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**The Role of Public Spending on Education, Health, and  
Economic Growth toward Human Development Index in  
the Local Economy**

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**Abstract:** This study investigates the effect of economic growth, education expenditures, and health expenditures on human development index (HDI) in Jambi Province. This study used panel data of 11 district/cities from 2012 to 2019. The analytical approach was quantitative by applying panel data regression models. The findings of the study indicated that the economic growth, education expenditure, and health expenditure had a significant and positive influence on the human development index. The implication of the model in this study shows that the efforts made by the Jambi provincial government are effective and optimal in allocating education and health spending to encourage increased human capital as measured by a high human development index. This is input in structural reforms in the education and health sectors to ensure that skilled human resources are developed in areas critical to economic development.

**Keywords:** Economic Growth; Education; Health Expenditures; HDI

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## Introduction

The success of regional economic development in Indonesia must be in line with the spirit of decentralization that has been running for two decades. The achievement of regional economic development goals is highly dependent on the planning and implementation of government policies and programs in each region through government spending (Najmuddin, 2020). In addition, policies and activity programs must be in accordance with development goals and regional needs (Chimhowu et al., 2019; Dai & Menhas, 2020). Government spending is one of the regional government policy instruments in encouraging the sustainability of regional economic activities (Dai & Menhas, 2020; Holden et al., 2014).

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Population growth is not meaningful without education and good health, the term the fulfillment of access to education and health is often claimed as an investment in human capital. The idea emerged in the works by Becker (1962); Denison (1962); Mushkin (1962); and Schultz (1961) which highlighted the role of education and health in the formation of human capital. In a modern economy, human capital is the main determinant of economic output. For this reason, the role of the government through fiscal policy is needed to create competent human qualities which in turn improve economic growth (Efthaltsidou et al., 2021; Kizilkaya et al., 2015; Mekdad et al., 2014; Shafuda & De, 2020).

Equitable development is a major problem that is difficult to realize (Dai & Menhas, 2020; Holden et al., 2014). Failure in general often occurs in policies and programs that are run that do not solve the problem from the root (Keech & Munger, 2015; Mueller, 2020). Local governments should better understand the needs and root causes of problems in their area (Kaijie, 2003; Malalgoda et al., 2016). Regional decentralization has given authority to local governments to implement regional development policies and programs more effectively and on target (Farida, 2021; Wardhana, 2019).

According to the United Nations Development Programme (2014) in its report, it is emphasized that the challenges of development in the 21st century are related to aspects of social justice and greater access to a better quality of human life. Quality development must be in harmony with the quality of human life because humans are both the subject and the object of development. Thus, the success of development depends on the quality of effective human resources so that economic growth and prosperity are achieved.

The progress of regional development can be seen from the economic growth which is reflected in the Gross Domestic Product (GDP). The increase in GDP is highly dependent on human quality. The quality of human development in an area can be illustrated by the value of the Human Development Index (HDI). An increase in HDI or a higher HDI value indicates that the quality of human life in terms of health, education, and a decent standard of living is getting better. The fulfilment of the basic needs of every human being can increase the productivity of society which in turn can improve the welfare of society. Several related studies have found that economic growth has a significant effect on human development and vice versa.

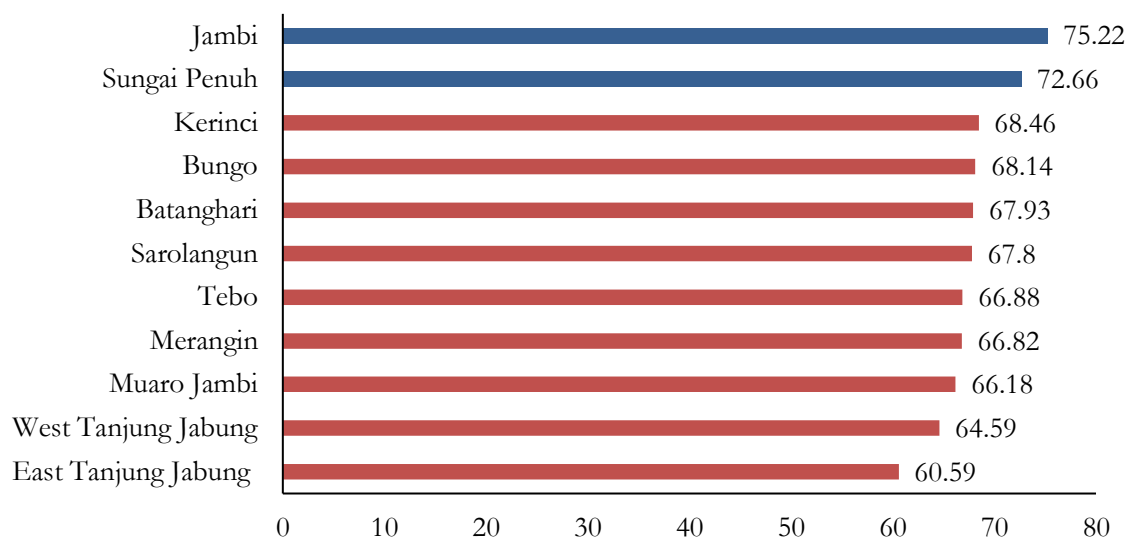
Additionally, improving the quality of life of the people of an area is inseparable from the role of the government in implementing policies and programs related to improving the quality of life of the community through government spending in the fields of education and health. The size of the government's allocation for spending on education and health will have an impact on life expectancy and expectations of years of schooling and thus the HDI will increase. In addition, the increase in HDI is also highly dependent on household consumption expenditure per capita as a measure of people's purchasing power.

Government spending is highly dependent on government revenues. Likewise, the increase in government revenue is in line with the level of economic growth. Improved economic growth indicates that government policies are running effectively. In theory, government spending has two views, namely (1) the consideration of government spending is endogenous in relation to economic development. Government spending is the impact of economic development. This considers sees pessimistically, that government spending

should be reduced or limited so that spending does not grow greater than economic growth. The policies offered are fiscal consolidation, where the budget deficit can be reduced without worrying that it will adversely affect the economy; and (2) optimistic consider, seeing that government spending is exogenous in relation to economic development (Keho, 2016). This means that government spending can encourage economic development by being used as a tool for fiscal policy (Surjaningsih et al., 2012).

The discussion on human development is still an interesting topic, this study does not look at the scope of the country but the states in Indonesia, the focus of the observation of this study is in Jambi province, this region is located on the island of Sumatra. The position of Jambi Province is quite strategic because it is directly facing the economic growth area, namely IMS-GT (Indonesia, Malaysia, Singapore Growth Triangle). This region has an area of 53,435.72 km<sup>2</sup> consisting of 50,160.05 km<sup>2</sup> are land and 3,274.95 km<sup>2</sup> is water. This area consists of 11 districts/cities. This region has a tropical climate and is rich in natural resources and biodiversity, but also remains a vulnerability to climate change. Symptoms of climate change such as rising temperatures, changes in the intensity and period of rain, shifts in the rainy/dry season, and sea-level rise, will threaten the carrying capacity of the environment and the activities of all development sectors.

Figure 1. **Average of Human Development Index in District/Cities of Jambi Province (2012-2019)**



Source: Indonesian Statistics Agency (2019)

Figure 1 presents the average HDI in Regencies/Cities, Jambi Province, during 2012-2019 almost all regions show an increasing trend. This increase in HDI occurred due to an increase in HDI components such as increased life chances, average length of schooling, and expected years of schooling in the District/City of Jambi Province. From Figure 1, it can be seen that the HDI in Jambi City is the highest HDI compared to other regions in Jambi Province. The average HDI in Jambi City is 75.22, followed by Sungai Penuh City, which is 72.66, which means that both areas are in the high category. The high HDI is due to an increase in HDI components such as an increase in life chances or life expectancy. While other regions still have numbers below 70, which means they are in the medium category. Meanwhile, the region that has the lowest HDI is East Tanjung Jabung Regency with an average of 60.59. The low component of the composite index of life expectancy,

the expected length of schooling, and per capita expenditure is the cause of the low HDI value.

A related study conducted by Mahulauw et al. (2016); Maitra & Mukhopadhyay (2013); Omodero (2019); Shafuda & De (2020); Kareem (2017); Nnenna & Stanley (2017); and Fadlli et al. (2019) found that human development issues have not been sufficiently captured in the national budget for capital expenditures so that there is an adverse effect of capital expenditures on the human development index. This indicates that by improving the quality of basic services such as health and education to the community, human development is also increasing (Adam & Negara, 2015; Sari, 2019). There are also those who argue that the increase in human development can encourage the economic progress of a region. Additionally, we see that many previous studies have discussed in the context of developing countries, there are still very few studies conducted at the regional level. This study is expected to have a contribution to science and can be a material for discussion and input to policy makers in improving policies in increasing the human development index at the regional level. Therefore, the purpose of this study was to investigate the effect of public spending on education, health, and economic growth on human development index in Jambi Province.

## **Literature Review**

This study refers to the human capital theory that appeared in the work of Becker (1962); Denison (1962); Mushkin (1962); and Schultz (1961) who highlighted the role of education and health in the formation of human capital. In modern economics, human capital is the main determinant of economic output. Rastogi (2002) which states that human capital is knowledge, competence, attitude, health, and characteristics possessed by humans. (Romer, 1990) states that human capital is a fundamental source of economic productivity. Human capital is also an investment made by humans to increase their productivity. Frank & Bernanke (2007); Rosen & Gayer (2008) argues that human capital is a combination of education, experience, training, skills, habits, health, energy and initiatives that affect human productivity.

Studies on economic growth, education expenditure, and health expenditure on HDI in districts/cities of Jambi Province in 2012-2020 have previously been conducted. However, there are some differences in this study from previous research, such as, there are several different variables, different years of research, and different research locations. There are several previous studies that are relevant to this research. Fadlli et al. (2019) found that government spending on health insignificant effect the health index, this condition can be expected because the quality of government spending is less accountable. Besides that, Aditia & Dewi (2015) found that government spending on the economy, education, and health had a positive and significant impact on the level of community welfare in Bali Province.

Iskandar (2017) found that the management of special autonomy funds is still not running optimally to support the human development index to encourage economic growth. Kareem (2017) found that the health and education sectors respectively based on life expectancy and literacy rate have a significant effect on economic growth, where literacy rate shows a positive effect on economic growth and life expectancy shows a negative effect on GDP. Meydiasari & Soejoto (2017) found that income distribution had a

significant positive effect on the HDI, the unemployment rate had a significant negative effect on the HDI, and government spending in the education sector had a non-significant positive effect on the HDI. Besides that, Muliza et al. (2017) found that government spending on education and health had no significant effect on HDI, poverty level had a negative and significant effect on HDI and GRDP had a significant and positive relationship on HDI. Nnenna & Stanley (2017) found that there is a direct relationship between government spending on education and on health and the human development index in Nigeria.

Zahari & Sudirman (2017) found that government spending on education increased while the human development index decreased and government spending on health increased while the human development index also increased i.e. that the variable of government spending on health was positive and significant for HDI. c found that increasing government spending on education and health insignificant effect on GRDP in East Kalimantan. Mahulauw et al. (2016) found that government spending on health, education, and infrastructure has a positive relationship and a significant effect on HDI in Maluku Province. Laisiana et al. (2015) found that spending on education has a significant effect on HDI, while spending on health has no effect on HDI. Bhakti (2014) found that GRDP has a positive sign and has a significant effect on HDI

## Methods

This study uses time series and cross-sectional data. Observation of data during the period 2012-2020 and as many as 11 districts/cities in Jambi. The source of this data was obtained from the Indonesian Statistics Agency and the Jambi Provincial Government. The detailed data are presented in Table 1 as follows.

Table 1. **Data and Measurement**

Variable	Definition	Measurement	Source
HDI	The human development index is a development process that aims to have more choices, especially in the areas of income, health and education	Index	Indonesian Statistics Agency
GDRP	Economic growth is the total income earned domestically, including income earned by foreign owned factors of production, total expenditure on goods and services produced domestically or the entire market value of all final goods and services produced for economy over a period of time	IDR (Rp)	Indonesian Statistics Agency
Edu	Education expenditures are budget allocations used for the education function and are budgeted through transfers to regions, budget allocations through state institutions, as well as through financing expenditures which include salaries to finance the administration of education which is the responsibility of the government.	IDR (Rp)	Ministry of Finance
Health	Health expenditure is a budget that is directed to improve the quality of health services that are equitable, fair and affordable for all levels of society. The goal is to improve the health status	IDR (Rp)	Ministry of Finance

Variable	Definition	Measurement	Source
	in order to increase the health status of the community as high as possible		

Model specification is the process of simplifying data into a form that is easier to interpret. The analysis used in this study is quantitative analysis which is expressed in the form of a numerical scale that is used in order to determine changes in the value of the dependent variable caused by changes in the independent variables in this study. The data analysis method used in this research is panel data regression analysis. Panel data is a combination of cross-section and time series data. Cross section data is data collected at one time on many individuals. Time series data is data collected from time to time against an individual. The econometric model in this study is as follows.

$$HDI_{it} = \beta_0 + \beta_1 \ln GRDP_{it} + \beta_2 \ln Edu_{it} + \beta_3 \ln Health_{it} + e_{it} \dots\dots\dots(1)$$

- Where:
- HDI*: Human Development Index.
- lnGRDP*: Economic Growth (IDR).
- lnEdu*: Education Expenditure.
- lnHealth*: Health Expenditure (IDR).
- $\beta_0$ : Intercept.
- $\beta_1, \beta_2, \beta_3$ : Parameters Coefficient.
- $e_{it}$ : Disturbance Term (error term).
- i*: Cross Section (11 district/cities).
- t*: Time Series.

Panel data is a combination of time series data and cross section data. The data covers several periods, in this study used annual data, namely eight years. Respondents in this study were all districts/cities in Jambi Province. There are three possible regression models that can be used, namely the common effect method, fixed effect, and random effect. There are two approaches that are often used in the selection of regression models with panel data, namely the Chow and Hausman tests. If the number of cross-sectional data (N) in a study is greater than the number of time series data (T), then the random effect method is used in processing, whereas if the number of cross-sectional data (N) is less than the number of time series (T), it will fixed effect method is used (Baltagi, 2005). However, to further ascertain whether the fixed effect model or the random effect model is the most appropriate to be used in the study, a Chow and Hausman test will be conducted.

## Findings

Table 2 reports the statistical description of the research data for each variable, according to the results of the descriptive statistics implying that the central tendency of the variables is relatively good. The standard deviation results show a relatively small value, this implies that the standard deviation or dispersion is still relatively normal. The results of the Jarque-Bera test also show that the data in the study are relatively normally distributed.

Table 2 also reports the results of the diagnosis of the relationship matrix between independent variables showing that the relationship matrix between independent variables in this study has medium and low categories. Thus, this research model does not have

symptoms of statistical multicollinearity assumptions, which means the research model can be continued to the next estimation stage.

**Table 2. The Result of Descriptive Statistics**

Descriptions	HDI	lnGRDP	lnEdu	lnHealth
Mean	65.75	3.486	3.438	2.856
Median	65.68	3.822	3.278	2.561
Maximum	75.22	3.932	3.506	3.925
Minimum	58.63	3.250	3.057	3.049
Std. Dev.	0.733	0.752	1.391	0.425
Skewness	-0.117	-0.017	-0.244	0.167
Kurtosis	1.304	1.604	1.445	1.605
Jarque-Bera	3.377	3.258	4.551	3.558
Probability	0.167	0.112	0.720	0.138
Observations	88	88	88	88
<b>Correlation</b>				
lnGRDP		-	0.554	0.482
lnEdu		0.554	-	0.355
lnHealth		0.482	0.355	-

Source: Authors computation

Testing the validity of the data using the Augmented Dickey Fuller test (ADF Test) is carried out by identifying whether the time series data used has stability in the observed period, such as the average, variance and covariance of the independent variables who are not entirely influenced by time. The results of the stationary test on the variables presented in Table 3 show that in the level-level test all variables contain unit roots, which means they are not stationary. While the ADF test was tested in the first difference stage, all variables did not contain unit roots, it was concluded that the time series data used were stationary. Thus, the variables that can be used in the study are at the first differences stage.

**Table 3. The Result of Unit Root Test**

Variable	Unit root test				
	Critical value (%)	level		1 <sup>st</sup> differences	
		t-stat	ADF-test	t-stat	ADF-test
HDI	1%	-4.264		-4.284	
	5%	-3.423	-0.842	-3.532	-5.524***
	10%	-2.537		-3.252	
lnGRDP	1%	-4.578		-3.131	
	5%	-3.925	-0.426	-2.246	-4.652***
	10%	-3.601		-2.231	
lnEdu	1%	-4.552		-3.246	
	5%	-3.702	-0.672	-2.748	-5.624***
	10%	-3.525		-2.527	
lnHealth	1%	-3.535		-3.425	
	5%	-2.633	-0.625	-2.463	-6.421***
	10%	-2.923		-2.748	

Note: \*\*\*1%, \*\*5%, \*10% at significant level

Source: Authors computation

The selection of the best panel data estimation method can use two tests, namely the Chow and Hausman tests. We report the results of the Chow test presented in Table 4 show that statistically it can be concluded that accepting the alternative hypothesis ( $H_1$ ), the panel data estimation model used is the fixed effect model which is better than the common effect model. Similarly, the Hausman test results show that statistically it can be concluded that accepting the alternative hypothesis ( $H_1$ ), the panel data estimation model used is the fixed effect method, which is better than the random effect, so that in this study it is concluded that the chosen method is fixed effect.

The classical assumption test in the panel data regression presented in Table 4 consists of an autocorrelation test using the LM test with the Breusch-Godfrey approach to get an F-test value of 5.526 with a probability of 0.412 which means that the model used contains a serial correlation. Furthermore, the heteroscedasticity test using the Glejser test method obtained an F-test value of 2.089 with a probability of 0.117, which means that the variation of the model used has the same variance of residuals for all observations in the panel data regression model. The summary of the panel data regression presented in Table 4 shows that the value of the adjustment determination coefficient (Adj.  $R^2$ ) is 0.9098, which means that the proportion of variation in the dependent variable that can be predicted from the independent variable is 90.98 percent. Then the F-stat from the estimation results used in the model was obtained at 49,052, which means that statistically economic growth, education expenditure, and health expenditure have a joint effect on HDI.

Table 4. **Panel Regression Result of Fixed Effect Method**

Dependent Variable: HDI				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	1.971	0.204	9.662	0.000
lnGDRP	0.758	0.095	7.979	0.000
lnEdu	0.139	0.065	2.138	0.037
lnHealth	0.366	0.148	2.473	0.017
Summary				
$R^2$	0.9191			
Adj. $R^2$	0.9098			
F-stat	49.052			
Prob(F-stat)	0.000			
Selected methods for panel:		$X^2$ test	Prob.	
Chow test		369.505	0.000	
Hausman test		30.142	0.000	
Diagnostic test		F-test	Prob.	
LM test		5.526	0.412	
Glejser test		2.089	0.117	

Source: Authors computation

The results of the panel data regression estimation show that statistically economic growth has a positive sign and a significant effect on HDI, where the coefficient of economic growth is 0.758, which means that a 1 percent increase in economic growth will increase HDI by 0.758 percent with the assumption of *ceteris paribus*. The economic growth of each region has had an impact on increasing community welfare. The increased welfare of the people will affect the increase in people's consumption patterns so that the purchasing power of the people increases. The high purchasing power of the people reflects the high



ability of the people to buy goods and services which directly increase HDI. Regional development that continues to grow rapidly is driven by community cooperation. The higher the HDI number of an area, the better, so it can be said that the development is successful. The acceleration of regional development will create regional economic growth. The importance of a regional development policy must be balanced with improving the quality of human resources which also accelerates the development process. In addition, improving the quality of human resources is expected to provide benefits for reducing problems that often occur in developing countries, especially developing countries with high population density levels, such as reducing disparities between regions. The results of this study are in line with the findings study by Elistia & Syahzuni (2018); Grubaugh (2015); Harahap et al. (2020); Bhakti (2014) and Sangaji (2016) found that economic growth had a significant effect on HDI. In addition, these findings contradict the findings study by Feriyanto (2016); Meydiasari & Soejoto (2017); and Barus et al. (2021) found that economic growth had no effect on HDI.

Further findings indicate that government spending on education has a positive sign and a significant effect on HDI, where the coefficient value of government spending on education is 0.139, which means that a 1 percent increase in government spending on education will increase HDI by 0.139 percent with the assumption *ceteris paribus*. The government's efforts through government spending on education are considered successful. Education reflects the success of human development and is the government's task to carry out development. This is in line by UNDP (2015) that concept of human development which is a process of expanding choices for the community and the level that can be achieved from this effort. Government expenditures are channeled for education such as 12-year compulsory education, scholarships, construction of school buildings, revitalization of school buildings and provision of learning support equipment. This is in line with research conducted by Mahulauw et al. (2016), that local government spending in education has a significant effect on HDI, where every change in government spending on education is followed by a change in HDI. An equitable increase in spending on the basic education sector will accelerate human development (Gupta et al., 1998). Wagner's law explains that an increase in government spending also increases the role of government in the economic life of society. Thus, local government policies to increase education spending can encourage an increase in HDI. The results of this study are in line with and support the findings study by Nnenna & Stanley (2017); Zahari & Sudirman (2017); Mahulauw et al. (2016); Aditia & Dewi (2015); and Laisiana et al. (2015) found that government spending on education has a significant effect on HDI. Meanwhile, findings study by Muliza et al. (2017) and Fadlli et al. (2019) found that government spending on education had no effect on HDI.

Likewise, the results of government spending on health have a positive sign and a significant effect on HDI, where the coefficient value of government spending on health is 0.366, which means that a 1 percent increase in government spending on health will increase HDI by 0.366 percent assuming *ceteris paribus*. Efforts to develop health facilities through investments made by the government have proven to be able to encourage human development which in turn will help in economic progress in the region. Developments and health facilities help ensure that people get the right to health, this will certainly get many great benefits in the future, especially in creating a better economy in a region. Government spending on health is very important, especially for the poor, the government has the responsibility to fulfilling basic rights and access to health services, this policy must

continue to be improved to increase life expectancy and reduce mortality, especially infants. Health can create productive people and increase regional economic development. The results of this study are in line with and support the findings study by Aditia & Dewi (2015); Fadillah & Setiartiti (2021); Mahulauw et al. (2016); Pakdaman et al. (2019); Razmi et al. (2012); Zahari & Sudirman (2017) found that government spending on health has a significant effect on HDI. Meanwhile, contradicting study findings by Agustina et al. (2016); Fadlli et al. (2019); Laisiana et al. (2015); Muliza et al. (2017) found that government spending on health had no effect on HDI.

## Conclusions

The study findings conclude that economic growth, government spending on education, and health have a positive relationship and a significant effect on the human development index, this indicates that the Jambi provincial government's efforts through government spending on education and health are considered successful in increasing the human development index. Increasing access to education and health needs reflects the success of human development. Meanwhile, the positive trend of regional economic growth makes it possible to achieve higher levels of human development, which in turn, high human development can lead to increased opportunities for sustainable economic growth.

Expansive government spending policies on education and health can be adopted to realize faster human development, meaning that investments in the provision of education and health facilities provide the output needed in Jambi province. The implications of these findings can be used as input and discussion on the sustainability of public finances. Wagner's law views that government spending is the impact of economic development, while the Keynes hypothesis argues that government spending is a tool of fiscal policy to improve the economy. Therefore, increased government spending is often claimed to be the key to ensuring sustainable economic development as proposed by Keynes & Hicks (1936). Although the evidence from estimates supports Keynes's theory in several aspects for social sector activities and some development indicators.

The proposed recommendation is structural reforms in the education and health sectors to ensure that skilled human resources are developed in areas critical to economic development. The education system must be oriented towards the demand for skills to ensure a match between the demand for skills and supply in the economy. The health sector needs to be strengthened to ensure a healthy nation that is ready to learn new skills and able to work and increase productivity. Government funds should be channeled into projects capable of generating meaningful economic development.

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