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Analysis Of Factors Influencing The Poverty Rate In Central Java Province Using Panel Data Regression

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ABSTRACT

The issue of poverty in Indonesia has become a severe problem, particularly in Central Java Province, the third most populous province in Indonesia. The population of Central Java Province is approximately 36.74 million people, and it ranks second in having the highest poverty rate in Indonesia after East Java. Over the years, there has been an increase in poverty, peaking in 2021 at 11.79%. This study aims to model the poverty rate in Central Java Province using five independent variables, including provincial minimum wage, school participation rate, open unemployment rate, population density, and dependency ratio, using panel data regression and to identify the factors influencing the poverty rate. Three approaches used in panel data regression consist of the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). Based on the parameter testing results with panel data regression, it can be concluded that the best model for analyzing the factors influencing the poverty rate in Central Java Province is the FEM approach. The testing results with the FEM approach obtained a regression model Yit=7,290131+7,72×10-7X1it -0,021603X2it+0,086597X3it+ 8,27×10-5X4it+ 0,065326X5it. Provincial minimum wage, open unemployment rate, and dependency ratio variables positively and significantly affect the poverty rate in Central Java Province. In contrast, the population density has a positive but not significant effect. Meanwhile, the school participation rate has a negative and not significant effect.

Keywords: *CEM; FEM; panel data regression; poverty; REM*

INTRODUCTION

Indonesia is the fourth most populous country in the world after the People's Republic of China, India, and the United States (Indraswari & Yuhan, 2017). As a country with a large population and socio-economic diversity, Indonesia faces a problem that has yet to receive a solution to date, namely poverty(Nasution, 2014) . The population of a region has a significant effect on the poverty rate (Didu & Fauzi, 2016). In addition to population, poverty is also influenced by various other factors. The demographic conditions of an area that cause population density in a particular area, the provincial minimum wage, and the open unemployment rate are factors that cause increased poverty in a region (Dita et al., 2022).

Poverty is closely related to welfare (Cojanu & Stroe, 2017). According to Badan Pusat Statistik Indonesia (2023) , poverty is a condition when people experiencing poverty are unable to meet basic needs (basic needs approach), which is either food or non-food needs measured in terms of expenditure. Based on data published in the Official Statistical Gazette Poverty Profile in Indonesia March 2023, in general, in the period September 2011-March 2022, the poverty rate in Indonesia has decreased, both in terms of number and percentage, with the exception of September 2013, March 2015, March 2020, and March 2021.

Based on data displayed by the official website of Statistic Indonesia, in 2021, Central Java Province became the province with the third largest population in Indonesia, namely 36.74 million people, and the province with the highest poverty rate after East Java Province. Given the high poverty rate in Central Java Province, an analysis is needed to determine the factors that cause the high poverty rate. One method used to conduct the analysis is panel data regression.

Panel data regression analysis is a regression analysis technique with a panel data structure (Zulfikar, 2018). Panel data is a combination of data observations on several individual units (cross-sections) at a certain period in sequence (time series). Panel data regression was developed to overcome problems that arise when analyzing data with cross-section data or time series data separately, such as data availability problems, heteroscedasticity problems in cross-section data, and autocorrelation problems that often occur in time series data (Gujarati, 2019).

Many studies have been conducted on poverty and its causal factors using panel data regression. For example, research on the factors that influence the poverty rate in Indonesia using panel data regression was conducted by Mirtawati & Aulina (2021). Research by Solikhin (2022) discusses the factors that cause poverty in Central Java Province in 2018-2021. In addition, Khanifah & Juliprijanto (2022) also conducted research on the determinants of poverty in the Eks Karesidenan Kedu area in 2016-2020. The scope of this research is all districts/cities in Central Java Province, totaling 35 as cross section units in the 2018-2022 period as time series units. The purpose of this study is to model the poverty rate of Central Java Province using panel data regression and explain the factors that affect the poverty rate in Central Java Province.

METHOD

The data used in this study is secondary data obtained from the official website of the Statistics Indonesia, namely poverty rate data as the dependent variable and 5 independent variables. The selection of independent variables is based on previous studies that affect the poverty rate. A complete explanation of the independent variables used in this study are shows in Table 1. The scope of this study is districts/cities in Central Java Province from 2018 to 2022.

Table 1. Variable Descriptions

Symbol	Description Variable
Y	Poverty Rate
X_1	Provincial Minimum Wage
X_2	School Enrollment Rate
X_3	Open Unemployment Rate
X_4	Population Density
X_5	Dependency Ratio

The analysis step begins with estimating the panel data regression model with three approaches. The Common Effect Model (CEM) approach is the simplest estimation technique that combines all data without regard to individuals and time (Gujarati, 2019). The regression equation with CEM estimation is shown in equation (1)

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots + \beta_k X_{kit} + u_{it} \tag{1}$$

The second approach to estimating panel data regression that can be differentiated by individuals and time is the Fixed Effect Model (FEM). FEM has several types of equations, including a constant slope coefficient but varying intercepts for each individual shown in equation (2), a constant slope coefficient but varying intercepts at each time in equation (3), and a constant slope coefficient but varying intercepts for each individual and time shown in equation (4).

$$Y_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 X_{it} + \ldots + \beta_k X_{kit} + u_{it} \tag{2}$$

$$Y_{it} = \alpha_t + \beta_1 X_{it} + \beta_2 X_{it} + \ldots + \beta_k X_{kit} + u_{it} \tag{3}$$

$$Y_{it} = \alpha + \mu_i + \lambda_t + \beta_1 X_{it} + \beta_2 X_{it} + \ldots + \beta_k X_{kit} + u_{it} \tag{4}$$

The third approach is the Random Effect Model (REM), which involves a correlation between error terms due to changes in time or individuals (Greene, 2018). Mathematically, the panel data regression equation with REM estimation is shown in equation (5)

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots + \beta_k X_{kit} + w_{it}\, ; w_{it} = u_i + v_t \tag{5}$$

The stage after estimating the model is to choose the best estimation model. Model selection is done with three tests, namely the Chow Test, Hausman Test, and Lagrange Multiplier Test (Sriyana, 2014). The Chow test used to select a better model between Common Effect Model and Fixed Effect Model with the null hypothesis that there is no difference in individual effects or the common effect model is better than the fixed effect model. With a significance level of 5%, the H_0 is rejected if the p-value < 0.05. If it is concluded that Fixed Effect Model is better than Common Effect Model, a further test is carried out with the Hausman Test to choose a better model between Fixed Effect Model and Randok Effect Model. With the null hypothesis that there is no correlation between individual residuals and independent variables or the random effect model is better than the fixed effect model and a significance level of 5%, the H0 is rejected if the p-value < 0.05. If the results show that Fixed Effect Model is better than Random Effect Model, the test is complete, and Fixed Effect Model is chosen as the best model. However, if the results show that Random Effect Model is better than Fixed Effect Model, then further testing is continued with the Lagrange Multiplier Test to choose a better model between Common Effect Model and Random Effect Model. The null hypothesis of the Lagrange Multiplier test is that there is no relationship between errors or the common effect model is better than the random effect model, and the significance level is 5%, so H_0 is rejected if the p-value < 0.05.

After obtaining the best model, then a classical assumption test is carried out consisting of a non-multicollinearity test to see whether there is a correlation between the independent variables and a homoskedasticity test to see if there is an inequality of variance from the residuals of the model formed (Sriyana, 2014). If the assumptions have been met, then test the significance of the parameters simultaneously with the F test and partially with the t-test for the selected model. Furthermore, the coefficient of determination is checked to measure how much variation of the independent variable can explain the dependent variable.

RESULTS AND DISCUSSION

Data Overview

Figure 1 shows the plot of the poverty rate of Central Java Province for five years (2018-2020). It is clear that the poverty rate of Central Java Province in 2019 decreased by 0.52%. In 2020, poverty increased by 0.61%, peaking at 11.79% in 2021. Poverty gradually decreased in 2022, decreasing by 0.86% to 10.93%.

Estimation of Panel Data Regression

1) **Common Effect Model**

The panel data regression estimation using the Common Effect Model (CEM) approach is shown in Table 1. Based on Table 1, the panel data regression model using the Common Effect Model (CEM) approach is as follows:

$$Y_{it} = 9{,}539844 - 3{,}42 \times 10^{-6} X_{1it} - 0{,}087893 X_{2it} + 0{,}188733 X_{3it} - 0{,}000249 X_{4it} + 0{,}297277 X_{5it}$$

The common effect model means that for every one unit increase in the provincial minimum wage and other variables are constant, the poverty rate, which in this case is proxied by the percentage of poor people, will decrease by 0.00000342 percent, meaning that the poverty rate and the provincial minimum wage are inversely proportional. This also happens to the school enrollment rate, for every one unit increase in the school enrollment rate, poverty will decrease by 0.087893 percent. In contrast, the open unemployment rate positively affects the poverty rate. For every one unit increase in the open unemployment rate, poverty increases by 0.188733 percent. The population density is inversely related to the poverty rate. For every one unit increase in the population density, poverty decreases by 0.000249 percent. Meanwhile, the dependency ratio is directly proportional to the poverty rate. For every one unit increase in the dependency ratio, poverty will increase by 0.297277 percent.

2) **Fixed Effect Model**

Panel data regression estimation with the Fixed Effect Model (FEM) approach is shown in Table Based on Table 2, the panel data regression model using the Fixed Effect Model (FEM) approach is as follows:

$$Y_{it} = 7{,}290131 + 7{,}72 \times 10^{-7} X_{1it} - 0{,}021603 X_{2it} + 0{,}086597 X_{3it} + 8{,}27 \times 10^{-5} X_{4it} + 0{,}065326 X_{5it}$$

The fixed effect model means that if there is a one unit increase in the provincial minimum wage and other variables are constant, the poverty rate, which in this case is proxied by the percentage of poor people, will increase by 0.000000772 percent, meaning that the poverty rate and the provincial minimum wage variable are directly proportional. On the other hand, the school enrollment rate and poverty rate are inversely proportional, every one unit increase in the school enrollment rate and other variables are constant, poverty will decrease by 0.021603 percent. Meanwhile, the open unemployment rate, population density and dependency ratio variables are directly proportional to the poverty rate. Every one unit increase in the open unemployment rate will increase poverty by 0.086597 percent, every one unit increase in the population density will increase poverty by 0.0000827 percent and every one unit increase in the dependency ratio will increase poverty by 0.065326 percent.

3) **Random Effect Model**

Panel data regression estimates using the Random Effect Model (REM) approach are shown in Table 3. Based on Table 3, the panel data regression model using the Random Effect Model (REM) approach is as follows:

$$Y_{it} = 7{,}831560 + 8{,}18 \times 10^{-7} X_{1it} - 0{,}027905 X_{2it} + 0{,}081975 X_{3it} - -0{,}000143 X_{4it} 0{,}072269 X_{5it}$$

The random effect model implies that for every one unit increase in the provincial minimum wage variable and other variables are constant, the poverty rate, which in this case is proxied by the percentage of poor people, will increase by 0.0000000818 percent, meaning that the poverty rate and the provincial minimum wage are directly proportional. On the other hand, the school enrollment rate is inversely related to the poverty rate, for every one unit increase in the school enrollment rate, poverty will decrease by 0.027905 percent. Another case is with the open unemployment rate, which has a positive effect on the poverty rate. Every one unit increase in the open unemployment rate, poverty increases by 0.081975 percent. Meanwhile, the population density is inversely proportional to the poverty rate, while the dependency ratio is directly proportional to the poverty rate. This means that for every one unit increase in the population density , poverty decreases by 0.000143 percent, while for every one unit increase in the dependency ratio, poverty increases by 0.072269 percent.

Selection of the Best Model

The estimation model was chosen as the best model for conducting panel data regression analysis. Model selection can be done with the following tests:

1) **Chow Test**

The Chow test selects a better model between the Common Effect Model and the Fixed Effect Model. The hypothesis used is as follows:

$H_0 : \mu_1 = \mu_2 = \ldots = \mu_{N-1} = 0$ (there is no difference in individual effects or the common effect model is better than the fixed effect model)

H_1 : There are differences in individual effects and the fixed effect model is better than the common effect model.

With a significance level of 5%, H_0 is rejected if the value of $F_{statistic} > F_{0.05;(34,135)}$ or $p - value < 0.05$. The test results are shown in Table 4. The Chow Test statistics show that the $F_{statistic} = 216.299 > F_{0.05;(34,135)} = 1.526$ with $p - value = 0.000$ so that H_0 is rejected, meaning that there are differences in individual effects or the fixed effect model is better than the common effect model.

2) **Hausman Test**

The Hausman test aims to choose the better model between the Fixed Effect Model and the Random Effect Model. The test hypothesis is as follows:

H_0 : $corr(X_{it}, \varepsilon_{it}) = 0$ (There is no correlation between individual residuals and independent variables or the random effect model is better than the fixed effect model)

H_1 : $corr(X_{it}, \varepsilon_{it}) \neq 0$ (There is at least one correlation between individual residuals and independent variables or the fixed effect model is better than the random effect model)

With a significance level of 5%, H_0 is rejected if the p-value < 0.05. The test results show the p-value = 0.000 <0.005, so H_0 is rejected, meaning that the Fixed Effect Model is better than the Random Effect Model.

After conducting the Chow Test and Hausman Test and obtaining the results that the Fixed Effect Model is the best model for conducting panel data regression analysis, the model selection is complete. Next, the classical assumptions test is carried out using the best model that has been obtained.

Classical Assumption Test

There are several assumption tests that must be met in conducting panel data regression analysis, including:

1) **Homoscedasticity Test**

The Homoscedasticity test aims to test whether in the regression model there is an inequality of variance from the residues of one observation to another. Homoscedasticity is fulfilled if the variance of the residuals of one observation to another observation remains. Testing is done with the Glejser test with the following hypothesis:

$H_0 : {\sigma_1}^2 = {\sigma_2}^2$ (residual variances are homoscedasticity)

$H_1 : {\sigma_1}^2 \neq {\sigma_2}^2$ (residual variance is heteroscedasticity)

With a significance level of 5%, H_0 is rejected if $|t_{value}| > t_{(0,025;30)} = 2.3595$ or $p-value < 0.05$. The test results are shown in Table 6. Based on Table 6, it can be concluded that H_0 fails to be rejected so that the residual variance is free of heteroscedasticity problems.

2) **Non-Multicollinearity Test**

The Non-Multicollinearity Test aims to see whether there is a correlation between the independent variables. The test is carried out using the pairwise correlation method with a correlation decision <0.85. The calculation results are shown in Table 5.

Based on Table 5. It can be seen that the correlation value between the independent variables is less than 0.85 so it can be concluded that the independent variables are free from multicollinearity problems.

Parameter Significance Test

1) **Simultaneous Test (F Test)**

The F test is conducted to test the results of the regression model estimation whether the independent variables together have an influence on the dependent variable. Hypothesis testing is as follows:

$H_0 :\ \beta_1 = \beta_2 = \ldots = \beta_j = 0,\ k = 1,2,3,4,5$ (all independent variables are not simultaneously significant effect to the dependent variable)

$H_1 : \exists\ \beta_k \neq 0$ (there is at least one independent variable that is simultaneously significant effect to the dependent variable)

With a significance level of 5%, H_0 is rejected if $F_{value} > F_{0.05;(34,\ 135)} = 340.93$ or $p-value < 0.05$

After testing, the results obtained and then the conclusion can be drawn to reject which means that the variables of the provincial minimum wage, school enrollment rate, open unemployment rate, population density, and dependency ratio simultaneously affect the poverty rate of Central Java Province.

2) **Partial Test (t Test)**

The t-test is conducted to see whether each independent variable individually influences the dependent variable. The hypothesis used in partial testing is as follows:

$H_0 : \beta_k = 0,\ k = 1,2,3,4,5$ (The k-th independent variable is not partially significant effect to the dependent variable)

$H_1 :\ \beta_k \neq 0$ (The k-th independent variable has a partially significant effect on the dependent variable)

With a significance level of 5%, H_0 is rejected if $|t_{value}| > t_{(0.025,\ 30)} = 2.3595$ or

The test results are shown in Table 7. Based on Table 7, the value of the provincial minimum wage, open unemployment rate, and dependency ratio variables is greater than

$t_{(0.025,\ 30)} = 2.3595$ and $-value < 0.05$, then it can be concluded to reject H_0 , meaning that the provincial minimum wage, open unemployment rate, and dependency ratio variables have a significant effect on poverty in Central Java Province. The variables of school enrollment rate and population density have values smaller than 2.3595 and and $p - value < 0.05$, so it can be concluded that these two variables do not have a significant effect on poverty in Central Java Province.

Coefficient of Determination

The test results show that the panel data regression model with the Fixed Effect Model (FEM) approach has a coefficient of determination of 0.9881. This means that the independent variable is able to explain the dependent variable by 98.8%, while other variables outside the model explain the remaining 1.2% of the dependent variable.

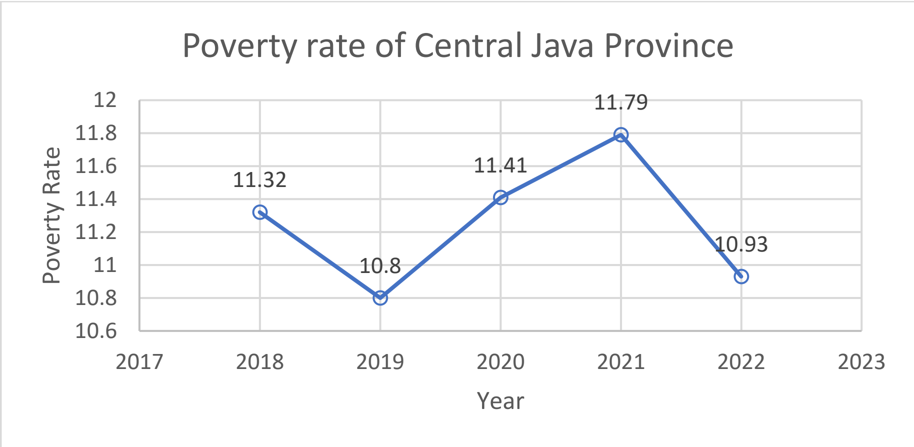

Figure 1 Poverty Rate Plot

Table 2 Common Effect Model

Variable	Coeficient	Std. Error	t-Statistic	Prob.
C	9,539844	4,686014	2,035812	0,0433
X1	-3,42E-06	1,05E-06	-3,261942	0,0013
X2	-0,087893	0,023747	-3,701186	0,0003
X3	0,188733	0,120588	1,565104	0,1194
X4	-0,000249	0,000110	-2,261130	0,0250
X5	0,297277	0,066897	4,443835	0,0000

Table 3 Fixed Effect Model

Variable	Coeficient	Std. Error	t-Statistic	Prob.
C	7,290131	1,549613	4,704484	0,0000
X1	7,72E-07	2,86E-07	2,697554	0,0079
X2	-0,021603	0,011915	-1,813132	0,0720
X3	0,086597	0,033477	2,586763	0,0107
X4	8,27E-05	0,000128	0,644728	0,5202
X5	0,065326	0,018200	3,589279	0,0005

Table 4 Random Effect Model

Variable	Coeficient	Std. Error	t-Statistic	Prob.
C	7,831560	1,574538	4,973879	0,0000
X1	8,18E-07	2,81E-07	2,908320	0,0041
X2	-0,027905	0,011549	-2,416265	0,0167
X3	0,081975	0,032921	2,490084	0,0137
X4	-0,000143	0,000102	-1,397338	0,1641
X5	0,072269	0,018014	4,011869	0,0001

Table 5 Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	225,308095	(34,135)	0,0000
Cross-secyion Chi-square	709,804195	34	0,0000

Table 6 Non-Multicollinearity Test

	X1	X2	X3	X4	X5
X1	1,000000	0,056172	0,370994	0,123964	-0,470602
X2	0,056172	1,000000	-0,203977	0,233156	-0,200069
X3	0,370994	-0,203977	1,000000	0,284580	-0,105457
X4	0,123964	0,233156	0,284580	1,000000	-0,562712
X5	-0,470602	-0,200069	-0,105457	-0,562712	1,000000

Table 7 Homoskedasticity Test

Variable	Coeficient	Std.Error	t-Statistic	Prob.	Decision
C	4,721204	2,724168	1,733081	0,0849	Homoscedasticity
X1	-1,04E-06	6,09E-07	-1,709486	0,0892	Homoscedasticity
X2	-0,003373	0,013805	-0,244333	0,8073	Homoscedasticity
X3	0,130538	0,070103	1.862089	0,0643	Homoscedasticity
X4	-5,47E-05	6,39E-05	-0,856488	0,3929	Homoscedasticity
X5	-0,022537	0,038890	-0,579503	0,5630	Homoscedasticity

Table 8 Partial Test (t-Test)

Variable	Coeficient	Std.Error	t-Statistic	Prob.	Decision
C	7,290131	1,549613	4,704484	0,0000	Significant
X1	7,72E-07	2,86E-07	2,697554	0,0079	Significant
X2	-0,021603	0,011915	-1,813132	0,0720	Not Significant
X3	0,086597	0,033477	2,586763	0,0107	Significant
X4	8,27E-05	0,000128	0,644728	0,5202	Not Significant
X5	0,065326	0,018200	3,589279	0,0005	Significant

Interpretation of the Result

Based on the model selection that has been done, the best model used in panel data regression analysis is the Fixed Effect Model (FEM). The independent variables consist of provincial minimum wage, school enrollment rate, open unemployment rate, population density, and dependency ratio. The panel data regression equation with the best model can be written as follows:

$$Y_{it} = 7.290131 + 7.72 \times 10^{-7} X_{1it} - 0.021603 X_{2it} + 0.086597 X_{3it} + 8.27 \times 10^{-5} X_{4it} + 0.065326 X_{5it}$$

The interpretation of the panel data regression model in the case of factors affecting the poverty rate in Central Java Province is as follows:

1. The provincial minimum wage positively and significantly affects the poverty rate. This means that statistically, for every one unit increase in the provincial minimum wage, poverty will increase by 0.000000772%. This is in line with research by (Syahputri & Fisabilillah, 2022) which reveals that an increase in the minimum wage is accompanied by an increase in the price of basic necessities and inflation so that people living below the poverty line will find it increasingly difficult to meet their needs. In addition, an increase in the minimum wage can impact increasing unemployment due to an increase in termination of employment (Islami & Anis, 2019). In Central Java Province, the industrial sector is not the primary sector, but the agricultural and plantation sectors. Therefore, increasing the minimum wage does not significantly impact reducing the poverty rate.

2. Statistically, the analysis shows that the school enrollment rate does not significantly affect the poverty rate in Central Java Province. This is because the school enrollment rate in all districts/municipalities in Central Java Province is relatively high, which is above 50%, even reaching 80% to 90% in some districts/municipalities. This condition is in accordance with research conducted by Rahmayani & Andriyani (2022) which revealed that the school enrollment rate has no significant effect on the poverty rate.
3. The Open Unemployment Rate has a positive and significant effect on the poverty rate in Central Java Province. This means that for every one unit percent increase in the open unemployment rate, the poverty rate will statistically increase by 0.086597%. Based on economic theory, an increase in unemployment can cause poverty to increase, meaning that the open unemployment rate and poverty rates are directly proportional. Limited employment can cause some people to be unemployed (Ashari et al., 2023). This impacts reduced income so that these people cannot meet their needs.
4. The results show that population density has no significant effect on poverty. In some areas in Central Java, especially industrial areas, population density is directly proportional to the availability of employment, so the increase in population density statistically does not affect poverty.
5. Dependency Ratio has a positive and significant effect on poverty. Statistically, for every one percent increase in the dependency ratio, poverty will increase by 0.065326%. The increasing dependency ratio indicates that the burden borne by the productive population on the non-productive population is getting higher. A continuous increase in the dependency ratio will result in the inability of the community to fulfill their needs, thus increasing poverty.

CONCLUSIONS

Modeling the poverty rate of Central Java Province using panel data regression was conducted using the best model selected, the Fixed Effect Model. The test results using the Fixed Effect Model (FEM) with the dependent variable of poverty rate in Central Java Province and independent variables including provincial minimum wage, school enrollment rate, open unemployment rate, population density, and dependency ratio resulted in a coefficient of determination of 98.8% with the following model estimation.

$$Y_{it} = 7{,}290131 + 7{,}72 \times 10^{-7} X_{1it} - 0{,}021603 X_{2it} + 0{,}086597 X_{3it} + 8{,}27 \times 10^{-5} X_{4it} + 0{,}065326 X_{5it}$$

The results of the analysis show that the minimum wage has a significant effect and is directly proportional to the poverty rate. The school enrollment rate is inversely proportional and has no significant impact on the poverty rate. Meanwhile, the open unemployment rate variable has a positive and significant effect on poverty in Central Java Province. The population density and dependency ratio have a positive impact on the poverty rate. The population density has no significant effect, while the dependency ratio has a significant impact on the poverty rate.

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REFERENCES

Ashari, R. T., Athoillah, M., Studi, P., Pembangunan, E., & Ekonomi, F. (2023). Analisis Pengaruh TPT, Tingkat Partisipasi Angkatan Kerja, Upah Minimum, IPM, Pertumbuhan E3konomi dan Jumlah Penduduk. *Journal Of Development and Social Studies*, *2*(2).

Badan Pusat Statistik Indonesia. (2023). Profil Kemiskinan di Indonesia Maret 2023. *Badan Pusat Statistik*, *57*, 1–8. https://www.bps.go.id/pressrelease/2018/07/16/1483/persentase-penduduk-miskin-maret-2018-turun-menjadi-9-82-persen.html

Cojanu, S., & Stroe, C. (2017). Causes of Poverty – What Do the Poor Think? Poverty Attribution and Its Behavioural Effects. *LUMEN Proceedings*, *1*, 186–197. https://doi.org/10.18662/lumproc.rsacvp2017.18

Didu, S., & Fauzi, F. (2016). Pengaruh Jumlah Penduduk, Pendidikan Dan Pertumbuhan Ekonomi Terhadap Kemiskinan Di Kabupaten Lebak. *Jurnal Ekonomi-Qu*, *6*(1), 102–117. https://doi.org/10.35448/jequ.v6i1.4199

Dita, R. A., Rahayu, A., & Suharsih, S. (2022). Determinan keparahan kemiskinan provinsi di pulau jawa Tahun 2010-2020. *Journal Locus Penelitian Dan Pengabdian*, *1*(03), 105–114. https://doi.org/10.58344/locus.v1i3.17

Greene, W. H. (2018). *Econometric analysis* (8th ed.). Pearson Education.

Gujarati, D. N. (2019). *Basic Econometrics* (6th ed.). MC GRAW HILL INDIA.

Indraswari, R. R., & Yuhan, R. J. (2017). Faktor-Faktor Yang Memengaruhi Penundaan Kelahiran Anak Pertama Di Wilayah Perdesaan Indonesia: Analisis Data Sdki 2012. *Jurnal Kependudukan Indonesia |*, *12*(1), 1–12.

Islami, N., & Anis, A. (2019). Pengaruh Upah Minimum Provinsi, Pendidikan Dan Kesehatan Terhadap Kemiskinan Di Indonesia. *Jurnal Kajian Ekonomi Dan Pembangunan*, *1*(3), 939–948. https://doi.org/10.24036/jkep.v1i3.7721

Khanifah, Z., & Juliprijanto, W. (2022). *ANALISIS DETERMINAN KEMISKINAN DI DAERAH EKS KARESIDENAN KEDU TAHUN 2016-2020*. *2*(2), 225–236.

Mirtawati, M., & Aulina, N. (2021). Analisis Regresi Data Panel Pada Faktor-Faktor Yang Mempengaruhi Kemiskinan Di Indonesia Tahun 2015 – 2019. *KINERJA Jurnal Ekonomi Dan Bisnis*, *4*(1), 78–90. https://doi.org/10.34005/kinerja.v4i1.1781

Nasution, Z. (2014). PERTUMBUHAN EKONOMI DAN KEMISKINAN Zulkarnain. *Jurnal Ecobisma*, *1*(2), 1–10.

Rahmayani, P., & Andriyani, D. (2022). Pengaruh Dana Bantuan Pendidikan, Angka Partisipasi Sekolah Dan Pengangguran Terbuka Terhadap Kemiskinan Di Sumatera. *Jurnal Ekonomi Regional Unimal*, *5*(2), 1–8. https://doi.org/10.29103/jeru.v5i2.8308

Solikhin. (2022). Kemiskinan Di Provinsi Jawa Tengah 2018-2021 Apa Saja Penyebabnya. *Jurnal Manajemen Dan Ekonomi*, *5*(1), 71–82. file:///C:/Users/USER/Downloads/329-Article Text-829-1-10-20220414.pdf

Sriyana, J. (2014). *Metode Regresi Data Panel* (1st ed.). Ekonisia.

Syahputri, R. K. R., & Fisabilillah, L. W. P. (2022). Pengaruh Pengangguran, Upah Minimum, Dan PDRB Terhadap Kemiskinan Di Provinsi Jawa Timur. *Independent: Journal of Economics*, *2*(2), 169–184. https://doi.org/10.26740/independent.v2i2.50990

Zulfikar, R. (2018). Estimation Model And Selection Method Of Panel Data Regression: An Overview Of Common Effect, Fixed Effect, And Random Effect Model. *Jurnal Ilmiah Bidang Akuntansi*, *9*(2), 1–10. https://doi.org/10.31227/osf.io/9qe2b

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