

The Causality between Education and Health Funds Allocation to Poverty in Indonesia

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Abstract: This study aims to examine the causality between education and health fund to poverty in Indonesia. The data used is quarterly from 1998Q1 to 2017Q4. This research uses granger causality model. The results show on lag 1, there is no causality between education, health, and poverty. Similar results are also found in lag estimates 4. Estimates of lag 2 indicate education and poverty have bidirectional relationships. Meanwhile health and poverty have unidirectional relationships. The peak lag 3 illustrates only one-way education on poverty vice versa. But health found no causality. The recommendation that the allocation should have an impact and effective in the short term and increase the allocation of health budget.

1 INTRODUCTION

Poverty has been a problem facing by developing countries. It has been a serious problem for the developing countries. It is also a problem for Indonesia as the country is among developing countries. Poverty is also viewed as a complex problem with many dimensions includes social, economic, culture, and other aspects. In Indonesian case, poverty causes the difficulties for the people in fulfilling their needs. Poor people face the lack of access for a better life.

Indonesian Statistic Board (BPS) via www.bps.go.id stated that in 1996, the amount of poor people in Indonesia were 22.5 million people. The number had increased for the year 1998 with the amount of 49.5 million people. The sharp increase for that period of time one was caused by the financial crisis in South East Asian Countries including Indonesia. The economic performance in 1998 showed that Indonesian economy had grown by minus 4 percent which caused many economic problems such as high unemployment and increasing in the poverty rate. But, many years after the economic crisis, Indonesian economy had recovered since 2005 with the decrease in poverty.

In order to reduce the poverty, Indonesian government has the policy on increasing human capital via education, increasing health care via

health insurance skim (BPJS), income support, and mandatory education requirement (12 years of schooling), and many other programs. Education has been the focus of government with budget allocation as much as 20 percent of total national government budget (APBN) and regional government budget (APBD).

The allocation of funds for education and health is mainly plotted from the tax. Since 2000, Indonesian government has plotted 20 percent of APBN for education and 5 percent of APBN for health care. The efforts in reducing poverty continuously have been the key for the government. The policy is also adjusted with the economic conditions.

Theoretically, poor people face vicious circle of poverty. According to Chambers in Syarifuddin (2017), poor households and neighborhood has the link in one circle that cause poor households in poverty trap. There are five weaknesses that owned by poor households, those are the limitation in assets, weak physical condition, isolation, vulnerability, and not empowered. On the other sides, poverty can also be caused by the limitation in capital as the economic factors. This can be explained by income, saving, investment, and productivity.

In terms of government expenditure, according to Saifuddin (2017), the government expenditure from one period to another period is not based on

national income. In the economic downfall, for instance the income from tax decreases. But, in order to reduce unemployment, the government needs to release development programs. Thus, the expenditures have to be increased.

One of the important expenditure of government is for education. According to Atmanti (2005), there are many factors as the reasons for the importance of education development. First, the higher education level expands the knowledge of the people with high rationality in thinking. Second, education makes the people possible in learning technical knowledge that is needed in ruling modern firms and other activities. Third, a better knowledge got from education becomes the stimulus in creating new innovations in technical, economical manner, and other aspect of life.

Furthermore, Ehrenberg et al. (2012) viewed education as the investment. According to him, fulfilling education means it needs some amount of funding. Investment in human capital has cost used in some period of times with the expectation of high return in the future. In case of investment in education, one people expect a better return in form of higher income, increase in work satisfaction and higher social status.

Muhi (2000) explained that human capital investment is one of important priority for majority of people. Majority of people have the expectation to continue and finish education in the higher level. Human capital has direct contribution in creating national assets.

Another Indonesian government expenditure focus is on health care. This expenditure can strengthen the health status of the people. Health program also can give the welfare for the people. With government involvement, the people can reduce their expenditure for health.

According to Azwar (2004), health a person is not only can be seen from physic but also mental. The body health includes physical, mental, and social aspects. All those aspects affect the performance of each individual in doing their activities such as working and leisure times.

Based on the research background and some theoretical review, this paper is aimed in analyzing the causality between education and health fund allocation on the poverty in Indonesia. The rests of this paper are designed as follow. Second part is the methodology, third is research findings, and the last is conclusion.

2 METHODOLOGY

The method applied in this study was the causality of poverty in Indonesia using education and health funds. The period of observation was between years 1998 to 2017 with the observation as much as 19 years. Due to the limitation of data, time series analysis needs long period of data, thus the researcher had done the interpolation from yearly data into quarterly data. Thus, the observation period had become from 1998Q1 to 2017Q4 with the sample as much as 76.

The kind of data used in this study is time series data as secondary data source from Indonesian Statistic Board (BPS), Ministry of Finance, World Bank, and others.

The method of analysis used in this research is quantitative analysis with time series data. The model of analysis used is the causality analysis between education and health funds and education with Granger Causality Test. The use of this is in order to understand the causality relationship reciprocally between the variables, where in one side the dependent variable is affected by independent variables, and on the other side, the independent variables can replace the dependent variable (Saifuddin, 2017).

So far, the formula used in the study are as follow:

1. $KMS_t = \alpha_0 + \alpha_1 \Delta KMS_{t-1} + \alpha_2 \Delta GOVE_t \dots (1)$
2. $\Delta KMS_t = \beta_0 + \beta_1 \Delta KMS_{t-1} + \beta_2 \Delta GOVH_t \dots (2)$
3. $\Delta GOVE_t = \pi_0 + \pi_1 \Delta GOVE_{t-1} + \pi_2 \Delta KMS_t \dots (3)$
4. $\Delta GOVH_t = \mu_0 + \mu_1 \Delta GOVH_{t-1} + \mu_2 \Delta KMS_t \dots (4)$

Where:

KMS = the amount of poor people

GOVE = share of the allocation of government fund to education.

GOVH = share of the allocation of government fund to health.

The estimation of regression model during the period of the research uses Granger Causality. Following Holzt-Eakin, Newey and Rosen, the Granger Causality Test is formulated in the form of vector autoregressive (Arfa, 2016) as follow:

$$Y_{it} = a_0 + \sum_{k=1}^m a_k Y_{it-k} + \sum_{l=1}^n b_l X_{it-l} + u_{1it} \quad (5)$$

$$X_{it} = a_0 + \sum_{k=1}^m a_k X_{it-k} + \sum_{l=1}^n \beta_l Y_{it-l} + u_{2it} \quad (6)$$

The time series procedures in the test were applied such as Unit Root Test (Rosadi, 2012; Arfa, 2016), and the length of lag test as explained by Gujarati (2003). According to him, in testing the lag in Granger Causality Method, it needs the determination of lag into some variables in order to

give better estimation. The more length of lag, the less will be the degree of freedom (df) of the model, while the shorter lag will result in error in (Gujarati, 2003).

Stationarity test has become necessary condition and first step in estimation of model for some specific time period mainly in the model of Granger causality. This test is undertaken in order to test that the variables in model has the stable pattern or stationary or not. If the time series data directly analyzed thus will give false regression analysis. This will effect in bias conclusion and miss policy implication. The result of test is as in Table 1.

3 RESULT AND DISCUSSION

The Stationarity Test

Table 1: The Result of Stationary Test of ADP and PP

Variable	ADF		PP	
	Level I(0)	First-Difference I (1)	Level I(0)	First-Difference I (1)
KMS	-1.86	-3.66***	-1.97	-3.35**
GOVE	-1.64	-3.88***	-1.87	-4.11***
GOVH	-1.69	-2.67*	-1.99	-3.59***

Source: Output Eviews, 2018. ***, **, and * show the level of significance of 1%, 5 %, and 10%.

The stationarity test in this study was using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP). Table 1 show that the poverty variable (KMS), education variable (GOVE), and health variable (GOVH) have unit root at level shown by the insignificant value of ADF and PP or accepted H0.

Then, the stationarity again test at first difference and found that the variables of poverty, education, and health do not have unit root or stationary with ADF 1 percent and 10 percent, while PP are 5 and 1 percent.

Optimal Lag Test

The optimal lag test is important in Granger Causality Test. The lag has the function in explaining how long the effect of one variable on other variable. Thus, it is needed to undertake the optimal lag from each path. This can be done by using Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SC), and Hannan Quinn Criterion (HQ). The expected value is the smaller one.

Table 2 explained the optimal lag using lag limit 5. The result shows the same lag at 5. The result

shows the similarity for AIC at 3 lag, SC at 3 lag, and HQ at 3 lag. Based on those three criteria, thus in this research was used lag 3 as the optimal lag.

Table 2: Lag Information Criteria

Lag	AIC	SC	HQ
0	11.266	11.358	11.303
1	3.112	3.482	3.620
2	-1.167	-0.518	-0.908
3	-2.320*	-1.393*	-1.949*
4	-2.253	-1.048	-1.772
5	-2.078	-0.594	-1.485

Sourcer: Estimation result

Granger Causality Test and the Implications

Table 3 show the causality relationship between the variables using some lags. The estimation result using suitable optimal lag is shown at lag 3, while the use of lag 4 in order to verified the relationship between variables. First, the reduction in poverty is caused by other factors.

Table 3: The Results of Grabger Causality for Education, Health, and Poverty

Dependent variable	Independent variable		
	KMS	GOVE	GOVH
Lag 1			
KMS	-	1.605	0.011
GOVE	1.509	-	-

GOVH	0.437	-	-
<i>Lag 2</i>			
KMS		16.138***	7.310***
GOVE	13.685***	-	-
GOVH	1.648	-	-
<i>Lag 3</i>			
KMS	-	2.892**	0.770
GOVE	2.137	-	-
GOVH	0.730	-	-
<i>Lag 4</i>			
KMS	-	1.810	0.539
GOVE	1.613	-	-
GOVH	0.621	-	-

Source: Estimation Result ***, **, and * show the level of significance at 1%, 5 %, and 10%.

Second, the estimation result at lag 2 give the different result with lag 1. The value of F statistic for education is 16.138 and for health is 7.310 which are significant at 1 percent. This explain that the two variables have the relationships with poverty up two the second last period or 6 months has the significant impact compared to first quarter. The conclusion is that education and poverty have bidirectional relationship or Granger causality. While health and poverty have one direction relationship or unidirectional.

Third, lag 3 shows that the optimal lag explain that the variable of education has the effect on poverty with F value is 2.892 and significant at 5 percent. In contrast to health and poverty, the causality relationship was not happen. This means that the allocation of education fund has the impact on poverty at quarter 3 previously

Finally, lag 4 is the effect of education allocation fund period -1 year on poverty. The result shows the same estimation of causality of lag 1 where there are no causality between education, health, and poverty.

4 CONCLUSION

Education and health are the basic need that are the right of the people, but the problem is not all these things are fulfilled especially for the poor people. The estimation results dynamically show the allocation of education fund effect poverty but it is not immediately but needs time from 6 to 9 months. But, the allocation of health fund has the effect on the poverty but in 6 months. The allocation of education and health funds by the government show there is ineffectiveness in reducing poverty. Thus, the government needs to increase the effectiveness of the fund. Then, the share of health fund from

national budget (APBN) is needed to be increased for the poor people.

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