Analysis of the effect of human development index components on economic growth

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Article Info

ABSTRACT

This study aims to determine the effect of the components of the human development index on the economic growth of Pematangsiantar City. The method used in this study is a quantitative method and uses an ordinary least square multiple regression model. The data used is secondary data obtained from the Central Statistics Agency (BPS). In this study, the analysis used was a multiple regression analysis model. The results showed that the health index had a positive and significant effect on economic growth in Pematangsiantar City, the education index had a positive and insignificant effect on economic growth in Pematangsiantar City, the purchasing power index had a positive and significant impact on economic growth in Pematangsiantar City, and the Human Development Index (health index, education index, and purchasing power index) have a positive and significant effect on economic growth in Pematangsiantar City. The coefficient of determination obtained by the Adjusted R20.9909 indicates that the value of the health variable, education variable, and purchasing power variable can explain the variation of the economic growth variable in Pematangsiantar City by 99.09%, while the remaining 0.91% is explained by other variables outside research model.

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Introduction

The concept of development cannot be separated from the population aspect. Population is an important part in human development efforts. In human development capital there is a reciprocal relationship between economic growth and human development. Human development is a development paradigm that places humans (population) as the focus and ultimate goal of all development activities, namely achieving control over resources (income to achieve a decent life) (Maratade, 2016).

Economic growth is a prerequisite for achieving human development, because economic growth will ensure increased productivity and income through the creation of job opportunities (Moyer & Hedden, 2020). Human development will also affect economic growth, because a high level of human development greatly determines the ability of the population to absorb and manage sources of economic growth, both in relation to technology and to institutions as an important means to achieve economic growth.

Welfare of the population can be known from the Human Development Index (HDI) both the level of physical and non-physical quality of the population. The physical Human Development Index can be seen from

life expectancy and the non-physical Human Development Index is known from the average population in school and the literacy rate and economic capacity.

The Human Development Index is a process of expanding human choices. Basically human choices are numerous and rapidly changing. But at all levels of development, there are three most basic choices, namely to live a long and healthy life, to get an education, and to have access to the necessary resources in order to live a decent life. According to UNDP, the Human Development Index (HDI) measures human development achievements based on a number of basic components of quality of life (Statistik, 2020).

To see the progress of human development, there are two aspects that need to be considered, namely speed and status of achievement. The achievements of human development in Pematangsiantar City, North Sumatra, and the National in 2020 are quite varied.
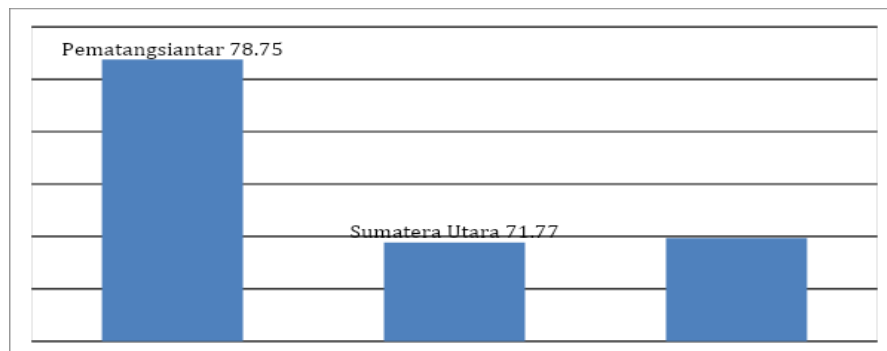

Figure 1. Human Development Achievement of Pematangsiantar City, North Sumatra and Nationally in 2020
Source: Central Statistics Agency, 2021

The Human Development Index (IPM) of Pematangsiantar City in 2020 reached 78.75. This figure increased by 0.18 points or grew by 0.23 percent compared to the previous year. Pematangsiantar ranks second out of 33 regencies/cities in North Sumatra after Medan City. While the Human Development Index (HDI) of North Sumatra reached 71.77. This figure increased by 0.03 points or grew by 0.04 percent compared to the previous year, and Indonesia's Human Development Index (HDI) in 2020 was 71.94. This figure increased by 0.02 points or grew by 0.03 percent compared to the previous year's achievement (Statistik, 2020).

The increase in HDI can not be separated from the increase in the indicators that form it. In 2020 Life Expectancy (UHH) Pematangsiantar is much better than North Sumatra, UHH Pematangsiantar is 73.55, there is a difference of 4.45 years compared to North Sumatra's UHH, which is 69.1 years, and there is a difference of 2.08 years compared to the National UHH, which is 71.47 (Statistik, 2020).

The knowledge dimension is measured by two indicators, namely Expected Length of School (HLS) and Average Length of School (RLS). The value of the Pematangsiantar HLS indicator is quite high, reaching 14.45 years. The HLS indicator tends to increase, although the magnitude of the increase tends to fluctuate. The biggest increase occurred in 2019 and 2020, reaching 1 percent more and larger than North Sumatra, which was 13.23 years. Meanwhile, there is a difference of 1.47 years compared to the National HLS, which is 12.98 years. While the RLS Pematangsiantar is two years longer than North Sumatra and National (Pematangsiantar of 11.16 years; North Sumatra of 9.54 years; National of 8.48 years) (Statistik, 2020).

Meanwhile, Pematangsiantar City's per capita expenditure in 2020 is Rp. 12,372 thousand. However, there was a decline in 2020 by 1.58 percent compared to the previous year. The decline in per capita expenditure also occurred in North Sumatra and Nationally (Rp. 10,420 thousand; Rp. 11.01 million), much larger than Pematangsiantar, which reached 2.15 percent (North Sumatra) and 2.53 percent (National). The condition of the COVID-19 pandemic that occurred in 2020 resulted in a decrease in the per capita expenditure of the people in Pematangsiantar City, North Sumatra and Nationally (Sidabutar et al., 2020). In terms of the comparison of HDI achievements in Pematangsiantar City, North Sumatra and Nationally, the order of the lowest HDI is in National, while the highest order is in Pematangsiantar City.

It has been widely stated that the Human Development Index (HDI) component is one of the important factors in economic development. This is supported by several previous studies. Among them are research conducted by Damanik et al (2021), Santika (2014), Muqorrobin (2017), Asnidar (2018) which states that human development is one indicator of achieving economic development. Economic development activities in a country aim to increase per capita income which leads to improving people's welfare. Stable economic growth is highly expected by developing countries such as Indonesia, because it can overcome problems in the economy,

including; problems of poverty, unemployment, illiteracy, improve people's welfare and give more attention to health and education.

Based on the background described above, the researchers are interested in conducting research with the title "The Influence of the Components of the Human Development Index (HDI) on Economic Growth in Pematangsiantar".

The purpose of this study was to determine whether the components of the health index affect the economic growth of Pematangsiantar City; to find out whether the education index affects the economic growth of Pematangsiantar City?; to find out whether the purchasing power index affects the economic growth of Pematangsiantar City?; to find out whether the components of the human development index (health index, education index, purchasing power index) simultaneously affect the economic growth of Pematangsiantar City?

Method

Time and Place of Research
The location of this research was conducted in Pematangsiantar, regarding economic growth and the Human Development Index (HDI) which includes the health index, education index, and purchasing power index through the Central Statistics Agency (BPS) Pematangsiantar City. The time of the research was carried out May 2021 – August 2021.

Design
The method used in this research is a quantitative method, which is a process of finding knowledge that uses data in the form of numbers as a means of determining information regarding the Influence of the Components of the Human Development Index (IPM) on Economic Growth in Pematangsiantar . According to Purba et al. (2020: 56-57) Quantitative Research emphasizes more on numerical data in analyzing it and processing it first using statistical methods.

The design used in this research is descriptive research. According to Purba, et al (2021: 56-57) Descriptive research is a research method that conveys facts by describing what is seen, obtained and felt. Through descriptive research, researchers try to describe events and events that are the center of attention without giving special treatment to these events.

Types of Research
This type of research is quantitative research. Emphasizing on data in the form of numbers which are then processed using statistical methods. Basically, this type of quantitative research is carried out on research which in testing the hypothesis is in the form of data in the form of numbers. Quantitative methods will obtain significant differences or significant relationships between the variables studied.

Operational Definition of Variables The
Variables used in this study are: 1) Economic Growth (Y), is an increase in the real output of an economy as measured by changes in real GDP in Pematangsiantar; 2) Health Index (X1), is the average length of human life since birth achieved by residents in Pematangsiantar; 3) Education index (X2), is the average number of years spent by residents aged 15 years and over to take all types of formal education that has been undertaken by residents of Pematangsiantar; 4) Purchasing power index (X3), is the ability of the community to spend their money on goods and services every year in Pematangsiantar.

Data Analysis Techniques
In this study, the analysis used was a multiple regression analysis model. Basically the multiple linear regression model has the same properties as the simple linear regression model. However, this model consists of more than 1 independent variable. Therefore, the general form used from the multiple regression model is:

$$y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Information:
Y   = Economic Growth Rate
$-\beta_1 - \beta_2$ = Constant coefficient in each independent variable
X_1 = Health Index
X_2 = Education Index
X_3 = Purchasing Power Index
e   = Confounding Variable

Result and Discussion

Classical Assumption Test.

Multicollinearity

The multicollinearity test aims to test whether there is a correlation between the independent variables in the regression model. Based on the rules of Variance Inflation Factor (VIF) and tolerance, if the VIF exceeds the number 10 or the tolerance is less than 0.10, then multicollinearity is declared.

Table 1. The multicollinearity test

Included observations: 15

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	330.7913	1091245.	NA
X1	23.46386	1414403.	2.958582
X2	1.947296	36369.55	2.266931
X3	0.000305	242.6854	1.676887

Source: Data processed 2021

X_1 = 2.9586; $X2_{2.2669}$; X_3 = 1.6769, all of which are smaller than 10. Then the regression model is free from multicollinearity symptoms.

Normality

This test is used to see whether in a regression model, the independent variable, and the dependent variable or both have a normal distribution or not.
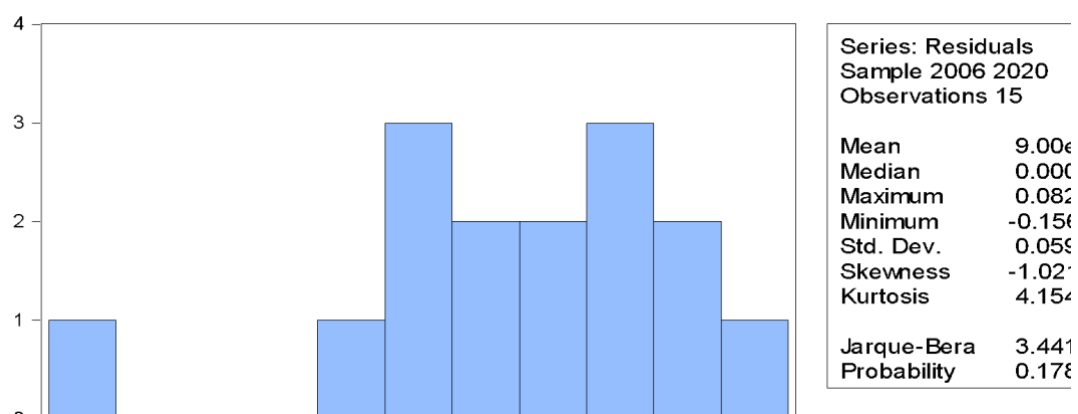

Figure 2. Normality test results
Source: Data processed, 2021

Judging from the test above the value of Jarque-Bera is 3.4417 and the probability value is 0.1789 > 0.05. So it can be concluded from this regression model that normality occurs.

Heteroscedasticity

Test This test aims to test whether in the regression model there is an inequality of residual variance from one observation to another. A good regression model that does not occur heteroscedasticity

Table 2. Test results Heteroscedasticity Test: Glejser

F-statistic	1.479351	Prob. F(3.11)	0.2739
Obs*R-squared	4.312123	Prob. Chi-Square(3)	0.2297
Scaled explained SS	3.887296	Prob. Chi-Square(3)	0.2739

Source: Processed data, 2021

From table 4.5, it can be seen that the independent variable has a probability value greater than = 0.05 (0.2297 > 0.05). So it can be concluded that in the regression model there is no symptom of heteroscedasticity.

Autocorrelation

This test aims to test whether in the linear regression model there is a correlation between the confounding error in a period (t) and the previous period (t-1). If there is a correlation then there is an autocorrelation problem.

Table 3. Results of autocorrelation test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.098718	Prob. F(2.9)	0.9070
Obs*R-squared	0.321997	Prob. Chi-Square(2)	0.8513

Source: Processed data, 2021

Based on the table above, it can be concluded that there is no autocorrelation of the regression model.

Multiple Linear Regression Analysis Regression
Analysis was conducted to determine the level of influence of the variables and to test the research hypotheses that had been determined previously.

Table 4. Multiple regression test results

Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-51.17687	18.18767	-2.813823	0.0169
X1	12.76518	4.843950	2.635284	0.0232
X2	1.865018	1.395455	1.336494	0.2084
X3	0.493313	0.017458	28.25768	0.0000
R squared	0.992895	Mean var		15.46533 dependent
-resid	0.050017	Schwarz criterion		-2.143423
Log likelihood	21.49178	Hannan-Quinn criter.		-2.334248
F-statistic	512.3956	Durbin-Watson stat		2.185884
Prob (F-statistic)	0.000000			

Source: Processed data, 2021
Based on the regression results above, the following regression equation is obtained:
$Y = -51.1769 + 12.7652X_1 + 1.8650X_2 + 0.4933X_3 + e$

From table 4.8, it can be seen that the results of the F statistical test show the effect of the variables of health level, education level, level of expenditure per capita, on economic growth obtained a significant value of $0.00000 < 0.05$ (5%). This means that it simultaneously has a positive and significant effect on economic growth.

Based on table 4.8, it can be seen the results of the t-test of the health level variable of $0.0232 < 0.05$, meaning that the health level variable has a positive and significant effect on economic growth, the education level variable is $0.2084 > 0.05$, meaning that the education level variable has a positive and insignificant effect on economic growth, and the variable level of expenditure per capita is $0.000 < 0.05$, meaning that the variable level of expenditure per capita has a positive and significant effect on economic growth.

Effect of Health Index (X_1) on Economic Growth (Y)
The results of the estimated coefficient of the health index variable in Pematangsiantar City obtained a probability value of 0.0232. These results indicate that the health index variable has a probability value less than 0.05 and the regression coefficient shows a positive value. This means that the health index variable has a significant and significant effect on economic growth in Pematangsiantar City. Based on this, the hypothesis which states that the health index has a positive and significant effect on economic growth in Pematangsiantar City is accepted. The results of this study are in accordance with the results of Permana et al. research (2020), which states that the level of health has a positive and significant influence on economic growth.

Effect of Education Index (X_2) on Economic Growth (Y)
Meanwhile, the estimated coefficient of the education index in Pematangsiantar City obtained a probability value of 0.2084 . These results indicate that the education index variable has a probability value greater than 0.05 and the regression coefficient shows a positive value. This means that the education index variable has no significant effect on economic growth in Pematangsiantar City. Based on this, the hypothesis which states that the education index has a positive and significant effect is rejected. The results of this study are in accordance

with the results of Chantika's research (2018), which states that the level of education has a positive and insignificant effect on economic growth.

The effect of the purchasing power index (X_3) on economic growth (Y)
The purchasing power index obtained a probability value of 0.000. which means the purchasing power index variable has a probability value less than 0.05 and the regression coefficient shows a positive value. This means that the purchasing power index variable has an effect and is significant on economic growth in Pematangsiantar City. Based on this, the hypothesis which states that the purchasing power index has a positive and significant effect is accepted. The results of this study are in accordance with the results of research by Muda et al (2019), which states that per capita expenditure has a positive and significant effect on economic growth.

Conclusion

Based on the results of the analysis that has been described, it can be concluded that the health index has a positive and significant effect on economic growth in Pematangsiantar City; The education index has a positive and insignificant effect on economic growth in Pematangsiantar City; The purchasing power index has a positive and significant effect on economic growth in Pematangsiantar City; The Human Development Index (health index, education index, and purchasing power index) has a positive and significant effect on economic growth in Pematangsiantar City; and the results of the coefficient of determination test obtained the *Adjusted R2*$^{0.9909}$ or 99.09% indicating that the value of economic growth is influenced by health variables, education variables, purchasing power variables, while the remaining 0.91% is caused by other variables outside the Research Model. That can be given to the Pematangsiantar City government are as follows: 1) The local government and all levels of society are expected to cooperate and support each other in improving the health index drugs generic , for the poor in an equitable manner. and right on target so that all people get health insurance and no longer have to worry about expensive medical expenses. So that in the end Pematangsiantar's health status increases every year; 2) The increase in education that increases every year illustrates the success of the government in eradicating illiteracy in Pematangsiantar City. Local governments and all levels of society are expected to cooperate and support each other in increasing the education index through improving facilities, both facilities and infrastructure in remote areas so that people can receive education, especially in remote areas that have so far received less attention from the government. The need for additional employment opportunities for job seekers so that all can be absorbed so that the skills they have can be utilized and can reduce the unemployment rate, especially educated unemployment. This needs attention, especially in the education sector because education is an important factor to improve the quality of human resources so that it can increase growth; 2) Regional governments are expected to maintain stable purchasing power or even increase purchasing power every year. An increase in purchasing power can be achieved by keeping the inflation rate stable.

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