

Determinants of Educational Access in Indonesia

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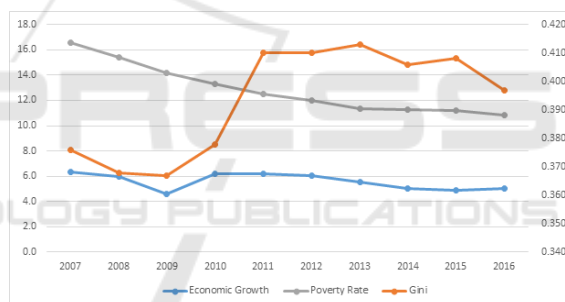
Keywords: Net Enrollment Ratio (NER), Mean Years of Schooling (MYS), Inequality.

Abstract: Indonesia's economy continues to expand, as indicated by its positive economic growth. Economic growth is expected to positively affect human resource quality in Indonesia through the improvement of net enrollment ratio (NER) in education. In this study, the econometric model utilized for determining education access in Indonesia relied on Susenas data between 2011 and 2015 and several macro data. The analysis result shows there is significant effect of per capita income and the Indonesian government's expenditure on education and income inequality on the NER at all education levels, whereas the mean years of schooling (MYS) are solely influenced by the government's expenditure on education and the ages for secondary school (junior and senior high).

1 INTRODUCTION

Indonesia's economic growth seemed to slow down from 2007 to 2016. The figure reached 5.3% in 2007 before eventually decreasing to 5% in 2016. The progress of Indonesia's economy was affected adversely by many factors, including international economic conditions. However, the poverty rate (percentage of people living in poverty) gradually decreased between 2007 and 2016. This effort of developing the economy by reducing the poverty rate was a success. Conversely, income inequality distribution as shown by the GINI index was a cause for concern regardless of the economic development of Indonesia. Income inequality got worse from 2011 until 2013, but then there was a decrease in income inequality from 2014 to 2016.

Figure 1 reflects developments in Indonesia's economic growth, level of poverty and income inequality from 2007 until 2016. The chart shows that there is high-income inequality when poverty is higher than 10%. This is bound to happen when poverty per capita per month in 2016 was 364.527 IDR for urban areas and 34.647 IDR for rural areas. It means there are more people living in poverty when the need is higher than the poverty level.

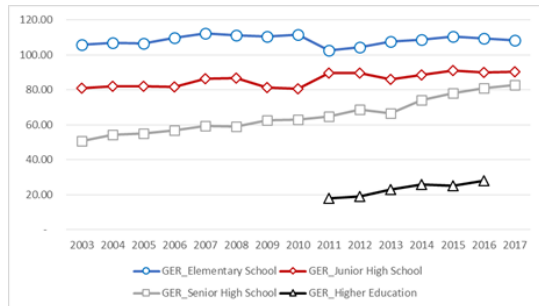


Source: Adapted from Central Bureau of Statistics.

Figure 1: Economic Growth, Poverty Rate, and Income Inequality in Indonesia Year 2007-2016.

The success of economic growth in Indonesia can be identified from how economic growth related to the improvement of human resource quality. One of the economic development purposes is to make human as a resource and acknowledge human as a subject, not an object (Human Centered Development). Education is fundamental in shaping better human skills as a form of the core ideas of development. The main objective of development is sustainable education and health care (Todaro, and Smith, 2012). Education plays an important role in developing a country because it is an investment to improve human resource skill, physical strength, and adaptation ability in utilizing techniques for operating machine tools used in industry (World Bank, 1996).

After more than 40 years of development, Indonesia displays its impressive improvement in several indicators of education. In general, there was an increase in the enrollment ratio for elementary and secondary schools shown in Figure 2. Generally, the enrollment ratio increased from 2003 until 2017 with gross enrollment ratio (GER) for elementary school grew from 105.80 to 108.5 in that period.



Source: Adapted from the Central Bureau of Statistics.

Figure 2: Gross Enrollment Ratio (GER) Year 2003-2017.

While the gross enrollment ratio (GER) for junior high school was 81.10 in 2003 and 90.23 in 2017. This trend was different from the enrollment ratio for senior high school and higher education in 2003-2017 which had an average number of 65.16 and 23.16 respectively. Data for higher education was not available enough like others. Although the number is considered low, the trend goes upward consistently. However, the mean years of schooling (MYS) within aged 15 and above increased from 7.24 years in 2004 to 7.92 years in 2011.

Meanwhile, the challenges and problems in Indonesia's education are still about achievement inequality in the education sector. This inequality happens in several forms including number of gender (male and female), place of living (rural and urban areas), and poverty level (the lowest 20% of people with low income, and the highest 20% of people with high income). Fahmi and Satriatna (2013) stated that the gap of achievements in education according to the place or living (rural and urban areas) indicated that people living in urban areas were more likely to be superior in academic achievement compared to those living in rural areas.

Yusuf (2014) also said that there was a decrease in the gap of literacy based on gender between in 1992 and in 2010 which finally reached 5% gap. However, the net enrollment ratio of junior high school for people living in urban areas is always higher than those living in rural areas. At the start of the study, the gap between net enrollment ratios was wide with around 30% while at the end of the study, the gap was

only 5%. Further, the inequality in the net enrollment ratio for people living in urban and rural areas who enter university decreased but still considered high. Finally, the average years of schooling for people living in urban and rural areas showed only a slight change.

2 LITERATURE STUDY

The possibility of a nation's economic growth is highly affected by national resources, including human capital, physical capital, or resource endowment. Harbison (1973) stated that human capital is the underlying basis of national assets. Physical capital and resource endowment are factors of production which are passive while human capital is an active resource. People are subjects that always actively collect capital needed for economy; exploit natural resources; build social organizations, economy, and politics; and execute national development. A country will never grow when the human capital quality is not fully and effectively used for improving national economic development and management.

Schultz (1961) argued that a society should invest in its members through providing expenses for the needs of education, training, research, and health to optimize human resource productivity. Human capital is a machine for economic development (Azid and Khan, 2010). Education is the basis of human capital quality, the higher the educational attainment, the higher the quality and productivity of human capital. Every person has their own path and time in achieving proper educational attainment and health sustainability as the measuring criteria for human capital quality. High educational attainment and good healthy life are defined as something requiring high cost for certain society. It means not all people can get the same level of educational attainment and healthy life. Educational attainment is influenced by various factors as have been discussed and published in many academic journals.

Many researchers have mentioned the variables affecting education like income per capita, population growth rate, government expenditure on education, total and urban population, which all are significant variables for adult educational attainment in many developing countries (Mazumdar, 2005).

Meanwhile, Faguet and Sánchez (2008) proposed more various variables to identify those variables' effect on education. They include per capita expenditure of public education, government expenditure on education, growth in regional

expenditure, student–teacher ratio, politics, household demography, and socioeconomic status.

Poverty significantly impacts on people’s lives, not only for those living in poverty but also for people living in prosperity. Poverty is both individual and social problem which means every nation should work together defeating poverty. The best way to escape poverty is through education (Maipita, 2014, 2016). Empirical evidence shows that better access to education for lower socioeconomic status is pivotal in saving a nation from poverty. Poverty can be caused by: (a) low quality of human resource caused by low level of education, (b) difficult and limited access of capital ownership, (c) low technological competence, (d) inefficient use of resources, and (e) high population growth (Sharp et al., 2000). Many research results imply that economic growth can improve per capita income that will finally lead to the decrease of poverty ratio (Dollar and Kraay, 2001; Field, 1989).

3 RESEARCH METHOD

This study followed a model built according to the main literature from Rajkumar and Swaroop (2008) and some complementary articles including from Anyanwu (2007); Checchi (1999); Flug et al. (1998); Pritchett and Filmer (1999); and Psacharopoulos (1994). A model of educational data results is developed into two categories, enrollment ratio and years of schooling. Both were assumed to be the main indicators of education besides many other variables. The categories used for enrollment ratio were Elementary School (ES), Junior High School (JHS), and Senior High School (SHS), as the score results of education. The first model was the determinant of enrollment which was divided into three levels of education: ES, JHS, and SHS in net enrollment ratio (NER). The second model was the determinant of mean years of schooling (MYS). The independent variables taken from the result of literature studies were per capita income; government expenditure on education; GINI coefficient; and age from people aged 7-12 years old (Elementary School age), 3-15 year old (Junior High School age), and 16-18 years old (Senior High School age).

The data used in this study was from the Susenas 2011-2015. The macro economic and fiscal data were collected from the Central Bureau of Statistics and the Ministry of Finance, Directorate General for Fiscal Affairs of the Republic of Indonesia. Unit analysis was done at the provincial level annually. Additionally, the econometric model was formed

from panel and time series data during 2011-2015, and cross section data for provinces in Indonesia.

To analyze the significant relationship between independent and dependent variables from regression econometric model, hypothesis testing on the parameters of population regression function was conducted. This hypothesis testing covered single parameter significance test and overall test on the population regression function. T-test was used for hypothesis testing in parameters of a single population while the significance of overall regression was tested using f-test (Wooldridge, 2009). To identify whether there was multicollinearity, Variance Inflation Factor (VIF) was utilized. Then the white test was employed for analyzing Heterocedasticity.

4 RESULT AND DISCUSSIONS

In this section, the estimation results for each equation are discussed. The model is estimated by using the Fixed Effect for 29 provincial data and 5 years of observation from 2011 to 2015. There are 5 provinces that are not included in the estimation because the data is not available. The five provinces are: Riau Islands Province, Jakarta Special Capital Region Province, Gorontalo Province, West Sulawesi Province and West Papua Province. The 29 provinces are considered to be sufficient to represent Indonesia. Hence, the analysis can still be done.

The Fixed Effect model was chosen because it has the ability to make model specifications for each variable from the data cross-section. This is to provide an in-depth analysis of each province in the model. This makes it easy to determine which provinces have a greater impact, having different roles based on coefficient signs.

One of the key indicators of educational performance is school enrollment and mean years of schooling. Table 1 is the result of estimation for elementary school, junior high school (NER_JHS) and senior high school (NER_SHS) school enrollment and the estimation results for mean years of schooling (MYS) as the dependent variable and all in percent units. Independent variables consisting of Per Capita Income (PCI) in natural logarithms, government expenditure on education (GOV_Ed) in percent units against the GRDP of each province. GINI variables remain in index units and age variables. The elementary school age (AGE712), junior high school age (AGE1315) and senior high school age (AGE1618) are all in percent units of the population.

The models in equations 2 through 4 are estimated using AR (2) to get a better estimation result. Equation 1 does not use AR (auto regressive), so the estimation results are satisfactory. Table 1 provides an overview of the four similarities in determining school enrollment and determining the mean years of schooling estimated.

Table 1: Estimation Results Using Fixed Model Effect for the Equation of School Enrollment Rate Determinants and Mean Years of Schooling Determinants.

	APM SD _{it}	APM SMP _{it}	APM SMA _{it}	RLS _{it}
	(1)	(2)	(3)	(4)
Konstanta	74.8024*** (4.4302)	81.1079*** (4.1211)	57.4197*** (4.4721)	2.1242*** (0.1161)
PCI _{it}	0.5924** (0.2975)	0.6656*** (0.2420)	0.6613*** (0.2463)	0.0099 (0.0070)
GOV_ED _{it}	0.7668*** (0.2323)	-0.9771*** (0.2749)	-0.7166*** (0.2100)	-0.0043** (0.0017)
GINI _{it}	15.9305** (7.4930)	-15.1003* (7.7262)	-12.7883* (7.6282)	0.0343 (0.1637)
AGE_712 _{it}	0.3184*** (0.0333)			-0.0186*** (0.0037)
AGE_1315 _{it}		-0.1054 (0.3245)		0.0441*** (0.0071)
AGE_1618 _{it}			0.5895*** (0.0701)	0.0503*** (0.0084)
AR(2) _{it}		0.4529*** (0.0589)	0.2804*** (0.0396)	-0.0441 (0.0445)
R2	0.7358	0.9548	0.9812	0.8002
Adj R2	0.6603	0.9267	0.9812	0.6630

Notes:

In parentheses shows the standard error

* shows the significance level at alpha 10%

** shows the significance level at alpha 5%

*** shows the significance level at alpha 1%

School enrollment at the elementary, junior high and senior high school levels in Indonesia is equally affected by per capita income level. The higher the level of per capita income, the higher the level of school enrollment from elementary, junior high and senior high school levels. While it is viewed as coefficient, the per capita income at the junior high school level has a greater influence when compared to elementary and senior high schools. One percent increase in per capita income will increase junior high school enrollment by 0.67%, while equalization in elementary school enrollment is only 0.59% and 0.66% at the senior high school level.

The per capita income variable for school enrollment rates from the elementary school level is effective in Aceh Province with a coefficient of 4.3. This figure is obtained by doing model specifications for per capita income (PCI). The figure 4.3 shows the high level of elasticity for increasing welfare can increase elementary school enrollment. The highest elasticity for junior high school enrollment is Central

Kalimantan, Bali and North Sulawesi, while for senior high school enrollment, the highest per capita income is West Sumatra, South Sumatra and Aceh.

Table 2: The per capita income variable coefficient.

No	Prov	ES	JHS	SHS	MYS
1	Aceh	4.33	10.61	7.01	0.14
2	Sumut	2.06	3.16	3.38	-0.22
3	Sumbar	2.85	3.39	19.57	0.22
4	Riau	0.30	0.56	2.70	0.05
5	Jambi	0.76	1.31	5.14	-0.01
6	Sumsel	-4.20	0.76	7.32	0.76
7	Bengkulu	-0.02	0.44	-2.70	0.02
8	Lampung	0.92	-2.69	0.36	0.18
9	Babel	0.36	-0.88	-3.52	-0.03
10	Jabar	-1.89	-0.48	-1.53	-0.21
11	Jateng	-2.30	0.09	2.83	0.12
12	Yogya	-0.21	-7.17	-3.41	-0.23
13	Jatim	-0.65	-4.31	-8.53	-0.09
14	Banten	2.30	1.52	1.88	0.56
15	Bali	-0.26	4.29	2.99	0.12
16	NTB	-0.14	-1.09	-3.27	0.33
17	NTT	1.21	2.79	5.96	-0.03
18	Kalbar	1.53	-1.56	6.05	0.49
19	Kalteng	1.31	13.09	5.88	0.16
20	Kalsel	3.47	-0.23	1.71	0.02
21	Kaltim	0.76	-0.18	-0.11	0.01
22	Kalut	-5.59	-6.96	-8.13	-0.19
23	Sulut	-1.68	4.09	1.28	0.00
24	Sulteng	0.42	3.05	0.08	0.29
25	Sulsel	3.48	1.04	-0.96	0.01
26	Sultra	1.89	0.93	1.97	0.00
27	Maluku	-4.40	-8.79	11.02	-0.01
28	Malut	-0.64	-4.49	0.62	-0.05
29	Papua	0.10	-0.13	-0.04	0.06

Source: Processed Data.

Government expenditure on education variables has a positive influence on school enrollment only at the elementary level. At the junior and senior high school level, it has a negative influence. This is certainly in contrast to the concept of increasing school enrollment with an increase in the budget for education at the junior and senior high school level. All variables have a statistically significant effect on the greatest level of trust, which is 99%. The mean years of schooling equation also shows the negative influence of the government expenditure on education variable. This shows the ineffectiveness of education spending to increase school enrollment. The model specification for the government expenditure on education variables shows that not all provinces have a negative influence. This shows that

several provinces can actually increase school enrollment by issuing budgets for education. Aceh is one of the provinces showing the effectiveness of education spending to increase school enrollment. Income inequality variables have a significant influence on school enrollment at the elementary, junior high and senior high school level. Increasing GINI ratios or inequality worsen will have an impact on increasing school enrollment at the elementary level, while for junior and senior high schools it shows the opposite effect. Higher inequality actually decreases school enrollment rates for junior and senior high schools.

Table 3: The Government Expenditures on Education Variable coefficients.

No	Prov	ES	JHS	SHS	MYS
1	Aceh	1.79	0.66	0.54	-0.01
2	Sumut	-2.06	-7.35	-6.15	0.05
3	Sumbar	4.39	-0.43	1.19	-0.13
4	Riau	0.34	-4.33	-7.37	-0.45
5	Jambi	5.66	4.12	20.85	0.51
6	Sumsel	4.8	-3.88	-12.02	-0.07
7	Bengkulu	2.31	0.10	3.70	0.10
8	Lampung	0.85	0.95	1.98	0.10
9	Babel	3.22	23.22	11.16	0.02
10	Jabar	-9.32	-5.67	-16.70	-2.02
11	Jateng	-3.46	-3.44	-9.35	0.28
12	Yogya	2.65	-2.06	0.70	0.06
13	Jatim	-5.95	-7.63	-20.93	0.26
14	Banten	-0.07	0.43	-2.76	-0.14
15	Bali	-0.88	-1.39	-2.31	0.23
16	NTB	0.17	-0.41	-0.60	-0.03
17	NTT	0.47	-1.76	-0.71	0.01
18	Kalbar	0.06	-3.19	0.62	-0.08
19	Kalteng	1.80	-3.22	-1.58	-0.31
20	Kalsel	3.94	-1.26	0.88	0.25
21	Kaltim	5.65	-5.72	-3.13	0.00
22	Kalut	1.24	-0.73	0.32	-0.03
23	Sulut	7.81	-10.78	-6.39	-0.35
24	Sulteng	-1.23	-4.12	-1.70	0.25
25	Sulsel	-5.03	-2.60	-3.96	0.03
26	Sultra	-1.44	-1.56	-3.08	-0.01
27	Maluku	1.05	-2.37	-1.67	0.00
28	Malut	0.22	0.95	-0.23	-0.02
29	Papua	-16.03	-16.73	-11.68	-0.17

Source: Processed Data.

Table 4: Income inequality for education variables coefficient.

No	Prov	ES	JHS	SHS	MYS
1	Aceh	81.41	-294.56	442.85	-0.51
2	Sumut	33.94	-66.06	-89.44	-2.80
3	Sumbar	6.79	-22.68	-103.59	-2.00
4	Riau	47.80	0.81	-26.97	3.91
5	Jambi	-123.67	15.35	208.08	2.92
6	Sumsel	-30.06	74.24	32.46	0.77
7	Bengkulu	-37.75	-187.14	-318.21	-2.56
8	Lampung	46.99	19.14	-101.48	-4.88
9	Babel	-18.35	-157.77	58.98	-3.23
10	Jabar	-14.40	-54.21	-200.84	2.55
11	Jateng	187.17	4.26	-98.84	-55.09
12	Yogya	15.04	148.12	399.58	5.18
13	Jatim	49.22	41.08	178.00	-0.35
14	Banten	34.52	19.98	53.81	-1.86
15	Bali	59.40	50.06	4.35	-2.42
16	NTB	25.23	37.83	111.29	3.72
17	NTT	-5.44	-826.17	477.88	-4.96
18	Kalbar	2.44	-54.97	0.88	0.91
19	Kalteng	9.16	-41.01	-29.26	0.79
20	Kalsel	12.65	-82.83	-64.94	3.93
21	Kaltim	-11.15	9.22	-119.81	-4.22
22	Kalut	58.98	13.30	55.38	-1.16
23	Sulut	22.31	-33.53	15.33	-2.06
24	Sulteng	23.39	-189.57	38.64	6.93
25	Sulsel	-47.22	6.83	-101.37	-1.35
26	Sultra	-131.47	-195.05	-386.10	-0.68
27	Maluku	-68.20	-113.02	-174.92	0.83
28	Malut	-114.05	89.68	-31.31	-0.02
29	Papua	3.49	-83.99	9.19	2.42

Source: Processed Data.

Especially for the equation one or elementary school enrollment rate, the age of elementary school students or around the age of 7 to 12 years has a positive influence on elementary school enrollment. With more residents ages 7 to 12 years old, elementary school enrollment is increasing. For junior high school level, junior high school age or around 13 to 15 years old will have a negative impact even though it does not have a statistical effect. If the percentage of junior high school age increases, then the junior high school enrollment rate will decrease. For the senior high school level, it has a positive and statistically significant effect.

Per capita income for equation two (junior high school level) has a greater influence when compared to equation one (elementary school level) and equation 3 (senior high school level). Variable per capita income for school enrollment rates from the elementary school level is effective in Aceh Province with a coefficient of 4.3. The highest elasticity for junior high school enrollment is Central Kalimantan,

Bali and North Sulawesi. While for senior high school enrollment, the highest per capita income is West Sumatra, South Sumatra and Aceh.

Government expenditure on education variables has a positive influence on school enrollment only at the elementary school level. At the junior and senior high school level, it has a negative influence.

Income inequality variables have a significant influence on school enrollment at the elementary, junior high and senior high school level. Increasing GINI ratios or worsening inequality will have an impact on increasing school enrollment at the elementary school level, while for junior and senior high schools it shows the opposite effect.

Age among elementary school students or around the age of 7 to 12 years has had a positive influence on elementary school enrollment. The more residents ages 7 to 12 years, the more elementary school enrollment. For junior high school level, junior high school age or around 13 to 15 years old will have a negative impact even though it does not have a statistical effect. If the percentage of junior high school age increases, then the junior high school enrollment rate will decrease. For the high school level, it has a positive and statistically significant effect.

For the mean years of schooling modeled on Equation Four in Table 1, per capita income does not have a significant effect on the mean years of schooling, although it has a positive sign. Government expenditure on education also does not encourage the increasing the mean years of schooling, and even decreases with the increase of the government expenditure for education. Income inequality variables or GINI have no significant effect. From elementary, junior high and senior high school age variables, only the senior high school age does not affect the mean years of schooling.

Per capita income has no significant effect on the mean years of schooling. Government expenditure on education also does not encourage the increasing the mean years of schooling, and even decreases with the increase of the government expenditure on education. Income inequality variables or GINI have no significant effect. From elementary, junior high and senior high school age variables, only the senior high school age does not affect the mean years of schooling.

5 CONCLUSIONS

Per capita income at the junior high school level has a greater influence compared to elementary and

senior high school. Per capita income variables for school enrollment rates from the elementary school level are effective in Aceh Province with a coefficient of 4.3. The highest elasticity for junior high school enrollment is Central Kalimantan, Bali and North Sulawesi, while for senior high school enrollment, the highest per capita income is West Sumatra, South Sumatra and Aceh.

Government expenditure on education variables has a positive influence on school enrollment only at the elementary level. At the junior and senior high school level it has a negative influence.

Income inequality variables have a significant influence on school enrollment at the elementary, junior high and senior high school level. Increasing GINI ratios or worsening income inequality will have an impact on increasing school enrollment at the elementary school level. While for junior and senior high schools, it shows the opposite effect.

Age among elementary school students or around the age of 7 to 12 years has had a positive influence on elementary school enrollment. The more residents ages 7 to 12 years, the more elementary school enrollment. For junior high school level, junior high school age or around 13 to 15 years old will have a negative impact even though it does not have a statistical effect. If the percentage of junior high school age increases, then the junior high school enrollment rate will decrease. For the high school level, it has a positive and statistically significant effect.

Per capita income has no significant effect on the mean years of schooling. Government expenditure on education also does not encourage the increasing the mean years of schooling, and even decreases with the increase of the government expenditure on education. Income inequality variables or GINI have no significant effect. From elementary, junior high and senior high school age variables, only the senior high school age does not affect the mean years of schooling.

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