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Submission date: 26-Feb-2023 03:52PM (UTC+0700)
Submission ID: 2023137277
File name: 5-5-45-100.pdf (140.81K)
Word count: 3342
Character count: 17021

How the education and health spendingworks on human capital quality: An evidence revolution?

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Abstract
The Human Development Index is one of the main indicators to assess the success of a country to improve the Human Development Index for the needs for government expenditure in the Education and Health sector, Gross Regional Domestic Product (GRDP) and Population density in the Province of Aceh. This study method used a panel data regression model. The data used are secondary data for the period 2013-2017. For partial tests of Education, Health and GRDP Expenditures affect the Human Development Index in Aceh Province, while Population Density does not have a partial effect.

Keywords: Government Expenditures, HDI, GRDP, Population Density.

1. Introduction
Human capitals have an important role in economic development, in addition to their physical capital which give effect to economic development, M orking man likely to give a good effect for a longer period than the development of physical capital. Developing human capital is expected to be one of the initial sources in sustainable development. Mincer (1996) said that an important key to sustainable economic growth is the reciprocal relationship between economic growth and human capital development where this growth not only contributes to one aspect but economic growth is also able to contribute to other sectors such as welfare and poverty reduction, this can be measured by the level of poverty and the quality of existing human capital.

The government as the executor of development requires qualified human beings as the basic capital for development. D nature of Capital human perananya is the role of the subject and object of development, which means humans as well as actors of development is the goal of the development itself, it takes a variety of facilities and infrastructure to encourage the human role in the development of one of them is the need for investment to be able to create human resources productive and competent.

Human capitals can refer to education and health also where education and health is a fundamental-development objectives in each region. Brata (2000) said that education can contribute to human capital and economic development, this happens because in fact the education is a saving that can lead to the accumulation of human capital and aggregate output growth if human capital is included in the aggregate production function.

Education is the core of the most important or most basic welfare to achieve a decent life. Development of Education has a very important role in the face of modern market share as it is today where the ability of developing countries to accept modern technology and to develop human capital in order to create growth and sustainable development (Todaro, 2006).

2. Definition of Operational Variables
The following is a table of the definition of operational variables that used in this study:

Table 2.1: Variable Definitions

No	Variable	Unit	Descriptions
1	Human Development Index	Percent	Quality of Human Capital
2	Health Expenditure	Million IDR	Health Budget
3	Education Expenditure	Million IDR	Education Budget
4	Gross Regional Domestic Product	Million IDR	Total GRDP at constant prices
5	Poplation Density	Soul / Km^2	(Population Density)/Area

Research Methods
The variables in this study use two types, namely the independent variable and the dependent variable. The independent variables in this study are government spending in the Health, Education, Gross Bombing Products (PDRB) sector and Population Density. While the dependent variable of this study is the Human Development Index (HDI) for the 2013-1017 period.

The data used in this study are secondary data obtained by government data. Data used in this study include the Human Development Index (HDI), Gross Regional Domestic Product (GRDP), Population Density, Government Expenditure in Health and Education. This study uses penel data regression. This panel data regression is a regression of a combination of two data namely time series data and cross section data. So that it can load more data and also produce a greater degree of freedom too. Panel data analysis in this study has the following equation model.

$$Y_{it} = \beta_0 + \beta_1 Ht_{it} + \beta_2 Edu_{it} + \beta_3 GRDP_{it} + \beta_4 PD_{it} + e_{it}$$

Y it	=	Human Development Index
Ht	=	Gov. Spending in the Health sector
Edu	=	Gov. Spending in the Education sector
GRDP	=	Gross Regional Domestic Product
PD	=	Population Density
β_0, β_1	=	Intercept, Coefficient
i	=	Cities in Aceh province
t, e	=	Period, error term

4. Results and Analysis

4.1 Description of Research Data

In this study the data used panel data. Panel data is a combination of time series data and cross section data. The time series data in this study were 5 years from 2013 to 2017. The cross-section data in this study were 23 district / cities in Aceh Province. The combined time series data with the cross-section data is secondary data taken from the Central Statistics Agency (BPS) of Aceh and the Directorate General of Fiscal Balance (DGFB). Data sourced from BPS are Human Development Index (HDI) data, Population Density and GRDP at current prices. Data taken from DGT is budget data for the education sector, district / city health in Aceh Province. The dependent variable in this research Index human development (HDI) and the independent variables in this study consisted of government spending Health sector (X1), Education (X2), GRDP per capita (X3) and Population Density (X4) in the Aceh Province.

4.2 Panel Data Analysis

This study uses a multiple regression analysis model. In analyzing data, eviews software is used to make it easier. The following are the results of the panel data analysis. Following are the results of the Common Effect Model (CEM), Fixed Effect Model (FEM) and Random Effect Model (REM) test estimates

Table 4.1: Estimate Results of CEM, FEM and REM

Variable	CEM		FEM		REM	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
C	3,814740	0.0000	3.0 50392	0.0000	3. 3 5 9814	0.0000
Edu	-0.016648	0.0 120	-0. 014185	0.0000	-0.01 5149	0.0 120
Ht	0.02 0695	0.0 366	0.0 19243	0.0000	0.0 20134	0.0 366
GRDP	0.00 8356	0.1 720	0.06 9949	0.0000	0.0 48489	0. 1720
PD	0.039 672	0.0000	-0.00 1311	0. 6255	0.00 2381	0 0000
R - squared	0. 621664		0.9 87672		0. 62166	

In choosing the best model there are two tests. The first is to use the Chow test by comparing the Common Effect model with the Fixed Effect model. The second test of LM ie comparing the models Common Effect with a model Random effec t which one is better. the third Hausman test compares the Fixed Effect model with the Random Effect model.

4.2.1 Chow Test

In this Chow test will compare the best model between the Common Effect Model with the Fixed Effect Model.

Hypothesis
Ho: Common Effect Model
Ha: Fixed Effect Model

Table 4.2: Result of Chow Test

Effect test	Statistics	Prob
Cross-section F	118.761186	0.0000
Chi-squared cross-section	393.753851	0.0000

By using alpha 5% when the probability is less than 0.0 5 then reject Ho and model of fixed effect be a better model. from the Chow test results it can be seen that the probability of cross-section F is less than alpha 5%. That is, refused Ho. Therefore, the fixed effect model is the best model.

4.2.2 Langrange Multiplier Test

In this study comparing comparing the Random Effect Model with the Common Effect Model

Hypothesis:
Ho: Common Effect Model
Ha: Random Effect Model

Table 4.3: Langrange Multiplier Test Results

Test summary	Chi-sq statistics	Prob
Breusch-Pagan	164,1028	0.0000

From the LM test results above, the probability is 0.0000 under alpha 5% or 0.05, which means reject Ho. Therefore, the Random Effect Model is the best model

4.2.3 Hausman Test

In this test will choose the best model between the Fixed Effect Model and the Random Effect Model.

Hypothesis s:
Ho: Random Effect Model
Ha: Fixed Effect Model
By using alpha 5%, then when the probability is less than 0.05, it rejects Ho, so the best model is Fixed Effect Model

Table 4.4: Hausman Test Results

Summary Test	Chi-Sq Statistics	Chi-Sq.df	Prob
Random cross section	29,364,437	4	0.0000

From the random test results above it can be seen that the probability is less than alpha 5%. It means reject Ho. Therefore the Fixed Effect Model is a better model. Thus it can be concluded in this study, the best model is to use the Fixed Effect Model.

4.3 Best Model Interpretation

Here are the estimation results of the Fixed Effect Model as the best model

Table 4.5: Best Model Estimation

Variable	Coefficient	Prob.
C	3.0 50392	0.0000
Edu	-0.014185	0.0000
Ht	0.0 19243	0.0000
GRDP	0.06 9949	0.0000
PD	-0.00 1311	0. 6255
R - squared	0987672	
Prob (F-statistic)	0.000000	

4.3.1 Coefficient of Determination

The coefficient of determination is describing how and how much the percentage of the dependent variable is explained by the independent variable. A good coefficient is greater than zero and smaller than one. In the best models of this study extend the value of the coefficient of determination (R 2) is 0 987 672. that is to say 98, 8 % change in the human development index in regencies / cities in Aceh province which can be explained by the variable of education, health and of population density. while 1.2 % is explained by other variables outside the study.

4.3.2 Partial Test (statistical t test)

T test was conducted to determine the effect of independent variables on the dependent variable. To determine whether the independent variable affects the dependent variable is to look at the probability. The probability will be compared with a degree of confidence of 5% or 0.05.
The following independent variables in this study:
a) Education Spending (X1)
Can be seen from the estimation results in table 4.2.4. that the magnitude of the probability of the Education variable is 0.0 000 smaller than the confidence level of 0.05. This means that the education sector government expenditure (X1). Significantly influence the variable Human Development Index (Y).
b) Health Spending (X2)
In this study can be seen from table 4.2.4. That the results of the estimation of health variables with the magnitude of the probability is 0.0 000 more than the confidence level of 0.05. This means that health sector spending (X2) significantly influences the variable Human Development Index (Y).
c) GRDP per capita (X3)
Can be seen from the estimation results in table 4.2.4. that the probability of the GDP at current prices was 0.0000 is smaller than the degree of confidence of 0.05. This means that the GRDP variable (X3) have significantly impactful to the variable Human Development Index (Y).
d) Population Density (X4)
Can be seen from the estimation results in table 4.2.4. That the probability of Population Density is 0.6255 is greater than the degree of trust that is 0.05. This means that the Population Density variable (X4). No significant effect on the variable Human Development Index (Y).

4.3.3 Model Feasibility Test (Test F)

The model feasibility test (Test F) is carried out to test whether together the independent variables can influence the dependent variable. In determining a feasible or not used model can be compared by comparing the probability of F-statistics with a degree of confidence of 5% or 0.05. It is seen in table 4.2.4 that the magnitude of the F-statistic probability is 0.000000 less than the 0.05 degree of confidence, which means that together the independent variables consisting of Health, Education and GRDP expenditure affect the Human Development Index.

4.4 Interpretation of Equation Results

The interpretation of the results of the equation is to explain the results of the best model equation by looking at the coefficients of each independent variable.
$$Y = 3.050392 - 0. X_1 + 0.019243X_2 + 0.069949X_3 - 0.014185001311X_5$$
From the results of the regression equation above can be seen and will be hidden as follows:

Education Spending (X1)
The coefficient value of government sector spending on Education in the above equation is -0.0 141 85. This means that when the health sector expenditure increases 1 percent, it will affect the HDI increase of -0.01 4185 percent, assuming that the government health sector and GRDP expenditure based on current prices are considered fixed.
This is not in accordance with the initial hypothesis that education sector government spending has a positive and significant effect on the Human Development Index (HDI). The result of a negative value on education expenditure of -0.01 4 185 is consistent with research conducted by Sugiarto, et.al (2013). In his research that the Education variable has a significant but negative effect because the amount of Education expenditure is below the minimum target set at 20 percent. Other things that have an impact on the allocation of government spending do not always go up even down this phenomenon can affect HDI.

Health Spending (X2)
The coefficient value of health sector government expenditure in the equation above is 0.019243 This means that when the health sector government expenditure increases 1 percent, it will increase HDI by 0.019243 percent, assuming government spending in the education sector, GRDP and population density is considered constant. This is consistent with the initial hypothesis that health spending has a positive and significant effect on HDI. These results are consistent with research conducted by Mahardika (2016) regarding government spending in the Health and Education sector on HDI in Maluku Province. Because the realization of the health budget carried out by the government over the past five years has increased by an average of 8, 9 % so that it can improve the average life expectancy which means that the health of the population in Maluku has increased.

Gross Regional Domestic Product (X3)
The coefficient value of the GRDP variable based on the prevailing price in the equation above is 0.069949. This means that when the GRDP at current prices rises by 1 percent, it will have a positive effect on the increase in HDI by 0.069949, assuming government spending in the Health sector, Education and Population Density is considered permanent.
This is consistent with the initial hypothesis that the GRDP has a positive and significant effect on HDI. These results are consistent with research conducted by Fajriani (2014) related to the analysis of government spending in health and education, GRDP per capita, capital expenditure in influencing the level of HDI in Papua. because of the

increased income received by the people of Papua, causing public spending to increase human development and fulfill high quality of life.

Population Density (X4)

The coefficient value of the Population Density variable in the equation above is -0.001311 This means that when the population density in Aceh Province has increased 1 percent, it will have a negative effect on the increase in the HDI variable by -0.00131, assuming government spending in the Education, Health and GRDP sectors is assumed to be fixed.

This is different from the initial hypothesis that Population Density has a positive and significant effect on HDI. Negative results on population density can occur because the population density in the Aceh region is only filled by the large number of migrants and surrounding communities whose main purpose is to find work without being balanced by the quality of human capital such as good education, good health and public facilities supporting the improvement of human quality in the Aceh region.

5. Conclusion

From the results of the study, it can be concluded that

1. Education expenditure in Aceh Province has a negative and significant effect on Human Development Index, that means the Education expenditure in 2013-2017 has a significant, but negative correlation on HDI.
2. Health expenditure in Aceh Province has a positive and significant effect on Human Development Index, that means Health expenditure in 2013-2017 has a positive and significant effect on HDI.
3. GRDP in Aceh Province has a positive and significant influence on Human Development Index, that means GRDP in 2013-2017 has a positive and significant effect on HDI.
4. Population Density in Aceh Province does not have a positive and significant effect on Human Development Index, that means Population Density in 2013-2017 has negative and significant effect on HDI.

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From the conclusions above, several implications can be drawn from the conclusions in order to provide recommendations in solving a problem in research to improve Human Development Index, in Aceh Province, local governments must try to increase government spending in the education sector in Aceh. Increasing education budgets by providing public facilities will supporting human quality improvement, student achievements, school standart quality, and provide good education service.

The government is also expected to remain consistent in raising the health budget to continue to renew the health service system of puskesmas and hospitals, adding health experts who are currently lacking and supporting public health services. The government is expected to be able to continue to increase the GRDP with the production approach, expenditure approach and income approach continuously to keep increasing Human Development Index. The government is expected to be able to improve education and public health in Aceh Province that will impact to improve the quality of human resources development.

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