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Research Article

Does Human Capital Matter for Economic Growth in Indonesia?

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Abstract: This study aims to investigate the role of human capital in the Indonesian economic growth over the period from 1980 to 2017. Specifically, it attempts to empirically explore the short- and long-run effects of government spending on education and health on the economic growth of Indonesia using the Autoregressive Distributed Lag (ARDL) model. The study found a long-run equilibrium between government expenditures on economic growth, signifying the importance of government spending to promote economic growth in the country over the long-run period. Government spending on education and health sector were found to have a positive influence on economic growth both in the short- and long- run. These findings suggest that to further promote sustainable economic growth in Indonesia; the government should focus on optimizing government spending on education and health sector.
Keywords: Fiscal policy, Government expenditure, Human capital, Education, Health, Economic growth.

INTRODUCTION

The progress of a nation's economy can be viewed from its economic growth. Economic growth is a benchmark for the success of a country in meeting the needs of its citizens for goods and services. Therefore, every country is always trying to spur its level of economic growth. In this case, the role of the government is very important in driving the progress of economic growth. The government has two policies to encourage economic growth, namely monetary policy and fiscal policy (Lucas, 1986). Through monetary policy, government controls the number of money supply, price stability, and in turns stabilizes its economic growth, while through fiscal policy, the government allocates state revenues in the form of taxes and non-taxes into state expenditure to promote economic growth.

From the perspective of fiscal policy, the government does not only urge to generate more state revenues, but it also to allocate them into the right economic sector that has a significant impact on the development of the national economy. In Indonesia, over the past few decades, government investment in human resources has been recognized as one of the important fiscal strategic policies to promote sustainable economic development. If viewed from the side of the state budget policy, the government spending on human capital would improve the quality of human resources and its Human Development Index (HDI).

HDI is a composite index that measures of the condition of human resources in a country, covering three areas of human development which are considered very basic, namely economic, educational, and health dimensions. The government's seriousness in improving the quality of human resources is marked by an increase in government spending in the education and health sectors every year. These government spending would contribute to economic growth through an increase in human resources' capability and competency. Although the investment in human capital is sometimes not immediately able to increase economic growth directly, but government spending in the field of education and health will have an indirect influence on long-term economic growth.

Previous studies on the effect of human capital on economic growth have been done extensively, focusing on both advanced and developing economies. For example, the impact of various type of public expenditures on economic growth have been conducted in the U.S (Rodríguez, 2018), EU countries (Mărginean,

2014), Tunisia and Morocco (Ifa and Guetat, 2018), Nigeria (Edeme, 2014), and Caribbean countries (Craihwell *et al.,*, 2012). Similar studies have also conducted for the case of Indonesia (Khusaini, 2013; Astri *et al.,*, 2013; Dewi, 2014; Sanggelorang *et al.,*, 2015; Safitri, 2016; Heka *et al.,*, 2017; and Anggraeni, 2017). However, the majority of studies for the case of Indonesia analyzed the effect of government expenditure on education and health on provincial economic growth. Few studies have investigated the effect of government expenditure on education and health on the national economic growth using the multiple panel regression analysis.

Unlike the previous studies on human capital-economic growth nexus, this study focuses its analysis of the effect of government expenditure in education and health on the national economy of Indonesia using the Autoregressive Distributed Lag (ARDL) model. This model could provide both short- and long-run effects of human capital on economic growth. Thus, the findings of this study would shed some lights for policy-makers to design a proper fiscal policy to promote both short- and long-run economic growth through human capital investment.

The rest of this study proceeds to review selected relevant literature in Section 2, followed by providing the empirical framework and data used in the study. Section 4 discusses the findings and their implications, and finally, Section 5 concludes the paper.

LITERATURE REVIEW

There have been many studies investigated the government expenditure-economic growth nexus worldwide. Exploring government expenditure and economic growth is basically discussing the role of fiscal policy in an economy. The role of fiscal policy in the world economy has been explored by Easterly and Rebelo (1993). In their study over 100 countries for the period 1970-1988, Easterly and Rebelo (1993) found that a strong association between the development level and the fiscal structure. The poor countries were found to rely heavily on international trade taxes, while income taxes were only important in developed economies. The effectiveness of fiscal policy was influenced by the economies of scale and investment in transport and communication were correlated with economic growth. Using time series data from the G7 industrialized countries over the sample period 1960 - 1993, Kolluri *et al.,* (2000) found both the short- and long-run effects of growth in national income on government expenditure, consistent with the Wagner's Law.

Focusing on the EU countries, Marginean (2014) adopted the Vector Error Correction Model (VECM) to explore the effect of government spending on education and health in developed Countries. He found that a positive influence of the budget allocation

of government spending in education and health on economic growth. Using a Vector Autoregression (VAR) model, Rodriguez (2018) documented that public spending has a macroeconomic impact on the U.S economy. Meanwhile, Gamlath and Lahiri (2018) found that the budget allocation of government expenditure for public goods in the education sector has a long-term impact on the economy, but private expenditure in the field education or parental expenditure for their children's education as a substitute or choice has a short-term influence on economic growth.

For the case of Tunisia and Morocco, using the ARDL model, Ifa and Guetat (2018) documented a positive short term relationship between public spending on education and Moroccan economic growth, while for the case of Tunisia it was negatively related. In the long run, on the contrary, government spending on public expenditure in education showed a positive relationship on the economic growth of both Tunisia and Morocco.

Finally, for the case of Indonesia, Safitri (2016) found that government spending has a negative impact on economic growth both in the long term and in the short term based the Error Correction Model (ECM). This finding is, however, contradicted the finding of Aditia and Dewi (2018) who found a positive relationship between government spending in the fields of education and health on people's welfare based on the multiple linear regression analysis.

Government expenditures on education and economic growth

Education is a form of investment in human resources. The level of education also affects the level of economic growth. One way to improve economic growth is through improving the quality of education. Thus, investment in education is absolutely necessary to build a good educational facility and system. The government spending on education is a tangible manifestation of investment to increase people's productivity. There has been a lot of empirical evidence that supports a positive relationship between government expenditures on education on economic growth. For example, Angelopoulos *et al.,* (2007) found that using human capital as a factor of production; government spending on education promotes economic growth. Similarly, found that formal education attended by the community has improved HDI (Heka *et al.,* 2017) and consequently triggered economic growth (Khusaini, 2013).

Government expenditures on health and economic growth

The level of public health greatly influences economic growth as it is closely related to the ability and productivity of the community. Government spending on the health sector is a form of government

investment in the health sector for the purpose of improving human quality to support economic growth. Previous studies supported the importance of government expenditure on health to promote the quality of human resources and ultimately the economic growth. For example, Baeti (2013) found that government spending in the health sector was able to improve the HDI. An improved in HDI indicates an increase in the quality of human beings that contribute to the enhancement of economic growth. This evidence is as documented by previous studies where government spending in the health sector positively affected the level of public welfare (Aditia and Dewi, 2018) and economic growth (Marginean, 2014).

RESEARCH METHOD

To explore the short- and long-run effects of government expenditures on education and health on the economic growth of Indonesia, this study uses secondary time series data over the period from 1980 to 2017. These data include economic growth, government expenditures on education, and government expenditures on health that gathered from the Central Bureau of Statistics of Indonesia and the World Bank database. In this study, economic growth is measured by the rate of economic growth in percentages, while government expenditures on education and health are measured by the proportion of government expenditure allocated in the education and health sectors in the Indonesian Rupiah (IDR) at constant prices, respectively.

The following Autoregressive Distributed Lag Model (ARDL) is used to empirically explore the short- and long-run effects of government expenditures on education and health on the Indonesian economic growth:

$$D(\text{EGRW})_t = \beta_{01} + \sum_{i=1}^{k} \beta_{11}(\text{EGRW})_{t-i} + \sum_{i=1}^{k} \beta_{12}(\text{GEDU})_{t-i} + \sum_{i=1}^{k} \beta_{13}(\text{GEHE})_{t-i} + \theta_{11}\text{EGRW}_{t1} + \theta_{12}\text{GEDU}_{t1} + \theta_{13}\text{GEHE}_{t1} + \varepsilon_{t1} \text{---------------------} \quad (1)$$

Where *EGRW* is the economic growth, *GEDU* is the government expenditure on education, *GEHE* is the government expenditure on health, *D* is the first difference, β_{ii} are the constant and the estimated short term coefficient, θ_{ii} are the estimated long term coefficient, ε is an error term, and *k* is the lag-length.

To measure the short-run effect of government expenditures on education and health, the null-hypothesis of $H_0: \beta_{11} = \beta_{12} = \beta_{13} = 0$ is tested against the alternate hypothesis of $H_a: \beta_{11} \neq \beta_{12} \neq \beta_{13} \neq 0$. Meanwhile, to explore the long-run effect of government expenditures on education and health, the null-hypothesis of $H_0: \theta_{11} = \theta_{12} = \theta_{13} = 0$ is tested against the alternate hypothesis of $H_a: \theta_{11} \neq \theta_{12} \neq \theta_{13} \neq 0$.

FINDINGS AND DISCUSSION

Before estimating the ARDL model, the study conducted several tests, comprising tests of the stationary, optimal lag-lengths' determination, cointegration, and model stability to ascertain the goodness of fit of the estimated model.

Table 1 illustrates the findings from the stationary tests based on the Augmented Dickey-Fuller (ADF) and Philips-Perron (PP). The results of the stationary test showed that the economic growth (EGRW), government expenditure on education (GEDU), and government expenditure on health (GEHE) were stationarity at first different [I (1)]. These findings satisfy the use of ARDL technique as the model requires the dependent variable, EGRW to be stationarity at the first difference, while other independent variables can be stationarity either at the level or first difference (Majid, 2007a; Majid, 2007b; Majid, 2007c; Majid, 2008).

Table 1. Stationary tests

Variable	PP		ADF	
	Level	1st Difference	Level	1st Difference
EGRW	-0.2352	-8.0591[***]	-0.7727	-10.8036[***]
GEDU	-0.2842	-4.6632[***]	-0.2444	-4.7018[***]
GEHE	-0.6981	-7.0875[***]	-0.7380	-6.4450[***]

Note: *** indicates significance at the 0.01 level.

In the next step, the study proceeds to decide the lag-length to be incorporated in the estimated ARDL model. Using the Akaike Information Criteria (AIC), the optimal lag-length = 4 was found to be the number of optimal lag to be included in the model.

Subsequent to identifying the lag-length, the study proceeds to test the existence of cointegration relationship among the variables using the Pesaran *et al.,*'s (2001) bound testing to cointegration. The purpose of this test is to verify whether non-stationary variables are cointegrated or not. Table 2 reports the findings from the cointegration test.

Tabel 2. Cointegration test

F-statistics = 16.30	Critical Values	
	Lower Bound	Upper Bound
1% significance level	5.15	6.36
5% significance level	3.79	4.85
10% significance level	3.17	4.14

As illustrated in Table 2, the finding of a cointegration test showed that the value of F-statistics of 16.30 is greater than the critical values of lower bound and upper bounds, indicating the non-rejection of the alternate-hypothesis of cointegration at the 1% significance level. This finding implies the existence of a cointegration relationship between economic growth

and government expenditures on education and health in the Indonesian economy.

Having documented the presence of cointegration among the variables, in the next step, the ARDL model is estimated to discover the nature and size of the short- and long-run effects of government expenditures on education and health on economic growth. The findings from the estimated ARLD model are presented in Table 3.

Table 3. Findings of the ARDL (0, 4, 1) model

Variable	Coefficient	P-value
DEGRW	-0.2067	0.3074
DGEDU	1.9127**	0.0525
DGEDU(-1)	0.1317	0.4675
DGEDU(-2)	0.3055**	0.0253
DGEDU(-3)	-1.8537**	0.0548
DGEHE	-3.3390*	0.0557
ECT(-1)	-0.3892***	0.0032
R^2 = 0.5137; Adj. R^2 = 0.3775; D-W stat = 1.6524; F-stats. = 3.7720; Prob. = 0.0063		

Note: ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 levels.

As illustrated in Table 3, in the short-run, the study found that government expenditure on education both in the contemporaneous period and last two-year period has a positive impact on economic growth at the 5% level of significance. This indicates the importance of government expenditure on education to promote economic growth in Indonesia, findings similar to those of Kolluri *et al.,* (2000), Craigwell *et al.,* (2013), and Ifa and Guetat (2018). However, the last three-year government expenditure negative affected the economic growth of Indonesia. This could be due to the allocation of government expenditure on education was to spend ineffectively. For example, it has been spent for building improper educational infrastructure such as sports facilities surrounding schools, and when it is occupied by the student during school hours it has created noises which disturbed other students' studying and learning activities. Additionally, the misuse of school budget by the school principals for unnecessary activities has adversely impacted schools' achievement. Some cases of corruption of school's budget by teachers and principals that were reported by local and national media in the last few years are believed as the additional contributor for the ineffectiveness of government spending on education to promote the performance of education institution nationwide.

Next, the study also found a negative impact on government expenditure on health on economic growth. Low health quality services, lack of specialist medical doctors, lack skills of nurses, and low quality of medicines across the health services centers and hospitals in the country are believed as the reasons for negative growth-government expenditure on health association. An increase in government expenditure on

health has been benefitted more medical staff than patients. The lacking number of specialist medical doctors in the country have forced them to serve more than one hospital at the same office hours had caused the low quality of services provided to the patients. In addition, almost all specialist medical doctors also opened their own health center or clinics in the afternoon and nights have worsened the quality of services provided by the public hospital in the country. Although the government expenditures on the health sector have increased over the last few years; but it had failed to enhance the economic growth of Indonesia in the short-run. This finding is in harmony with the previous study by Castelló and Doménech (2002).

As for the long run adjustment, as it is shown by the estimated value of Error Correction Term (ECT), the study found it negatively significance at the 1% level with the value of -0.3892. This indicates that any short-run disequilibrium existed in the Indonesian economic growth; it would be corrected by 38.92% in the next year to move toward its long-run equilibrium. The short-run imbalances in the Indonesian national economy would be cleared within a shorter period due to changes in government spending on education and health sectors. In other words, it would take about 2.6 years for short-run imbalances to restore into the long-run equilibrium.

Table4. Findings of the long-run relationship

PDB = 4.7624*GEDU - 4.7728*GEHE - 9.3935		
Variable	Coefficient	P-value
GEDU	4.7624***	0.0016
GEHE	4.7728***	0.0036
C	-9.3935***	0.0079

As for the long-run relationships, as illustrated in Table 4, the study found that government expenditure on education has a positive relationship with economic growth. Specifically, the finding indicated that a 1% increase in government expenditure on education; it has caused an increase in economic growth by 4.76% at the 1% level of significance. This further indicates the importance of education in the long run to promote the economy. Through education, the competencies and quality of human resources as the driving force of economic growth could be improved. Having relevant skills to the labor market, human resources would contribute significantly toward the promotion of economic growth of Indonesia. This finding is in line with previous studies such as Kolluri *et al.,* (2000), Craigwell *et al.,* (2013), Ifa and Guetat (2018) who recorded the importance of education in enhancing economic growth.

Similarly, the also found a positive impact of government expenditure on education on economic growth. Specifically, the finding indicated that a 1% increase in government expenditure on education contributed to a 4.77% increase in economic growth at

the 1% level of significance. This further confirmed the importance of the health sector in the long-run economic growth. Through the health sector, human resources would have a healthy body and become an energetic person in the workforce, thus consequently could contribute to promoting economic growth. This finding similar to Craigwell *et al.,* (2012) and Mărginean (2014) who found that the health sector was one of the important sectors in driving the economy of a country.

Our findings suggested that although government spending on education and health in certain last three periods was negatively affected economic growth in the short-run, but the government expenditures on these two sectors would certainly contribute positively to the economic growth of Indonesia. To further enhance these sectors as the driving forces to the regional economic growth, the

government should allocate and manage expenditures efficiently by ensuring no corruption existed among the development actors.

Model stability test

Figure 1 presents the stability of our estimated ARDL model based on the CUSUM (cumulative sum) and the CUSUMQ (cumulative sum of squares) tests. As illustrated in Figure 1, our estimated parameters are found to be stable at the significance level of 5%, as indicated by the cumulative sum and cumulative sum of squares plots are within the 5% significance lines. In short, our estimated model was best linear unbiased estimator (BLUE) and stable, thus its findings could robust and be referred by policy-makers in designing a proper fiscal policy to promote economic growth both in short- and long run by focusing on managing government expenditures on education and health sectors.
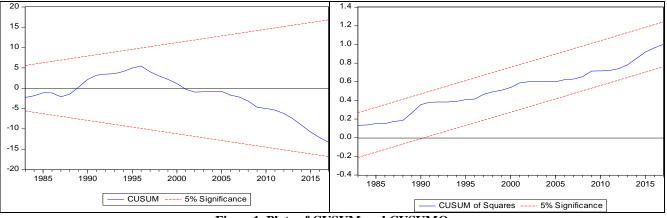

Figure1. Plots of CUSUM and CUSUMQ

CONCLUSION

This study empirically investigated the role of human capital in the Indonesian economic growth over the period from 1980 to 2017. Specifically, it attempted to empirically explore the short- and long-run effects of government spending on education and health on the economic growth of Indonesia. Based on the Autoregressive Distributed Lag (ARDL) model, the study found a long-run equilibrium between government expenditures on economic growth, signifying the importance of government spending to promote the economic growth in the country over the long-run period. Government spending on education and health sector were found to have a positive influence on economic growth both in the short- and long- run. These findings suggest that to further promote sustainable economic growth in Indonesia; the government should focus on optimizing government spending on education and health sector.

To further enhance the empirical findings on the relationship between government expenditures on education and health sectors on economic growth, further studies might consider more socio-economic

factors into the model. Identifying the causal relationship between the variables could also provide a comprehensive insight into the directional causalities between government expenditures and economic growth using a more advanced estimated model such as panel cointegration analysis. Finally, comparing economic growth across 34 provinces nationwide in Indonesia could also provide a better picture of the relationship between government expenditure and economic growth.

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