

Analysis of the Effect of Education Level, Minimum Wage, and Gross Regional Domestic Product on the Open Unemployment Rate in Banten Province

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ABSTRACT

Unemployment is an important issue in regional economic development because it has a direct impact on community welfare. Banten Province is recorded as one of the provinces with the highest open unemployment rate (TPT) in Indonesia despite having relatively developed economic growth and industrial areas. This study aims to analyze the effect of education level, provincial minimum wage (UMP), and Regional Gross Domestic Product (PDRB) on the Open Unemployment Rate in Banten Province during the period 2014–2023. The study uses a quantitative approach with a descriptive-explanatory method and utilizes panel data sourced from the Central Statistics Agency (BPS). The analysis technique used is panel data regression with the Fixed Effect Model (FEM). The results show that the level of education, measured by the average length of schooling, has a negative and significant effect on the OUR, meaning that an increase in education can reduce the unemployment rate. Conversely, the UMP has a positive and significant effect on the TPT, indicating that an increase in the minimum wage tends to increase unemployment if it is not balanced with an increase in labor productivity. Meanwhile, the PDRB has a negative but insignificant effect on the TPT, indicating that economic growth in Banten Province is not yet inclusive and has not been able to optimally absorb labor. Simultaneously, all three variables have a significant effect on the OUR. These findings emphasize the need for integrated policies that combine improvements in education quality, balanced wage setting, and economic development oriented toward job creation.

INTRODUCTION

Unemployment is one of the fundamental indicators in assessing the success of regional economic development. A high Open Unemployment Rate (TPT) not only reflects an imbalance in the labor market, but also indicates that human resources are not being optimally utilized in the production process. Macroeconomically, unemployment has an impact on declining purchasing power, increasing the government's fiscal burden, and potentially causing social instability. Therefore, the issue of unemployment cannot be viewed solely as a labor problem, but rather as a structural problem of economic development.

The province of Banten is one of the strategic regions on the island of Java with unique economic characteristics. Its location, which borders directly with DKI Jakarta, and the existence of national and international industrial areas make Banten one of the new economic growth centers in Indonesia. Theoretically, regions with high industrial concentration and economic growth should have a large capacity to absorb labor. However, empirical facts show contradictory conditions. Based on data from the Central Statistics Agency in 2023, Banten recorded an unemployment rate of 7.52 percent and was among the six provinces with the highest unemployment rates in Indonesia. This condition shows a development paradox, where relatively high economic growth has not been able to significantly reduce the unemployment rate.

Table 1 Comparison of the Highest Unemployment Rates in Six Provinces

PROVINCE	PERCENT (%)
Banten	7.5
West Java	7.44
Riau Islands	6.80
Jakarta	6.53
Maluku	6.31
North Sulawesi	6.10

Source: Central Statistics Agency 2023

Banten had the highest unemployment rate of 7.52% in August 2023 compared to other provinces. This situation illustrates that although Banten has broad economic potential across various sectors, labor absorption is still not optimal. The differences in unemployment rates between provinces also indicate disparities in the quality of human resources, regional economic structures, and the effectiveness of employment policies in each region (Chandra Muzakki et al., 2024).

This phenomenon indicates a mismatch between economic growth and the quality of human resources, as well as imbalances in the labor market structure. Theoretically, the relationship between economic growth and unemployment is explained by Okun's Law, which states that an increase in output should be followed by a decrease in unemployment. However, in the context of Banten, economic growth tends to be dominated by capital-intensive sectors, such as large-scale manufacturing and technology-based industries, which have relatively low labor absorption elasticity. As a result, an increase in Regional Gross Domestic Product (RGDP) is not automatically followed by an increase in

employment opportunities (Ainaya & Imaningsih, 2025). The differences in unemployment rates between provinces also reflect disparities in the quality of human resources, regional economic structures, and the effectiveness of labor policies implemented in each region. Provinces with economic structures dominated by capital-intensive sectors tend to have lower labor absorption rates than provinces that develop labor-intensive sectors (Yuniar, 2022). This condition is thought to contribute to the high unemployment rate in Banten Province.

In addition to economic growth factors, the quality of education is an important determinant in explaining the dynamics of unemployment. From the perspective of human capital theory, education is seen as an investment that increases labor productivity and competitiveness. Workers with higher levels of education are assumed to have greater employment opportunities because they are able to adapt to technological changes and industry needs. However, in practice, improvements in education do not always lead to a decrease in unemployment if there is a mismatch between the competencies of graduates and the needs of the labor market. This condition has the potential to cause structural unemployment, especially in areas with rapid economic transformation such as Banten (Filiyasi & Setiawan, 2021).

Another factor influencing unemployment dynamics is minimum wage policy. The Provincial Minimum Wage (UMP) is set to protect workers' welfare and ensure a decent standard of living. However, in the framework of labor market theory, an increase in the minimum wage that exceeds the marginal productivity of labor has the potential to reduce labor demand, especially in labor-intensive sectors and small and medium-sized enterprises (Aulia et al., 2024). Thus, wage policy has dual implications: on the one hand, it improves the welfare of workers who are absorbed, but on the other hand, it has the potential to increase unemployment if it is not balanced by increased productivity.

Gross Regional Domestic Product (GRDP) is also an important indicator in analyzing the relationship between economic growth and unemployment. In theory, an increase in GRDP reflects increased economic activity in a region, which should be followed by an increase in labor absorption. However, in practice, economic growth in Banten Province tends to be dominated by capital-intensive sectors that are considered to absorb less labor. As a result, an increase in GRDP does not directly reduce the open unemployment rate. This phenomenon shows that economic growth that is not inclusive and not oriented towards job creation can cause unemployment to remain high even though the GRDP value increases (Rahma, 2023).

This study is expected to contribute theoretically to enriching the literature on the determinants of unemployment at the regional level, as well as practically as a basis for formulating more integrated employment policies. By understanding the interaction between education, wage policies, and economic growth, local governments can design development strategies that are not only oriented towards output growth but also towards the creation of inclusive and sustainable employment opportunities.

LITERATURE REVIEW

The theoretical basis of this study is rooted in the Classical Growth Theory proposed by Adam Smith and Gary Becker's Human Capital Theory. Classical Growth Theory asserts that economic growth is influenced by the accumulation of capital, labor, and specialization that increases productivity, so that in theory, GRDP growth should be able to expand employment opportunities and reduce unemployment. Meanwhile, the Human Capital Theory places education as a form of investment that improves the quality, skills, and productivity of the workforce, thereby increasing opportunities to be absorbed in the labor market. In the context of the labor market, the marginal productivity wage theory explains that setting a minimum wage that exceeds productivity can suppress labor demand and potentially increase unemployment. Thus, conceptually, the relationship between education, minimum wage, and GRDP on the Open Unemployment Rate reflects the interaction between the quality of human resources, labor policies, and the structure of regional economic growth.

METHODOLOGY

This study uses a quantitative approach with a descriptive-explanatory method. The quantitative approach aims to analyze the causal relationship between the variables of education level, provincial minimum wage, and Gross Regional Domestic Product on the open unemployment rate. The descriptive-explanatory method is used to explain the phenomenon of unemployment while empirically testing the influence of independent variables on dependent variables. This study was conducted in Banten Province as the study area. Banten Province was chosen as the object of study because it has a high open unemployment rate and a diverse economic structure. This study uses secondary data with an observation period from 2014 to 2023, which reflects medium-term employment conditions.

This study uses secondary data sourced from the Central Statistics Agency (BPS). The research data was collected from official publications of the Banten Province BPS and district/city BPS during the research period. The data used includes annual data so that the analysis results consistently reflect regional economic dynamics.

$$TPT = \alpha + b_1 RLS_{it} + b_2 UMP_{it} + b_3 GRDP_{it} + e$$

Where:

Y	= Dependent Variable (LDR)
α	= Constant
RLS	= Education Level (Average Length of Schooling)
UMP	= Provincial Minimum Wage (UMP)
GRDP	= Gross Regional Domestic Product (GRDP)
b_1	= RLS Regression Coefficient
b_2	= UMP Regression Coefficient
b_3	= PDRB Regression Coefficient
e	= Error (Disturbance Variable)
t	= Time
i	= Company

RESEARCH RESULTS

The main findings of the study are presented in the results and discussion section, which is written systematically. This section only contains data or information related to the research objectives. The discussion in the research article provides an explanation of the results obtained from the study.

Table 2 Regression Output

Dependent Variable: Y Method: Panel Least Squares Date: 06/18/25 Time: 12:50 Sample: 2014-2023
 Periods included: 10
 Cross-sections included: 8
 Total panel (balanced) observations: 80

Variable	Coefficient	Standard Error	t-Statistic	Prob.
C	45.02951	8.855437	5.084956	0.0000
RLS	-4.147502	1.148779	-3.610356	0.0006
UMP	1.28E-06	6.39E-07	1.997075	0.0498
GRDP	-7.20E-08	4.62E-08	-1.557865	0.1238

Effects Specification

Source: Eviews 12 Output

Panel data estimation using the Fixed Effect Model (FEM) produces the following regression equation:

$$Y = 45.0277 - 4.1476 + 1.2763e-06 - 7.1969e-08$$

- RLS (-4.1476): Each 1-year increase in average length of schooling will reduce the TPT by 4.15 percentage points, assuming other variables remain constant.
- UMP (+1.2763e-06): An increase in the minimum wage of IDR 1,000 will increase the TPT by 0.0013%, assuming it is constant.
- PDRB (-7.1969e-08): Every increase in GRDP by Rp1,000,000,000 will reduce the TPT by 0.0719%, assuming it remains constant.

Table 3 Hypothesis Test

Variable	Coefficient	t-Statistic	Prob.
C	45.02951	5.084956	0.0000
RLS	-4.147502	-3.610356	0.0006
UMP	1.28E-06	1.997075	0.0498
GRDP	-7.20E-08	-1.557865	0.1238

Source: Eviews 12 Data Processing Results

Based on the results of the t-test (partial) on panel data regression with the Fixed Effect Model (FEM), it can be concluded that each independent variable shows a different level of influence on the Open Unemployment Rate (TPT).

a. The Effect of Education Level on Open Unemployment Rate

The Education Level variable, using Average Length of Schooling (ALS) data, has a coefficient of -4.1475 with a probability value of 0.0006 (<0.05), "indicating that ALS has a negative and significant effect on the open

unemployment rate." This means that the lower the level of education of the population, the higher the unemployment rate.

b. The Effect of Minimum Wage on Open Unemployment Rate

The Provincial Minimum Wage (UMP) variable shows a positive coefficient of 1.28E-06 with a probability value of 0.0498 (<0.05), "so it can be concluded that UMP has a positive and significant effect on TPT." This means that every increase in UMP tends to be followed by an increase in the number of unemployed.

c. The Effect of Regional Gross Domestic Product on the Open Unemployment Rate

The Regional Domestic Product (RDP) variable has a coefficient of $-7.20E-08$ with a probability value of 0.1238 (>0.05), indicating that RDP has a negative but insignificant effect on the TPT. This shows that an increase in GRDP has not been able to reduce unemployment significantly because economic growth tends to be non-inclusive and is dominated by capital-intensive sectors that absorb minimal labor.

Table 4 Simultaneous Test & R-Square

Cross-section fixed (dummy variables)			
Root MSE	1.207881	R-squared	0.697039
Mean dependent variable	9.148946	Adjusted R-squared	0.653131
S.D. dependent variable	2.208319	S.E. of regression	1.300602
Akaike information criterion	3.490612	Sum of squared residuals	116.7180
Schwarz criterion	3.818140	Log likelihood	-128.6245
Hannan-Quinn criterion	3.621927	F-statistic	15.87518
Durbin-Watson statistic	1.699458	Probability of F-statistic	0.00000

Source: Eviews 12 Data Processing Results

Based on the regression output, the F-test results in the fixed effect panel regression model show an F-statistic value of 15.88 with Prob(F) 0.0000 (<0.05), which means that simultaneously Average Length of Schooling (RLS), the District Minimum Wage (UMK), and GRDP significantly affect the Open Unemployment Rate (TPT). These findings indicate that these three variables together can explain the variation in unemployment rates in the region and period of the study, so that policies in the fields of education, minimum wages, and economic growth need to be formulated in an integrated manner.

The determination test results show that the model is able to explain around 65-70% of the variation in the Open Unemployment Rate (TPT) through the variables of RLS, UMP, GRDP, and the fixed effect of the district/city. The Adjusted R-Squared value of 0.6531 indicates that the model has a fairly good explanatory power, while the low S.E. of regression (1.3006) and small sum squared residual indicate that the model's predictions are relatively accurate.

DISCUSSION

The results of panel data regression estimation using the Fixed Effect Model (FEM) approach show that the variation in the Open Unemployment Rate (OUR)

in Banten Province is significantly influenced by education and minimum wage factors, while GRDP has not shown a significant effect. These findings confirm that the issue of unemployment in Banten is not solely a matter of economic growth, but is more deeply related to the quality of human resources and the structure of the labor market.

Partially, the level of education proxied by Average Length of Schooling (ALS) has a negative and significant effect on the OUR. A coefficient of -4.1475 indicates that an increase of one year in the average length of schooling can substantially reduce the OUR. This result is consistent with the Human Capital theory, which states that education is an investment that increases labor productivity and competitiveness. In the context of Banten, increased education increases the chances of labor being absorbed into the formal sector, particularly in the manufacturing, modern services, and trade industries that are developing in the Tangerang and Cilegon areas. This finding reinforces the argument that improving access to and quality of education is not only a social policy but also a strategic instrument in reducing structural unemployment. However, the effectiveness of education still depends on the alignment of the curriculum with industry needs (), making vocational education reform crucial.

In contrast to education, the Provincial Minimum Wage (UMP) variable shows a positive and significant effect on the TPT. A positive coefficient indicates that an increase in the UMP tends to be followed by an increase in open unemployment. Theoretically, this result can be explained through the classical wage theory and labor demand theory, where an increase in wages above the marginal productivity of labor can reduce labor demand. In Banten's economic structure, which is still dominated by labor-intensive manufacturing and MSMEs, an increase in the UMP increases production costs, prompting companies to streamline their workforce, delay recruitment, or switch to automation. This finding does not necessarily indicate that the UMP policy is wrong, but rather confirms that wage policies must be accompanied by increased labor productivity through training, competency certification, and incentives for the business sector to remain expansive.

Meanwhile, GRDP has a negative but insignificant effect on TPT. Theoretically, economic growth should reduce unemployment, as explained in Okun's law. However, in the case of Banten, economic growth as reflected in the increase in GRDP has not been inclusive. The regional economic structure tends to rely on capital-intensive sectors such as the chemical, steel, and large-scale manufacturing industries, which have relatively low labor elasticity. This means that increased output does not proportionally increase labor absorption. This condition indicates the phenomenon of jobless growth, where economic growth occurs without being followed by adequate expansion of employment opportunities. Thus, the quality of economic growth becomes the main issue, not just the magnitude of growth itself.

Simultaneously, all three variables show a significant effect on TPT with an Adjusted R-Squared value of 0.6531. This means that approximately 65% of the variation in unemployment can be explained by education, UMP, and PDRB, as well as the fixed characteristics of each district/city. The rest is influenced by

other factors such as labor migration, industrial structure, investment, technological developments, and demographic dynamics that are not included in the model. The high coefficient of determination value indicates that the model has a fairly strong explanatory power, but still leaves room for further research with additional variables.

Overall, the results of this study confirm that the problem of unemployment in Banten Province is multidimensional. Education has been proven to be a protective factor against unemployment, while minimum wage policies have consequences for labor demand if they are not balanced with increased productivity. On the other hand, inclusive economic growth has not been able to significantly reduce unemployment despite an increase in gross regional domestic product (GRDP). Therefore, strategies to reduce unemployment in Banten require an integrated approach that includes industry-based education reform, wage policies that are adaptive to productivity, and economic structural transformation towards labor-intensive and job-oriented sectors.

CONCLUSION AND RECOMMENDATION

Based on the results of panel data regression analysis using the Fixed Effect Model (FEM) approach, it can be concluded that education levels, the Provincial Minimum Wage (UMP), and Regional Domestic Product (PDRB) simultaneously have a significant effect on the Open Unemployment Rate (TPT) in Banten Province during the 2014–2023 period. The research model was able to explain around 65% of the variation in TPT, indicating that these three variables have a fairly strong contribution in explaining the dynamics of unemployment in the region. Partially, the level of education, measured by the average length of schooling, has a negative and significant effect on the OUR. This means that improving the quality of education can reduce unemployment because a more educated workforce has better competitiveness, productivity, and employment opportunities. This finding emphasizes the importance of investing in the education sector as a long-term strategy to reduce structural unemployment.

Conversely, the minimum wage has a positive and significant effect on the TPT. This shows that an increase in the minimum wage, if not balanced with an increase in labor productivity and business capacity, can lead to an increase in unemployment due to the additional production costs borne by companies. Therefore, wage policies need to be designed in a balanced manner, taking into account industrial conditions and labor capacity. Meanwhile, GRDP has a negative but insignificant effect on the TPT. This indicates that economic growth in Banten Province is not yet fully inclusive and has not been able to optimally absorb labor, as it is still dominated by capital-intensive sectors. Thus, economic development policies that are more oriented towards job creation are needed, particularly through strengthening labor-intensive sectors and increasing the link between education and industry needs.

Overall, this study confirms that reducing the unemployment rate in Banten Province requires integrated policies between improving the quality of education, setting proportional wages, and implementing inclusive and labor-absorbing economic growth strategies.

ADVANCED RESEARCH

This study concludes that education level, Provincial Minimum Wage (UMP), and Gross Regional Domestic Product (GRDP) simultaneously have a significant effect on the Open Unemployment Rate (OUR) in Banten Province during 2014–2023, with the model explaining about 65% of unemployment variation. Partially, education has a negative and significant effect on unemployment, while the minimum wage has a positive and significant effect, indicating that wage increases not balanced with productivity may increase unemployment. Meanwhile, GRDP has a negative but insignificant effect, suggesting that economic growth has not been fully inclusive in absorbing labor. Overall, reducing unemployment requires integrated policies focusing on improving education quality, balanced wage policies, and labor-absorbing economic growth.

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