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# Analysis of Changes in the Unemployment Rate as a Result of the Human Development Index in Indonesia (Case Study 2010-2019)

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## Abstract

Unemployment occurs because of an imbalance in the labor market. The labor demand curve shows the number of workers employed by firms and has a negative slope at a certain wage level, while the labor supply curve shows the amount of labor that households will supply and has a positive slope to wages. The research objective was to determine the effect of the Human Development Index (HDI) on the unemployment rate in Indonesia in 2010-2019. The method used in this research is time-series data analysis method with quantitative methods. In this study, the results show that the relationship between the Human Development Index (HDI) and the unemployment rate is 0.960, which means that it has a very strong relationship. The influence of the contribution of the Human Development Index (HDI) variable in the unemployment rate is 82.1%. The Human Development Index (HDI) has a significant and negative effect at the 5% level on the unemployment rate. This is evidenced by a significance value.

**Keywords:** Human Development Index (HDI), Unemployment Rate

## A. PRELIMINARY

A country will never be free from various problems, which are certainly related to its citizens, including countries that have a high population such as Indonesia. The economic problem that is often faced in Indonesia is unemployment. The unemployment problem is indicated by the open unemployment rate from year to year. Economic development is a structural change effort that aims to increase productivity and create job opportunities as well as a multidimensional process that involves a variety of fundamental changes to social structures, attitudes of society and national institutions (Todaro, 2003).

Unemployment is a serious problem faced by developing countries such as Indonesia. Unemployment occurs as a result of the high rate of change in the workforce that is not matched by employment and absorption, which tends to be a small percentage. This is due to the low growth rate of job creation to accommodate workers who are ready to work.

One indicator that can be used to measure unemployment is the Open Unemployment Rate (TPT). The value of TPT is the size of the working-age population who is included in unemployment. According to the Indonesian Central Statistics, Agency (BPS) (2020), open unemployment consists of those who do not have a job, are looking for work, are preparing a business and those who are not looking for work. The amount of unemployment in Indonesia in 2010-2019 can be seen in Table 1 below:

Table 1: Unemployment Rate in Indonesia, 2010 – 2019

Year	Unemployment Rate
2010	7.14
2011	7.48
2012	6.13
2013	6.17
2014	5.94
2015	6.18
2016	5.61
2017	5.50
2018	5.34
2019	5.28

Sources : Central Bureau of Statistics

Based on table 1 shows that the unemployment rate in Indonesia fluctuates every year. The highest unemployment rate in Indonesia during 2010-2019 occurred in 2011 at 7.48%, then decreased to 6.13% in 2012, but in 2015 it increased to 6.18%. After that, it has decreased until 2019.

Factors that can affect the unemployment rate include the human development index (HDI), inflation, economic growth rate, investment, district / city minimum wages. However, in this study, researchers only examined the human development index (HDI) variable. The quality of human resources can be measured by the amount of the Human Development Index (HDI). The Human Development Index (HDI) can be interpreted as a number that measures the achievement of human development based on a number of basic components of quality of life that can affect a person's level of productivity (Saputra, 2011). According to the Indonesian Central Statistics Agency (2020), explaining that the human development index is built through a three-dimensional approach. These dimensions include long life and healthy life, knowledge, and a decent standard of living.

According to the Indonesian Central Statistics Agency (2020), measuring the health dimension uses life expectancy, while measuring the dimension of knowledge uses the indicator of the old-school expectancy rate. As for measuring the dimension of decent living, an indicator of the purchasing power of the community for a number of basic needs is used as seen from the average amount of per-capita expenditure as an income approach that represents development achievements to be able to live properly.

According to Napitupulu (2007), the human development index contains three important dimensions in development, namely those related to the aspects of fulfilling the needs of a long and healthy life, obtaining knowledge and being able to meet decent living standards. The better the health level of the workforce, the higher the knowledge and the obtaining of a decent life, the better and quality the work results will be, on the other hand, the worse the condition of the workforce, the results of the work will be worse or of no quality. This shows that three important dimensions in human development are indicators to assess the quality of human resources who are ready to work so as to reduce the high level of unemployment in an area. The development of the Human Development Index (HDI) in Indonesia in 2010-2019 can be seen in Table 2 below.

Table 2: Human Development Index (HDI) in Indonesia 2010-2019

YEAR	HDI
2010	66.53
2011	67.09
2012	67.70
2013	68.31
2014	68.90
2015	69.55
2016	70.18
2017	70.81
2018	71.39
2019	71.92

Sources: Central Bureau of Statistics

Based on table 2, it shows that the Human Development Index (HDI) in Indonesia in 2010-2019 continues to increase. This shows that the quality of human development in Indonesia is quite good.

According to the results of research conducted by Burhanudin (2015) regarding the relationship between the human development index and the unemployment rate, it is concluded that the human development index has a significant and negative effect on the unemployment rate. This explains that the higher the human development index number in a region, it will cause the unemployment rate to decrease and vice versa, if the human development index is low, it will have an impact on the high level of unemployment in that region.

According to Todaro (2003), HDI is a development goal in itself which can shape a country's ability to absorb modern technology to open job opportunities, reduce unemployment and create sustainable growth and development. This shows that human development as measured by the value of the HDI will have an impact on the low unemployment rate in a region.

The hypothesis built from this study is that it is suspected that there is an effect of the development index of the unemployment rate in Indonesia in 2010 - 2019. The purpose of this study is to determine the effect of the effect of the human development index of the unemployment rate in Indonesia in 2010 - 2019.

## B. LITERATURE REVIEW

### 1. Unemployment Rate

Unemployment is a problem that occurs a lot in a region, especially in developing countries. According to Sukirno (2008) unemployment is a condition in which someone belonging to the labor force wants to get a job but has not yet obtained it. According to Simanjuntak (2003), unemployment, is a person aged in the labor force who does not work at all or works less than two days during the week before the census and tries to get a job. Meanwhile, according to the Indonesian Central Statistics, Agency (2020) unemployment consists of those who do not have a job, are looking for work, are preparing a business and those who are not looking for work because they feel it is impossible to get a job and those who already have a job but have not started working.

Unemployment occurs because of an imbalance in the labor market. The labor demand curve shows the number of workers employed by firms and has a negative slope at a certain wage level, while the labor supply curve shows the amount of labor that households will supply and has a positive slope to wages.

Market equilibrium will be achieved if a situation occurs where the amount of labor demanded is the same as the number of workers offered at a certain wage level. This shows that if the number of workers offered exceeds the number of workers asked, it will result in unemployment. Figure 1 below illustrates the balance that occurs in the labor market.

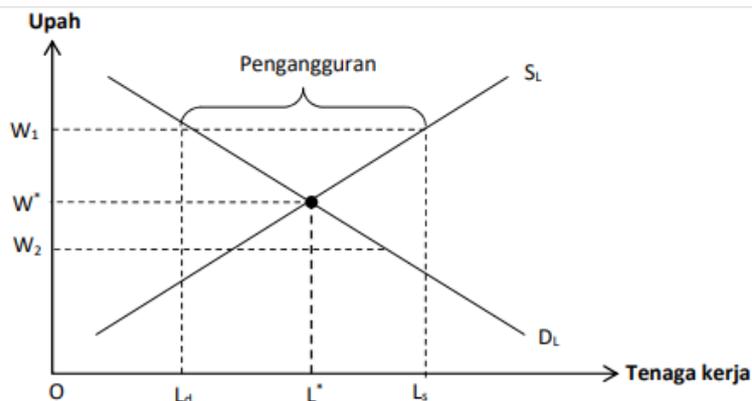


Figure 1 Equilibrium Curve in the Labor Market

Sources : Borjas, George J, 2008

Figure 1 shows that the labor market equilibrium is at point  $W * L$ . If the wage is above the equilibrium level ( $W_1$ ), the quantity of labor supply will exceed the amount demanded. If the wage is below the equilibrium level ( $W_2$ ), the demand for labor is greater than the supply of labor. This imbalance is called unemployment.

The new growth theory can enhance human capital development and development to increase human productivity. It is hoped that investment in education will be able to improve the quality of human resources, which is shown by an increase in a person's knowledge and skills so that it will boost work productivity. A decrease per unit of goods will reduce the price per unit of goods. If the price of goods decreases, the demand for goods will increase, which will encourage entrepreneurs to increase the demand for labor, so that the absorption of more workers can reduce the unemployment rate (Todaro, 2003).

According to Nanang (2004), labor, productivity can determine labor demand conditions. With low productivity, it will make companies terminate employment (PHK) with workers so that it will increase the unemployment rate in an area. According to Abbas (2010), the competencies needed in the world of work provided by education are basically related to five things, namely: motive or driving, speed of reaction, personal self-image, someone's information obtained in certain fields and the ability to carry out tasks physically and mentally. A qualified and more capable workforce will be more appreciated when compared to those who are less able. The level of education, which is one of the indicators of HDI, affects the unemployment rate because if the workforce has low education, it will be difficult to get a job so that it will have an impact on increasing the unemployment rate.

According to Keynes's Theory, it explains that the emergence of unemployment is caused by low aggregate demand. This demand is all demand for goods and services that occur in an economy. When the supply of labor has increased, the wages will decrease and the decrease in wages will result in losses not profitable because the decrease in wages illustrates the purchasing power of society for an item. Public purchasing power, which is one of the indicators in the low HDI, will result in companies reducing their production and unable to absorb excess labor so that the demand and supply of labor are almost never balanced and unemployment often occurs (Sukirno, 2008).

According to Keynes, the relationship between aggregate demand and labor absorption can be explained in Figure 2 below :

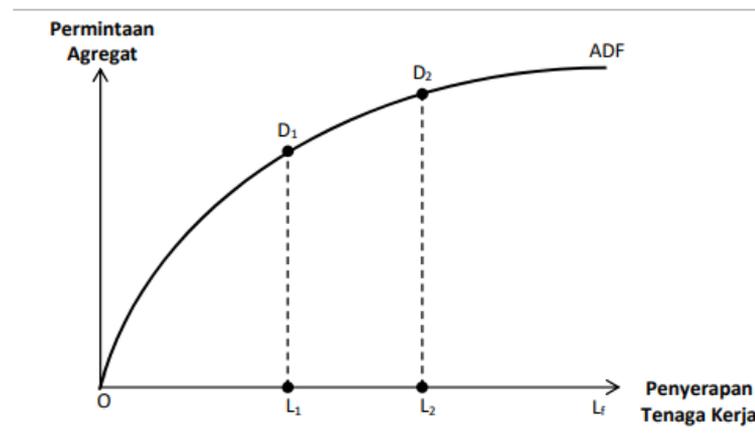


Figure 2 Aggregate Demand Function and Labor Absorption  
Sources : Keynes, John Maynard 1924

Based on Figure 2, it can be seen that the total aggregate demand is at  $D_1L_1$  and the absorption of labor is  $OL_1$ , then the demand increases to  $D_2L_2$  by absorbing labor into  $OL_2$ .  $OL_2$  is a full level job. Initially, ADF increased along with the absorption of labor caused by public demand and finally producer sales revenue increased. This increase triggers producers to increase output so that additional labor is needed, which results in a decrease in the unemployment rate.

## 2. Human Development Index (HDI)

The concept of human development focuses on human resources in line with economic growth. The development of human resources physically and mentally implies increasing the basic capacity of the population which will then provide opportunities to participate in the sustainable development process. The Human Development Index (HDI) is an indicator to assess the success of human development in an area (BPS Indonesia, 2020).

The Human Development Index (HDI) is a comparative measure of life expectancy, education and living standards for all countries around the world. IPM explains how residents can access development outcomes in terms of income, health, education, and so on. HDI is used to classify whether a country is a developed country, a developing country or an underdeveloped country and to provide the results of the influence of economic policy on the quality of life. An area is expected to have a good HDI value and have a quality of life for the people, or it can also be said that if the HDI value is high, then supposed poverty is low. The quality of human resources (HR) can be a factor in the occurrence of poor people. The quality of human resources can be seen from the quality of life index / human development index (Napitupulu, 2007). With HDI data, the government can make better and more targeted development decisions and policies.

The theory of the formation of the Human Development Index (HDI) can be measured in three dimensions, including: Long and healthy age is indicated by life expectancy at birth, which is formulated as Life Expectancy Rate. Then in the dimension of science which is measured from the level of literacy, and the average length of schooling can be formulated into the Education Index. Finally, the dimensions of a decent standard of living are shown by real expenditures per capita (Hasan, 2016).

According to the United Nation Development Program (UNDP Indonesia), the indicators chosen to measure the dimensions of the Human Development Index (HDI) are:

- a. Longevity, incomplete sentence measured by variable life expectancy at birth or life expectancy of birth and infant mortality rate per thousand populations.
- b. Educational Achievement is measured using two indicators, namely the literacy of the population aged 15 years and over (adult literacy rate) and the average years of schooling for residents of 25 and over (the mean years of schooling).

- c. Access to resource, can be measured at the macro level through real GDP per capita with purchasing power parity terminology in US dollars and can be complemented by labor force level.

According to the Indonesian Central Statistics Agency (BPS Indonesia, 2020), the methodological calculation of the Human Development Index (HDI) value since 2011 has changed. There are several indicators that have changed, namely :

- a. The literacy rate in the old method was replaced with the expected rate for the old school
- b. Gross Domestic Product (GDP) per capita was replaced by Gross National Product (GNI) per capita.

Some of the reasons for changing the methodology for calculating the Human Development Index (HDI) include :

- a. Several indicators are not appropriate to be used in calculating the HDI, namely the literacy rate indicator is not relevant in measuring education as a whole because it cannot describe the quality of education. In addition, because the literacy rate in most regions is high, it is impossible to differentiate the level of education between regions properly and the GDP per capita indicator cannot describe the income of the people in an area.
- b. The use of the arithmetic average formula in calculating the HDI illustrates that low performance in one dimension can be masked by high performance from another dimension.

Several advantages of calculating the value of the Human Development Index (HDI) using the new method, namely:

- a. Using indicators that are more precise and can differentiate well (discriminatory), namely :
  1. Including the average length of schooling and the expected number of years of schooling, a more relevant picture of education and the changes that have occurred can be obtained.
  2. PNB replaces GDP because it describes the income of the people in a region.
- b. Using geometric averages in compiling the HDI can mean that the achievements of one dimension cannot be covered by the achievements in other dimensions. This means that in order to realize good human development, these three dimensions must receive equal attention because they are equally important.

According to the Indonesian Central Statistics Agency (2020), the human development index is built through a three-dimensional approach. These dimensions include a long and healthy life, knowledge and a decent standard of living. In measuring the health dimension life expectancy is used, then for the knowledge dimension. The indicator of the old-school expectancy rate is used.

The general formula used to calculate the Human Development Index (Saputra, 2011) is as follows :

$$IPM = \frac{1}{3} (\text{Indeks } X_1 + \text{Indeks } X_2 + \text{Indeks } X_3)$$

Information :

$X_1$  = Health Index

$X_2$  = Education index

$X_3$  = Public purchasing power index

According to the United Nations (PBB) in Saputra (2011), assigning human development performance ratings on a scale of 0.0-100 with the following categories :

1. HDI more than 80,0 : High
2. HDI between 66,0-79,9 : Upper intermediate
3. HDI between 50,0-65,9 : Lower intermediate
4. HDI less than 50,0 : Low

### 3. Relationship between Human Development Index and Unemployment Rate

The new growth theory explains that increasing human development through human capital, which is reflected in the level of education and health, can increase productivity so that the demand for labor will increase and decrease in the unemployment rate. According to the Keynesian Theory that through an increase in people's purchasing power, which indicates an increase in aggregate demand can affect employment opportunities. If the aggregate demand is low, the company will reduce the amount of productions and cannot absorb excess labor so that the demand and supply of labor are almost never balanced and unemployment often occurs. According to Okun's Law, it states that productivity is caused by an increased human development index and will certainly encourage economic growth. The increase in economic growth is expected to increase employment opportunities and increase demand for labor so that many people can be absorbed in the labor market which in turn can reduce the unemployment rate.

Based on several previous unemployment theories, it is concluded that the Human Development Index and unemployment have a negative relationship through three indicators, namely education, health and people's purchasing power for goods and services that cause a shift in labor demand. If the HDI value in a region is high, it will result in a decrease in the unemployment rate and vice versa when the HDI value is low it can increase the unemployment rate in that region. This situation can be seen in Figure 3 below :

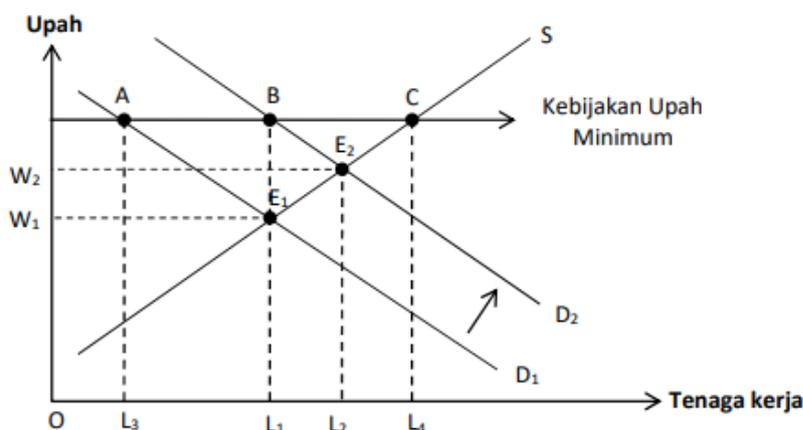


Figure 3 Shifting the Labor Demand Curve

Sources : Borjas, George J, 2008

Figure 3 shows that the labor demand curve is  $D_1$ , and the labor supply curve is  $S_1$  with the point  $E_1$  as the equilibrium point with a wage of  $W_1$  and the number of workers of  $L_1$ . After an increase in labor demand as a result of the increase in HDI, the labor demand curve shifts to the right from  $D_1$  to  $D_2$  with the equilibrium point to  $E_2$ .

### C. Hypothesis

Hypotheses are temporary answers to research formulations, therefore the formulation of research problems is usually arranged in the form of question sentences. The hypothesis is a proportion that will be tested for its validity or is a temporary answer to the researcher's statement. It is said temporarily, because the answers given are only based on relevant theories, not based on empirical facts obtained through data collection. So, the hypothesis can also be stated as a theoretical answer to the formulation of the research problem, not an empirical answer. The hypothesis of this study can be formulated as follows :

$H_1$  : The human development index has a significant effect on the unemployment rate

### D. RESEARCH PURPOSES

The purpose of this study is to determine the effect of the effect of the human development index of the unemployment rate in Indonesia in 2010 - 2019.

### E. RESEARCH METHODS

This type of research used in this research is explanatory research. This method is an analytical tool to explain the causal relationship between variables by testing the hypothesis. The format of explanation is to describe a generalization of the relationship between one variable and another, therefore this study uses hypothesis testing with inferential statistics. This is in accordance with the opinion of Bungin (2013, p. 51).

The variables used in this study are the unemployment rate (dependent variable) and the human development index as the independent variable. This study uses secondary data, namely data obtained indirectly, which is the object of research. Secondary data is obtained in the form of annual reports that are registered and published in the Central Bureau of Statistics.

This research takes a study of the country of Indonesia, whose reports have been registered with the Central Bureau of Statistics for the last ten years, starting from 2010-2019. Secondary data were obtained from the official website publication of the Central Statistics Agency (BPS), namely bps.go.id.

Data collection techniques used are documentation techniques, this documentation technique where researchers collect quantitative data obtained through non-participant observation or obtained indirectly, namely by collecting, recording and reviewing secondary data in the form of reports that are registered and published in the Agency. Statistics Center (BPS) for the period 2010-2019.

Data collection begins with the previous research stage by conducting literature studies by studying books and journals related to the subject of this research. At this stage what is needed is the availability of data, how to obtain data, and an overview of obtaining data. The next stage, the researcher collected all the data needed to answer the problems in the study, and expanded the literature to support the quantitative data obtained.

The data analysis method used in this study used regression analysis. To process the secondary data obtained, the researcher used the Statistical Package for Social Science (SPSS) for Windows version 18.0 application assistance program.

The data analysis technique used in this research is inferential statistics and regression analysis. The research method according to the level of exploration in this study is associative research. Associative research is research that aims to determine the relationship between two or more variables. According to the type of data and analysis using quantitative data types (Sugiyono, 2010, p. 4-13).

## 1. Statistical Analysis Model

### a. Inferential Statistical Analysis

This research is a quantitative analysis study using inferential statistics, as tools and techniques used to analyze data for explanatory purposes. This means that the statistical model is only used for generalization purposes. In other words, this study aims to test the research hypothesis (Bungin, 2013, p. 208).

### b. Multiple Linear Regression Analysis

According to Riduwan and Engkos A. Kuncoro (2007, p. 4), regression is a process of systematically estimating what is most likely to happen in the future based on past and present information so that errors can be minimized. Regression is also defined as an attempt to predict changes in the future. So, regression suggests curiosity about what will happen in the future to contribute to determining the best decision.

## 2. Hypothesis Testing

Hypothesis testing is intended to determine whether there is a significant influence between the independent variables and the dependent variable. In testing this hypothesis, the researcher uses a significant test, by establishing the null hypothesis ( $H_0$ ) and the alternative hypothesis ( $H_a$ ). The null hypothesis ( $H_0$ ) is a hypothesis which states that there is no significant influence between the independent variable and the dependent variable, while the alternative hypothesis ( $H_a$ ) is a hypothesis which states that there is a significant influence between the independent variable and the dependent variable. This test is performed using the t test.

a. Significance test for Individual Parameters (t test)

The t statistical test is also called the individual significance test. This test shows how far the influence of the independent variable on the dependent variable. In the end, a conclusion will be drawn that  $H_0$  is rejected or  $H_a$  is accepted from the hypothesis that has been formulated.

If  $H_0$  is accepted, then this means that the effect of the independent variable partially on the dependent variable is considered insignificant and vice versa, if  $H_0$  is rejected, this means that the independent variable has a significant effect on the dependent variable.

3. Analysis of the coefficient of determination ( $R^2$ )

The coefficient of determination ( $R^2$ ) used to measure the ability of the model to explain variations in the independent variable. The coefficient of determination ranges from zero to one. This means that if  $R^2 = 0$  indicates there is no influence of the independent variable (independent variable) on the dependent variable (dependent variable) and vice versa if  $R^2$  it is close to one, the smaller the effect of the independent variable (independent variable) on the dependent variable (dependent variable).

## F. RESULTS AND DISCUSSION

### 1. Data Description

This study discusses the effect of the Human Development Index on the unemployment rate in Indonesia in 2010-2019. The HDI data and the unemployment rate are as follows :

Table 3: HDI data and unemployment rates for 2010-2019

Year	HDI	Unemployment Rates
2010	66.53	7.14
2011	67.09	7.48
2012	67.70	6.13
2013	68.31	6.17
2014	68.90	5.94
2015	69.55	6.18
2016	70.18	5.61
2017	70.81	5.50
2018	71.39	5.34
2019	71.92	5.28

### 2. Research Results

The calculation of this study uses the help of the Statistical Package for the Social Science (SPSS) program for Windows version 18.0. The results of this study can be seen as follows:

a. Correlation

Correlation Coefficient Analysis is used to determine the relationship between two variables whose other variables are considered influential as controlled or as a control variable, the correlation value ( $r$ ) ranges from 1 to -1, the value getting closer to 1 or -1 means the relationship between the two variables is getting stronger, vice versa. approaching 0 means that the relationship between the two variables is getting weaker. Positive values indicate a unidirectional relationship (variable X increases, variable Y increases) and negative values indicate an inverse relationship (variable X increases, variable Y decreases).

The relationship between the human development index variable and the unemployment rate will be shown by the model summary table as below :

Table 4: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.906 <sup>a</sup>	.821	.798	.33027

a. Predictors: (Constant), IPM

Sumber : SPSS Output Results

Based on the table 4 above, it can be concluded that the value of the correlation coefficient (r) of the human development index with an unemployment rate of 0.906. The value of  $r = 0.906$  is in the range 0.80 to 1.00 means that the correlation between the human development index and the unemployment rate is very strong.

b. Coefficient of Determination

The strength of the influence of the independent variable (human development index) on the dependent variable (unemployment rate) can be seen from the value of the determinant coefficient ( $R^2$ ), which is in the formula between zero and one.

Table 4 shows the coefficient of determination ( $R^2$ ) = 0.821 or 82.1% which means that 82.1% is the contribution of the independent variable (human development index) to the dependent variable (unemployment rate). While the rest or  $100\% - 82.1\% = 17.9\%$  is the influence of other variables that were not studied.

c. Linear Regression

The Human Development Index (HDI) has a significant and negative effect at the 5% level on the unemployment rate. This is evidenced by a significance value.

Table 5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	31.111	4.137		7.520	.000
	IPM	-.362	.060	-.906	-6.053	.000

a. Dependent Variable: Unemployment Rate

The regression equation  $Y = 31,111 - 0.362 X$  can be interpreted that the value of the human development index coefficient (HDI) for variable X is -0.362 and is negative. This indicates that HDI has a relationship in the opposite direction to the unemployment rate. This implies that for each increase in the human development index (HDI) one unit, the variable Beta (Y) unemployment rate will decrease by 0.362 assuming that the other independent variables of the regression model are fixed.

This is in accordance to the theory described by (Todaro, 2003) that increasing human productivity can be through the development of human capital (human capital). Through investment in education, it is hoped that it will be able to improve the quality of Human Resources (HR) which is shown by increasing a person's knowledge and skills so that it will boost work productivity. Increased productivity can affect job opportunities, namely by

productivity, there will be a decrease in the cost per unit of goods. A decrease in the cost of production per unit of goods will reduce the price per unit of goods. If the price of goods falls, the demand for goods will increase, which will encourage entrepreneurs to increase the demand for labor. If the price of goods falls, the demand for goods will increase, which will encourage entrepreneurs to increase the demand for labor so that the absorption of more workers can reduce the high level of unemployment.

d. Interpretation and Discussion of Hypothesis Testing

The hypothesis put forward states that the human development index has a negative and significant effect on the unemployment rate, namely from the research results obtained a significance value which can be seen in table 5 of 0.000 which indicates that the value is less than 0.05. For a regression coefficient of -0.362 with a negative value, it means that each human development index of 1% will reduce the unemployment rate by 0.362%. Thus the hypothesis which states that the human development index has a significant effect on the unemployment rate is accepted.

### Conclusion

This study attempts to examine how the human development index (HDI) affects the unemployment rate in 2010-2019. Based on the results of the research and analysis discussed, it can be concluded that the Human Development Index (HDI) variable has a negative and significant effect on the unemployment rate in Indonesia. This shows that the greater the value of the Human Development Index (HDI), the smaller the unemployment rate.

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