421 |
| P        | 0.006559    | 0.002594   | 2.528715     | 0.0132 |
| L        | -0.008215   | 0.002501   | -3.284477    | 0.0015 |

Effects Specification

|                      | SD       | Rho    |
|----------------------|----------|--------|
| Random cross-section | 0.021900 | 0.6765 |
| Idiosyncratic random | 0.015146 | 0.3235 |

Weighted Statistics

|                    |          |                    |          |
|--------------------|----------|--------------------|----------|
| R-squared          | 0.483592 | Mean dependent var | 0.090261 |
| Adjusted R-squared | 0.460640 | SD dependent var   | 0.020665 |
| SE of regression   | 0.015176 | Sum squared resid  | 0.020729 |
| F-statistics       | 21.07017 | Durbin-Watson stat | 1.261562 |
| Prob(F-statistic)  | 0.000000 |                    |          |

Unweighted Statistics

|                   |          |                    |          |
|-------------------|----------|--------------------|----------|
| R-squared         | 0.760657 | Mean dependent var | 0.305474 |
| Sum squared resid | 0.059298 | Durbin-Watson stat | 0.441004 |

Based on the results of panel data regression analysis, the regression equation can be written as follows:

$$KGP_{it} = \alpha + \beta_1 GE_{it} + \beta_2 GG_{it} + \beta_3 P_{it} + \beta_4 L_{it} + \epsilon_{it}$$

$$KGP = 2.09 - 0.00009 GE - 0.012 GG + 0.007 P - 0.008 L$$

Based on the results of data analysis, it is known that the R-squared value is 0.4835. This shows the magnitude of the influence of government spending in the education sector, gender gap, poverty level, and life expectancy on education inequality is 48.35% and the remaining 51.65% is influenced by other variables that are not included in the research model.

The regression coefficient for the variable government expenditure in the education sector (GE) is 0.00009 which is negative, indicating that there is a negative effect of government spending in the education sector on education inequality. This means that if government spending in the education sector increases by one billion, it will be able to reduce the level of education inequality by 0.00009 with the assumption that other variables do not change (ceteris paribus).

The regression coefficient for the gender gap variable (GG) is 0.012 which is negative, indicating a negative effect of the gender gap on educational inequality. This means that if the gender gap increases by one percent, it will reduce educational inequality by 0.012 with the assumption that other variables do not change (ceteris paribus).

The regression coefficient for the poverty level variable (P) is 0.007 which is positive, indicating a positive influence on

the poverty level on educational inequality. This means that if the poverty rate increases by one percent, it will increase educational inequality by 0.007 with the assumption that other variables do not change (*ceteris paribus*).

The regression coefficient for the variable life expectancy (L) is 0.008 which is negative, indicating that there is a negative effect of life expectancy on educational inequality. This means that if life expectancy increases by one percent, it will be able to reduce educational inequality by 0.008 percent with the assumption that other variables do not change (*ceteris paribus*).

Based on the results of testing the first hypothesis, it is known that government spending in the education sector has a significant negative effect on educational inequality. The higher government spending in the education sector will certainly reduce the level of education inequality. The government's role in improving the quality of education can be seen from the budget issued by the government for education. The intervention that can be carried out by the government is through a government budget policy that is obtained from taxes by increasing the income of the poor directly or indirectly, for example by expanding access to basic education. The effect of government spending on the education sector on education inequality has a negative and significant effect. It can be concluded that the greater government spending in the education sector, it will be able to reduce educational inequality in an area. The results of this study are in line with research which states that the variable government investment in education has a role in reducing educational inequality in an area (Sholikhah et al., 2014; Khusaini et al., 2020).

Based on the results of testing the second hypothesis, it is known that the gender gap has a significant negative effect on educational inequality. The higher the gender gap, of course, the lower the level of

educational inequality. The gender gap is the gap between men and women in getting education. Gender inequality in education can be seen from the literacy rate, which will increase educational inequality. The findings of this study are consistent with the findings of (Hamzah et al., 2017; Abdelbaki, 2012) states that the literacy rate in each gender has a significant and positive effect on educational inequality. It can be said that the gender gap affects the level of educational inequality. The higher the gender gap, the higher the level of educational inequality.

Based on the results of testing the third hypothesis, it is known that the level of poverty has a significant negative effect on educational inequality. The higher the poverty level, of course, the higher the educational inequality. The effect of poverty on education has a very large impact. Poverty that occurs in society makes it difficult for people who are on the poverty line to get a proper education. Many poor children prefer to help their parents to earn a living, thus neglecting the importance of getting an education. The findings of this study are relevant to several previous research findings which found that poor people were unable to take advantage of opportunities to attend secondary and higher education for financial reasons or other reasons, the education system actually perpetuates and even enlarges inequalities within a generation and between generations in developing countries. The level of poverty has a positive and significant relationship to educational inequality. So it can be said that the level of poverty can affect the high and low inequality of education (Banu & Rawal, 2015; Adiningtyas & Budyanra, 2020).

Based on the results of testing the fourth hypothesis, it is known that life expectancy has a significant negative effect on educational inequality. The higher the life expectancy, the lower the level of educational inequality. Life Expectancy Rate (AHH) is a tool to evaluate the

government's performance in improving the welfare of the population in general, and improving health status in particular. Life expectancy describes the average age reached by a person in a mortality situation prevailing in his community. The low life expectancy in an area indicates that health development has not been successful, and the higher the AHH, the more successful the health development in that area is. (Banu & Rawal, 2015; Coady & Dizioli, 2017; Abdelbaki, 2012).

## CONCLUSIONS

Based on the results of the study, it was found that government spending in the education sector had a significant negative effect on educational inequality. The higher government spending in the education sector will certainly reduce the level of education inequality. This study also found that the gender gap had a significant negative effect on educational inequality. The higher the gender gap, of course, the lower the level of educational inequality. The gender gap is the gap between men and women in getting education. Furthermore, it was found that the level of poverty has a significant negative effect on educational inequality. The higher the poverty level, of course, the higher the educational inequality. The effect of poverty on education has a very large impact. Poverty that occurs in society makes it difficult for people who are on the poverty line to get a proper education. This study also found that life expectancy has a significant negative effect on educational inequality. The higher the life expectancy, the lower the level of educational inequality.

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