

# The Effect Of Open Unemployment Rate (TPT), Number Of Poor People (JPM), And Percentage Rate Of Labor Force (TPAK) On The Human Development Index (HDI) In North Sumatra Province

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## Abstract

This study aims to determine the effect of open unemployment rate (TPT), labor force percentage rate (TPAK), number of poor people (JPM) on the Human Development Index (HDI) in North Sumatra Province for the period 2001-2022. The data used in this study are secondary data sourced from the Central Bureau of Statistics of North Sumatra Province. From the analysis, it is known that the Open Unemployment Rate (TPT) has a positive and significant effect on the Human Development Index in the long term with a coefficient of 0.75. However, in the short term, the Open Unemployment Rate variable has a negative and insignificant effect on the Human Development Index with a coefficient of 0.46. The Labor Force Percentage Rate has a negative and significant effect on the Human Development Index both in the long run with a coefficient of 0.72 and in the short run with a coefficient of 0.59. The number of poor people has no effect on the Human Development Index either in the long term with a coefficient of 8.77 or in the short term with a coefficient of 12.5. Simultaneously or together, both in the long and short term, the TPT, JPM, and TPAK variables have a significant effect on the Human Development Index in North Sumatra Province.

*Keywords: Open unemployment rate, Labor Force Percentage Rate, Number of poor people, Human Development Index (HDI)*

## INTRODUCTION

The published unemployment rate (TPT) is a component of HDI that measures a country's unemployment rate. Negative and significant impacts Open unemployment rate to HDI can reduce income inequality, because human development can improve aspects of public health and expenditure. The number of poor people is one component of HDI that measures income inequality between regions. Because human development can improve public health and expenditure, HDI has the potential to have a negative impact and significantly reduce income inequality. The Labor Force Participation Rate is a component of HDI that measures employee employability and performance. The positive impact of the Labor Force Participation Rate on HDI reduces income inequality, as improved job performance can contribute to economic development and reduce the unemployment rate. In this case, the impact of the Undisclosed Unemployment Rate, Number of Poor People (JPM), and Labor Force Participation Rate on the Human Development Index (HDI) of North Sumatra. The positive and significant impact of open poverty rates on the number of poor people. Human capital theory states that society can increase its income through higher education. The positive and significant impact of open poverty rates on the number of poor people. An increase in the number of poor people can lead to an increase in the poverty rate. Impact of Labor Participation Rate Labor

is a very important factor of production and has a very important role in development. Labor problems can cause new problems in both economic and non-economic sectors. The impact of the Human Development Index (HDI) has a negative impact on the number of people living in poverty. Many negative impacts are caused by the high rate of poverty in a region, where poverty ultimately causes new problems, especially in the social sector. Poverty ultimately has a direct or indirect impact on regional economic growth. Because poverty alleviation is important, we need to find the root causes and causes of poverty. The Arianxar study (2021) found that the open unemployment rate (TPT) and minimum wage did not have a significant effect on poverty in the Pintukertascila area. The findings of this study are in line with the research of Mukhtar, Saptono, and Arifin (2019) which shows that the open unemployment rate does not have a significant effect on poverty in Indonesia, while the labor force participation rate has a significant influence. Positive impact on poverty in Indonesia.

Poverty is considered as one form of development problems due to the negative impact of unbalanced economic growth, thus widening income gaps between communities and between regions. Relative poverty is a measure of income distribution inequality, because wages are already above the minimum wage. This has an impact on other workers, especially less educated and inexperienced workers, because the minimum wage reduces the number of workers that companies seek, thus potentially increasing unemployment (Mankiw, 2006).

Common problems arising from the specific impact of the Poverty Rate (TPT), Number of Poor People (JPM) and Labor Force Participation Rate (TPAK) on the Human Development Index (HDI) in North Sumatra Province are explained by several factors:

- Open Unemployment Rate (TPT): The high level of open poverty (TPT) can cause social welfare problems such as decreased purchasing power, increased poverty and crime.
- High levels of poverty can also affect the quality of labor and human resources which are the main components of human development.
- Number of Poor People (JPM): The high number of poor people (JPM) can cause welfare problems such as low education, poverty, and health. JPM can also cause social problems such as violence, corruption, and violence.
- Labor force participation rate (TPAK): High labor force participation rate (TPAK) can cause social welfare problems such as decreased purchasing power, increased poverty and crime. The level of education and the quality of labor can also affect the level of human development.
- Human Development Index (HDI): The Human Development Index (HDI) is an indicator that links general welfare and human development. High HDI can cause problems in people's welfare, such as health, education, and welfare.

## **RESEARCH METHODS**

The method applied is a quantitative method. Quantitative research is a type of scientific research that collects large amounts of data, given the wide scope of the respondent population. This method is widely used to research problems that are obvious, have a wide population, and aim to test hypotheses. An example of quantitative research is research that collects statistical data from a sample of people, using mathematical formulations and statistical theory to examine relationships between variables.

According to AV Wiratna Sujarweni, quantitative research is a type of research that produces findings that can be achieved using statistical procedures or other quantification methods.

In this study, researchers investigated the effect of open poverty rate (TPT), the number of poor people, and the percentage rate of labor force on the human development index. Cases in this approach are limited by time and activity, and researchers collect complete information using time-based data collection procedures.

#### 1. Subject, Time, and Place of Research

The subject of this study is North Sumatra Province, focusing on the Human Development Index using several economic indicators. The data used is time series data from 2001 to 2022. The study was conducted in March 2024.

#### 2. Data Collection Techniques

This study uses secondary data from the Central Bureau of Statistics of North Sumatra Province, covering the period 2001-2022. The variables used in this study are Open Unemployment Rate (TPT), Number of Poor People (JPM), Percentage Rate of Labor Force (TPAK), and Human Development Index (HDI).

#### 3. Data Analysis Techniques

The data analysis method used is time series data using Error Correction Model (ECM) and Eviews 12 software. ECM is used to process non-stationary time series data as well as to understand the influence of desire and free variables in the long and short term. Data obtained from the Central Statistics Agency (BPS) include the open poverty rate, the number of poor people, and the percentage rate of the labor force against the human development index in North Sumatra Province. The analysis steps include:

- a. Stationary test: ensures that variables do not have trends or patterns that change over time.
- b. Degree of integration testing: determines whether an integrated variable is of order I (I(1)) or order II (I(2)).
- c. Cointegration testing: determines whether there is a long-term relationship between the independent and dependent variables.
- d. ECM model estimation: using the Ordinary Least Squares (OLS) method.
- e. Diagnostic test: ensures that the estimated model meets all classical requirements.
- f. Interpretation of results: explain the influence of TPT, JPM, and TPAK on HDI in North Sumatra Province.

Some advantages in using the ECM method. The most prominent advantage is being able to overcome problems contained in time series research data that are not stationary. Suppose there is a long-term relationship in two variables X and Y:

$$Y_t = \beta_0 + \beta_1 X_t$$

Ket:

If the variable Y at the equilibrium point with respect to X, then the equilibrium of variables X and Y in the first equation is satisfied. However, economic variables are rarely found in equilibrium. When  $Y_t$  has a value that is different from its equilibrium, then the value of the difference that occurs in X and Y in the first equation is:

$$C_t = Y_t - \beta_0 - \beta_1 X_t$$

Ket:

This  $E C_t$  value is referred to as an error at the point of imbalance (disequilibrium error). Thus, if  $E C_t = 0$ , then the variables Y and X will be equilibrium. Therefore, the variables X and Y rarely find equilibrium. The solution is to observe the relationship of equilibrium (short-

term), by means of the element of inaction of variables Y and X. According to Engle-Granger, if variables Y and X are not stationary, but cointegrated, then the relationship between X and Y can be explained by ECM. The similarities are:

$$DY_t = \alpha_0 + \alpha_1 DX_t + \alpha_2 ECT_t + \varepsilon$$

Information:

Where  $ECT_t = Y_t - \beta_0 - \beta_1 X_t$ .  $\alpha_1$  is the short-run coefficient, while  $\beta_1$  in equation two is the long-run coefficient. Furthermore,  $\alpha_2$  is an absolute value that describes how quickly it takes to reach the equilibrium value.

## RESULTS AND DISCUSSION

### 1. Stacionecity Test (Root Test)

Variable	Unit Root Test					
	Level			1st Difference		
	ADF	Prob	Conclusion	ADF	Prob	Conclusion
HDI	-5.283.543	0,0004	Stationary	-8.445.443	0.0000	Stationary
TPT	-1.055.789	0.7106	Non-stationary	-5.537.688	0.0002	Stationary
TPAK	-7.381.643	0.0000	Stationary	-8.962.574	0.0000	Stationary
JPM	-1.233.447	0.6397	Non-stationary	-5.164.382	0.0005	Stationary

Based on the table of stationary test results above, it can be shown that the TPT and JPM variables are not stationary at the level level of  $\alpha = 5\%$ . Furthermore, all variables are IPM, TPT, TPAK, and JPM Stationary at the *level of 1<sup>st</sup> Difference*. Because the data is stationary, this research is eligible to be able to use the ECM (*Error Correction Model*) model.

Based on the table of Cointegration test results above, it can be seen that the

Variabel	ADF	Prob	Kesimpulan
ECT	-3.385216	0.0235	Stasioner

probability value of the ECT variable is  $0.0235 < 0.05$ . This gives the information that the ECT variable is stationary at the Level and implicitly states that IPM, TPT, TPAK, and JPM are cointegrated with each other so that testing can proceed to the stage of estimating long-term equations.

### 3. Long-Term Model Estimation

Dependent Variable: IPM

Method: Least Squares

Date: 10/21/23 Time: 14:13

Sample: 2001 2022

Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	239.9079	77.18539	3.108204	0.0061
LOG(JPM)	-8.776536	5.098620	-1.721355	0.1023
TPAK	-0.725371	0.176445	-4.111038	0.0007
TPT	0.757736	0.316309	2.395557	0.0277

R-squared	0.558080	Mean dependent var	71.07955
Adjusted R-squared	0.484426	S.D. dependent var	2.889827
S.E. of regression	2.074996	Akaike info criterion	4.460761
Sum squared resid	77.50095	Schwarz criterion	4.659133

Log likelihood	-45.06837	Hannan-Quinn criter.	4.507491
F-statistic	7.577106	Durbin-Watson stat	1.359049
Prob(F-statistic)	0.001757		

Based on the table above, a regression equation model can be arranged as follows:

$$\text{HDI} = 239.907945456 - 8.77653616834 * \text{LOG(JPM)} + 0.757735900431 * \text{TPT} - 0.725370855346 * \text{TPAK}$$

From the results of the ECM model equation above, it can be interpreted as follows:

1. A constant of 239.907945456 is obtained so it can be estimated that if the assumptions of independent variables, namely Open Unemployment Rate, Number of Poor People, Labor Force Participation Rate equal to 0, then the HDI value in North Sumatra Province will increase by 239.90 percent.
2. The variable regression coefficient of the Number of Poor People is - 8.77653616834 which means that every decrease in the Number of Poor People by 1 percent will increase the HDI in North Sumatra Province by 8.776 percent.
3. The regression coefficient of the Open Unemployment Rate variable of 0.757735900431 which means that every increase in the Open Unemployment Rate of 1 percent will increase the HDI in North Sumatra Province by 0.7577 percent.
4. The regression coefficient of the variable Labor Force Participation Rate is - 0.725370855346 which means that every decrease in the Labor Force Participation Rate by 1 percent will increase the HDI in North Sumatra Province by 0.7253 percent

#### 4. Short-Term Model Estimation

Dependent Variable: D(IPM)  
Method: Least Squares  
Date: 10/21/23 Time: 14:30  
Sample (adjusted): 2002 2022  
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.282201	0.412025	-0.684913	0.5032
D(LOG(JPM))	-12.52903	7.171562	-1.747044	0.0998
D(TPT)	0.462695	0.240749	1.921897	0.0726
D(TPAK)	-0.592615	0.124103	-4.775196	0.0002
ECT(-1)	-0.708889	0.209316	-3.386697	0.0038
R-squared	0.727591	Mean dependent var		-0.370952
Adjusted R-squared	0.659489	S.D. dependent var		3.056781
S.E. of regression	1.783733	Akaike info criterion		4.199550
Sum squared resid	50.90724	Schwarz criterion		4.448246
Log likelihood	-39.09528	Hannan-Quinn criter.		4.253524
F-statistic	10.68382	Durbin-Watson stat		1.726271
Prob(F-statistic)	0.000207			

Based on the table above, a regression equation model can be arranged as follows:

$$\text{D(HDI)} = -0.282201427082 - 12.5290314438 * \text{D(LOG(JPM))} + 0.462694892584 * \text{D(TPT)} - 0.592615277027 * \text{D(TPAK)} - 0.708889191399 * \text{ECT(-1)}$$

From the results of the ECM model equation above, it can be interpreted as follows:

1. A constant of -0.282201427082 is obtained, so it can be estimated that if the assumptions of independent variables, namely Open Unemployment Rate, Number

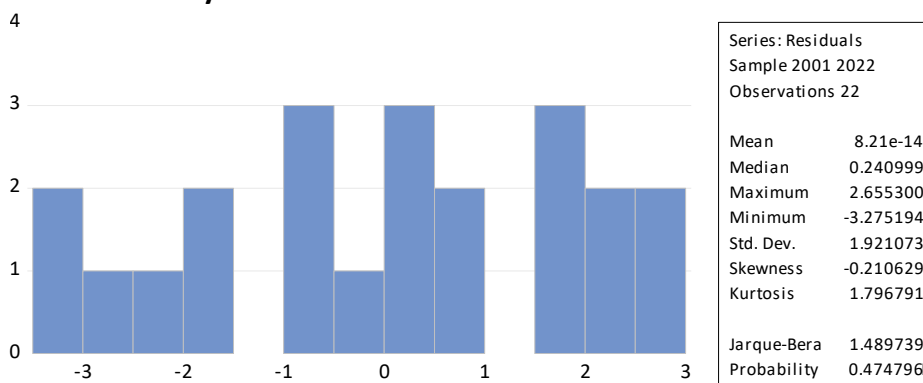
of Poor People, Labor Force Participation Rate equal to 0, then the HDI value in North Sumatra Province will decrease by 0.2822 percent.

2. The variable regression coefficient of the Number of Poor People is - 12.5290314438 which means that every decrease in the Number of Poor People by 1 percent will increase the HDI in North Sumatra Province by 12.529 percent.
3. The regression coefficient of the Open Unemployment Rate variable of 0.462694892584 which means that every increase in the Open Unemployment Rate of 1 percent will increase the HDI in North Sumatra Province by 0.4626 percent.
4. The regression coefficient of the variable Labor Force Participation Rate is - 0.592615277027 which means that every decrease in the Labor Force Participation Rate by 1 percent will increase the HDI in North Sumatra Province by 0.5926 percent.
5. The ECT Coefficient value of - 0.708889191399 which means that if there is an imbalance in the previous year of 100 percent, the Human Development Index in North Sumatra Province will adjust to a decrease of 0.7088 percent.

## 5. Classical Assumption Test Results

### 5.1 Long-Term Classical Assumption Test Results

#### 5.1.1 Normality Test



Based on the figure above, it is known that the Jarque-Bera value is 1.489739 while the  $\alpha$  value is 0.05 so, the probable value is 0.474796 > the  $\alpha$  value is 0.05, so, it can be concluded that the data used is normally distributed.

#### 5.1.2 Multicollinearity

Variance Inflation Factors

Date: 10/21/23 Time: 15:05

Sample: 2001 2022

Included observations: 22

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	5957.584	30440.96	NA
LOG(JPM)	25.99593	26933.05	2.903344
TPT	0.100051	32.48442	2.420394
TPAK	0.031133	747.2715	1.321101

From the table above, it can be seen that the centered VIF value of each variable is less than 10, it can be concluded that all independent variables are not indicated by symptoms of multicollinearity and it shows a perfect linear relationship between some or all independent variables of this model.

#### 5.1.3 Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.652492	Prob. F(2,16)	0.5341
Obs*R-squared	1.659039	Prob. Chi-Square(2)	0.4363

Based on the table above, it can be seen that the value of Prob Chi-Square is 0.4363 which means greater than the  $\alpha$  rate of 0.05. It can be concluded that in this study free from autocorrelation problems.

### 5.1.4 Heteroscedasticity Test

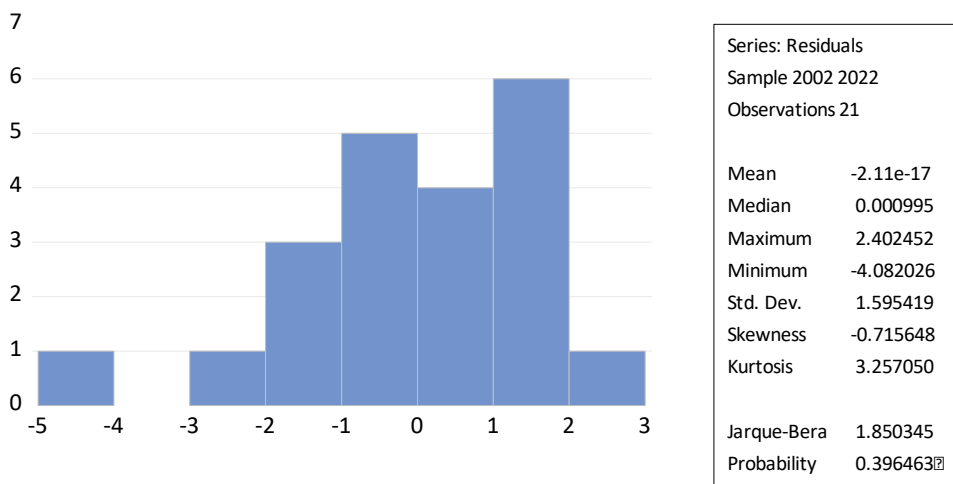
Heteroskedasticity Test: Breusch-Pagan-Godfrey  
Null hypothesis: Homoskedasticity

F-statistic	0.678887	Prob. F(3,18)	0.5763
Obs*R-squared	2.236227	Prob. Chi-Square(3)	0.5248
Scaled explained SS	0.596389	Prob. Chi-Square(3)	0.8973

Based on the table above, it can be seen that the value of Prob Chi-Square is 0.5248 > 0.05, so it can be concluded in this mode free from heteroscedasticity problems.

## 5.2 Short-term classical assumption test results

### 5.2.1 Normality Test



Based on the figure above, it is known that the Jarque-Bera value is 1.850345 while the  $\alpha$  value is 0.05 so, the probable value is 0.396463 > the  $\alpha$  value is 0.05, so, it can be concluded that the data used is normally distributed.

### 5.2.2 Multicollinearity

Variance Inflation Factors  
Date: 10/21/23 Time: 14:49  
Sample: 2001 2022  
Included observations: 21

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.169765	1.120488	NA
D(TPT)	0.057960	1.100024	1.092577
D(TPAK)	0.015402	1.173236	1.140977
D(LOG(JPM))	51.43130	1.259666	1.129575
ECT(-1)	0.043813	1.017137	1.014752

From the table above, it can be seen that the centered VIF value of each variable is

less than 10, it can be concluded that all independent variables are not indicated by symptoms of multicollinearity and it shows a perfect linear relationship between some or all independent variables of this model.

### 5.2.3 Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.737516	Prob. F(2,14)	0.4960
Obs*R-squared	2.001655	Prob. Chi-Square(2)	0.3676

Based on the table above, it can be seen that the value of Prob Chi-Square is 0.3676 which means greater than the  $\alpha$  rate of 0.05. It can be concluded that in this study free from autocorrelation problems.

### 5.2.4 Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

Null hypothesis: Homoskedasticity

F-statistic	0.878895	Prob. F(4,16)	0.4983
Obs*R-squared	3.782985	Prob. Chi-Square(4)	0.4362
Scaled explained SS	2.478262	Prob. Chi-Square(4)	0.6485

Based on the table above, it can be seen that the value of Prob Chi-Square is 0.4362 > 0.05, so it can be concluded in this mode free from heteroscedasticity problems.

## 6. Test the hypothesis

### 6.1 Long-Term Hypothesis Test

#### 6.1.1 T Test (Partial)

The t-test is carried out by comparing the t-count with the t-table with the following decision collection criteria:

- Accept  $H_0$ , if t count < t table and or prob > 0.05 on a one-way test. This means that there is an influence of the independent variable on the dependent variable both in the short and long term.
- Reject  $H_0$ , if t count > t table and or prob < 0.05 on a one-way ui. This means that there is an influence of the independent variable on the dependent variable both long-term and short-term.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	239.9079	77.18539	<b>3.108204</b>	<b>0.0061</b>
LOG(JPM)	-8.776536	5.098620	<b>-1.721355</b>	<b>0.1023</b>
TPT	0.757736	0.316309	<b>2.395557</b>	<b>0.0277</b>
TPAK	-0.725371	0.176445	<b>-4.111038</b>	<b>0.0007</b>

Based on the table above, the interpretation of the results of the T test in the long term is as follows:

#### 1. The Effect of the Number of Poor People on the Human Development Index

The variable Number of Poor People has a t-Statistic value of -1.721355, meaning that the calculated t value (-1.721355) < t table (2.100922037) and the probability value of 0.1023 >  $\alpha = 5\%$ . Therefore testing the t-test hypothesis then  $H_0$  is accepted. This means that the variable Number of Poor People partially does not affect the Human Development Index in North Sumatra Province.



## 2. The Effect of Open Unemployment Rate on Human Development Index

The Open Unemployment Rate variable has a t-Statistic value of 2.395557, meaning that the calculated t value (2.395557) > t table (2.100922037) and the probability value of 0.0277 >  $\alpha = 5\%$ . Therefore testing the t-test hypothesis then Ho Rejected. This means that the variable Open Unemployment Rate partially has a positive and significant effect on the Human Development Index in North Sumatra Province.

## 3. Effect of Labor Force Percentage Rate on Human Development Index

The Labor Force Percentage Rate variable has a t-Statistic value of -4.111038, meaning that the calculated t value (-4.111038,) > t table (2.100922037) and the probability value of 0.0007 >  $\alpha = 5\%$ . Therefore testing the t-test hypothesis then Ho Rejected. This means that the variable Percentage Rate of the Labor Force partially has a negative and significant effect on the Human Development Index in North Sumatra Province.

### 6.1.2 F Test (Simultaneous)

The decision-making criteria are as follows:

- Accept Ho, if f count < f table and or prob > 0.05 on a one-way test. This means that simultaneously there is no influence of the independent variable on the dependent variable both short and long term.
- Reject Ho, if f count > f table and or prob < 0.05 on a one-way ui. This means that there is simultaneously the influence of the independent variable on the dependent variable both in the long and short term.

F-statistic	Prob (F-Statistik)
7.577.106	0.001757

### 6.1.3 Coefficient of Determination

R- Squared	Adjusten R-Squared
0.558080	0.484426

From the regression results above, the value of the R coefficient of determination (R-Squared) is 0.558080 or 55.80%. This shows that the independent variables in this study, namely Open Unemployment Rate, Number of Poor People, Labor Force Participation Rate explain the magnitude of the influence on Human Development in North Sumatra Province. The remaining 44.192% were assessed with other variables that were not included in the study.

## 6.2 Short-Term Hypothesis Test

### 6.2.1 T Test (Partial)

The t-test is carried out by comparing the t-count with the t-table with the following decision collection criteria:

- Accept Ho, if t count < t table and or prob > 0.05 on a one-way test. This means that there is an influence of the independent variable on the dependent variable both in the short and long term.
- Reject Ho, if t count > t table and or prob < 0.05 on a one-way ui. This means that there is an influence of the independent variable on the dependent variable both long-term and short-term.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.282201	0.412025	-0.684913	0.5032
D(LOG(JPM))	-12.52903	7.171562	-1.747044	0.0998
D(TPT)	0.462695	0.240749	1.921897	0.0726
D(TPAK)	-0.592615	0.124103	-4.775196	0.0002

Based on the table above, the interpretation of the results of the T test in the long term is as follows:

**1. The Effect of the Number of Poor People on the Human Development Index**

The variable Number of Poor People has a t-Statistic value of -1.747044, meaning that the calculated t value ( $-1.747044 < t \text{ table } (2.100922037)$ ) and the probability value of  $0.0998 > \alpha = 5\%$ . Therefore testing the t-test hypothesis then  $H_0$  is accepted. This means that the variable Number of Poor People partially does not affect the Human Development Index in North Sumatra Province.

**2. The Effect of Open Unemployment Rate on Human Development Index**

The Open Unemployment Rate variable has a t-Statistic value of 1.921897, meaning that the calculated t value ( $1.921897 < t \text{ table } (2.100922037)$ ) and the probability value of  $0.0726 > \alpha = 5\%$ . Therefore testing the t-test hypothesis then  $H_0$  is accepted. This means that the variable Open Unemployment Rate does not partially affect the Human Development Index in North Sumatra Province.

**3. Effect of Labor Force Percentage Rate on Human Development Index**

The Labor Force Percentage Rate variable has a t-Statistic value of -4.775196, meaning that the calculated t value ( $-4.775196 > t \text{ table } (2.100922037)$ ) and the probability value of  $0.0007 > \alpha = 5\%$ . Therefore testing the t-test hypothesis then  $H_0$  Rejected. This means that the variable Percentage Level of the Labor Force partially has a negative and significant effect on the Human Development Index in North Sumatra Province.

**6.2.2 F Test (Simultaneous)**

The decision-making criteria are as follows:

- Accept  $H_0$ , if  $f \text{ count} < f \text{ table}$  and or  $\text{prob} > 0.05$  on a one-way test. This means that simultaneously there is no influence of the independent variable on the dependent variable both short and long term.
- Reject  $H_0$ , if  $f \text{ count} > f \text{ table}$  and or  $\text{prob} < 0.05$  on a one-way ui. This means that there is simultaneously the influence of the independent variable on the dependent variable both in the long and short term.

F-statistic	Prob (F-Statistik)
10.68382	0.000207

**6.2.3 Test Coefficient of Determination**

R- Squared	Adjusten R-Squared
0.727591	0.659489

From the regression results above, the value of the R coefficient of determination (R-Squared) was obtained at 0.727591 or 72.7591%. This shows that the independent variables in this study, namely Open Unemployment Rate, Number of Poor People, Labor Force Participation Rate explain the magnitude of the influence on Human Development in North Sumatra Province. The remaining 27.2409% were explained by other variables not included in the study.

**Discussion**

**1. The Effect of Labor Force Participation Rate on Human Development Index**

The results of the Error Correction Model (ECM) estimation show that the variable Labor Force Participation Rate has a negative and significant effect on the Human Development Index both in the long and short term. The results of long-term estimation of the value of the variable regression coefficient of the Labor Force Participation Rate of - 0.725370855346 which means that

every decrease in the Labor Force Participation Rate by 1 percent will increase HDI in North Sumatra Province by 0.7253 percent. Meanwhile, the results of short-term estimates of the regression coefficient value of the variable Labor Force Participation Rate of - 0.592615277027 which means that every decrease in the Labor Force Participation Rate by 1 percent will increase HDI in North Sumatra Province by 0.5926 percent.

The results of this study are in accordance with the research hypothesis that the Percentage Rate of the Labor Force affects the Human Development Index. This research is in line with research conducted by Assa Faelasuffa (2021) which states that the Percentage Rate of the Labor Force affects the Human Development Index (HDI).

## **2. The Effect of Open Unemployment Rate on Human Development Index**

The results of the Error Correction Model (ECM) estimation show that the variable Open Unemployment Rate has a positive and significant effect on the Human Development Index in the long run. However, in the short term, it shows that the variable Open Unemployment Rate has a negative and insignificant effect on the Human Development Index. The results of long-term estimates of the regression coefficient of the open unemployment rate variable of 0.757735900431 which means that every increase in the open unemployment rate of 1 percent will increase the HDI in North Sumatra Province by 0.7577 percent. Meanwhile, the results of short-term estimates of the regression coefficient value of the open unemployment rate variable of 0.462694892584 which means that every increase in the open unemployment rate of 1 percent will increase HDI in North Sumatra Province by 0.4626 percent.

The results of this study are not in accordance with the research hypothesis that the Open Unemployment Rate affects the Human Development Index in the long and short term. Based on this study, only in the long run that the Open Unemployment Rate affects the Human Development Index while in the short term the Open Unemployment Rate variable does not affect the Human Development Index. This happens because changes in unemployment may affect people's incomes, but the impact is indirect and takes time to reflect in an increase or decrease in HDI. The human development index better reflects long-term developments in people's well-being. In addition, HDI measurement includes several components that are more responsive to changes in government policy, investment in education, health services, and sustainable human development efforts. Therefore, in the short run the relationship between the open unemployment rate and the human development index looks weak or indirect.

## **3. The Effect of the Number of Poor People on the Human Development Index**

The results of the Error Correction Model (ECM) estimation show that the variable Number of poor people has no effect on the Human Development Index both in the long and short term. The results of long-term estimation of the value of the variable regression coefficient of the number of poor people amounted to - 8.77653616834 which means that every decrease in the number of poor people by 1 percent will increase the HDI in North Sumatra Province by 8.776 percent. Meanwhile, the results of short-term estimation of the value of the variable regression coefficient of the number of poor people amounted to - 12.5290314438 which means that every decrease in the number of poor people by 1 percent will increase HDI in North Sumatra Province by 12.529 percent.

In the long term and in the short term, the variable number of poor people has no effect on the Human Development Index. This means that the hypothesis of the number of poor people affecting the Human Development Index is not tested or rejected. This can happen because there are several factors that influence it, including:

- a. First, in the short term an increase in the number of poor people may not directly affect HDI because changes in factors such as health, education, and living standards take time to develop. However, in the long run high economic inequality and a large number of poor people can hamper HDI growth.

- b. Both the quality of education and health, this can affect the relationship between the number of poor people and HDI. If the number of poor people has better access to these services, HDI can remain high.
- c. Third, the distribution of wealth that is unequal among the population can affect HDI. For example, if most wealth and resources are centered on a small segment of the population, then HDI could have a negative effect.
- d. Fourth, policies and interventions, government actions, social programs, and development policies can play an important role in reducing the impact of poor people on HDI.. So good interventions can help reduce inequality and increase HDI.

This research is in line with research conducted by Siti Nur Fatimah (2018) which states that the number of poor people does not affect the Human Development Index.

#### **4. Effect of Labor Force Participation Rate, Open Unemployment Rate, Number of Poor People on Human Development Index**

Based on the results of the long-term F test, a probability value of 7.577106 is obtained. This means that F-statistic (7.577106) > t table (3.049125006) and probability value 0.001757 <  $\alpha=5\%$ . Therefore the hypothetical testing of the t test then Ho is rejected. So that simultaneously the variables of Labor Force Participation Rate, Open Unemployment Rate, Number of Poor People have a significant effect on the Human Development Index in North Sumatra Province. Meanwhile, based on the results of the short-term F test, a value of 10.68382 was obtained. This means that F-statistic (10.68382) > F table (3.159907598) and probability value 0.000207 <  $\alpha=5\%$ . Therefore the hypothetical testing of the t test then Ho is rejected. So that simultaneously the variables of Labor Force Participation Rate, Open Unemployment Rate, Number of Poor People have a significant impact on the Human Development Index in North Sumatra Province.

This explains that a high labor force participation rate contributes positively to HDI, as more people working can increase people's income and welfare. On the other hand, a high open unemployment rate can hinder the development of HDI, as lack of employment opportunities can result in a deterioration in income and quality of life. The number of poor people also has a strong negative influence on HDI, because the inability to meet the basic needs of education, health and food can damage human development.

## **CONCLUSIONS**

The results of research and discussions that have been carried out related to the effect of the Open Unemployment Rate (TPT), Number of Poor People (JPM), Percentage Rate of the Labor Force (TPAK), on the Human Development Index (HDI) in North Sumatra Province in 2001-2022. It can be concluded that the Open Unemployment Rate (TPT) has a positive and significant effect on the Human Development Index in the long run. However, in the short term, it shows that the variable Open Unemployment Rate has a negative and insignificant effect on the Human Development Index. Labor Force Participation has a negative and significant effect on the Human Development Index both in the long and short term. The number of poor people has no effect on the Human Development Index in either the long or short term. Simultaneously or together, both long-term and short-term variables TPT, JPM, and TPAK have a significant impact on the Human Development Index in North Sumatra Province.

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