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Analysis of The Influence of The Unemployment Rate and HDI on Poverty Levels in Province of Central Java

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Abstract

The high level of poverty in Central Java shows that the process of economic development has not been able to increase people's welfare evenly. Thus, an analysis is needed to determine the factors that influence poverty in the context of overcoming poverty. The aim of this research is to analyze the Unemployment Rate, Human Development Index (HDI) on poverty in 35 Regencies/Cities in Central Java Province from 2016 to 2020. This research uses secondary data with *cross-section* data consisting of 35 Regencies/Cities in the Province Central Java and time-series data, namely 2016-2020. The analytical tool used to estimate the panel data regression model is *the Fixed Effect Model (FEM)* or also called *Least Square Dummy Variable* . The results showed that the HDI variable had a negative and significant effect on the poverty level. Meanwhile, the Open Unemployment Rate has a positive and significant effect on the Poverty Level. Based on the research results, the government is advised to coordinate with related agencies in formulating policies to improve the quality of education and optimize health services.

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INTRODUCTION

Nurkse (2006) explains two circles of the poverty trap in terms of *supply* and *demand* . The supply side explains that the low income level of the community due to low productivity levels causes the ability of the community to save to be low. The low ability to save people causes a low level of capital formation (investment), resulting in a shortage of capital and thus a low level of productivity. And so on. Meanwhile, from a demand perspective, in poor countries the stimulus to invest is very low due to the limited market area for various types of goods. This is due to the very low income of the people due to their low level of productivity, as a result of the limited level of capital formation in the past. This limited capital formation is due to a lack of stimulation to invest capital.

One of Indonesia's national development goals based on the Preamble to the 1945 Constitution is to promote public welfare. General welfare is a condition of fulfilling the material, spiritual and social needs of the country's population so that they can live properly and be able to develop themselves, so that they can carry out their social and economic functions. General welfare in Indonesia can be described based on the level of poverty. There is a negative relationship between general welfare and poverty levels in Indonesia. The lower the poverty level, the higher the welfare of the population.

The problem of poverty is a complex and multidimensional problem, therefore, efforts to eradicate poverty must be carried out comprehensively, covering various aspects of people's lives, and implemented in an integrated manner (Nasir, 2008) . Efforts to overcome poverty in Java are being implemented through five pillars called the " *Grand Strategy* ". First, expanding employment opportunities, aimed at creating economic, political and social conditions and environments that enable poor people to have the opportunity to fulfill their basic rights and improve their standard of living in a sustainable manner. Second, community empowerment, carried out to accelerate social, political, economic and cultural institutions in society and expand the participation of poor communities in making public policy decisions that guarantee respect, protection and fulfillment of basic rights. Third, capacity building, is carried out to develop the basic abilities and business capabilities of poor communities so they can take advantage of environmental developments. Fourth, social protection, is carried out to provide protection and a sense of security for vulnerable groups and poor people, both men and women, caused by, among other things, natural disasters, the negative impact of the economic crisis and social conflict.

According to Todaro (2013) population growth and labor force growth have traditionally been considered one of the positive factors that spur economic growth. A larger number of workers will increase the level of production. Furthermore, it is said that the positive or negative effects of population growth depend on the ability of the regional economic system to absorb and productively utilize the increase in the workforce.

According to Sukirno (2012) a large population in the development of an area is a fundamental problem. Because uncontrolled population growth can result in not achieving the goals of economic development, namely people's welfare and reducing poverty. Population growth can be a driving and inhibiting factor for development.

Mariyanti and Mahfudz (2016) who conducted research on the relationship between economic growth and poverty, obtained results that there was a causal relationship between economic growth and poverty. On the other hand, Akoum (2008) in his research stated that countries with high economic growth have high poverty rates. Meanwhile, Prasad (1998) argued that no concrete relationship was found between economic growth and poverty.

The quality of human resources can also be a factor causing poverty. The quality of human resources can be seen from the quality of life index/human development index. Low HDI will result in low work productivity of the population. To produce quality people, efforts are needed to improve the quality of human resources. Human quality can be measured through HDI. According to Mulyadi (2003) , improving human quality can be achieved through various policies, namely education development will also pay attention to the direction of economic development in the

future, health development must receive attention by instilling a culture of healthy living and expanding the coverage and quality of health services for the poor. Quality improvement is carried out by providing practical skills.

According to Ginting (2008) human development in Indonesia is synonymous with poverty reduction. Investments in education and health will be more meaningful for poor people than for non-poor people, because the main asset of poor people is manual labor. The availability of cheap education and health facilities will really help to increase people's productivity.

In their research, Hong and Pandey (2007) obtained results that residents with a higher level of education were less likely to become poor. Ele-Ojo Ataguba et al (2013) in their research stated that one of the determinants of reducing poverty levels is education.

research (2010) regarding the effect of the Human Development Index (IPM) on the poverty rate in Indonesia explains that HDI has a negative and significant effect. Saputra's research (2010) regarding the analysis of the effect of population, HDI, unemployment on poverty rates in Central Java districts/cities in 2011 explains that HDI has a negative effect on poverty rates.

The purpose of this study is to analyze how the effect of the unemployment rate and HDI on the poverty rate in Central Java Province (2016-2020).

RESEARCH METHODS

This research uses three variables, consisting of one dependent variable and two independent variables. The poverty level (P) of Central Java is the dependent variable, then the independent variables in this research include the unemployment rate (U), HDI (I) from each region of 34 districts/cities in Central Java Province. The existence of operational definitions serves to clarify and make it easier to understand the use of the variables that will be analyzed in this research.

The operational definition is as follows.

The poverty level (P) is a population whose average monthly per capita expenditure is below the poverty line (BPS, 2013) . The variable used is the percentage of poor people in each district/city in Central Java in 2016-2020 in percentage units (%).

HDI (I) can explain how residents can access development in obtaining income, health and education (BPS, 2016) . HDI is also an important indicator for measuring the level of success in efforts to build the quality of human life. The variable used in this research is the HDI in each district/city in Central Java in 2016-2020 in percent units (%)./city in Central Java in 2016-2020 in percent units (%).

The open unemployment rate (U) is a number that shows the number of unemployed (BPS, 2007) , for 100 residents in the labor force category, which can be calculated as follows:

$$\text{Tingkat Pengangguran} = \frac{\text{Jumlah Pencari Kerja}}{\text{Jumlah Angkatan Kerja}} \text{ X } 100\%$$

What is used in this research is data on the Open Unemployment Rate for each district/city in Central Java for 2016-2020 in percent (%).

This research uses panel data analysis (*pooling data*) which is processed using the Eviews 9 program. Analysis using panel data is a combination of time *series* and *cross section* . In the panel data model, the model equation using *cross-section data* can be written as follows:

$Yi = \beta 0 + \beta 1\ Xi + \mu i\ ;\ i = 1, 2, ..., N$ …….(1)

where N is the number of *cross-section data* .

While the model equation with *time series* is

$Yt = \beta 0 + \beta 1\ Xt + \mu t\ ;\ t = 1, 2, ..., T$ …….(2)

where T is the number of *time series data*

Considering that panel data is a combination of *time series* and *cross-section* , the model can be written as:

$Pit = \alpha 0 + \alpha 1\ Iit + \alpha 2\ Uit + \mu it$ .....(3)

Where Pit is the poverty level, $\alpha 0$ is the intercept, is the regression coefficient of the independent variable, U is the open unemployment rate of districts/cities in Central Java, I is the annual HDI of districts/cities in Central Java, and μ is the error/variable outside the model.

Next, econometric and statistical tests were carried out on the results of the regression analysis with this model.

Classic Assumption Detection

Ordinary Least Squares (OLS) method is a model that seeks to minimize deviations from calculation results (regression) against actual conditions. Compared to other methods, *Ordinary Least Squares* is a simple method that can be used to perform linear regression of a model. As an estimator, *Ordinary Least Squares* is a regression method with the advantage of being the best unbiased linear estimator or commonly known as BLUE (*Best Linear Unbiased Estimator), so that the results of Ordinary Least Squares* calculations can be used as a basis for policy making. However, to be a good and unbiased estimator, there are several classical assumption tests that must be met.

Gujarati (2010) says that the ten assumptions must be met. First, the equation model is linear. Second, the value of the independent variable remains the same even in repeated sampling. Third, the average deviation value is zero. Fourth, homoscedasticity. Fifth, there is no autocorrelation between variables. Sixth, the *covariance value* is equal to zero. Seventh, the number of observations must be greater than the number of parameters estimated. Eighth, the value of the independent variables varies. Ninth, the regression model must have a clear form. Tenth, is the absence of multicollinearity between independent variables. Fulfillment of the ten assumptions above makes the regression results have a high degree of confidence.

Normality Detection

The normality assumption detection is performed to see whether *the error term* follows a normal distribution. If the assumptions are not met then the test procedure using the test becomes invalid. Detection is done by Jarque Bera test or by looking at the plot of the residue. The hypothesis in the detection of normality, namely:

H 0 : *The error term* follows a normal distribution

H 1 : *The error term* does not follow a normal distribution.

Decisions are taken by comparing the probability value of Jarque Bera with a significant level of $\alpha = 0.05$. If the Jarque Bera probability value is more than $\alpha = 0.05$ then it can be concluded that the error term is normally distributed.

Heteroscedasticity Detection

Heteroscedasticity is a condition where the homoscedasticity assumption is not fulfilled. In multiple linear regression, one of the assumptions that must be met so that the parameter estimates in the model are BLUE (*Best, Linear, Unbiased Estimator*) is (μi) = σ2 which has the same variation (homoscedasticity). In other cases where μi is not constant it is called heteroscedasticity. To detect the presence of heteroscedasticity, it can be done using the White Test.

If the Chi-Square statistic is greater than the Chi-Square table, then it can be said that there is an indication of heteroscedasticity. The test was carried out by comparing the White's *Obs*R-squared* test value with the significance level value ($\alpha = 5\%$).

H0: Homoscedasticity

H1 : Heteroscedasticity

If the calculated *Obs*Squared value* is greater than the significance level value ($\alpha = 5\%$), then the regression model is free from symptoms of heteroscedasticity.

Multicollinearity Detection

Multicollinearity means that there is a perfect or definite linear relationship between some or all of the independent variables in the regression model. In the case of serious multicollinearity, the regression coefficients no longer show the pure influence of the independent variables in the model. The method used in the detection of multicollinearity is the Klein method and the Gujarati agreement on the correlation values between variables, namely by comparison between the adjusted R2 (*adjusted* R2) of the regression results between the independent variables. There is a possibility of multi-collinearity if *the Adjusted R* 2 model detects the independent variable higher than the Adjusted R2 of the main model. Another indication that there are symptoms of multicollinearity is by using *correlation matrices* , where if *the correlation matrix* is greater than 0.8, it means that there are symptoms of multicollinearity, and vice versa.

Hausman test

To determine precisely the specifications of the model to be used, whether the model is *a fixed*

effect or *a random effect* , a Hausman test is carried out to test the best model to be used in the estimation. The Hausman test will provide an assessment using *Chi-Square Statistics* so that model selection decisions can be determined correctly. Rejection of the Hausman statistic means rejection of *the fixed effect model* or *dummy variable model* , so that the greater the Hausman statistical value the more it leads to the acceptance of the alleged *error component model* .

Model Parameter Testing

Model parameter testing aims to determine the feasibility of the model and whether the estimated coefficients are in accordance with the theory or hypothesis. This test includes the coefficient of determination (R2), partial regression coefficient test (t test) and overall regression coefficient test (F- *test* or F test). For models that have passed the significance test and the detection of new classical assumptions can be used for hypothesis testing.

RESULTS AND DISCUSSION

Central Java Province includes 29 regencies and 6 cities, namely Cilacap Regency, Cilacap Regency, Banyumas, Purbalingga, Banjarnegara, Kebumen, Perworejo, Wonosobo, Magelang, Boyolali, Klaten, Sukoharjo, Wonogiri, Karanganyar, Sragen, Gobogan, Blora, Rembang Pati, Kudus, Jepara, Demak, Semarang, Temanggung, Kendal, Batang, Pekalongan, Pemalang, Tegal and Brebes as well as the cities of Magelang, Surakarta, Salatiga, Semarang, Pekalongan and Tegal. The area of Central Java is 3,254,412 ha or 25.4% of the area of the island of Java and the equivalent of 1.7% of the area of Indonesia. Based on the results of the National Economic Census, the population of Java Province from 2016 to 2020 has increased.

The percentage of poor people in each district/city tends to decrease from year to year. Until 2020, the percentage of poor people in Central Java Province was 13.27%. The district with the highest percentage of poor people in 2016 was Wonosobo district at 20.53%, while the district with the lowest percentage of poor people was Kudus district at 7.65%. The city with the highest percentage of poor people is Surakarta City at 10.88%, while Semarang City has the lowest percentage of poor people at 4.85%.

Open Unemployment Rate for 29 Regencies and 6 Cities in Central Java Province from 2016 to 2020. The district with the lowest average Open Unemployment Rate is Temanggung Regency at 3.24%, while the highest is Brebes Regency at 8.99%. In other words, 8.83% of the working age population of Brebes Regency is not yet working. The city with the lowest average open unemployment rate is Pekalongan City at 5.93%, while the highest is Tegal City at 8.88%. This means that 8.88% of Tegal City's working age population is not yet employed.

The Human Development Index in each Regency/City in Central Java Province, specifically in 29 Regencies and 6 Cities, tends to increase from 2016-2020. In 2016, the district with the lowest Human Development Index was Brebes District at 63.98, while the district with the highest development index was Sukoharjo District at 75.06%. The city with the highest Human Development Index is Semarang City at 81.19%, while Pekalongan City has the lowest Human Development Index at 73.32%.

Normality Detection

The normality test is carried out with the aim of seeing whether *the error term* is normally distributed. The Normality Test is carried out by looking at the Jarque-Bera probability. If the Jarque-Bera probability is greater than $\alpha = 5\%$, then it can be said that *the error term* is normally distributed. Based on the normality test results, by looking at the Jarque-Bera probability value of 15.73 at $\alpha = 5\%$, it can be said that *the error term* is normally distributed because the Jarque-Bera probability is greater than $\alpha = 5\%$.

Heteroscedasticity Detection

Heteroscedasticity testing aims to test whether in the regression model there is inequality of variance from the residuals of one observation to another observation. If the variance from the residual of one observation to another observation remains, then it is called homoscedasticity and if it is different it is called heteroscedasticity. A good regression model is one that has homoscedasticity or does not have heteroscedasticity (Ghozali, 2016)

. Based on the results in the White Test table, the statistical *Chi-Square value* of 0.141 is greater than α = 5%. The statistical *Obs*R-squared* value of 9.703 is smaller than *the Obs*R-squared* calculated by the table, namely 124.342 or the probability value is more than 0.05. In other words, the regression model in this study does not experience heteroscedasticity.

Multicollinearity Detection

A regression model that is classified as good is that there is no strong correlation between the independent variables in the model. A regression model experiences multicollinearity when two or more independent variables in the model have a strong correlation. One way to detect multicollinearity is to use *correlation matrices* , where if *the correlation matrix* is greater than 0.8, it means there are symptoms of multicollinearity. Based on the results of *Correlation Matrices* , the coefficient of the poverty variable with HDI is -0.466, with the unemployment variable being -0.038. The magnitude of the correlation coefficient between independent variables in the regression model is smaller than 0.8. In other words, the regression model in the research does not experience multicollinearity.

Coefficient of Determination Test

The coefficient of determination (R2) is used to measure how far the model's ability to explain variations in the dependent variable. The coefficient of determination value is zero to one. A small value (R2) means that the ability of the independent variables to explain variations in the dependent variable is very limited. Meanwhile, a value (R2) that is close to one means that the independent variables provide almost all the information needed to predict variations in the dependent variable, or in other words, the independent variables in the model are able to explain variations in the dependent variable very well. The R-Squared value of 0.96 in the table means that 98.1% of the Poverty Level variable can be explained by the HDI and Unemployment variables. Meanwhile, the remaining 0.4% of poverty can be explained by other variables not included in the analysis model of this research.

Simultaneous Significance Test (F Test)

The F test is used to show the influence (significance) of the independent variables included in the model simultaneously (simultaneously) on the dependent variable. Statistical F value can be calculated by looking at the value of the F table. In this study, the results of estimating HDI and Unemployment on Poverty Levels for 2016-2020 with a confidence level of 95%, *degree of freedom for numerator* = 4 (k-1) and *degree of freedom for denominator* = 5, obtained an F table value of 4.40. Based on the regression results, the statistical F value was 119.2212. In other words, the HDI and Unemployment variables simultaneously influence the Central Java Poverty Level variable.

Partial Significance Test (t Test)

The t statistical test shows how much influence each independent variable individually has in explaining the dependent variable. In this research, the value *of degree of freedom* = 175 (nk = 180-5), then the t table value obtained with α = 5% is 1.980. Based on the results of the partial significance test, the t statistical value of the HDI variable is -12,198 and the t statistical value of the Unemployment variable is 4.620. So it can be concluded that the HDI and Unemployment variables have a partially significant effect on the Poverty Level in Central Java.

Based on computer processed results using Eviews 9.0 software. The test results obtained are shown in Table 1.

Based on the results of data processing in Table 1, the following equation is obtained:

Pit = 321.1121 + 0.129398 Unemployment – 4.29180 HDI

The regression model in this research meets the classic assumptions, namely BLUE (*Best Linear Unbiased Estimate*). The independent variables in the model, namely Education, Health, and Unemployment significantly influence the Poverty Level (α = 5%). The coefficient of determination test results show a figure of 0.9878. So it can be said that as much as 96.48% of the variation in poverty levels can be explained by variations in education, health and unemployment, while 3.52% is explained by other variables outside the model.

HDI has a negative and significant influence on the poverty level of Central Java Province. Based on the regression results, the HDI coefficient value is -5.027. This means that every 1 year increase in the HDI will have an impact on reducing the poverty rate by 5.027%. The results of

this research are in line with research by Bakhtiari and Meisami (2009) which states that an increase in education will reduce the poverty rate. In line with Bakhtiari and Meisami, research conducted by Ataguba et al (2013) also obtained results stating that one of the determining factors in reducing poverty levels is education.

Unemployment as represented by the Open Unemployment Rate (TPT) has a positive and significant influence on the Poverty Level of Central Java Province. Based on the regression results, the Unemployment coefficient value is 0.229. This means that every 1% increase in the Open Unemployment Rate will have the impact of increasing the Poverty Rate by 0.229. The results of this research are in accordance with research by Hong and Pandey (2007) which states that unemployment has a positive effect on poverty. The same results were also obtained by Ukpere and Slabbert (2009) , namely that unemployment in the era of globalization has a positive and significant effect on poverty. This result can be interpreted that when the unemployment rate rises, the poverty rate will also increase.

Table 1. Research Data Processing Results

Variables	Coefficient	Std. Error	t-Statistics	Prob.	Information
C	321.1121	22.78542	11.52751	0	Significant
UNEMPLOYMENT	0.129398	0.0881	4.620656	0	Significant
IPM	-4.29180	0.321877	-12.19873	0	Significant
F-statistics					119.2212
Prob(F-statistic)					0
R-Squared					0.853712

CONCLUSION

Based on the research results, the unemployment variable represented by the Open Unemployment Rate (TPT) has a positive and significant effect on the Poverty Rate in 35 Regencies/Cities in Central Java Province. This result is in accordance with Todaro's opinion which states that the problem of unemployment is closely related to the prosperity of society. Increasing employment opportunities through expanding employment opportunities will reduce the unemployment rate, so that the level of community prosperity will increase. The HDI as represented by the annual HDI has a negative effect on the level of poverty in 35 districts/cities in Central Java Province. HDI is related to productivity. A good HDI will increase work power so that it will increase output.

Suggestion

Formal education is a pioneer in the formation of quality human capital. The government is expected to be able to coordinate with related agencies in formulating policies that improve the quality of education in Central Java. This quality is not only related to facilities such as schools or teachers, but also the ease with which people can access education which can later be used as capital to improve welfare. The Central Java Provincial Government is expected to be able to coordinate with related agencies in optimizing health services so that people can access them easily, especially for less fortunate people.

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