

Analysis Of The Effect Of Economic Growth, Open Unemployment Rate, Human Development Index On The Number Of Poor People In Sumatra Island Using Panel Data

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Abstract. *The purpose of this study is to analyze the effect of economic growth, open unemployment rate, and Human Development Index on the number of poor people on the island of Sumatra both partially and simultaneously. This type of research is quantitative research and the data in this study are secondary data from the period 2012 - 2021 sourced from the Central Bureau of Statistics and using panel data analysis techniques. The results of the study are that economic growth has an effect and is not significant on the number of poor people on the island of Sumatra, the open unemployment rate has an effect and is significant on the number of poor people on the island of Sumatra, the human development index has no effect on the number of poor people on the island of Sumatra. Simultaneously, economic growth, open unemployment rate, and human development index have a significant effect on the number of poor people on the island of Sumatra.*

Keywords: *economic growth, human development index, poverty, unemployment*

INTRODUCTION

The eradication of poverty and the empowerment of the poor are some of the main tasks of the government in the country that must be carried out by the laws and regulations. Community development and community empowerment are very broad aspects, behind the economic, social, cultural, and even political aspects. Poverty alleviation and community empowerment are some of the efforts to improve the welfare of the community.

In Indonesia, poverty has become a chronic social disease that has not gone away until now. In September 2020, the number of poor people rose to 27.55 million due to the Covid-19 pandemic which had a major impact on increasing the poverty rate in Indonesia. The percentage of poverty in 2020 increased by 2 digits, from 9.22% in September 2019 to 10.19%. Many have felt the impact of the high poverty rate, such as the increasing crime rate, loss of humanity, political insecurity, illness, and even the death of many people, as well as

horizontal conflicts that lead to SARA. In the end, it all led to the economic crisis that occurred leading to a multidimensional crisis.

So far, economic development in Indonesia has tended to be centered on the island of Sumatra, but in fact, there is a poverty problem centered on the island of Sumatra, especially in Aceh, North Sumatra, South Sumatra, Bengkulu, and Lampung. The following data on the number of poor people in several provinces on the island of Sumatra can be seen in Table 1. below, it can be seen that the national poverty rate has fluctuated in the last five years, in 2017 the national poverty rate reached 10.6% then in 2018 it decreased by 9.8% then experienced a decline again in 2019 by 9.4% and this figure rose in the following two years to 9.8% in 2020, and to 10.1% in 2021.

Table 1. Data on the Poor Population of Sumatra Island 2017-2021 (%)

Province	2017	2018	2019	2020	2021
Aceh	16,89	15,97	15,32	14,99	15,33
North Sumatra	10,22	9,22	8,63	9,14	8,49
West Sumatra	6,87	6,65	6,42	6,28	6,63
Riau	7,78	7,39	7,08	6,82	7,12
Jambi	8,19	7,92	7,60	7,58	8,09
South Sumatra	13,19	12,80	12,71	12,66	12,84
Bengkulu	16,45	15,43	15,23	15,03	15,05
Lampung	13,69	13,14	12,62	12,34	12,62
Bangka Belitung Island	5,20	5,25	4,62	4,53	4,90
Riau Island	6,06	6,20	5,80	6,13	6,12
National	10,6	9,8	9,4	9,8	10,1

Sumber: BPS, 2023

Based on the data on the percentage of the number of poor people on Sumatraland Island, it can be seen that the poverty rate of the 10 provinces on the island of Sumatra is still uneven, most of the poverty rate is above 10%, namely the provinces of Aceh, North Sumatra, South Sumatra, Bengkulu, and Lampung, while West Sumatra, Riau, Jambi, Bangka Belitung Islands and Riau Islands are below 10%.

Murdiyana., et al (2017) stated that poverty is a common problem in developing countries. As a developing country, poverty is a major problem in Indonesia. Poverty exists in almost every region in Indonesia. Sumatra, which is part of Indonesia, has varying levels of poverty in its various regions. Poverty is a serious problem that affects several people in Sumatra.

Economic growth is believed to have a significant effect on poverty reduction. However, this effect may differ from country to country. The state of income distribution, population, and urbanization have an important bearing on the effect of economic growth on

poverty reduction (Hasan and Quibria, 2002). According to Jonidi (2012), there is a strong two-way relationship between economic growth and poverty in Indonesia. Economic growth has a significant effect on poverty reduction, especially in rural areas where there are many pockets of poverty. Conversely, poverty also has a significant effect on economic growth.

Therefore, it can be concluded that economic growth can have a positive impact on poverty reduction if economic growth is in favor of the poor. Siregar (2006) also states that economic growth is a necessary condition for poverty reduction, while the sufficient condition is that economic growth must be effective in reducing poverty. This means that growth should be spread across all income groups, including the poor (growth with equity). Directly, this means that growth needs to be ensured in sectors where the poor work (agriculture or labor-intensive sectors). Indirectly, it means that the government needs to be effective enough to redistribute the benefits of growth.

Unemployment is a labor problem that is often encountered in several countries, especially in developing countries. Unemployment is described as a group of individuals who are 15 years of age or older and are members of the labor force, who are looking for work and have not yet obtained a job. When this problem is left unchecked and continues to increase every year, it can have an unfavorable impact on a region or country. Some of the cases caused by unemployment are crime and poverty (Berliani, 2021).

Poverty and labor are interrelated; this can be seen in the relationship between poverty and unemployment. Unemployment and underemployment are indicators chosen based on the fact that they are related to a person's income. A person who does not yet have a job and is still looking for a job does not get income, while underemployment is related to the short working hours and the income received. The poverty rate always continues to move in line with the unemployment rate. Because when the unemployment rate increases, the poverty rate increases (Berliani, 2021). In this research, the index that is seen and calculated to measure unemployment is the Open Unemployment Rate. Where it produces an indication of the number of individuals who enter the working age into unemployment. In research (Ningrum 2017) shows that the level of open unemployment has a positive and significant influence on the value of the poverty rate. A person who has not obtained a job or is looking for a job project certainly does not have an income that can meet the high and varied needs of life, which requires them to work harder in an effort to meet their needs. Research (Khamilah, 2018) found that the level of open unemployment has a positive and significant impact on the poverty rate..

The Human Development Index (HDI) is a comparative measurement of life expectancy, literacy, education and living standards for all countries around the world. The HDI is used to classify whether a country is developed, developing or underdeveloped and also to measure the effect of economic policies on quality of life. The quality of human resources can also be a contributing factor to poverty. The quality of human resources can be seen from the quality of life index/human development index. The low Human Development Index (HDI) will result in the low labor productivity of the population. Low productivity results in low income. Therefore, low income leads to a high number of poor people.

The higher the number and percentage of poor people in the province, the higher the burden of development. Therefore, the development of the province will be successful if the number and percentage of poor people in the province will be less. For this reason, the government has made various programs to alleviate poverty, but in the meantime, the alleviation of poverty has not yet reached the ideal level and has not been following the law. The complexity of the problem of poverty is due to the number of factors that influence the creation of poverty. As a multidimensional problem, poverty is related to various aspects of the lives of poor people, so efforts to solve the problem of poverty are not easy.

THEORETICAL REVIEW

Poverty

Poverty is powerlessness, marginalization, and lack of freedom (Arsyad, 2017). Besides being a problem that arises in society, poverty is also related to ownership of production factors, productivity, and the level of development of the community itself, as well as related to the national development policies implemented. In other words, this poverty problem can not only be caused by natural or cultural things, poverty can also be caused by poor development strategies and policies.

According to the Central Bureau of Statistics, there are several indicators in measuring poverty, including (a) Head Count Index (HCI - P0) is the percentage of the population that is below the poverty line (GK). (b) The Poverty Depth Index (Poverty Gap Index P1) is a measure of the average expenditure gap of each poor person against the poverty line. The higher the index value, the further the average expenditure of the population is from the poverty line. (c) The Poverty Severity Index P2 is a description of the distribution of expenditure among the poor. The higher the index value, the higher the expenditure inequality among the poor (Suprayitno, 2018).

Growth Economy

Economic growth can be defined as activity in the economy that causes an increase in the goods and services produced in society. The problem of economic growth can be viewed as a long-term macroeconomic problem. Over time a country's ability to produce goods and services increases.

Economic growth is the process by which output per capita increases over the long term. Economic growth is an indicator of successful development and a necessary prerequisite for reducing unemployment. A sufficient requirement is that economic growth effectively reduces the unemployment rate. (Rahayu et al., 2018).

The relationship between economic growth and poverty is complex and controversial. In general, economic growth is a prerequisite for poverty alleviation. But that is not enough, several researchers have tried to analyze the relationship between economic growth and poverty, which is methodologically grouped into two groups. The first group focuses on the general relationship between poverty, income growth and income distribution, which are microeconomic indicators, while the second group focuses on the elasticity of poverty relative to GDP, which are microeconomic indicators. In this hall, economic structure is an important element that determines the effect of economic growth on poverty (Alzmi, 2019).

Unemployment

Unemployment is a situation in which a person who is included in the labor force wants to get a job, but has not yet got it. The problem of unemployment is closely related to the level of output. The main factor that causes unemployment is a decrease in the aggregate level. The decrease in demand for goods and services means a decrease in the desire of companies to produce goods and services. This decline in production forces the company to reduce production costs, especially the reduction of labor because paying wages is the most that the company bears (Telisal, 2019).

There is a very close link between high unemployment and poverty. The majority of people who do not have a permanent job or only have a part-time job are always very poor. Factors affecting the expansion of employment opportunities include: Population and labor force trends, economic growth and measures to expand employment opportunities themselves. Along with natural resources, capital and technology, labor is one of the most important factors of production. As a development factor, employment plays a very important role in development. Employment problems are very real and environmental problems, even employment problems can cause new problems both in the economic and non-economic

fields. High unemployment leads to low income, which in turn leads to high unemployment which leads to low income, which in turn triggers poverty (Probosiw, 2016).

Human Development Index (HDI)

The Human Development Index (HDI) is an indicator that explains how people in an area can access development results through their rights to livelihoods, health, education, and others (Alzmi, 2019).

The Human Development Index (HDI) measures the achievement of human development based on several basic components of quality of life. As a measure of quality of life, the HDI is constructed using a basic three-dimensional approach. These dimensions include longevity and healthy living; knowledge and decent living. The three dimensions have a very broad meaning because they are related to many factors.

These three dimensions have a very broad understanding because they are related to many factors. In its first report, the United Nations Development Program measured the health dimension by using life expectancy at birth. Furthermore, to measure the dimension of knowledge, literacy rates are used. As for measuring the dimensions of a decent standard of living, the indicator of Gross Domestic Product (GDP) per capita is used (Damanik et al, 2022)

RESEARCH METHODS

Types, Data Sources, and Data Analysis Methods

The data used in this study are secondary data on economic growth, open unemployment rate, human development index, and the number of poor people for the period 2012-2021. The data is obtained from the Central Statistics Agency (BPS) both at the provincial and national levels.

This analysis method includes panel data regression analysis and statistical tests. The basic model developed in this study is as follows:

$$JPM_{it} = \beta_0 + \beta_1 PE_{it} + \beta_2 TPT_{it} + \beta_3 IPM_{it} + \mu_{it}$$

Description:

JPM	: Number of Poor Population	β_0	: Intercept
PE	: Economic Growth	$\beta_1, \beta_2, \beta_3$: Coefficient of Regression
TPT	: Open Unemployment Rate	i	: Cross section
IPM	: Human Development Index (HDI)	t	: Time series
		μ	: Error term

Operational Definitions

1. Economic Growth

Economic growth is the development of activities in the economy that causes the goods and services produced in society to increase and the prosperity of society increases. Economic growth data of the provinces in Sumatra Island in 2012-2021 (in percent).

2. The open unemployment rate (TPT)

The open unemployment rate (TPT) is for those who do not have a job and are looking for work. Those who do not have a job and are preparing a business. Those who do not have a job and are not looking for work, because they feel it is impossible to get a job. The data used in the study is the open unemployment rate of each province in Sumatra Island 2012-2021 (in percent).

3. The Human Development Index (HDI)

The human development index (HDI) is a measure of human development achievements based on a number of basic components of quality of life. As a measure of quality of life, the HDI is constructed through a three-dimensional approach. These dimensions include a long and healthy life; knowledge, and a decent life. This study uses HDI data in the new method from each province in Sumatra Island in 2012-2021 (in percent).

4. The Number of Poor Population

The Number of Poor Population is a population that has an average monthly per capita expenditure below the poverty line. The poverty data used in this study is the data on the number of poor people in each province on the island of Sumatra from 2012 to 2021 (in percent).

Analysis of Panel Data

Panel data is a combination of cross-sectional and time series. If each cross-sectional unit has the same number of time series observations, then such panel data is called a balanced panel. Otherwise, it is called an unbalanced panel. In this study, the number of cross-section data (provinces) or $N = 10$ while the number of time series data (years) or $T = 10$, so it can be said that the panel data is balanced (balanced panel) (Hill, et.al. 2012).

Several methods can be used to estimate regression models with panel data, namely: Common Effect, Fixed Effect, and Random Effect models. The following is an explanation of the three models (Widarjono, 2013):

- a. Common Effect Model, This model is the simplest regression technique for estimating panel data, by simply combining time series and cross-section data. This model only

combines the data without looking at differences between time and individuals, so it can be said that this model is the same as the Ordinary Least Square (OLS) method because it uses ordinary least squares. In this model, it is only assumed that the behavior of data between spaces is the same in various periods.

- b. Fixed Effect Model, The assumption used in the fixed effect regression model is that the intercept is different between individuals while the slope is fixed between individuals. The Fixed Effect model technique is a technique for estimating panel data using dummy variables to capture intercept differences. This estimation method is often called Least Square Dummy Variables (LSDV).
- c. Random Effect Model, The inclusion of dummy variables in the fixed effect model aims to represent the ignorance of the actual model. However, this also brings the consequence of reduced degrees of freedom which in turn reduces the efficiency of the estimated parameters. This problem can be overcome by using nuisance variables (error terms) known as the random effect method. In this case, the disturbance variables are different between individuals but fixed between times. Therefore, the random effect model is also often called the Error Component Model (ECM).

Model Specification Test

The analysis used in this study uses panel data analysis consisting of common effect models, fixed effect models, and random effect models. To choose one of the estimation models that is considered the most appropriate of the three types of models, it is necessary to conduct a model specification test, namely the Chow Test, and the Hausman Test.

Chow Test

This test is conducted to select the best estimation model between the common effect model and the fixed effect model. The hypothesis of the Chow test is as follows:

Ho : model common effect

Ha : model fixed effect

The basis for rejecting the null hypothesis is to use the F-statistic test. The decision to reject or accept H is as follows:

- a. If the F-count > F-table, it means Ho is rejected and the model used is a fixed effect model.
- b. If the F-count value < F-table, then it means Ho is accepted and the model used is the common effect model

Hausman Test

This test is conducted as a basis for consideration in choosing one of the best panel analysis models between the fixed effect and random effect models. The steps for the Hausman Test are as follows:

- a. Regress each estimation model for fixed effect and random effect.
- b. Formulate the null hypothesis (Ho) and alternative hypothesis (Ha) as follows:
 - Ho: random effect model
 - Ha: fixed effect model
- c. Determine the critical limit to reject or not reject the hypothesis.
- d. The decision to reject or accept Ho is as follows:
 - If the calculated chi-square value > the table chi-square value, then Ho is rejected or Ha is accepted.
 - If the calculated chi-square value < the table chi-square value, then Ho is accepted or rejects Ha.

RESULTS AND DISCUSSION

Selection of the Best Model

Selection of the best regression model suitable for the data used by conducting the Chow test and Hausman test. The Chow test is conducted to see which model is more appropriate, the common effect model or the fixed effect model. The following are the results of the Chow test:

Table 2: Chow Test Results

Effects Test	Statistic	d.f.	Prob.
Cross-section F	782.913588	(9,87)	0.0000
Cross-section Chi-square	440.661023	9	0.0000

Source: Results of data processing with Eviews 9.

Based on the Chow test results, the cross-section F prob value is 0.0000 and the chi-square value is 0.0000. These results indicate that the prob value. <0.05 which means H0 is rejected, then H1 is accepted which means that the fixed effect model is better than the common effect model.

The Hausman test is carried out to see which method is more appropriate the fixed effect model or the random effect model. The following are the results of the Hausman test:

Table 3. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.848486	3	0.4156

Source: Results of data processing with Eviews 9.

Based on the results of the Hausman test, the prob. value of 0.4156 is obtained, this means that the prob. value is 0.05. > 0.05 which indicates that H0 is accepted. This explains that regression with a random effect model is better than regression using a fixed effect model. So in this study the panel data regression method used is the Random Effect Model.

The following are the results of datal panel regression using the random effect model.

Table 4. Panel Data Regression Results from Random Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	32.47076	3.070388	10.57546	0.0000
X1	0.041616	0.028143	1.478744	0.1425
X2	0.184447	0.053708	3.434287	0.0009
X3	-0.332269	0.036649	-9.066330	0.0000
R-squared	0.670400			
Prob(F-statistic)	0.000000			

Source: Results of data processing with Eviews 9.

Equation of panel data regression results with random effect method:

$$\text{JPM} = 32,47076 + 0,041616 \text{ PE} + 0,184447 \text{ TPT} - 0,332269 \text{ IPM}$$

The panel data regression results using the random effect test show a constant value of 32.47076, this value means that if all independent variables (economic growth, open unemployment rate, human development index) are equal to zero or considered constant or unchanged (*ceteris paribus*) then the number of poor people on the island of Sumatra is 32.47076 people.

The coefficient of determination obtained using the random effect test is 0.670400, this shows that the model can explain the relationship between the variables of economic growth, open unemployment rate, and human development index to the open unemployment rate on the island of Sumatra by 67% while the remaining 33% is explained by other variables that are not included in the model.

The Effect of Economic Growth on the Number of Poor People in Pulalu Sumatra

Based on the results of the tests that have been carried out, it show that the effect of economic growth on the number of poor people in 10 provinces on the island of Sumatra has

a positive and insignificant effect. With a probability value of economic growth of $0.1425 > 0.05$ and a coefficient value of 0.041616 . This indicates that if economic growth increases by 1%, the number of poor people will increase by 0.041616 .

The results of this study were not by the hypothesis proposed at the beginning, namely that economic growth has a significant and negative effect on the number of poor people or what is also known as the trickle-down effect theory, which means that economic progress characterized by the rate of economic growth will itself trickle down to create jobs and create an equitable distribution of economic results. In this case, the implication is that economic growth will be felt by the rich first, then trickle down to the poor who occur by themselves.

Thus, the results of this study indicate an indirect effect of economic growth in reducing the number of poor people. Economic growth must be able to encourage employment growth. With a pro-growth, pro-job, pro-poor strategy. This strategy is to minimize income inequality between the rich and the poor, which is caused by economic growth. Do not let economic growth only be enjoyed by the rich, and only revolve among them.

The results of this study are the same as Mahendra's research which states that the economic growth variable has no real (significant) effect on the variable number of poor people in North Sumatra. And also this research is reinforced by previous researchers with a broader research object, namely Ari dan Sulia who examined the effect of economic growth on poverty in Indonesia which states that economic growth has no significant effect on reducing poverty levels due to a probability value of 0.23 which exceeds the 5% probability level. However, this research is not the same as the researcher Dita Sekar Ayu who stated that there is a negative influence on the significance of economic growth with the number of poor people in East Jalwal Province.

The Effect of Open Unemployment Rate on the Number of Poor People in Sumatera Island

One of the problems faced by developing countries including Indonesia is the problem of unemployment. Unemployment is one of the macroeconomic problems that hampers regional development because it will cause other social problems (Yehosual, et al, 2019).

The number of unemployed people if it lasts for a long time will have an impact that will further worsen the economic conditions. Where the state of poverty caused by unemployment causes many problems such as criminal behavior and so on. Insufficient employment conditions and the lack of motivation for someone to do business and open their

own jobs through their own business or what is called entrepreneurship result in unemployment. When viewed from the results of research that has been conducted related to the effect of the open unemployment rate on the number of poor people in 10 provinces on the island of Sumatra is the coefficient value of 0.184447 with a prob. value of (0.0009 <0.05) which states that the variable open unemployment rate has a significant effect on the number of poor people in 10 provinces on the island of Sumatra. That is, if the value of unemployment increases by 1%, it will increase the number of poor people by about 0.184447, so the greater the unemployment rate, the greater the number of poor people on the island of Sumatra. The results of this study are in line with Dina Sekar Ayu's research entitled "Analysis of the Effect of Gross Regional Domestic Product, Open Unemployment Rate, HDI, Population and Minimum Wage on Poverty in East Jawa Province", with the results showing that the open unemployment rate has a significant effect on the number of poor people in East Jawa Province.

The results of this study are not by the theory of previous research which is the basis of the research, where the results of Emal, et al's research show that the open unemployment rate has a positive and insignificant effect on the poverty rate in East Java Province. The results of Reki, et al's research showed that the variable open unemployment rate individually had no significant effect on the poverty rate in Jambi Province. The results of this regression analysis are by Todaro's theory, which states that one of the main mechanisms to reduce poverty is to overcome labor and unemployment problems. In this theory, it is stated that a high level of open unemployment will affect the poverty rate, which means that a high level of open unemployment will encourage an increase in poverty.

The Effect of the Human Development Index on the Number of Poor People in Sumatra Island

The results of the research that has been conducted related to the influence of the human development index on the number of poor people in 10 provinces on the island of Sumatra are as follows: Based on the results of hypothesis testing that has been carried out, it shows that the effect of the human development index on the number of poor people has a negative and significant effect. With a probability value of 0.0000 <0.05 and a coefficient value of -0.332269. This shows that if the human development index increases by 1% then the number of poor people will decrease by 0.332269. The reduction in the number of poor people due to an increase in HDI states that HDI can obtain decent work and increase human labor productivity, which will increase income to meet the needs of a decent life.

CONCLUSION

Based on the results of data analysis and the findings obtained, it can be concluded that: Partially, economic growth has an effect and is not significant on the number of poor people on the island of Sumatra; the open unemployment rate has an effect and is significant on the number of poor people on the island of Sumatra; the Human Development Index does not affect the number of poor people on the island of Sumatra. Simultaneously, economic growth, open unemployment rate, and human development index have a significant effect on the number of poor people on the island of Sumatra. The coefficient of determination (R^2) is 0.670400, which means that 67.04% of the variable number of poor people can be explained by the variables of Economic Growth, Open Unemployment Rate, and Human Development Index, while the remaining 32.96% is influenced by other variables outside this regression equation or variables not examined.

The recommendation that can be given in this study is that the Government immediately evaluates these problems pays attention to the population above the poverty line and immediately provides the right solution so that the increase in economic growth can have an impact on reducing the number of poor people on the island of Sumatra. And it is hoped that the Government will provide assistance in providing capital or investment in each economic sector and must pay attention to the development of the people who receive this assistance, the Government of each province on the island of Sumatra is able to move the informal sector, because unemployment in this study uses open unemployment data which consists of groups of people looking for work, have got a job but have not started to work or prepare a business so that it can be called unemployment.

The government is also expected to be able to foster a competitive (competitive) and cooperative (cooperative) attitude between provinces so that each province can compete and be more creative in managing the resources available in each region, and establish good cooperation relations between provinces, and the Government gives incentive attention to the lower group of people (who are classified as poor) in the fields of education and health for the provision of expertise and skills that can support labor productivity to increase per capita income personally and at the same time encourage economic growth.

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