

Analysis of Economic Growth, Education, Labor Participation, and Minimum Wage on Open Unemployment in Malang

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Abstract

This study investigates the determinants of the open unemployment rate in Malang City, where unemployment remains a major challenge despite ongoing regional economic development. The study aims to analyze the effects of economic growth, education level, labor force participation rate, and minimum wage on the open unemployment rate during the 2008–2024 period. Using a quantitative approach, this research applies multiple linear regression analysis based on secondary data obtained from the Central Statistics Agency (BPS) and related institutions. Hypothesis testing was conducted through the t-test, F-test, and coefficient of determination (R^2). The findings reveal that economic growth and minimum wage have a negative and significant effect on the open unemployment rate, indicating that higher economic growth and appropriate wage policies contribute to reducing unemployment in Malang City. In contrast, education level and labor force participation rate do not show a significant effect on unemployment. Simultaneously, all independent variables significantly influence the open unemployment rate. These findings imply that policies promoting sustainable economic growth and effective minimum wage regulations can serve as important instruments in reducing unemployment and supporting regional economic development in Malang City.

Keywords: Economic Growth, Education Level, Labor Force Participation Rate, Minimum Wage, Open Unemployment Rate

INTRODUCTION

Unemployment remains one of the major economic challenges in regional development in Indonesia (Helvira & Rizki, 2020). A high unemployment rate can generate various negative impacts, such as declining public income, increasing poverty, and disruptions to social and economic stability. Therefore, the open unemployment rate (OUR) is often used as an important indicator to assess the success of regional economic development.

The Open Unemployment Rate (OUR) refers to the percentage of unemployed individuals within the total labor force (BPS, 2024). Open unemployment includes working-age individuals who do not have jobs and are actively seeking employment, preparing a business, or have not yet started working despite already obtaining a job. A high OUR indicates that the labor market has not been able to absorb the available labor force fully.

Malang City is one of the major cities in East Java Province that plays an important role in economic, educational, and service activities. As a well-known education city, Malang has a large productive-age population. However, the increasing labor force has not been fully matched by the availability of adequate employment opportunities.

Data presented in Figure 1 show the five regencies/cities with the highest Open Unemployment Rate in East Java Province in 2024. Malang City ranked third highest in East Java with an unemployment rate of 6.10%, after Sidoarjo Regency and Gresik Regency, which recorded 6.49% and 6.45%, respectively. Below Malang City were Bangkalan Regency at 5.35% and Malang Regency at 5.13%. This condition indicates that despite experiencing significant economic and educational development, unemployment remains an important issue in Malang City.

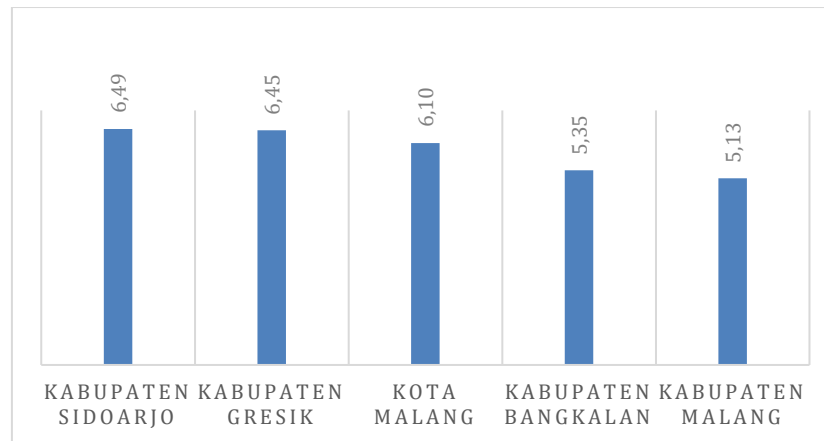


Figure 1. Regencies/Cities with the Highest Open Unemployment Rate in East Java Province, 2024

Source: BPS East Java Province

One factor suspected of influencing the open unemployment rate is economic growth. Economic growth reflects the increase in the production of goods and services in a region, measured through Gross Regional Domestic Product (GRDP). According to Keynesian theory, higher economic growth stimulates labor demand and can reduce unemployment (Sufriadi, 2024).

In addition to economic growth, education level is closely related to unemployment. Human capital theory explains that education is an investment in human resources that can improve skills, productivity, and employment opportunities (Hasan et al., 2023). Higher levels of education are expected to increase individuals' chances of being absorbed into the labor market.

However, higher education does not always lead to lower unemployment. In some cases, highly educated graduates still face difficulties in finding jobs due to mismatches between their skills and labor market demands. This condition results in educated unemployment, which is still common in many regions, including Malang City.

Another factor affecting unemployment is the Labor Force Participation Rate (LFPR). LFPR reflects the proportion of the working-age population actively participating in the labor market, either by working or seeking employment (Siregar, 2018). A higher LFPR indicates an increase in labor supply, which may intensify competition in obtaining jobs.

On the other hand, minimum wage is also an important factor in labor dynamics. Minimum wage refers to the lowest wage standard established by the government to protect workers' welfare. According to classical economic theory, an increase in minimum wage above the labor market equilibrium may reduce labor demand and increase unemployment (Adam Smith & Ricardo in classical wage theory). Nevertheless, an appropriate minimum wage may also improve workers' productivity and welfare.

The relationship between economic growth, education level, LFPR, and minimum wage on the open unemployment rate does not always show consistent directions. Differences in previous research findings indicate that the effects of these variables on unemployment may vary across regions and research periods. Therefore, a more comprehensive empirical analysis is necessary to understand the relationships among these variables.

This study uses Malang City as the research object with an observation period from 2008 to 2024. The selected period aims to examine the long-term development of open unemployment and the influence of various economic and labor-related factors during that time.

This research employs a quantitative approach using multiple linear regression analysis. The data used are secondary data obtained from the Central Statistics Agency (BPS) and related institutions. The independent variables in this study are economic growth, education level, labor force participation rate, and minimum wage, while the dependent variable is the open unemployment rate.

This study is expected to provide empirical evidence regarding the factors influencing the open unemployment rate in Malang City. The findings are expected to serve as a reference for local governments in formulating employment policies, improving human resource quality, and developing economic strategies to reduce open unemployment sustainably.

METHOD

The method section contains an explanation of the research subject, research design, data collection methods, intervention procedures, and data analysis techniques.

This study employs a quantitative approach with an explanatory research design to analyze the effects of economic growth, education level, labor force participation rate, and minimum wage on the open unemployment rate in Malang City. The study uses time series data covering the period 2008–2024. The data are secondary data obtained from Statistics Indonesia and related institutions.

The dependent variable in this study is the open unemployment rate (OUR), while the independent variables consist of economic growth, education level measured by average years of schooling, labor force participation rate (LFPR), and minimum wage. Data analysis was conducted using multiple linear regression analysis to determine the effect of each independent variable on the dependent variable.

The regression model used in this study is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Where:

- Y = Open Unemployment Rate (OUR)
- X₁ = Economic Growth
- X₂ = Education Level
- X₃ = Labor Force Participation Rate (LFPR)
- X₄ = Minimum Wage
- β₀ = Constant
- β₁–β₄ = Regression coefficients
- e = Error term

Hypothesis testing was conducted using the t-test to examine the partial effect of each independent variable on the dependent variable, the F-test to determine the simultaneous effect of all independent variables, and the coefficient of determination (R²) to measure the model's ability to explain the dependent variable. In addition, classical assumption tests consisting of normality, multicollinearity, heteroscedasticity, and autocorrelation tests were carried out to ensure that the regression model met the statistical requirements.

RESULTS AND DISCUSSION

Classical Assumption Tes

Normality Test

The normality test was conducted to determine whether the independent and dependent variables in the regression model were normally distributed. This study used the One-Sample Kolmogorov-Smirnov (K-S) test to examine data normality. The data are considered normally distributed if the Asymp. Sig. (2-tailed) value is greater than the significance level of 5% (0.05).

Table 1. Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardi zed Residual
N		17
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	.87480642
Most Extreme Differences	Absolute	.177
	Positive	.177
	Negative	-.099
Test Statistic		.177
Asymp. Sig. (2-tailed) ^c		.164

Source: SPSS Output

Based on Table 1, the Asymp. Sig. (2-tailed) value is 0.164, which is greater than 0.05, indicating that the residuals are normally distributed. Therefore, the regression model satisfies the normality assumption and is appropriate for further analysis.

Multicollinearity Test

The multicollinearity test is conducted to examine the relationship or correlation among the independent variables. If the independent variables are correlated with each other, the variables are considered non-orthogonal. This test is assessed using the Tolerance value and Variance Inflation Factor (VIF), where the criteria are a Tolerance value greater than 0.10 and a VIF value less than 10.

Table 2. Multicollinearity Test

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Pertumbuhan_Ekonomi	0.874	1.144
Tingkat_Pendidikan	0.625	1.601
TPAK	0.558	1.792
Upah_Minimum	0.391	2.559

a. Dependent Variable: Tingkat Pengangguran Terbuka

Source: SPSS Output

Based on the test results above, the tolerance values of all four variables are greater than 0.10, while the VIF values are less than 10. Therefore, it can be concluded that the data do not indicate multicollinearity.

Heteroscedasticity Test

The heteroscedasticity test was conducted to determine whether the regression model exhibited unequal residual variances across observations. This study used the Glejser test, where a significance value greater than 0.05 indicates the absence of heteroscedasticity. Therefore, a regression model is considered appropriate if it meets the homoscedasticity assumption.

Table 3. Heteroscedasticity Test

Variabel	Sig.	Kriteria	Keterangan
Pertumbuhan Ekonomi	0.359	>0.05	Tidak Terjadi Heteroskedastisitas
Tingkat Pendidikan	0.563	>0.05	Tidak Terjadi Heteroskedastisitas
Tingkat Partisipasi Angkatan Kerja	0.775	>0.05	Tidak Terjadi Heteroskedastisitas
Upah Minimum	0.868	>0.05	Tidak Terjadi Heteroskedastisitas

Source: SPSS Output

Based on Table 3, the significance values of the research data are greater than 0.05, indicating that the regression model does not exhibit heteroscedasticity and is suitable for further testing.

Autocorrelation Test

The autocorrelation test was conducted to determine the relationship between residual errors in period t and period t-1 within the regression model. This study used the run test to detect autocorrelation. The results of the autocorrelation test are presented in the following table:

Table 4. Autocorrelation Test

Runs Test	
	Unstandardized Residual
Test Value ^a	-.33100
Cases < Test Value	8
Cases ≥ Test Value	9
Total Cases	17
Number of Runs	8
Z	-.488
Asymp. Sig. (2-tailed)	.626

Source: SPSS Output

Based on the test results in Table 4, the Asymp. Sig. (2-tailed) value is 0.626, which is greater than 0.05. Therefore, it can be concluded that the regression model does not exhibit autocorrelation, indicating that the autocorrelation assumption is satisfied.

Multiple Linear Regression Analysis

Multiple Linear Regression Analysis was used to determine the significant effect of the independent variables on the dependent variable. The results of the data analysis are presented as follows:

Table 5. Multiple Linear Regression Analysis

	Unstandardized Coefficients B	Sig.
(Constant)	-1.241	0.924
Pertumbuhan_Ekonomi	-0.924	0.005
Tingkat_Pendidikan	1.194	0.084
TPAK	0.09	0.543
Upah_Minimum	-1.80E-06	0.002

Source: SPSS Output

Based on Table 5, the multiple linear regression equation is expressed as follows:

$$Y = -1.241 - 0.924X_1 + 1.194X_2 + 0.09X_3 - 1.80 \times 10^{-6}X_4$$

The regression results indicate that if all independent variables are constant, the open unemployment rate is -1.241 . Economic growth has a negative coefficient of -0.924 , meaning that a 1% increase in economic growth will reduce the open unemployment rate by 0.924%, assuming other variables remain constant. The education level has a positive coefficient of 1.194, indicating that a one-unit increase in education level will increase the open unemployment rate by 1.194 units. The labor force participation rate has a positive coefficient of 0.09, meaning that a 1% increase in LFPR will increase the open unemployment rate by 0.09%. Meanwhile, the minimum wage coefficient is -1.80×10^{-6} , indicating that an increase of one million rupiahs in the minimum wage will reduce the open unemployment rate by 0.0000018 units, assuming other variables remain constant.

Hypothesis Testing

Coefficient of Determination Test (R^2)

The coefficient of determination test (R^2) is used to measure how well the independent variables explain the dependent variable, as indicated by the R-square value. The results of the coefficient of determination test are presented in the following table:

Table 6. Coefficient of Determination Test (R^2)

R	R Square	Adjusted R Square	Std. Error of the Estimate
.825 ^a	0.681	0.575	1.01014

Source: SPSS Output

Based on Table 6, the R-square value is 0.681 or 68.1%. This indicates that the independent variables, namely Economic Growth (X_1), Education Level (X_2), Labor Force Participation Rate (X_3), and Minimum Wage (X_4), are able to explain 68.1% of the variation in the Open Unemployment Rate (Y), while the remaining 31.9% is explained by other variables outside this study.

F-Test (Simultaneous Test)

The F-test is used to determine the simultaneous effect of the independent variables on the dependent variable. In this test, the model is considered appropriate for research analysis if the significance value is less than 0.05. Conversely, if the significance value is greater than 0.05, the model is considered inappropriate for use in the study. The results of the F-test are presented in the following table:

Table 7. F-Test (Simultaneous Test ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.168	4	6.542	6.411	.005 ^b
	Residual	12.245	12	1.02		
	Total	38.412	16			

Source: SPSS Output

Based on Table 7, the calculated F-value is 6.411 with a significance value of 0.005, which is smaller than 0.05. The F-table value obtained from the calculation is 3.26, indicating that F-count (6.411) is greater than F-table (3.26). Therefore, it can be concluded that all independent variables, namely Economic Growth, Education Level, Labor Force Participation Rate, and Minimum Wage, simultaneously influence the Open Unemployment Rate as the dependent variable.

t-Test (Partial Test)

The t-test is used to examine the significance of the partial effect of each independent variable on the dependent variable. Through this test, it can be determined whether each independent variable has a significant or insignificant effect on the dependent variable. Partially, the results for each variable are as follows:

Table 8. t-Test (Partial Test)

Variabel	t Hitung	t Tabel	Sig.
Pertumbuhan Ekonomi	-3.416	2.179	0.005
Tingkat Pendidikan	1.883	2.179	0.084
Tingkat Partisipasi Angkatan Kerja	0.625	2.179	0.543
Upah Minimum	-3.905	2.179	0.002

Source: SPSS Output

Based on the t-test results in Table 8, the first step was determining the t-table value. The calculation was conducted at a significance level of 0.05 using a two-tailed test ($0.05/2 = 0.025$) with degrees of freedom (df) equal to $n - k - 1$ or $(17 - 4 - 1) = 12$. Based on this calculation, the t-table value obtained was 2.179.

Economic Growth (X1) has a t-value of -3.416 (> 2.179), so H_0 is rejected. This means it has a significant effect on Open Unemployment Rate (OUR) with a negative direction, indicating that higher economic growth reduces unemployment in Malang City.

Education Level (X2) has a t-value of 1.883 (< 2.179), so H_0 is accepted. This means it has no significant effect on the Open Unemployment Rate.

Labor Force Participation Rate (X3) has a t-value of 0.625 (< 2.179), so H_0 is accepted. This means it has no significant effect on the Open Unemployment Rate.

Minimum Wage (X4) has a t-value of -3.905 (> 2.179), so H_0 is rejected. This indicates a significant effect on the Open Unemployment Rate with a negative direction, meaning that an increase in the minimum wage reduces unemployment in Malang City.

Discussion

Based on the multiple linear regression results, the economic growth variable has a coefficient of -0.924 with a t-value of -3.416 and a significance level of 0.005 (< 0.05), indicating that it has a negative and significant effect on the Open Unemployment Rate (OUR) in Malang City. This means that every 1% increase in economic growth will reduce the unemployment rate by 0.924%, assuming other variables remain constant. The results show that increased economic activity can enhance labor absorption and reduce unemployment, which is consistent with economic growth theory and the Keynesian theory stating that an increase in output leads to higher labor demand, thereby lowering unemployment.

Based on the multiple linear regression results, the education level variable has a coefficient of 1.194 with a t-value of 1.883 and a significance level of 0.084 (> 0.05), indicating that it has no significant effect on the Open Unemployment Rate (OUR) in Malang City. Although the coefficient is positive, suggesting that an increase in average years of schooling may raise unemployment by 1.194%, the effect is not statistically significant. This finding implies that higher education does not directly reduce unemployment, which may be explained by a mismatch between educational qualifications and labor market demand or the slower growth of job opportunities compared to the number of graduates.

Based on the multiple linear regression results, the Labor Force Participation Rate (LFPR) has a coefficient of 0.090 with a t-value of 0.625 and a significance level of 0.543 (> 0.05), indicating no significant effect on the Open Unemployment Rate (OUR) in Malang City. Although the relationship is positive, it is not statistically significant, meaning LFPR does not directly

influence unemployment. This may occur because an increase in labor supply is not matched by labor demand, so job creation is insufficient to absorb additional workers.

Based on the multiple linear regression results, the Minimum Wage variable has a coefficient of -1.795E-6 with a t-value of -3.905 and a significance of 0.002 (< 0.05), indicating a negative and significant effect on the Open Unemployment Rate (OUR) in Malang City. This means that higher minimum wages are associated with lower unemployment. The result supports the Keynesian view that higher wages increase purchasing power, stimulate aggregate demand, and improve labor absorption.

CONCLUSION

Based on the results of the study on the effect of economic growth, education level, labor force participation rate, and minimum wage on the Open Unemployment Rate (OUR) in Malang City during the period 2008–2024, the following conclusions can be drawn:

Economic growth has a negative and significant effect on the Open Unemployment Rate. This indicates that higher economic growth is able to encourage job creation, thereby reducing the number of unemployed people. Thus, the higher the economic growth achieved, the lower the Open Unemployment Rate tends to be.

Education level has no significant effect on the Open Unemployment Rate. Although theoretically an increase in education can improve the quality of human resources and employment opportunities, in this study the average years of schooling have not been able to directly reduce unemployment. This may be caused by a mismatch between educational qualifications and labor market needs.

The Labor Force Participation Rate (LFPR) also has no significant effect on the Open Unemployment Rate. This shows that an increase in the number of people entering the labor market does not automatically affect the unemployment rate if it is not accompanied by sufficient job availability.

Minimum wage has a negative and significant effect on the Open Unemployment Rate. The increase in the minimum wage during the study period is actually associated with a decrease in unemployment, indicating that higher purchasing power and economic activity can encourage labor absorption.

Simultaneously, the variables of economic growth, education level, labor force participation rate, and minimum wage jointly affect the Open Unemployment Rate in Malang City.

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