



Determining Factors of Poverty in East Java Province, Indonesia

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

This study aims to examine and explain the effect of GRDP, Regional Minimum Wage, Open Unemployment Rate and Average length of schooling on the number of poor people in East Java Province. The analytical method used in this study is the panel data regression method using samples in 17 districts from 2017 to 2021. The results show that the Gross Regional Domestic Product and District Minimum Wage have a negative and significant effect on the Poverty Rate in East Java Province, while the Unemployment Rate Being open and the average length of schooling have a positive and significant impact on the number of poor people.

Keywords: Panel data; poverty rate; fixed effect model; gross regional domestic product.

1. INTRODUCTION

Poverty is an important indicator for measuring development in a country, including in developing countries such as Indonesia. Indonesia is a country that has the largest population, so it

continues to increase every year. Indonesia enters the 4th position in terms of the largest population with a total of 276.39 million people. Indonesia which is a developing country. Almost a small part of developing countries whose people enjoy the fruits of development, and much

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of the population belongs to the population group with the poverty line category.

According to Todaro & Smith [1] poverty can be distinguished based on its nature, namely absolute poverty, and relative poverty. Absolute poverty is poverty as seen from the number of people living below the minimum level of income needed to meet basic needs such as food, clothing, and shelter. People who are unable to meet their basic needs are called poor people. Relative Poverty is an unequal distribution of income resulting in a gap, even though a person's income can meet his basic needs, but the amount of income is still below the average income of the surrounding community, so that person is also said to be poor.

The number of poor people in Indonesia before the pandemic or in March 2019 according to the Indonesian Central Statistics Agency (BPS) was 25.14 million people or 9.41%. The number of poor people increased entering the first year of the pandemic and reached its peak in March 2021 as many as 27.54 million people or 10.14% of the total population. Fig. 1 shows the number of poor people in 2021 in Indonesia. The largest number of poor people is in East Java with a total poor population of 4.572 million people, followed by the provinces of West Java and Central Java, while the lowest number of poor people are in the provinces of North Kalimantan, Bangka Belitung Islands and North.

Limited job opportunities and lack of capital to start a business will exacerbate poverty, because

employment will determine one's income. Furthermore, the condition of a remote area will result in education, health and others not being able to get good services and resulting in low human resources. The above problems are very interesting for conducting studies on the factors driving the poor population in East Java, Indonesia.

2. PREVIOUS RESEARCH

Poverty is a situation where an individual or a household has difficulty meeting basic needs. This condition is not necessarily the result of being lazy to work, there are socio-economic factors behind this situation [2,3]. In 2021, the Indonesian Central Bureau of Statistics stated that the poor population in Indonesia reached 27.55 million people. This figure continues to increase every time. In 2020 alone, there was an increase in the number of poor people by 1.13 million just from March to September.

Quoting from the Ministry of Education and Culture, poverty is also a global problem. Poverty is a wider social barrier. When poverty begins to increase, poverty becomes a social problem because poverty will encourage individuals or groups to commit crimes. Poverty is also a social problem when social stratification creates levels and boundaries in society. As a result, there are deviations and limitations in interaction and communication between people at the top and bottom levels.

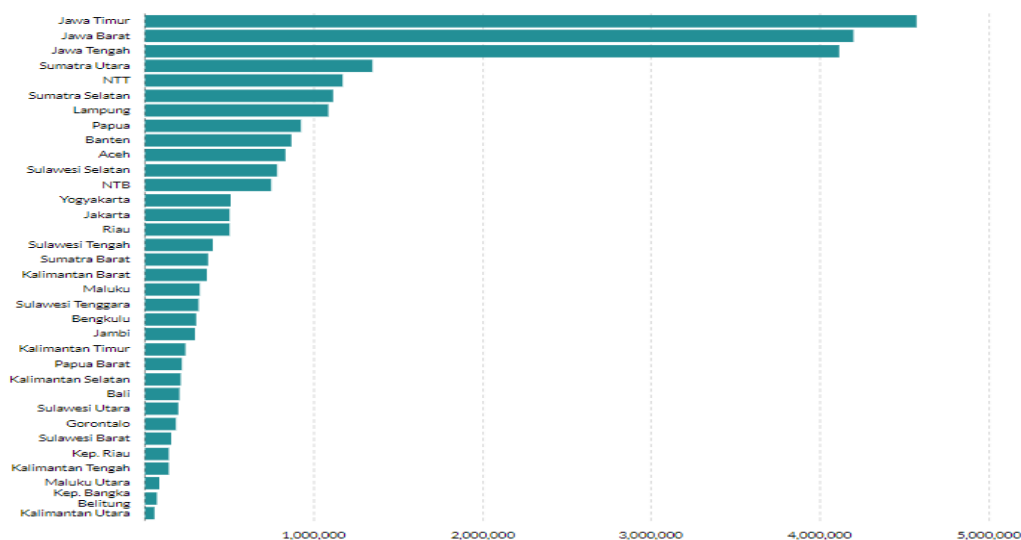


Fig. 1. Total Poor Population in Indonesia in 2021 (000 people)

Source: Badan Pusat Statistik Tahun 2021

Research conducted by Ebunoluwa & Yusuf [4]. states that the results of the study show that government expenditure in Nigeria is positively related to the occurrence of errors. This shows that the poor do not benefit from the economy, especially from total government spending. Meanwhile, research conducted by de Haan, et al. [5] shows that “financial development does not have a direct effect on the depletion of ruins. However, because financial development leads to greater inequality, which in turn results in more poverty, financial development has an indirect effect on poverty”. Another study conducted by Suryahadi, et al. [6] shows that “agricultural growth in rural areas still plays a major role in reducing poverty, policies that enable strong growth in the service sector both in urban and rural areas will accelerate poverty reduction”.

Research conducted by Leonita, et al. [7] shows that GRDP, the human development index, and unemployment simultaneously affect poverty. Meanwhile, research conducted by Widyawati, [8] shows that education and GRDP have a negative effect on the number of poor people, while district/city minimum wages have no effect on the number of poor people.

Research conducted by Fitriyadi, et al. [9] shows that education has no negative effect on the poor. Unemployment, minimum wages, and GRDP have a negative effect on the poor. Another study conducted by Giovani, [10] shows that unemployment and education levels have no effect on poverty, while GRDP influences poverty.

According to Mandey, et al. [11] “the results of the study show that GRDP and HDI have a negative effect on poverty, while length of schooling has a positive effect on poverty”. Other research according to Pradipta, et al. [12] shows that “school length has no effect on poverty, open unemployment has a positive effect on poverty in Banten Province”.

Research conducted by Lusia AP et al. [13] shows that economic growth and minimum wages have a negative effect on the poor, while open unemployment has no effect on poverty in Kulon Progo Regency. Meanwhile, research conducted by Hidayatullah et al. [14] shows that “regional gross domestic product and the human development index have a negative effect on poverty, while the minimum wage has a positive effect on poverty”.

Research conducted by Ayu, [15] shows that “GRDP, open unemployment rate, HDI, and population have a negative effect, while the District Minimum Wage has a positive effect on the poor”. Meanwhile, research conducted by Fajriah, [16] shows that “GRDP, population, open unemployment rate and HDI influence poverty, while regional minimum wages have no effect on poverty”. Another study conducted by Feriyanto et al. [17] shows that “unemployment, regional minimum wages have a positive effect on poverty, while GRDP has a negative effect on poverty in Indonesia”.

From this background and previous research, the authors are interested in examining the factors that affect the poor in East Java from 2017-2021 in 17 districts.

3. MATERIALS AND METHODS

This study aims to analyze the effect of Gross Regional Domestic Product, District Minimum Wage, Open Unemployment Rate, and Average Years of Schooling on Poverty Rates in East Java Province in 2017-2021 (Case Study in 17 Regencies in East Java). The panel data method is a research method that can be used to perform empirical analysis with dynamic data behavior. Panel data is a combination of time series (time series data) and cross-section (cross data). The advantage gained by using panel data in a study is that it produces a large degree of freedom because it can provide broader or more data and problems that arise when omitted variables occur can be resolved with panel data.

This study uses a panel data model that is used to test estimates of the influence of Gross Regional Domestic Product, District Minimum Wage, Open Unemployment Rate, Average Length of School on Poverty Levels. By using the Fixed Effect method with GLS (General Least Square) estimation and Random Effect or both which can give the same results before the proper estimation model is carried out. From the variables that will be carried out in this study, the model is arranged as follows:

$$Pov = f (GRDP, UMK, TPT, RLS) \quad (1)$$

$$Pov_{it} = a + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + e_{it} \quad (2)$$

Information:

Pov : Poverty
a : Constant

- β : Coefficient
- GRDP₁ : Gross Regional Domestic Product
- UMK₂ : District Minimum Wage
- TPT₃ : Open Unemployment Rate
- RLS₄ : Average Years of Schooling
- i : Individual District
- t : Time period (2017-2021)

4. RESULTS AND DISCUSSION

This study analyzes the influence of gross regional domestic product (GDP), district minimum wage, open unemployment rate, and average length of schooling in 17 districts of East Java province. The tool used for analysis is panel data with the Fixed Effect Model analysis model and completed using statistics, namely the E-views 10 application. The results of processing the data presented in this chapter are the best estimation results because they can meet the characteristics of economic theory in statistics and econometrics.

The heteroscedasticity test is a test with the aim of seeing in this regression model whether there is dissimilarity between the residuals of one observation and the other residuals. Problems that can arise in the heteroscedasticity test are the cross section variations that have been used. The test used in this study is the Glejser test. In the Glejser Test if the probability values of all

independent variables must be insignificant at the 5% level. A variable is said to be affected by heteroscedasticity if the probability value is greater than (>) 0.05. Following are the results of the heteroscedasticity test with the Glejser test:

In Table 1 it is stated that the probability value of each independent variable is greater than > 0.05, this indicates that the data does not experience heteroscedasticity. It can be concluded that the research data is free from heteroscedasticity problems.

Multicollinearity test that is when there is a linear relationship between the independent variables will be known as multicollinearity. All independent variable correlation matrix values must be less than 0.9 to check whether multicollinearity occurs. So the multicollinearity test uses the following matrix:

In Table 2 that there are no problems in the multicollinearity test. This is because the value of the correlation matrix for all independent variables is less than <0.9. The normality test of the regression analysis aims to determine whether the confounding factors in the analyzed data are normally distributed. The Jarque-Bera test statistic with the E-Views program was used in this investigation. The following are the results of the normality test as follows:

Table 1: Glejser Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.602962	0.547333	-1.101638	0.2747
LOG(PDRB)	0.066257	0.064158	1.032708	0.3056
LOG(UMK)	-0.010273	0.036669	-0.280150	0.7803
LOG(TPT)	0.000637	0.011130	0.057187	0.9546
LOG(RLS)	0.071521	0.102398	0.698461	0.4874

Source: Data Analysis 2023

Table 2: Multicollinierity Test

	LOG(PDRB)	LOG(UMK)	LOG(TPT)	LOG(RLS)
LOG(PDRB)	1.000000	0.682424	0.428812	0.441185
LOG(UMK)	0.682424	1.000000	0.591398	0.452773
LOG(TPT)	0.428812	0.591398	1.000000	0.312175
LOG(RLS)	0.441185	0.452773	0.312175	1.000000

Source: Data Analysis 2023

Table 3: Chow Test

Effect Test	Statistic	d	Prob.
Cross-section F	138.749689	(16.64)	0.0000

Source: Data analysis 2023

Table 4: Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. DF	Prob.
Cross Section Random	22.233294	4	0.0002

Source: Data Analysis 2023

Table 5: Regression Result

Variable Dependent (Pov): Poverty	Common Effect	Fixed Effect	Random Effect
Constant	0.682378	14.055880	5.376524
Standart Error	0.813784	1.176053	2.082954
Probobalitiv	0.4042	0.0000***	0.0117**
GDRP	0.144907	-0.731887	0.167582
Standart Error	0.030490	0.131583	0.117424
Probobalitiv	0.0000***	0.0000***	0.1574
Upah Minimum Kabupaten	0.48258	-0.198143	-0.044181
Standart Error	0.068384	0.074054	0.166292
Probobalitiv	0.0000***	0.0095***	0.7912
TPT	0.262519	0.056017	0.230773
Standart Error	0.030115	0.025069	0.063081
Probobalitiv	0.0000***	0.0290**	0.0005***
RLS	-1.568414	0.453079	-1.134366
Standart Error	0.077383	0.194195	0.296057
Probobalitiv	0.0000***	0.0228**	0.0003***
R²	0.854887	0.992805	0.210605
F-Statistik	117.8232	441.5345	5.335843
Probobalitas	0.000000***	0.000000***	0.000735***
Durbin-Watson Stat	0.743132	1.847875	2.028790

Source: Data Analysis 2023

Table 6: T-Statistic Result

Variable	T-statistic	Coefficient Regression	Prob.
LOG(PDRB)	-5.562186	-0.731887	0.0000
LOG(UMK)	-2.675657	-0.198143	0.0095
LOG(TPT)	2.234459	0.056017	0.0290
LOG(RLS)	2.333113	0.453079	0.0558

Source: Data Analysis 2023

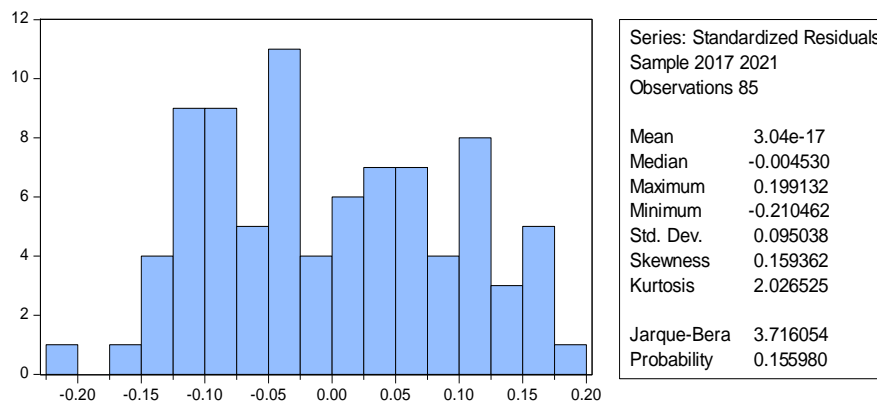


Fig. 2. Normality test

In Fig. 2, the calculated Jarque-Bera value is 3.716054 and the probability value is 0.156980. It is concluded that the probability value is greater than the significant level (0.156980 > 0.05), so it is said that the data is normally distributed.

“In the analysis of panel data models, there are three kinds of approaches [18] that will be used, namely the least squares approach (Common Effect), fixed effect approach (Fixed Effect), and random effect approach (Random Effect)”.

To determine the model to be carried out, the steps taken using the Fixed Effect are carried out in the chow test. If the results of the Chow test have significant F-statistic values, then the Hausman test will be continued to determine whether to use the Fixed Effect model or the Random Effect model. If the Hausman Test results are less than alpha, then the results will be significant, so that the Fixed Effect method can be used. However, if the Hausman Test results with a probability of more than alpha, then the Random Effect method can be used.

The chow test was conducted to determine whether the correct Fixed Effect or Common Effect is used in this model.

H0 = Common Effect
H1 = Fixed Effects

If the probability results are less than 0.05 then H0 is rejected, then the model that should be used is the Fixed Effect. However, if the result H0 is accepted, the Common Effect model is the best choice.

Based on Table 3, it is known that the Cross-section F value has a probability value of 0.0000. This shows less than 0.05, statistically it is stated that H1 is accepted and H0 is rejected, so that in the Chow Test the best model to choose is the Fixed Effect Model (FEM). Then data testing can be continued with the Hausman test.

The Hausman test is a test for selecting the estimation model to be used between Fixed Effects and Random Effects by testing the hypothesis:

H0 = Random Effects
H1 = Fixed Effects

If the probability of Period-F > 0.05 then H0 is accepted and H1 is rejected. Which means the best model to be used is the Random Effect model. However, if the probability of Period-F < 0.05 on the Hausman test then H0 is rejected and H1 is accepted, meaning that the best model used is Random Effect.

Based on the results of the Cross Section random probability value of 0.0002, which means

less than 0.05, statistically H0 is rejected and H1 is accepted so that it can be concluded in the Hausman test, the selected model or the Fixed Effect model is used.

In this study, the best model for the analysis test can be explained in the following table:

Based on the specification test in Table 5, the analysis that has been carried out is using the Likelihood Test and the Hausman Test. Both tests suggest using the Fixed Effect Model. To determine the best model, it can be seen in terms of probability and its R-square. Then the results of the comparison of the best selection test are used to estimate the Analysis of the Effect of Gross Regional Domestic Product (GDP), District Minimum Wage, Open Unemployment Rate, and Average Years of Schooling on the Poverty Rate of East Java Province in 2017-2021 (Case Study in 17 Districts in East Java) namely Fixed Effect. The reason is because a good model to use is the Fixed Effect which has the probability of the independent variable having significant results compared to the Random Effect Model and the Common Effect Model. Because the determinant coefficient (R-Square) is 0.992805 which is greater than the results of the other two model estimates. From the two analyzes that have been carried out using the likelihood and hausman tests, it can be said that they use the same model. In the first test using the chow test with the results of the model suggesting using the Fixed Effect Model. The best test can be seen through the probability value and R-Square.

Next is the estimation result from the Fixed Effect model to look at the independent variables of GRDP, the open unemployment rate, capital expenditures, and the human development index as well as for the poverty rate as the dependent variable. Based on the tests that have been carried out with the Chow test and Hausman test, it is suggested to use the Fixed Effect Model. Then the results of the estimation of the equation are as follows:

The Effect of Gross Regional Domestic Product on Poverty Levels in 17 East Java Districts. Based on the results of the analysis that the Gross Regional Domestic Product variable has a regression coefficient value of -0.731887 with a probability of 0.0000, which means it is significant at $\alpha = 5\%$. So, this if the Gross Regional Domestic Product increases by 1% it will result in poverty decreasing by 0.731887.

The Effect of District Minimum Wage on Poverty Levels in 17 East Java Districts. Based on the results of the analysis, the District Minimum Wage variable has a regression coefficient of -0.198143 with a probability of 0.0095, which means it is significant at $\alpha = 5\%$. So, this if the District Minimum Wage increases by 1% it will result in poverty decreasing by 0.19814.

Effect of Open Unemployment Rate on Poverty Rate in 17 East Java Regencies. Based on the results of the analysis, the Open Unemployment Rate variable has a regression coefficient value of 0.056017 with a probability of 0.0290, which means it is significant at $\alpha = 5\%$. So, if the Open Unemployment Rate increases by 1%, it will result in an increase in poverty by 0.056017.

Effect of Average Length of School on Poverty Levels in 17 East Java Districts. Based on the results of the analysis that the average length of schooling variable has a regression coefficient value of 0.453079 with a probability of 0.0558, which means it is significant at $\alpha = 10\%$. So, if the average length of schooling increases by 1%, it will result in an increase in poverty by 0.453079.

From the results of the research conducted, an analysis and discussion can be made about the influence of the independent variables (Gross Regional Domestic Product, District Minimum Wage, Open Unemployment Rate, and Average Years of Schooling) on the dependent variable (Unemployment Rate) in 17 Districts of East Java Province, with an explanation of the interpretation as follows:

Based on the research results, it can be concluded that the Gross Regional Domestic Product (GRDP) variable has a negative and significant effect on the poverty rate with a coefficient value of -0.731887, so if there is an increase in GRDP by 1%, the poverty rate will decrease by 0.731887 percent in East Java. This research is in line with research that has been conducted by Giovani, [10] who examined the Analysis of the Effects of Gross Regional Domestic Product, Unemployment and Education on Poverty Levels in Java Island in 2009-2016. The results obtained in this study are that Gross Regional Domestic Product has a negative and significant effect on poverty in Java in the 2009-2016 period. This states that gross regional domestic product is one indicator of the success

of a development to reduce poverty. This means that if the GRDP of each region increases, it will create an increase in people's income thereby reducing poverty and creating community welfare. Based on the research results, it can be concluded that the District Minimum Wage variable has a negative and significant effect on poverty with a coefficient value of -0.198143, so if there is an increase in the District Minimum Wage by 1%, the poverty rate will decrease by 0.198143 percent in East Java. This research is in line with research that has been conducted by Fitriyadi et al. [9] which examined the Analysis of Factors Affecting Poverty (Case Study of 35 Regencies/Cities in Central Java in 2011-2014). The results obtained in this study are that the District/City Minimum Wage has a negative and significant effect on poverty. This is said if the minimum wage increases in an area, then the income will increase so that people can obtain welfare and be free from poverty.

Based on the research results, it can be concluded that the Open Unemployment Rate variable has a positive and significant effect on poverty with a coefficient value of 0.056017, so if there is an increase in the Open Unemployment Rate of 1%, the poverty rate will increase by 0.056017 percent in East Java. This research is in line with research that has been conducted by Pradipta et al. [12] which examined the Effect of Average Length of School and Open Unemployment on Poverty. The results obtained in this study are that the Open Unemployment Rate has a positive and significant effect on poverty. This is a problem because unemployment is closely related to poverty, if many people are unemployed in an area, it causes lower income, meaning that low income causes people's purchasing power to decrease and has an impact on decreasing people's welfare, so there is an increase in poverty, and someone will continue to be trapped in poverty.

5. CONCLUSION

Thinking about poverty changes over time but is basically related to the inability to meet basic needs [19]. Poverty shows a situation of deprivation that occurs not because the poor person wants it, but because it cannot be avoided with the power they have. The results of this study conclude that the Gross Regional Domestic Product (GRDP) and Regional Minimum Wage have a negative and significant effect on poverty levels in East Java. While

Unemployment and Years of Schooling have a positive influence on increasing the number of poor people. The poverty alleviation strategy can adopt the strategy proposed by the World Bank, namely through creating jobs, increasing income, developing health and education (Increasing HDI), and protecting up to empowering the poor [20].

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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