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THE EFFECT OF OPEN UNEMPLOYMENT RATE AND EXPECTED YEARS OF SCHOOLING ON THE DYNAMICS OF THE POOR POPULATION IN EAST JAVA PROVINCE

Putri Nathasya Dhimastika[1], M. Afdal Samsuddin[2], Rowiyah Asengbaramae[3]
[1,2] Program Studi Ekonomi, Fakultas Ekonomi dan Bisnis, Universitas Bangka Belitung, Indonesia
[3] Faculty of Economics, Finance and Banking Fatoni University, Thailand
e-Mail: putrinathasya486@gmail.com1, m.afdal@ubb.ac.id, rowiyah.asengbaramae@ftu.ac.th

Abstract: Poverty in East Java Province remains a serious challenge despite various development efforts. This study aims to analyze the effect of open unemployment rate and expected years of schooling on the number of poor people in 38 districts/cities in East Java during the 2019-2023 period. The method used is panel data analysis with the Fixed Effect Model (FEM) approach, using secondary data from the Central Bureau of Statistics. The results showed that the open unemployment rate has a positive and significant effect on the number of poor people, meaning that an increase in unemployment will increase the number of poor people. In contrast, expected years of schooling has a negative and significant effect, meaning that the higher the expected years of schooling, the lower the number of poor people. This finding confirms the importance of government intervention in creating jobs and improving the quality of education as a strategy to alleviate poverty in East Java. This research is expected to serve as a reference for more effective and sustainable policy making in an effort to reduce poverty in this region.

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Introduction

Poverty is one of the crucial challenges faced by Indonesia, making it a priority in the nation's development agenda (World Bank, 2022). Data from the Central Statistics Agency (BPS, 2023) confirms that the national poverty rate is still relatively high, one of which is seen in East Java Province, which has a large poverty rate. This fact indicates that although development in various sectors has been ongoing, efforts to comprehensively eradicate poverty still require hard work.

Poverty is understood as a multidimensional concept that is not only limited to income, but also includes limited access to education, health services, and other basic needs (BPS, 2023; Suharto, 2021). In this context, education plays a vital role in breaking the cycle of poverty, as higher levels of education are positively correlated with better employment opportunities and income (Todaro & Smith, 2015). Therefore, Expected Years of Schooling (EOL) is an important indicator to analyze poverty dynamics. This indicator reflects the educational aspirations of the community and its impact on the quality of human resources in the future (Rahmn, 2021).

High unemployment is one of the main triggers of poverty because it causes a decrease in people's purchasing power, which in turn increases the number of poor people

(Mankiw, 2016). The correlation between high unemployment and poverty in a region has also been proven in Suryanto's research (2020). Furthermore, the impact of unemployment extends from individuals to families and communities, so that it can create a cycle of poverty that is difficult to unravel (Hidayati, 2020). These facts emphasize that the creation of wider employment opportunities is a vital requirement to reduce poverty.

On the other hand, the poverty rate is also strongly influenced by Expected Years of Schooling. Better education paves the way to higher employment and income (Todaro & Smith, 2015), and equips individuals with the ability to compete in the world of work (Sari, 2022). In line with this, Rahman's (2021) research confirms that raising HLS is effective in reducing poverty. Quality education essentially increases one's productivity and income (Prasetyo, 2022). Therefore, the relationship between HLS and poverty dynamics in East Java Province needs to be studied further.

East Java Province faces specific issues related to the education and employment sectors. BPS data (2023) indicates that although access to education has increased, the quality of education in some areas is still uneven. This condition has implications for the achievement of suboptimal Expected Years of Schooling, which in turn contributes to the problems of unemployment and poverty (Hidayati, 2020). In line with this, Prasetyo's research (2022) confirms that the availability of access to quality education is negatively correlated with the unemployment rate. Therefore, improving the quality of education is a strategic intervention to reduce poverty, which needs to be supported by strengthening education programs that are aligned with labor market demands so that graduates have relevant competencies (Nugroho, 2022).

External factors, such as changes in the global economy and government policies, also affect the socioeconomic conditions of East Java (Ministry of National Development Planning, 2021). Therefore, it is important to understand how these factors interact and influence poverty dynamics in the province (Setiawan, 2021). In addressing poverty, a holistic approach should be used, including education, health and job creation, according to research by Nugroho (2022). A more efficient solution to poverty is expected to be found through the application of a comprehensive approach.

In this case, this study examines the dynamics of the poor population in East Java Province during the 2019-2023 period through the influence of the open unemployment rate and expected years of schooling. It is hoped that this research can provide a deeper understanding of the relationship between these variables using panel data (Suhartono, 2023). This research is expected to serve as a basis for more effective policies to reduce poverty in East Java. In addition, this study will discuss the consequences of the findings and offer suggestions for policies that can be implemented to improve people's welfare in the province.

It is hoped that this research will find more appropriate solutions to the complex problem of poverty in East Java. The government and other stakeholders can make more efficient and sustainable policies by understanding the factors that influence poverty (Bappenas, 2022). In addition, it is expected that this research will add to the academic literature on unemployment and poverty in Indonesia (Wibowo, 2021). In addition, involving the community in the decision-making process of poverty alleviation policies is essential so that the policies made are more in line with local needs and situations (Kumar, 2020).

This research is expected to provide a clearer picture of the dynamics of poverty in East Java Province and how the open unemployment rate and expected years of schooling can contribute to poverty alleviation efforts. In addition, this study will discuss the results generated and offer suggestions for policies that can be implemented to improve people's welfare in the province. Therefore, it is expected that this study will serve as a reference for other researchers and policy makers in developing more efficient methods to combat poverty in Indonesia.

Literature Review

This literature review aims to provide a deeper understanding of the influence of the open unemployment rate and expected years of schooling on the dynamics of the poor in

Central Java Province. Some previous studies that are relevant to the title of this research include:

1. Previous research conducted by (David and Bonivasius P.I, 2017) in a study entitled "The Effect of Population, HDI, and TPT on Poverty (Monetary and Multidimensional Approaches) in Indonesia" the results of this study indicate that population has a significant effect in increasing monetary poverty, but has no significant effect in increasing multidimensional poverty. HDI has a significant effect in reducing monetary and multidimensional poverty. TPT has no significant effect in increasing monetary poverty, but has a significant effect in increasing multidimensional poverty.
2. Previous research conducted by (Islami and Anis, 2019) in a study entitled "The Effect of Provincial Minimum Wages, Education and Health, on Poverty in Indonesia" the results of this study indicate that UMP has an effect on poverty in Indonesia. Education affects poverty in Indonesia. Health affects poverty in Indonesia. Together, UMP, education, and health affect poverty in Indonesia.
3. Previous research conducted by (Rapika Kestriani Damanik and Selna Aprilia Sidauruk, 2020) in a study entitled "The Effect of Population and GRDP on poverty in North Sumatra Province" the results of this study indicate that population has a positive and significant effect on poverty variables in North Sumatra Province in 2008-2017. GRDP has a negative and significant effect on the poverty variable in North Sumatra Province in 2008-2017. Population and GRDP simultaneously have a significant influence on the poverty variable in North Sumatra Province in 2008-2017.
4. Previous research conducted by (Yulia Adella Sari, 2021) in a study entitled "The Effect of Minimum Wage, Open Unemployment Rate, and Population on Poverty in Central Java Province" the results of this study indicate that the minimum wage has a significant negative effect on poverty in Central Java Province. The open unemployment rate has a significant positive effect on poverty in Central Java Province. Total population has a significant positive effect on poverty in Central Java.
5. Previous research conducted by (Lestari I. and Setiyono, 2018) in a study entitled "Multidimensional Poverty Analysis in Central Java Province 2011-2013" the results of this study show that poverty measured by only considering the monetary dimension turns out to provide a different picture from poverty measured by considering various dimensions (multidimensional). Although both show a rural phenomenon, which is indicated by the higher magnitude of poverty indicators in rural areas than urban areas. The percentage of multidimensionally poor people that is greater than the percentage of monetarily poor people indicates that there are people who are not identified as monetarily poor but still experience deprivation in various other dimensions of poverty.
6. Previous research conducted by (Tina Fransman and Derek Yu, 2019) in a study entitled "Multidimensional poverty in South Africa in 2001-2016" the results of this study show that African society accounts for more than 95% of multidimensional poverty, while unemployment, length of schooling, and disability are the three indicators that make the biggest contribution to poverty.
7. Previous research conducted by (Xiaoling W, 2022) in a study entitled "On the relationship between income poverty and multidimensional poverty in China" the results of this study show the coincidence of income poverty and multidimensional poverty is 31%. Econometric results show that increasing income can significantly reduce the incidence of multidimensional poverty in each dimension, but the impact is limited.

8. Previous research conducted by (Ofori Frimpong H, 2023) in a study entitled "An Assessment of Multidimensional Poverty Trends in Ghana" the results of this study showed that Ghana succeeded very well in reducing multidimensional poverty in all six indicators in the standard of living dimension. However, the country experienced an increase in multidimensional poverty in the dimensions of education and health.
9. Previous research conducted by (Zainuddin R., Asep Y.M., and Hukma R.P, 2023) in a study entitled "Multidimensional and Monetary Poverty in South Sulawesi Province" the results of this study show that multidimensional poverty in South Sulawesi Province is a rural phenomenon indicated by the three indicators of multidimensional poverty higher than urban areas. The health dimension is the largest contributor to multidimensional poverty in South Sulawesi.
10. Previous research conducted by (Mulugeta A. and Bantayehu T.A, 2022) in a study entitled "The Nexus Between Non-Farm Employments and Multidimensional Poverty in Rural Ethiopia" the results of this study showed that multidimensional poverty reduced from 94.9% in the 2013-2014 survey year to 92.5% in the 2015-2016 survey year. This is still a challenging phenomenon for rural households in Ethiopia.

Method

1. Type and Research Approach

This research uses quantitative research with a panel data approach that aims to find out objectively and measurably how the effect of the Open Unemployment Rate and Expected Years of Schooling on the Number of Poor People. The quantitative approach is used because it can process numerical data statistically, so the results are more accurate. While the panel data approach is used because it combines data from several regions (districts / cities in East Java) and from several years (2019-2023), so that it can provide a more complete picture of the changes that occur over time and between regions.

2. **Location and Research Period**
This research was conducted in East Java Province using annual data from 2019 to 2023. The selection of this province is based on the consideration of the importance of understanding the long-term dynamics between the open unemployment rate, expected years of schooling, and the number of poor people in the area as a whole.

3. Data Types and Sources
This study uses secondary data in the form of panel data. Panel data is a combination of time series data and cross-section data collected from several districts / cities in East Java Province during the period 2019 to 2023.
In panel data analysis, the model used in general is :

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \varepsilon_{it}$$

Description:

Y_{it} = Number of Poor Population in region and year

X_{1it} = Open Unemployment Rate

X_{2it} = Expected Years of Schooling

α = Constant

β1, β2 = Regression Coefficient

εit = Error

Results and Discussion

The results in this study are :

1. Panel Data Model Selection Test
In panel data analysis, we need to determine which model is most appropriate to use in regression, namely between the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model

(REM). The selection is done through the following tests:

a. Uji Chow (Fixed Effect Model Vs Common Effect Model)

The Chow test is used to determine whether the most appropriate model for panel data is the Common Effect Model (CEM) or the Fixed Effect Model (FEM). This test compares a model without dummy variables (CEM) with a model that takes into account fixed effects (FEM).

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	536.33306	(37, 150)	0.0000
Cross-section Chi-square	929.58799	37	0.0000

- Hypothesis:

  - H0 : The right model is Common Effect (same intercept)

  - H1 : The right model is Fixed Effect (different intercepts)

- Decision Criteria:

  - If Probability (p-value) of Cross-Section F or Chi-Square < 0.05, then H0 is rejected → choose FEM.

  - If Probability > 0.05, then H0 is accepted → choose CEM.

- Interpretation: If the Chow Test results select FEM, then the submission proceeds to the Hausman Test. If you have CEM, there is no need for Hausman test.

b. Uji Hausman (Fixed Effect Model Vs Random Effect Model)

The Hausman test is used to choose between the Fixed Effect Model (FEM) and the Random Effect Model (REM). This test looks at whether the errors in the model correlate with the independent variables.

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	7.830415	2	0.0199

- Hypothesis:

  - H0 : The correct model is Random Effect (no correlation between errors and independent variables).

  - H1 : The correct model is Fixed Effect (there is a correlation).

- Decision Criteria:

  - If the probability (p-value) of Cross-section Random < 0.05, choose FEM.

  - If the probability > 0.05, choose REM.

- Notes: The Hausman test is only performed if the Chow test selects FEM.

c. Uji Lagrange Multiplier/LM (Random Effect Model vs Common Effect Model)

The Lagrange Multiplier (LM) test is used to determine whether the

Random Effect model is better than the Common Effect.

Lagrange multiplier (LM) test for panel data
Date: 06/08/25 Time: 21:06
Sample: 2019 2023
Total panel observations: 190
Probability in ()

Null (no rand. effect) Alternative	Cross-section One-sided	Period One-sided	Both
Breusch-Pagan	367.8178 (0.0000)	1.860293 (0.1726)	369.6781 (0.0000)
Honda	19.17858 (0.0000)	-1.363926 (0.9137)	12.59686 (0.0000)
King-Wu	19.17858 (0.0000)	-1.363926 (0.9137)	4.694696 (0.0000)
GHM	-- --	-- --	367.8178 (0.0000)

- Hypothesis:

  - H0 : The correct model is Common Effect.

  - H1 : The right model is Random Effect.

- Decision Criteria:

  - If the probability (p-value) of the LM test <0.05, choose REM.

  - If the probability > 0.05, choose CEM.

- Notes: LM test is performed if chow does not select FEM and Hausman is not performed.

2. Panel Data Regression Analysis

Dependent Variable: JUMLAH_PENDUDUK_MISKIN__Y_
Method: Panel Least Squares
Date: 06/08/25 Time: 21:51
Sample: 2019 2023
Periods included: 5
Cross-sections included: 38
Total panel (balanced) observations: 190

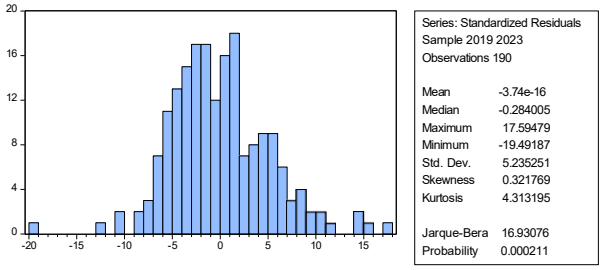
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	188.3157	44.85981	4.197872	0.0000
TINGKAT_PENGANGGURAN_TERBUKA_X1_	2.326859	0.423756	5.491041	0.0000
HARAPAN_LAMA_SEKOLAH__X2_	-6.482182	3.377813	-1.918751	0.0569

Based on the results of panel data regression using the Fixed Effect Model (FEM) method, we can see the effect of the open unemployment rate and expected years of schooling on the number of poor people in 38 regions from 2019 to 2023. The coefficient of the open unemployment rate is 2.33 and significant, meaning that if the unemployment rate increases by 1%, the number of poor people will increase by around 2.33 people, assuming other factors remain constant. Meanwhile, the expected years of schooling has a negative coefficient of -6.48, which means that if the expected years of schooling increase by 1 year, the number of poor people will decrease by around 6.48 people. However, the effect of school expectancy is only significant at the 90% confidence level or p-value of around 0.057, so the effect is rather weak but still there. The constant value of 188.32 shows the basic number of poor people if unemployment and schooling expectancy are considered zero.

3. Classical Assumption Test

a. Normality Test

Normality test is one of the classic assumption tests in regression analysis which aims to determine whether the residual difference between the actual value and the predicted value of the regression model is normally distributed. Residual normality is important because some statistical tests in regression, such as the t test and F test, assume that the residuals must be norma **l**y distributed for the results to be valid.



The histogram above shows the distribution of standardized residuals from the panel data regression results. Visually, the histogram is indeed in the form of a normal distribution, with most of the data piled up in the middle and less at the ends. However, if you look at the descriptive statistics on the side, there are a few things to note. The Skewness value of 0.32 indicates that the distribution is slightly skewed to the right, and the Kurtoris of 4.31 means that the distribution is more pointed than the normal distribution.

b. Heteroscedasticity Test

Heteroscedasticity test is a test conducted to determine whether the residual variance or the difference between the observation value and the predicted value in the regression model is constant or not.

Dependent Variable: ABSRES
Method: Panel Least Squares
Date: 06/08/25 Time: 21:56
Sample: 2019 2023
Periods included: 5
Cross-sections included: 38
Total panel (balanced) observations: 190

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	25.20857	22.58013	1.116405	0.2660
TINGKAT_PENGANGGURAN_TERBUKA_X1_	0.351682	0.213297	1.648790	0.1013
HARAPAN_LAMA_SEKOLAH_X2_	-1.711018	1.700218	-1.006352	0.3159
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.372314	Mean dependent var		4.032231
Adjusted R-squared	0.209116	S.D. dependent var		3.326101
S.E. of regression	2.957957	Akaike info criterion		5.191539
Sum squared resid	1312.426	Schwarz criterion		5.875123
Log likelihood	-453.1962	Hannan-Quinn criter.		5.468448
F-statistic	2.281360	Durbin-Watson stat		2.810872
Prob(F-statistic)	0.000210			

The heteroscedasticity test is a test conducted to determine whether the residual variance or the difference between the observed value and the predicted value in the regression model is constant or not. Based on the panel regression results with the dependent variable ABSRES (absolute value of residuals), this model is used to test the presence or absence of heteroscedasticity by regressing the absolute value of residuals on the independent variables, namely the open unemployment rate and expected years of schooling. The coefficients of both variables are not statistically significant (p-value of 0.1013 and 0.3159 respectively), which indicates that there is no significant relationship between the independent variables and the variation of the residuals. The R-squared value of 0.372 indicates that the model is only able to explain about 37.2%

of the variation in the absolute value of the residuals, and the significant F-statistic (p=0.000210) indicates that the overal**l** model is feasible. The Durbin-Watson of 2.81 indicates there is no autocorrelation problem in the residuals.

c. Multicollinearity Test

Multicollinearity test is a test conducted to ascertain whether in the regression model there is a correlation or strong linear relationship between independent variables.

	HARAPAN LAMA SEKOLAH X2	TINGKAT PENGANGGURAN TERBUKA X1
HARAPAN LAMA SEKOLAH X2	1	0.4356201
TINGKAT PENGANGGURAN TERBUKA X1	0.4356201	1

Based on the correlation data between the variable Expected Years of Schooling (X2) and Open Unemployment Rate (X1) of 0.4356, this value is still relatively low and far from the critical limit of 0.8. This means that there is not too strong a linear relationship between these two independent variables, so there is no multicollinearity in the regression model. This condition is normal and indicates that the two variables can be used together in the analysis without causing multicollinearity problems.

d. Autocorrelation Test

The autocorrelation test is a test that aims to detect whether there is a correlation between residuals (errors) in a period with residuals in the previous period in the regression model.

Dependent Variable: JUMLAH_PENDUDUK_MISKIN__Y_
Method: Panel Least Squares
Date: 06/08/25 Time: 21:51
Sample: 2019 2023
Periods included: 5
Cross-sections included: 38
Total panel (balanced) observations: 190

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	188.3157	44.85981	4.197872	0.0000
TINGKAT_PENGANGGURAN_TERBUKA___X1_	2.326859	0.423756	5.491041	0.0000
HARAPAN_LAMA_SEKOLAH__X2_	-6.481182	3.377813	-1.918751	0.0569

Effects Specification			
Cross-section fixed (dummy variables)			
R-squared	0.994280	Mean dependent var	113.0223
Adjusted R-squared	0.992793	S.D. dependent var	69.22018
S.E. of regression	5.876555	Akaike info criterion	6.564482
Sum squared resid	5180.085	Schwarz criterion	7.248066
Log likelihood	-583.6258	Hannan-Quinn criter.	6.841392
F-statistic	668.5374	Durbin-Watson stat	2.268875
Prob(F-statistic)	0.000000		

In the regression output, a Durbin-Watson (DW) value of 2.268875 was used to detect first-degree autocorrelation. This DW value is between 0 and 4, and specifically if the DW value is close to 2, then there is no indication of autocorrelation. As a general rule, a DW value between 1.5 and 2.5 is considered to indicate the absence of autocorrelation. Since your DW value is around 2.27, this indicates that the residuals of the model do not have significant autocorrelation. In other words, errors in one period are not correlated with errors in the previous period.

In conclusion, the autocorrelation test on this panel data regression model shows that there is no significant autocorrelation

problem. The regression model used has fulfilled the assumption of residual independence between time, so the coefficient estimation results and statistical tests can be trusted.

Conclusion

Based on the results of the panel data regression analysis of 38 districts/cities in East Java Province from 2019 to 2023, it can be concluded that the best model used is the Fixed Effect Model (FEM), as evidenced by the results of the Chow test and Hausman test. The Open Unemployment Rate (TPT) variable is proven to have a positive and significant effect on the number of poor people, which indicates that an increase in the unemployment rate will worsen the poverty rate. Meanwhile, the Expected Years of Schooling variable has a negative effect on poverty, but is not statistically significant although it is close to the significance limit.

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