



The Role Of Government Spending In Education Inequality: Evidence From Indonesia With A Panel Data Analysis

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Abstract:

This study aims to determine the level of inequality in education as measured by the Gini Education Coefficient (KGP) in Indonesia, to compare the level of inequality between provinces and to analyze the factors that influence educational inequality between provinces in Indonesia. This research was conducted in a number of Indonesian provinces in 2017-2019 using a panel data analysis methods. The results showed that education inequality in Indonesia in 2017-2019 was in the low inequality category. The number of Gini coefficients is getting smaller each year, which indicates a more even distribution of education in Indonesia. When viewed from the regional classification, Eastern Indonesia has a higher KGP score than the Western part of Indonesia. The education budget has a negative and significant effect on education inequality in Indonesia in 2017-2019 while the number of teachers and school principals has a significant positive effect on education inequality in Indonesia in 2017-2019.



Introduction

One of the most important factors in economic development is human resources. Some economists agree that human resources are the most decisive factor in the character and speed of the social and economic development of the nation concerned (Todaro,1998 :455).

The United National Development Program recorded Indonesia's Human Development Index (HDI) in 2019 of 0.718, making it in the high category. Indonesia is ranked 107th out of 189 countries analyzed by UNDP. From 1990 to 2019, the value of Indonesia's HDI increased from 0.523 to 0.718 or an increase of 37.3 percent. Table 1 below shows the contribution of each component index to Indonesia's HDI since 1990. Indonesia is ranked fifth among ASEAN countries. Indonesia's HDI lost to Singapore, Brunei Darussalam, Malaysia and Thailand. Indonesia lags far behind Singapore in all indicators. Singapore is in the very high HDI category and is ranked 11th in the world. Compared to Thailand, Indonesia excels in the category of average length of schooling. Indonesia is in the same rank as the Philippines, which is ranked 107. Indonesia is superior in terms of life expectancy (UHH), long school expectations (HLS) and national income per capita. Meanwhile, the Philippines excels in terms of average length of schooling.

Tabel 1.Indonesia's HDI trends based on consistent time series data and new goalposts

	Life Expectancy an Birth	Expected Years of Schooling	Mean Years of Schooling	GNI per Capita (2017 PPP\$)	HDI value
1990	62.3	10.1	3.3	4,202	0.523
1995	64.3	10.1	4.2	5,738	0.560
2000	65.8	10.6	6.7	5,315	0.603
2005	67.3	10.9	7.4	6,377	0.632
2010	69.2	12.2	7.4	8,059	0.665
2015	70.8	12.9	7.9	9,815	0.695
2016	71.0	13.3	7.9	10,197	0.703
2017	71.3	13.4	8.0	10,589	0.707
2018	71.5	13.5	8.0	11,042	0.712
2019	71.7	13.6	8.2	11,459	0.718

Source : UNDP, 2021

One of the benefits of HDI is to measure the success of building the quality of human life. The components used to measure HDI are income, health and education (BPS, 2021). According to human capital theory Schultz, (1961) states that an increase in education will have an impact on increasing productivity so that it will increase income. The link between education and health was also stated by Todaro dan Smith (2011) that the higher a person's education, the awareness of health is also getting better.

Sukirno (2011:439) states that to realize development requires two important factors, namely capital and experts. Experts are needed to carry out economic development. Sukirno explained that such a workforce requires education. The development of education is a step that must be carried out in development efforts. Based on the opinions of some of these experts, it can be concluded that one of the efforts to improve the quality of human resources is through education, where quality human resources are one of the capitals that must be owned to carry out economic development.

Hidayat (2014) said that the education sector is very important because education has a major impact on improving the quality of human resources. This is in line with the theory of human capital Schultz, (1961) which states that an increase in education will have an impact on increasing productivity so that it will increase income.

Education is contained in the Sustainable Development Goals (SDGs), which is to ensure inclusive and equitable quality education and increase lifelong learning opportunities for all. The importance of education is also stated in the preamble of the 1945 Constitution and has become one of the national ideals, namely the intellectual life of the nation. Therefore, the government is also seeking various programs to improve education, one of which is the 12-year compulsory education program.

To measure government policies in the field of education from an economic point of view, the government budget for education is used as the main indicator. This is because the budget set by the government is a manifestation of the government's political will. Todaro dan Smith, (2011) revealed that the provision of educational facilities is limited by the level of government spending. The higher the government budget for education will improve facilities and access and quality of education so that it will improve education. The Indonesian government budgets 20 percent of the State Budget (APBN) for education costs for education costs.

One of the serious problems faced is the problem of regional disparities in the level of development. In general, regional disparity is the failure of an area to take advantage of development potentials that have resources and resource advantages in relation to other areas, which include factors other than nature. Regional inequality is the difference between economic performance and welfare between countries or regions (OECD, 2002-2003). Inequality in educational attainment can occur because everyone does not have the same opportunities in obtaining education (Alonzo, 1995).

Thomas et al., (2000) using the term Education Gini Coefficient (KGP) to describe the unequal distribution of educational attainment among residents in an area. The KGP that is closer to 1 indicates a higher inequality in educational attainment. Meanwhile, KGP which is getting closer to 0 indicates lower educational inequality.

The importance of education in the development process of developing countries has led to several studies. Over the past decade, there has been a growing recognition of the importance of geography and space in the analysis of economic convergence (Dietrich dan Monasterio, 2009; Janikas dan Rey, 2005; Mossi et al., 2003). This convergence (whether between countries or within the same country) is widely debated with reference to the dynamics of monetary variables (income, wages, GDP, etc.). Spatial convergence analysis (within the same country) based on socioeconomic variables is rare. This indicator can be a complement to understanding the spatial dynamics of the region. Baumol., (1994) argues that the analysis of social variables can be the best way to study differences in performance between regions, especially in developing countries. Education indicators can provide a more comprehensive understanding of spatial asymmetry and imbalance in a given area and between different regions.

Based on the explanation above, the purpose of this study is to measure the level of education inequality between regions in Indonesia by using the Gini Coefficient of Education, to compare the level of education inequality between provinces in Indonesia and to analyze the factors of educational inequality between provinces in Indonesia.

The literature has grown since the research Thomas dan Yan (2009) to measure inequality in the distribution of education Zhang and Li, (2002); Castell and Domenech, (2002, 2008); Checchi, (2004); Morrisson and Murtin, (2007). The result is dependent on the level of development of the country.

Thomas et al., (2000) researched that education inequality in 85 countries in the world from 1960-1990 decreased. Hisham (2009) investigates income and education inequality in Bahrain. The main findings of this research study are as follows: first, there is a positive relationship between the education level of the household head and family income. Second, income inequality leads to educational inequality between different income classes, which in turn causes a widening of the income gap between future generations. Third, inequality in educational attainment in Bahrain has decreased over the period 1980–2006. The final result states that the main sources of educational inequality in Bahrain are inequality in education costs, availability of private schools in various regions and spending on education.

Results of research conducted Tomul, (2009) shows the relationship between inequality in education in Turkey and average years of schooling. The data source is the Population Census 2000: social and economic characteristics of the population. To determine inequality in education, the average years of schooling of the population aged 25 years and over and the Gini Index of education. The average years of schooling in all regions of Turkey during the period 1975-2000 increased and inequality in education decreased. A negative relationship was found between the mean years of schooling and the Gini index of education. A positive relationship was found between the rate of increase in the average year of schooling and the decline in the Gini index of education.

Agrawal, (2014) examines educational inequalities for India's main states. The education Gini index is calculated separately for the rural and urban sectors to examine changes in inequality over the past two decades. Using Gini Analysis (ANOGL), a technique for breaking down overall inequality into inequality within and between sectors, the researchers found that a large proportion of overall educational inequality is caused by intrasectoral inequality. Furthermore, intra-sectoral inequality has increased and inter-sectoral inequality has narrowed over the study period.

Umar et al., (2014) developed a regional production function model with educational inequality as a determinant of regional income disparities in Nigeria. Using microdata from the Living Standard Measurement Survey (LSMS) in Nigeria, researchers calculated educational inequality using the Theil index. Using a spatial cross section. Using an econometric approach, they found evidence that educational equity has a significant and positive effect on local income levels. Umar et al., (2014) in another study measured educational inequalities between northern and southern regions of Nigeria and compared them to the distribution of education in the regions. The results show that educational inequality is higher in the north than in the south. 17 of the 19 northern Nigerian states have a Theil index higher than the national Theil index. However, educational attainment and inequality were found to have a negative relationship.

Kanjuan dkk., (2017) examines the impact of education factors on economic growth in 31 provinces during 1996 and 2010 in China. The spatial panel estimation model is applied to study the impact of education on economic growth by considering the spillover spatial effect in the Feder model and the cumulative effect. The results revealed that the education factor

was significantly and spatially autocorrelated. The education factor has a spatial spillover effect. Regional differences in the impact of education still exist.

Maozhong and Hua, (2011) found five factors of uneven educational attainment using the main component analysis method, namely differences in socio-economic status, differences in employment and home ownership, differences in participation and educational resources, education investment by the government, and differences in parental education levels..

Mesa, (2011) conducted research on educational inequality in the Philippines. The researcher found that the Education Gini Coefficient was negatively related to GRDP per capita and positively related to poverty incidence. The distribution of educational attainment is poor (quite unequal) in provinces with high poverty rates. This finding is also in line with research Senadza, (2012) in Ghana that there is a positive correlation between poverty incidence and educational inequality.

Rahayu, (2005) Researching on Education Inequality in Indonesia from 1975 to 2000 using panel data analysis, it was found that education inequality during the 25 years of the study showed that most provinces in Indonesia tended to decline except for Papua Province which experienced an increase. Rahayu found that GDP had a significant effect while the gender gap had no effect on education inequality in Indonesia.

Digdowiseiso, (2010) also conducted research on educational inequality in Indonesia in 1999-2005. The results showed that there was a significant decline in Gini in Indonesia during the study period. RLS has a negative relationship and illiteracy rates by gender have a positive relationship with KGP in Indonesia.

Research Method

This study uses panel data combining time series data for 2017-2019 and cross section data from 6 provinces in Indonesia. The data needed in this study are KGP, government spending in the field of education and the number of teachers and principals obtained from the Ministry of Education and Culture. The dependent variable used is KGP which is calculated from the RLS combination function. The Independent Variables used are Government Expenditures in Education and the number of teachers and principals in a number of Provinces.

To determine the effect of the education budget on KGP in Indonesia in 2017-2019, the calculation results obtained the following model:

$$\text{Indeks Gini} = f(\text{Expen}, \text{TCH})$$

$$\text{KGP}_{it} = \alpha + \beta_1 \text{LnExpen}_{it} + \beta_2 \text{LnTCH}_{it} + \mu_{it}$$

Description :

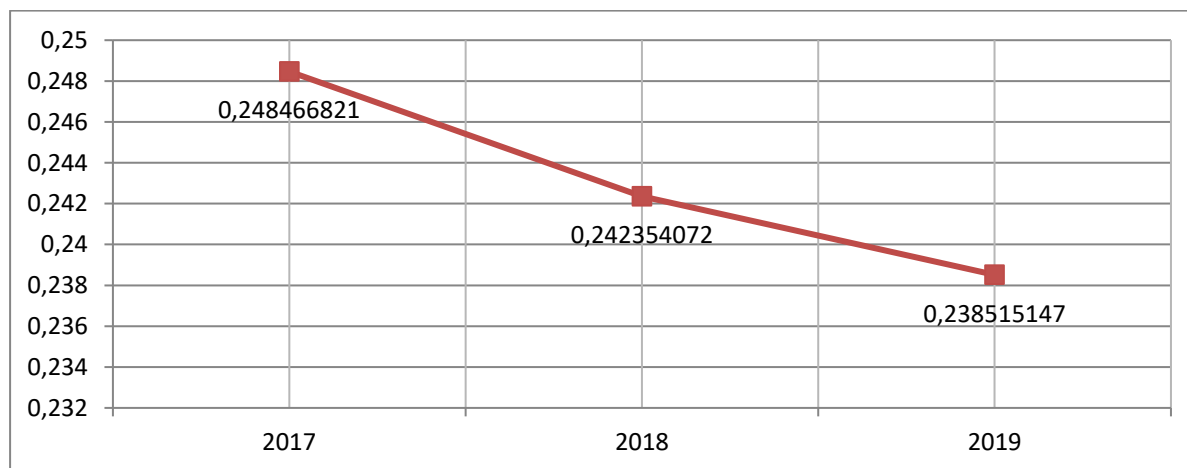
- KGP : Education Gini Coefficient (Index)
- α : Konstanta
- Expen : Education Budget (Billion Rupiah)
- TCH : Teachers and Principals (People)
- $\beta_{1,2}$: Coefficient of Independent Variables
- μ : *Terms of Error*
- i : Provincial Cross Section
- t : Time Series Data for 2017-2019

Based on the model, the significance of the variables was tested using the t test (partial) it was concluded that the education budget and the number of teachers and principals significantly affected KGP in Indonesia in 2017-2019 with a coefficient of determination of 0.995256 percent. This means that the model obtained can explain the diversity of KGP by 99.5256 percent of the variables of Government Expenditure in the Education Sector and Number of Teachers and Principals on Inequality in Education Distribution in Indonesia in 2017-2019 and the remaining 0.4744 percent is influenced by other variables outside the model.

Classical assumption testing is done to see if the model is feasible to use. From testing the three classical assumptions, namely normality, heteroscedasticity, and autocorrelation, it was found that the model formed can be used because it fulfills the assumptions in OLS. After going through several stages, it is found that the model is as follows:

$$KGP_{it} = 0,195101 - 0,063595 \text{ LnExpen}_{it} + 0,069235 \text{ LnTCH}_{it} + \mu_{it}$$

It is a model that can explain the diversity of educational inequality variations as measured by the KGP. The intercept in the model shows the magnitude of Indonesia's KGP if the value of the independent variable is equal to zero, then the education Gini index value is 0.195101 index points. An increase in Government Expenditure by 1 billion rupiah, the education Gini index will decrease by 0.063595 index points assuming a constant number of teachers and principals. This corresponds to Todaro dan Smith, (2011) which states that the greater the government spending on education, the better the provision of educational facilities will be, thereby reducing educational inequality. Education plays a central role in helping to improve the quality of human resources in optimizing the potential and ability to enhance economic development (Setyadi, 2022). In addition, the increase in teachers and principals by 1 person, the education Gini index will increase by 0.069235 index points.



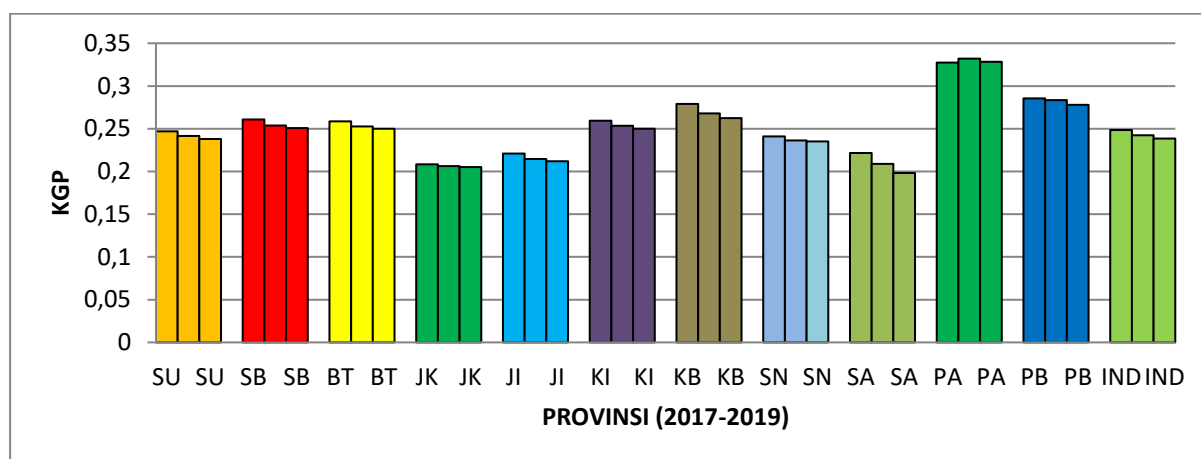
Source: Ministry of Education and Culture, 2021 (processed)

Figure 1. Education Inequality in Indonesia in 2017-2019

Education inequality in Indonesia has decreased every year. In 2017, Indonesia's KGP was at 0.24866821 and included in the low inequality category. In 2019, Indonesia's KGP was still in the same category but decreased to 0.238515147. This is the result of several programs made by the government to improve access and quality of education, including the improvement and improvement of classroom infrastructure and school buildings as well as

the construction of frontline schools and the assignment of teachers in the 3T (Front, Outermost and Disadvantaged) areas.

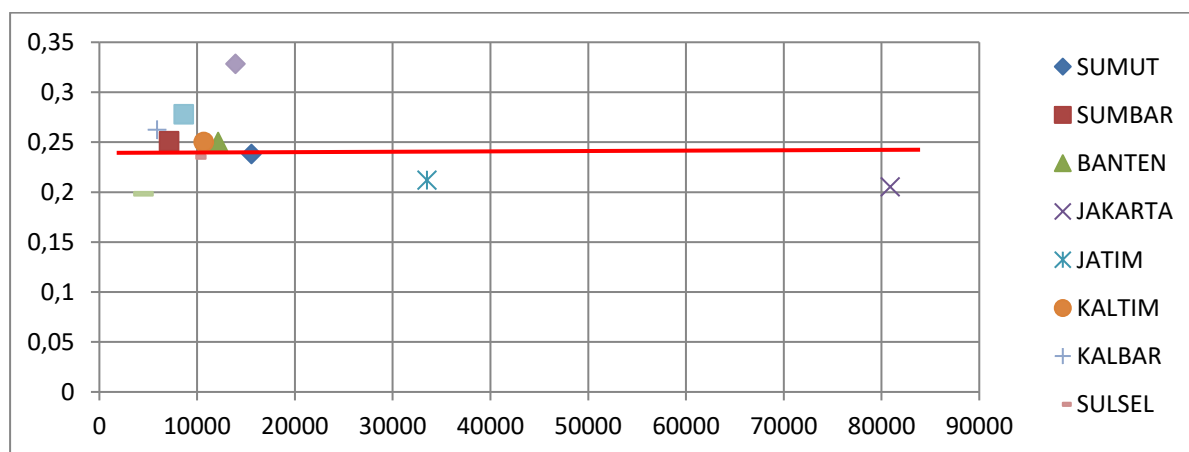
By region, provinces in Indonesia in general experienced a decrease in educational inequality from 2017-2019. KGP Papua Province shows the highest educational inequality rate from the provincial sample taken from 2017-2019. Meanwhile, the province with the lowest inequality rate is DKI Jakarta. This shows that people in DKI Jakarta Province have a more even level of education than people in Papua Province.



Source: Kemendikbud, 2021(processed)

Figure 2. Overview of Education Inequality by Province in Indonesia in 2017-2019

Graph 2 shows the distribution of KGP in 11 provinces in Indonesia in 2017-2019. Based on Graph 2, it can be seen that all provinces in Indonesia are categorized as low inequality. The provinces of Papua, West Papua, West Kalimantan, East Kalimantan, West Kalimantan, West Sumatra and Banten have indexes above the national average index. To analyze the provinces that need to increase the education budget in order to reduce the KGP, a Quadrant analysis is carried out.



Source: Kemendikbud, 2021(processed)

Figure 3. Plot Between Government Budget Allocation for Education and KGP in 2019

Based on Graph 3, the provinces that need to be considered are those where the KGP exceeds the national KGP and the provincial education budget is less than the average national

education budget. The provinces are West Sumatra, Banten, East Kalimantan, West Kalimantan, Papua and West Papua.

Conclusion

Based on the results and discussion, the following conclusions can be drawn, namely the inequality of education in Indonesia from 2017 to 2019 has decreased from 0.24866821 to 0.238515147 and is included in the low inequality category. A significant variable affecting education inequality in Indonesia is the education budget for the number of teachers and principals. The model obtained can explain the KGP diversity of 99.5256 percent of the variables of Government Expenditure in the Education Sector and Number of Teachers and Principals on Inequality of Education Distribution in Indonesia in 2017-2019 and the remaining 0.4744 percent is influenced by other variables outside the model. Provinces that need to be considered are those where the KGP exceeds the national KGP and the provincial education budget is less than the average national education budget. The provinces are West Sumatra, Banten, East Kalimantan, West Kalimantan, Papua and West Papua.

References

- Baltagi, B. H. (2005). *Econometric Analysis of Panel Data 3th Edition*. Chichester: John Wiley & Sons Ltd.
- Bustomi, M.J. (2012). *Ketimpangan Pendidikan Antar Kabupaten/Kota dan Implikasinya di Provinsi Jawa Tengah*. *Economics Development Analysis Journal*. journal.unnes.ac.id/sju/index.php/edaj/article/viewFile/477/507
- Digdowniseiso, K. (2010). *Measuring Gini Coefficient of Education: the Indonesian Cases*. [https://mpa.ub.uni-muenchen.de/19865/1/Measuring Gini Coefficient of Education.pdf](https://mpa.ub.uni-muenchen.de/19865/1/Measuring_Gini_Coefficient_of_Education.pdf)
- Greene, W. H. (2012). *Econometrics Analysis Seventh Edition*. New York: Pearson.
- Gujarati, D. N. & Porter, D. C. (2008). *Basic Econometrics Fifth Edition*. New York: McGraw-Hill.
- KEMENDIKBUD.(2020).*Neraca Pendidikan Indonesia*. <https://npd.kemdikbud.go.id/?appid=anggaran&tahun=2019>
- Hidayat, M. H. (2014). *Pendidikan dan Kesehatan dalam Pembangunan Ekonomi*. [https://www.academia.edu/16715231/Pendidikan dan Kesehatan Dalam Pembangunan Ekonomi](https://www.academia.edu/16715231/Pendidikan_dan_Kesehatan_Dalam_Pembangunan_Ekonomi)
- Maozhong, L., & Hua, S. (2011). *Education Inequality Analysis: International Comparison*. *International Journal of Business and Social Science*, Vol.2 No.16, 89-93. http://ijbssnet.com/journals/Vol_2_No_16_September_2011/10.pdf
- Mesa, E. P. (2007). *Measuring Education Inequality in The Philippines*. *The Philippine Review of Economics*, Vol.XLIV No.2, 33-70. https://www.researchgate.net/publication/227471603_Measuring_education_inequality_in_the_Philippines
- Modouw, James. (2013), *Pendidikan dan Peradaban Papua, Suatu Tinjauan Kritis Transformasi Sosial*, Bajawa Press Yogyakarta.

- Nisa Nur Sholekhatun & Smputra Palupi Lindiasari.(2020). *Analisis Ketimpangan Pendidikan di Provinsi Papua Barat*. <http://jurnal.unsyiah.ac.id/JPED/article/view/16388>
- Rahayu, A. (2005). *Ketimpangan Pendidikan di Indonesia*. <http://journal.umy.ac.id/index.php/esp/article/download/2147/2074> .
- Schultz, T. W. (1961). *Investment in Human Capital*. <https://www.jstor.org/stable/1818907?seq=1>
- Setyadi, S. (2022). Dampak Ketidaksetaraan Gender dan Variabel Ekonomi Terhadap Ketimpangan Pendidikan: Analisis Data Panel. *Gorontalo Development Review*, 5(1), 36–48. <https://doi.org/10.32662/golder.v5i1.2021>
- Sukirno, S. (2004). *Makro Ekonomi Teori Pengantar Edisi Ketiga*. Jakarta: Raja Grafindo Persada.
- Tirtarahardja, U. & La Sulo, S. L. (2005). *Pengantar Pendidikan (Edisi Revisi)*. Jakarta: PT Asdi Mahasatya. Todaro, M. P., & Smith, S. C. (2011). *Pembangunan Ekonomi Edisi kesebelas Jilid 1*. . Jakarta: Erlangga.
- Thomas, et al. (2000). Measuring Education Inequality: Gini Coefficients of Education. *Policy Research Working Paper: No. 2525*. <https://openknowledge.worldbank.org/handle/10986/19738>
- Zhang, H. (2014). The poverty trap of education: Education–poverty connections in Western China. *International Journal of Educational Development* <https://www.sciencedirect.com/science/article/abs/pii/S0738059314000431>