

## Analysis of Economic Growth and Human Development in Gorontalo Province

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Article Info	Abstract
<p><i>Article history:</i> Received November 21, 2021 Revised March 22, 2022 Accepted April 6, 2022 Available online June 30, 2022</p>	<p><i>Economic Development in Gorontalo Province has a higher growth rate than the national growth rate. It is inversely proportional to the Human Development Index (HDI) value, which is below the national importance, even though HDI is one of the determining factors for development in an area. Therefore, this study aims to see whether there is a relationship between economic growth and HDI in Gorontalo Province. This research method uses the Granger causality analysis technique to see the reciprocal relationship between economic growth and HDI and multiple linear regression analysis to see the effect of each HDI indicator on economic growth in Gorontalo Province. This study found a mutually influencing relationship between economic growth and HDI. Regression analysis also explains that the education indicator of HDI has a positive and significant effect on increasing economic development in Gorontalo Province. In contrast, the Health indicator has no considerable impact. Through the results of this study, it is hoped that the Gorontalo Provincial government can determine the right policies to increase the HDI of the community by improving the quality of its community resources so that the economy will also increase.</i></p>
<p><b>Keywords:</b> <i>HDI; Economic Growth; Granger Causality</i></p> <p><b>JEL Classification;</b> O1, F43, C31</p>	

### INTRODUCTION

Economic development increases per capita income and total income by considering population growth and fundamental changes in a country's population's economic structure and income distribution. Economic development can encourage economic growth. Economic development is declared successful if it can show three primary values (Todaro & Smith, 1993), (i) the ability of the community to experience development in meeting basic needs (*sustenance*), (ii) the increased sense of community *self-esteem* as a human being (*self-esteem*), (iii) the ability of the community has increased to choose (*freedom from servitude*) which is one of the human rights. Economic activities can run more smoothly and accelerate economic growth through economic development.

In the last ten years, economic growth in Indonesia has fluctuated but tends to increase due to various economic activities. In 2011 Indonesia's economic growth rate was 6.16 percent, then decreased in 2016 to 5.03 percent, and increased until 2018 by 5.17 percent. Then in 2020, it dropped to -2.07 percent due to the Covid-19 pandemic that hit the world, including Indonesia, which disrupted economic activity. The high level of income provided by

economic growth is a condition for meeting basic needs and improving human quality (Ezkirianto & Alexandi, 2018). The stability of the financial growth process is supported by human development. The development process's main objective and input factors are human development and economic growth.

Human development describes economic development through improving the quality of human resources. Where resources are factors of production that are valuable assets in a region's economic activity, one indicator that can be seen in improving human resources is the Human Development Index. The HDI has three components in its preparation: the knowledge dimension, the health dimension, and the decent standard of living dimension. The extent of knowledge is seen from the average length of the school and the expected length. The health dimension is seen from the size of life expectancy at birth. The standard of living dimension is appropriate from the adjusted per capita expenditure indicators. Based on data from the Central Bureau of Statistics, the HDI value in Indonesia in 2011 was 67.09, increasing until 2019 to 71.92. This value is in the high HDI classification, ranging from 70 to 80. Then in 2020, it rose to 71.94. This value has increased by 0.02 points from the previous year. The HDI value has increased, but its growth has slowed. This slowdown is caused by indicators of a decent standard of living seen from the value of per capita expenditure; This is due to the Covid-19 pandemic, which has caused a decrease in people's purchasing power. Education and health indicators have increased in value.

Gorontalo Province is one of Indonesia's provinces located north of Sulawesi Island. In the last ten years, the economic growth of Gorontalo Province has consistently been above the national average. In 2011, the economic growth rate of Gorontalo Province was 7.71 percent above the national increase of 6.16 percent. Even when almost all economic growth in every province in Indonesia reaches a minus value in 2020, Gorontalo Province has a value of -0.02 with a national economic growth value of -2.02. The HDI value of Gorontalo Province has increased from 63.48 in 2011 to 68.68 in 2020; This is in line with the national HDI value; the Gorontalo Province HDI value also experienced slowing growth, which was also caused by the decreasing actual per capita expenditure indicators. Meanwhile, education and health indicators continued to increase.

An increase in economic growth with a value that is always above the national average is not in line with the value of human development. The HDI value in Gorontalo Province always increases every year, but the value is still below the national average. Human development is one of the focuses of attention and the determinant of development success. Development success is often seen from the achievement of the quality of human resources because high economic growth has not been able to solve welfare problems optimally, such as poverty and the standard of living of the wider community (Zamruddin Hasid, 2019).

Several studies on economic growth and human development have found a relationship between the two variables. (Raharti et al., 2020), Their research entitled Analysis of Economic Growth and Human Development Index in the Special Region of Yogyakarta stated a causal relationship between economic

growth and HDI. The two variables have a relationship that influences each other, likewise to research conducted by (Dewi & Sutrisna, 2014), which states a positive and significant influence of the HDI component, namely the education index and people's purchasing power on economic growth in Bali Province. Meanwhile, the health index does not significantly affect economic growth in the province of Bali.

This study aims to determine whether economic growth and human development influence each other. A causal analysis of economic growth and human development is carried out to see the relationship between the two variables. Furthermore, the update in this study wants to know what HDI indicators affect and their relation to economic growth is carried out by regression testing. The indicators tested are education (expected years of school and average length) and health indicators (life expectancy). This indicator was chosen because this indicator has an increase in the HDI value, so we wanted to see which hand had more influence on economic growth. In addition, the role of the government is quite significant in efforts to increase its value so that later the government can determine the right policy to advance human development in Gorontalo Province.

## RESEARCH METHODS

### Data Sources and Research Variables

This research was conducted using data series from the first quarter of 2011 to the fourth quarter of 2020. The number of observations from this study was 40 observations. All data used are sourced from the Central Statistics Agency. The following are the research variables used:

**Table 1. Variable Definition**

Variable	Definition	Unit
PERTUMBUHAN EKONOMI	Gorontalo Province's economic growth is the percentage increase in regional GRDP every quarter.	Percent
IPM	The Human Development Index (HDI) of Gorontalo Province is an indicator of the level of development of a region.	Index
PERT_EKO	The people of Gorontalo Province obtain the average value of income per capita.	Rupiah
IPM_HLS	The Old Hope of the Gorontalo Province community school is the long hope that someone can take education in the future.	Year
IPM_RLS	The average length of schooling in Gorontalo	Year

IPM_UHH	Province shows the average length of time the population has attended education. Life Expectancy of the people of Gorontalo Province which shows the estimated life of a person in the future since he was born	Year
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**Analysis Method**

This study uses *time series* analysis methods, namely Granger causality and multiple linear regression. Granger causality analysis focuses on the interplay between HDI variables and economic growth in Gorontalo Province. At the same time, the multiple linear regression analysis aims to see whether the HDI variables (life expectancy, average length of schooling, and life expectancy) have a significant effect on economic growth, as seen through the income per capita of the people of Gorontalo province. The research data were processed using *Microsoft Excel* and *Eviews 8* applications.

**Kausalitas Granger**

This test aims to see a direct relationship between the independent variable, namely the sectoral economy of the Province of Bali, and the dependent variable, namely the economic growth of NTB and NTT. Here is the mathematical equation of the causality test (Gujarati & Porter, 2013):

$$Y_t = \sum_{i=1}^m a_i X_{t-i} + \sum_{j=1}^m b_j Y_{t-j} + U_{2t} \dots\dots\dots (1)$$

With,  $X_t$  : Variable X period t,  $Y_t$ : Variable Y period t;  $X_{t-1}$ : Variable X period (t-1);  $Y_{t-1}$ : Variable Y period to-(t-1); m: Number of lags;  $U_{1t}, U_{2t}$ : Confounding variable;  $a, b$  : Coefficient of each variable

The following is the test hypothesis for the Granger causality test:

$$H_0 : a_i = 0; i = 1, 2, \dots, m; H_1 : a_i \neq 0; i = 1, 2, \dots, m$$

or

$$H_0 : b_j = 0; j = 1, 2, \dots, m; H_1 : b_j \neq 0; j = 1, 2, \dots, m$$

Granger causality test using Wald test statistic. Here is the mathematical equation of Wald's test statistic (Gujarati & Porter, 2013):

$$W = \left( \frac{b_j}{se(b_j)} \right)^2 \sim \chi_{(1)} \dots\dots\dots (2)$$

**Multiple Linear Regression**

A multiple linear regression model is a linear regression analysis that uses more than one independent variable that affects the dependent variable (Gujarati & Porter, 2013). The relationship between these variables can be formulated in the following equation:

$$Y = a + b_1 X_1 + b_2 X_2 + b_n X_n + e \dots\dots\dots (3)$$

With, Y: Dependent Variable;  $\alpha$ : Intercept;  $b_1$ : The variable regression coefficient of  $X_1$ ;  $X_1$ : First independent variable;  $b_2$ : The variable regression coefficient of  $X_2$ ;  $X_2$ : Second independent variable;  $b_n$ : The regression coefficient of the n variable;  $X_n$ : Independent variable; e: Residual value

Intense or not, the linear relationship between independent variables can be seen through the correlation coefficient ( $r$ ) value. As for visiting, the influence of the independent variable on the dependent variable can be seen from the variable  $r$ -square ( $R^2$ ).

## RESULT AND DISCUSSION

### Data Stationarity Test

The stationary test was carried out to determine whether the time series data was stationary in the mean and variance or not influenced by time. Stationary test that can be used is the graphical method and the unit root method.

**Table 2. Data Stationarity Test Results**

Variable	$p$ -value (level)	$p$ -value (1 <sup>st</sup> difference)
PERT_EKO	0.7793	0.00
IPM	0.8773	0.00

The unit root test used is the *Phillips-Perron* test. This test includes an element of autocorrelation in the disturbance variable by having the independent variable as differential lags. The PP test can accommodate dependent and heterogeneously distributed *errors*. The data is stationary or has no unit root if the  $p$ -value is smaller than the  $\alpha$  value (0.05).

Based on Table 2, the test results show that the data is not stationary at the level. So it is necessary to differentiate and obtain variables in the stationary research data in the first differentiation.

### Optimum Lag Selection

The optimal length of variable lag is needed to capture the influence of a variable on other variables and the past. The lag selection must consider the possibility of correlation between residuals and decreasing degrees of freedom. A short leg length will result in a serial correlation. At the same time, a too-long lag results in a decrease in the degrees of independence from the resulting equation, and the number of parameters being estimated becomes more and more so that it becomes inefficient.

**Table 3. Results of Selection of Lag Model of HDI-Economic Growth**

Lag	FPE	AIC	SC	HQ
0	2.55e+09	27.33359	27.42338	27.36421
1	1.19e+09	26.57249	26.84184	26.66435
2	4.16e+08	25.51755	25.96648	25.67065
3	2.27e+08	24.90594	25.53445	25.12028
4	1.68e+08	24.59102	25.39909	24.86660
5	1.29e+08*	24.30496*	25.29261*	24.64178*

The optimal lag is determined from the most considerable LR value and the smallest AIC, FPE, SC, and HQ values (Wei, 2006). In addition, it is also seen from the lag that has the most (\*) signs. Based on the test, Table 3 shows that the optimal lag for the first model, namely the HDI-Economic Growth

model, is lag 5; This indicates that all variables influence each other up to the previous five periods, not only one period.

### Cointegration Test

A cointegration test was conducted to determine the balance of the relationship between the variables in the model in the long run. The test is carried out using *Johansen's Cointegration* test, which has two test statistics, namely, *trace* and *maximum eigenvalue*. The null hypothesis in this test is no cointegration between variables. If the value of the *trace statistic* and *max-eigen statistic* is greater than the *critical value* or the probability value is less than *alpha* 0.05, the null hypothesis is accepted.

**Table 5. Cointegration Test Results with Trace Statistics**

Hypothesis: $r$	Trace Statistics	p-value
None*	23.79582	0.0022
At most 1*	6.181933	0.0129

**Table 6. Cointegration Test Results with Maximum Eigen Statistics**

Hypothesis: $r$	Max-Eigen Statistics	p-value
None*	17.61389	0.0142
At most 1*	6.181933	0.0129

Based on Tables 5 and 6, the HDI-Economic Growth model shows at least a cointegration equation at an *alpha* value of 0.05 with both *trace* and *maximum eigentest* statistics. It can be said that HDI and Economic Growth have a relationship of stability and equality of movement in the long term. All variables tend to adjust to achieve long-run equilibrium in each short-run period.

### Granger Causality Test Estimation Results

The causality test measures the strength of the relationship between two or more variables, also expressed as cause and effect. This causality determines whether an endogenous variable can be treated as an exogenous variable. The causality test was carried out with the *Pairwise Granger Causality* test using an *alpha* of 0.05.

**Table 7. Causality of HDI with Economic Growth**

Variable	F-stat	Prob.
PERTUMBUHAN EKONOMI → IPM*	4.47607	0.0051
IPM → PERTUMBUHAN EKONOMI*	2.68163	0.0461

Based on Table 7, the probability value of the test results is smaller than the *alpha* value of 0.05; This indicates a two-way causal relationship between the HDI variable and economic growth.

### Regression Results

Hypothesis testing checks the model to meet the BLUE (Best Linear Unbiased Estimator) requirements by testing classical assumptions. The classical assumption is a requirement that must be completed in the linear regression model so that the resulting model becomes valid as an estimator. Classical assumption testing ensures the research results are

promising, with the data used in theory being unbiased and consistent, and the regression coefficient estimation is efficient (Gujarati & Porter, 2013). Some classical assumption tests include normality, heteroscedasticity, autocorrelation, and multicollinearity. The test results found that the data were normally distributed homoscedastic - no autocorrelation or multicollinearity.

**Table 8. Regression Test Results**

Variable	F-stat	Prob
C	5.767820	0.2032
LN_IPM_HLS	2.738275	0.0000
LN_IPM_RLS	1.714628	0.0000
LN_IPM_UHH	-0.129619	0.9118
<i>R-squared</i>	0.9773	

Based on Table 8, the following regression equation is obtained:

$$\text{LN\_PERT\_EK} = 5.767820 + 2.738275 \text{ LN\_IPM\_HLS}^* + 1.714628 \text{ LN\_IPM\_RLS}^* - 0.129619 \text{ LN\_IPM\_UHH}$$

The HDI education indicator has a positive and significant impact on economic growth. As for the health indicator, it hurts economic growth but is not substantial.

## DISCUSSION

This study found a two-way causal relationship between economic growth and HDI. This result is also in line with the research of (Raharti et al., 2020), which also states that HDI and Economic Growth have a two-way causal relationship in the long term for the nation's progress. This is also in line with the research results by (Sari et al., 2021), which explains that economic growth increases the supply of human resources needed. Increased resources will encourage better human development with proper allocation and a wider distribution of opportunities, especially job opportunities. Economic growth affects human development through grants from the government for education and health. In 2020, the Governor of Gorontalo instructed to prepare health facilities in various public service places, such as establishing a health service post at the Gorontalo Ferry Port (Haris, 2020). In education, the Gorontalo Provincial government established two new schools in 2019. SMAN 6 Gorontalo and SMA N 3 Wonosari, Boalemo Regency; This is one of the government's steps through superior quality education programs to improve educational facilities for the sake of increasingly advanced human resources (Haris, 2019).

The development of human development in Gorontalo Province continues to be carried out in stages. one of the HDI indicators can be seen, namely increasing people's per capita income. The increase in per capita income illustrates an improvement in the community's economic welfare, one of the measures of growing development and economic growth. Based on BPS data, the per capita income of Gorontalo Province has increased from 2011 of 15.7 million rupiahs to 23.3 million rupiahs in 2020. Other indicators, namely education and health, are further tested to determine which indicators significantly affect economic growth.

The HDI education indicator has a positive and significant impact on economic growth. As for the health indicator, it hurts economic growth but is not substantial; This is in line with the research of (Dewi & Sutrisna, 2014), where health indicators have a negative and insignificant effect, and education indicators have a positive and significant impact on economic growth. It can be said that with a confidence level of 97.73 percent and other variables held constant, if there is an increase of one point in the indicator for the expected length of schooling, then economic growth will increase by 2.74 percent. If there is an increase of one point in the average schooling size, economic growth will increase by 1.71 percent. And vice versa if there is a decrease. The expected number of years of schooling has grown every year, in 2011 by 11.68 years, increasing to 2020 by 13.08 years.

Education Statistics data of the Ministry of Education and Culture by a decrease in the total dropout rate for elementary to high school/vocational schools from 2016, as many as 863 to 2020, as many as 76. The reduction in the dropout rate increases the school participation rate and lowers the expected number of years of schooling. Bigger. A significant influence on economic growth from the HDI education indicator indicates that the human capital increases its productivity as a workforce that can encourage economic developments in education.

The positive influence of education indicators on economic growth can make the government focus on improving facilities and infrastructure in education. Improvements include training teachers as teaching staff who can be sent to remote areas and providing educational assistance for underprivileged communities. The community should also support policies made by the government.

## **CONCLUSION**

This study found that the Human Development Index and economic growth in Gorontalo Province have a two-way causality relationship; This means that these two indicators will influence each other. This two-way relationship can be the basis for the government to make policies. Economic growth that affects the HDI allows the government to allocate budgets to the education and health sectors. Hopefully, this budget allocation can improve facilities and infrastructure to improve the quality of human resources, especially in education and health.

Followed by regression testing, it was found that there was a positive and significant influence between education indicators on economic growth in Gorontalo Province. The higher the expected number of years of schooling and the average length of education, the better the level of education received by the community; it will further improve the economy in the area due to increased human quality. Different things happened to health indicators that had a negative and insignificant effect on economic growth in Gorontalo Province.

Further research is recommended to see the government budget's effect on human development. In addition, it can be seen from external factors in the form of investment both from within and outside the country to improve human



quality so that the government can determine the right policy direction to enhance human resources to be of higher quality.

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