

AN ANALYSIS OF THE FACTORS INFLUENCING EDUCATED UNEMPLOYMENT IN CENTRAL JAVA

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Abstract

Central Java has the third-highest number of unemployed among Indonesian provinces, with higher education graduates comprising 57.54% of the total unemployed population in 2023. This study analyzes the effects of investment, regional government expenditure, economic growth, the number of industries, and district minimum wages on educated unemployment in Central Java. Using a quantitative approach with secondary data from BPS, the study covers 35 districts/cities from 2019 to 2023. Panel data regression with a Fixed Effect Model is applied. The findings reveal that investment and economic growth have a negative and significant effect on educated unemployment. Conversely, the number of industries and district minimum wages have a positive and significant effect on educated unemployment. Meanwhile, regional government expenditure does not have a significant effect on educated unemployment. This study recommends: (1) Local governments should continuously promote a conducive investment climate through streamlined licensing processes, legal certainty, and improved infrastructure development. (2) Economic growth should be enhanced, particularly in sectors with a high absorption capacity for higher education graduates, such as modern services, finance, and the creative industry. (3) Local governments need to actively support the development of technology-based and innovation-driven industries that can generate more employment opportunities for university graduates. (4) Greater caution is needed when setting district minimum wage policies to ensure a fair balance between the interests of employers and workers.

Keywords: Educated Unemployment, Investment, Economic Growth, The Number of Industries, District Minimum Wages

INTRODUCTION

Unemployment remains a major labor market issue faced by all developing countries, including Indonesia. Unemployment refers to a condition in which individuals who are part of the labor force are actively seeking work but have not yet secured employment (Sukirno, 2012). According to data from the World Economic Outlook released by the IMF, as of April 2024, Indonesia recorded the highest unemployment rate and number of unemployed individuals among ASEAN countries, reaching 5.2 percent, or approximately 7.2 million people (Suryo, 2024). The high unemployment rate in Indonesia indicates that the country has not yet fully optimized its demographic potential (Kanda & Nafiah, 2024).

Central Java Province ranked third in terms of the highest number of unemployed individuals in Indonesia during the period 2019 to 2023, with consistently high and fluctuating figures each year. In terms of educational attainment, unemployment in Central Java is predominantly composed of graduates from vocational high schools, general high schools, diploma programs, and universities, accounting for 57.54 percent of the total unemployed population in the province in 2023. This is even though educated workers typically possess longer and more extensive training or education. According to the Regional Fiscal Review by the Directorate General of Treasury (DJPb) of

Central Java Regional Office (2024), one of the key employment issues in Central Java Province is the high unemployment rate among vocational high school graduates.

Table 1. Labor Force by Education Level in Central Java Province 2023

Education Level	Labor Force (Persons)	Employed (Persons)	Unemployed (Persons)	Labor Force Participation Rate (%)	Unemploy ment Rate (%)
Elementary School	8,764,743	8,524,488	240,255	97.26	2.74
Junior Secondary School	4,334,847	4,116,454	218,393	94.96	5.04
Senior High School (General)	2,942,388	2,733,687	208,701	92.91	7.09
Senior High School (Vocational)	3,117,350	2,809,197	308,153	90.11	9.89
Diploma	418,471	397,183	21,288	94.91	5.09
University	1,491,336	1,407,866	83,470	94.40	5.60
Total	21,069,135	19,988,875	1,080,260	94.87	5.13

Source: Central Statistics Agency of Central Java Province (2024)

Table 1 shows that the highest unemployment rate and number of unemployed individuals in Central Java Province are among vocational high school graduates, totaling 308,153 persons with an unemployment rate of 9.89%. This is followed by senior high school (general), university, and diploma graduates. In contrast, graduates of elementary and junior secondary school have lower unemployment rates, recorded at 2.74% and 5.04%, respectively. The phenomenon of educated unemployment in Central Java reflects a mismatch between educational development and labor market demands, and highlights a gap that contradicts human capital theory, which posits that education is an investment in human capital that enhances employment opportunities and income. Highly educated workers are expected to receive higher wages as compensation for the cost, time, and effort invested in their education (Burhanudin, 2021).

This study aims to analyze the influence of investment, regional government expenditure, economic growth, the number of industries, and district minimum wages on educated unemployment in Central Java. The research falls within the scope of Development Economics. It is expected to contribute to the advancement of economic science, particularly in the fields of development economics and labor economics, with a specific focus on educated unemployment and its determining factors. For local governments, the findings of this study may serve as a valuable reference in formulating more effective policies to reduce educated unemployment in Central Java Province. Moreover, for the Directorate General of Treasury, Regional Office of Central Java, the results of this research are expected to serve as input and guidance in designing more targeted budget allocations, especially for productive sectors capable of expanding employment opportunities.

The novelty of this research lies in its specific focus on the factors influencing unemployment among higher education graduates, whereas previous studies have largely concentrated on analyzing the determinants of general open unemployment. Additionally, this study incorporates two independent variables, namely regional government expenditure and the number of industries, which have received limited attention in prior research, particularly in the context of 35 districts and municipalities in Central Java Province during the period 2019 to 2023.

The results of the study using the Fixed Effect Model indicate that investment and economic growth have a negative and significant effect on educated unemployment. In contrast, the number of industries and district minimum wages have a positive and significant effect on educated

unemployment. Meanwhile, regional government expenditure does not have a significant effect on educated unemployment. This study recommends: (1) Local governments should continuously promote a conducive investment climate through streamlined licensing processes, legal certainty, and improved infrastructure development. (2) Economic growth should be enhanced, particularly in sectors with a high absorption capacity for higher education graduates, such as modern services, finance, and the creative industry. (3) Local governments need to actively support the development of technology-based and innovation-driven industries that can generate more employment opportunities for university graduates. (4) Greater caution is needed when setting district minimum wage policies to ensure a fair balance between the interests of employers and workers.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

1) Literature Review

A high unemployment rate can trigger various problems, both economic and social, which may hinder the pace of national economic development if not addressed promptly. In Central Java Province, the unemployment phenomenon is characterized by a predominance of higher education graduates among the unemployed population, a condition that contradicts human capital theory. Although various efforts have been made by the government to reduce unemployment, the outcomes have not been optimal, as reflected in the persistently high number of educated unemployed individuals.

This phenomenon aligns with the Keynesian school of thought, which assumes that the core of all economic problems lies in economic fluctuations, namely recessions and depressions, which are accompanied by the persistent presence of involuntary unemployment (Hasan et al., 2020). Keynesian theory emphasizes effective domestic aggregate demand as the strategic variable in overcoming stagnation in the utilization of production factors. Keynes argued that the total national income in the short term is determined by the willingness of households, the private sector, and governments to spend their income. Thus, economic stagnation is not caused by insufficient production, but rather by weak consumption. According to Keynes, low aggregate demand leads to low income and consequently results in high unemployment. He believed that this issue could not be resolved through free market mechanisms. Keynes advocated for government intervention to increase aggregate demand so that the private sector could generate employment opportunities (Mankiw, 2007).

A study by Simionescu and Naros (2019) discussed a similar issue, namely the phenomenon of unemployment among young and highly educated individuals. The study noted that by the late 1970s, the entry of young people into the labor market had become increasingly difficult. Initially, this phenomenon was linked to an excess labor supply resulting from the post-World War II baby boom generation. Later, in the late 1990s and early 2000s, the unemployment rate among young people in developed countries nearly doubled compared to the previous decade. The issue of integrating youth into the labor market became one of the most critical challenges for public policy at both the national and international levels. The recent global economic crisis has made it even more difficult for young people to enter the labor market, as they are highly sensitive to macroeconomic fluctuations (Simionescu and Naros, 2019).

Numerous studies have been conducted to analyze unemployment among young and educated populations, along with the contributing factors to find appropriate solutions. These studies cover global, national, and regional levels, including those conducted by Busch and Ochsén (2025), Simionescu and Naros (2019), Esposito and Scicchitano (2019), Wicaksono et al. (2024), Susanto and Padilla (2024), Jolianis et al. (2022), Fahmi (2022), Wirawan and Sentosa (2021), Anjarwati and Juliprijanto (2021), and Kusumaningtyas (2018).

Investment and government expenditure are components of aggregate demand that influence unemployment. An increase in realized investment will stimulate aggregate demand and consequently raise a country's national income (Aruan et al., 2023). Kusumaningtyas (2018) found that investment has a negative effect on educated unemployment. This is because higher levels of investment lead to greater opportunities for job creation. This finding is supported by Fahmi (2022), who also reported that investment has a negative effect on educated unemployment. However, Anjarwati and Juliprijanto (2021) found contrasting results, indicating that domestic investment has a positive effect on unemployment among university graduates.

Another key component of aggregate expenditure is government spending. Keynes argued that when the private sector reduces its expenditures, the government should intervene by increasing public spending to stimulate aggregate demand. Nursafitri and Yudha (2020) found that regional government expenditure has a negative effect on open unemployment. Similarly, a study by Pubra et al. (2024) also showed that unemployment levels are negatively affected by regional government spending. In contrast, a previous study by Nepram (2021) found opposing results, stating that government expenditure has a significant positive effect on unemployment.

The concept of unemployment in Keynesian theory was further developed by Arthur Okun in 1962. Okun's Law describes the inverse relationship between unemployment and economic growth (Astari et al., 2019). According to Okun, a one percent increase in unemployment will result in a decrease in economic growth by approximately two percent or more, and vice versa (Zunaida and Robertus, 2022). This assertion is supported by the findings of Rosalina et al. (2018) and Fahmi (2022), which indicate that economic growth has a negative effect on educated unemployment. However, Wicaksono et al. (2024) reported different findings, suggesting that economic growth has a positive effect on educated unemployment.

The level of unemployment is also affected by the industrial presence within a region. According to Okun's Law, rapid economic growth indicates an increase in output, including through the development of the industrial sector (Anggoro and Soesatyo, 2015). This argument is supported by the findings of Jolianis et al. (2020), which state that industries can reduce educated unemployment, particularly in sectors such as electricity and gas supply, as well as financial and insurance services. Furthermore, the study by Anjani and Fitriyani (2022) found that the number of industries has a positive and significant effect on labor absorption. However, Simanjuntak and Suharianto (2025) found that the number of medium and large industries positively affects unemployment, though not significantly.

In addition, Keynes also stated that the emergence of involuntary unemployment is the result of wage rigidity (Suhendra and Wicaksono, 2016). This statement is supported by the findings of Rahmania et al. (2016) and Kusumaningtyas (2018), which show that the minimum wage has a positive relationship with educated unemployment, meaning that an increase in the minimum wage is associated with a rise in educated unemployment. However, a different finding was reported by Putri (2015), whose study shows that educated unemployment is negatively affected by the minimum wage.

Following the identification of a phenomenon gap, namely the high proportion of educated unemployment in Central Java Province that contradicts the principles of human capital theory, a research gap is also evident. Prior studies that examined related variables have produced inconsistent or conflicting results. Based on the identified issues, the effects of investment, regional government expenditure, economic growth, the number of industries, and district minimum wages on educated unemployment in Central Java Province must be empirically tested through research.

2) Hypothesis Formulation

Investment spending on infrastructure projects such as roads, bridges, or ports creates direct employment opportunities. This condition boosts household income, which in turn contributes to increased household consumption. As aggregate demand rises, firms are able to expand production capacity and hire more workers. Findings from studies analyzed by Kusumaningtyas (2018) and Fahmi (2022) indicate that investment has a negative effect on educated unemployment. Based on the aforementioned discussion, the research hypotheses are formulated as follows:

H1: Investment has a negative effect on educated unemployment.

Regional government expenditure has the potential to generate a multiplier effect across various economic sectors. Government spending allocated to education, infrastructure, and economic development plays a role in promoting the creation of new jobs that can absorb educated labor. Studies by Nursafitri and Yudha (2020) as well as Pubra et al. (2024) state that regional government expenditure has a negative effect on unemployment. Based on the aforementioned discussion, the research hypotheses are formulated as follows:

H2: Regional government expenditure has a negative effect on educated unemployment.

An increase in economic growth in a region indicates a rise in the output of goods and services, leading to greater utilization of production factors by firms, including labor. This creates a demand for labor, which in turn reduces the level of unemployment. This statement is also supported by the findings of Rosalina et al. (2018) and Fahmi (2022), which show that educated unemployment is negatively affected by economic growth. Based on the aforementioned discussion, the research hypotheses are formulated as follows:

H3: Economic growth has a negative effect on educated unemployment.

Industries utilize skills and labor in the production process; therefore, a greater number of industries in a region is expected to increase labor absorption and contribute to a reduction in the unemployment rate. According to Jolianis et al. (2020), their research findings indicate that the industrial sector can reduce educated unemployment. Based on the aforementioned discussion, the research hypotheses are formulated as follows:

H4: The number of industries has a negative effect on educated unemployment.

An increase in the applicable minimum wage raises production costs for firms. This may eventually lead to a decline in output demand due to higher output prices resulting from increased production costs. As a consequence, companies tend to reduce their demand for labor as a means of efficiency, which ultimately leads to a rise in unemployment. According to Rahmania et al. (2016) and Kusumaningtyas (2018), the minimum wage is positively related to educated unemployment. Based on the aforementioned discussion, the research hypotheses are formulated as follows:

H5: District minimum wage has a positive effect on educated unemployment.

RESEARCH METHODS

1) Research Design

a. Type of Research

This study is categorized as quantitative research.

b. Object of Research

The objects of the study are 35 districts and municipalities in Central Java Province.

c. Subject of Research

The dependent variable in this study is educated unemployment, while the independent variables include investment, regional government expenditure, economic growth, the number of industries, and district minimum wage.

d. Data Collection Technique

The data used in this study are secondary data covering the period from 2019 to 2023. The data collection method employed in this research is a literature study. The data were collected from relevant official institutions, including Statistics Indonesia, the Directorate General of Fiscal Balance, and the Ministry of Manpower.

e. Operational Definitions Of The Variables

The operational definitions of the variables used in this study are as follows:

Table 2. Operational Definitions of Variables

No.	Variable	Operational Definitions	Unit	Data Source
1.	Educated Unemployment	The number of openly unemployed individuals classified by education level, including graduates of vocational high school, general high school, diploma programs, and universities.	Persons	Central Statistics Agency
2.	Investment	The total realized investment, including Domestic Investment and Foreign Direct Investment.	Rupiah	Central Statistics Agency
3.	Regional Government Expenditure	The total realized expenditures made by district and municipal governments in Central Java Province within a single fiscal period.	Rupiah	Directorate General of Fiscal Balance
4.	Economic Growth	The growth of Gross Regional Domestic Product (GRDP) at constant prices, using 2010 as the base year.	Percent	Central Statistics Agency
5.	The Number of Industries	All types or categories of industries, including large, medium, small, and household-scale industries.	Units	Central Statistics Agency
6.	District Minimum Wage	The minimum wage standard as regulated by applicable policies at the district and municipal levels in Central Java Province.	Rupiah	Ministry of Manpower

2) Data Analysis Techniques

a. Panel Data Regression

The method employed in this study is panel data regression analysis, which aims to examine the effects of investment, regional government expenditure, economic growth, the number of industries, and district minimum wage on educated unemployment. Panel data regression is a regression analysis technique that utilizes panel data, which is a combination of time series and cross-sectional data (Gujarati, 2012). Data processing in this study was carried out using the statistical software EViews 12. Mathematically, the panel data regression model used in this study can be expressed as follows:

$$EU_{it} = \beta_0 + \beta_1 INV_{it} + \beta_2 RGE_{it} + \beta_3 EG_{it} + \beta_4 IND_{it} + \beta_5 DMW_{it} + e_{it} \dots \dots \dots (1)$$

In order for the estimated coefficients obtained from the panel regression to be interpreted as the elasticity of each dimension with respect to the

percentage of educated unemployment, all variables were transformed into logarithmic form. Accordingly, equation (1) is modified into equation (2) as follows:

$$\ln EU_{it} = \beta_0 + \beta_1 \ln INV_{it} + \beta_2 \ln RGE_{it} + \beta_3 EG_{it} + \beta_4 \ln IND_{it} + \beta_5 \ln DMW_{it} + e_{it} \dots (2)$$

Note:

EU	: Educated Unemployment
i	: District or municipality i in Central Java Province
t	: Time (Year 2019–2023)
β_0	: Constant
$\beta_{1,2,3,4,5}$	: Regression Coefficients
INV	: Investment
RGE	: Regional Government Expenditure
EG	: Economic Growth
IND	: Number of Industries
DMW	: District Minimum Wage
e	: Error term

In the panel data analysis stage, it is necessary to determine the most appropriate estimation model among the Common Effect, Fixed Effect, or Random Effect models by conducting the Chow Test, Hausman Test, and Lagrange Multiplier Test.

b. Classical Assumption Test

Classical assumption testing is applied to evaluate whether the regression model used is appropriate. The classical assumption tests employed in this panel data regression study include multicollinearity and heteroscedasticity tests (Basuki and Prawoto, 2016).

c. Determination Coefficient (R^2)

The coefficient of determination (R^2) indicates the extent to which the independent variables can explain the variation in the dependent variable (Sugiyono, 2017).

d. Statistical Tests

1. F-Test

The F-test, also known as the model significance test, is used to determine whether the independent variables jointly have a significant effect on the dependent variable (Widarjono, 2018).

2. T-Test

The t-test is conducted to assess the significance of the partial effect of each independent variable on the dependent variable (Ghozali, 2018).

RESULTS AND DISCUSSION

1) Results

a. Panel Data Regression

This study was conducted to examine the effects of investment, regional government expenditure, economic growth, the number of industries, and district minimum wage on educated unemployment. The analysis was carried out using panel data regression. Based on the results of the Chow test, the probability value of the F-

statistic was 0.000, and the Hausman test yielded a Chi-square probability value of 0.000. Therefore, the most appropriate estimation method is the Fixed Effect Model, as both tests reject the null hypothesis (H_0) at a 5 percent significance level. The results of the panel data regression analysis using the Fixed Effect Model are presented as follows:

Table 3. Summary of Fixed Effect Model Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.182	8.817	-1.155	0.250
Ln_INV	-0.060	0.020	-3.076	0.003
Ln_RGE	0.068	0.309	0.221	0.825
EG	-0.038	0.006	-6.601	0.000
Ln_IND	0.075	0.035	2.124	0.036
Ln_DMW	1.273	0.345	3.686	0.000
Significance level $\alpha = 0.05$				
R-squared	= 0.9182		F-statistic	= 38.855
Adjusted R-squared	= 0.8946		Prob (F-statistic)	= 0.000

Source: EViews 12, processed data (2025)

The panel data regression equation using the Fixed Effect Model can be expressed as follows:

$$\ln EU_{it} = -10,182 - 0,060 \ln INV_{it} + 0,068 \ln RGE_{it} - 0,038 EG_{it} + 0,075 \ln IND_{it} + 1,273 \ln DMW_{it} \dots \dots \dots (3)$$

b. Classical Assumption Test

The multicollinearity test is used to determine whether there is a correlation among the independent variables in the regression model. According to the test criteria, if the correlation coefficient between independent variables is less than 0.85, then multicollinearity is not present (Napitupulu et al., 2021). Based on the test results, the correlation coefficients of each variable were found to be less than 0.85, indicating that there is no multicollinearity in the model.

The heteroscedasticity test is conducted to determine whether there are differences in the variance of the residuals across observations in the regression model. One method to detect heteroscedasticity is by observing the residual plot. According to the test criteria, if the residual values do not exceed the range of -500 to 500, it can be concluded that heteroscedasticity is not present (Napitupulu et al., 2021). Based on the test results, the residual values for each variable fall within the range of -500 to 500, indicating that there is no heteroscedasticity problem in the model.

c. Determination Coefficient (R^2)

Based on the Fixed Effect Model estimation in Table 3, the R-squared value is 0.9182 or 91.82 percent. This indicates that the independent variables, namely investment, regional government expenditure, economic growth, number of industries, and district minimum wage can explain 91.82 percent of the variation in the dependent variable, which is educated unemployment. The remaining 8.18 percent is explained by other variables that are not included in this model.

d. Statistical Tests

1. F-Test

The analysis results in Table 3 show that the F-statistic probability value is 0.000, which is lower than the alpha value of 0.05. The F-statistic value is 38.855, which is greater than the F-table value of 2.27. This indicates that the null hypothesis is rejected and the alternative hypothesis is accepted, meaning that the independent variables, which include investment, regional government expenditure, economic growth, number of industries, and district minimum wage, jointly have a significant effect on the dependent variable, which is educated unemployment.

2. T-Test

Based on the analysis results in Table 3, the t-statistic value for the investment variable is -3.076 and for economic growth is -6.601 , both of which are smaller than the t-table value of -1.653 . Therefore, these variables are concluded to have a negative and significant effect on educated unemployment. Meanwhile, the t-statistic value for the number of industries is 2.124 and for district minimum wage is 3.686 , both greater than the t table value of 1.653 , indicating a positive and significant effect on educated unemployment. Lastly, the t-statistic value for regional government expenditure is 0.221 , which is smaller than the t-table value of 1.653 , suggesting that this variable has no significant effect on educated unemployment.

2) Discussion

a. The Effect of Investment on Educated Unemployment

The analysis results of this study indicate that investment has a negative and significant effect on educated unemployment in Central Java Province during the period from 2019 to 2023. This finding is consistent with the hypothesis of this study, which assumes that investment negatively affects educated unemployment. Based on the panel data regression estimation results, investment has a negative regression coefficient of -0.060 . This means that a one percent increase in investment will reduce educated unemployment by 0.060 percent.

Investment, both domestic direct investment and foreign direct investment, plays an important role in job creation. Investment spending on infrastructure projects such as roads, bridges, or ports generates direct employment, which increases household income and subsequently raises household consumption. As a result, firms may expand production and hire more workers in response to rising aggregate demand. In addition, investment inflows are often accompanied by technology transfer and productivity enhancement, which require highly skilled human resources to manage them. As investment increases the demand for educated labor, the level of educated unemployment will decline.

This finding aligns with Keynes's Aggregate Demand Theory, which explains that investment is a component of aggregate demand. Therefore, an increase in investment will raise aggregate demand and national income. The increase in aggregate demand can help address the unemployment problem. Higher demand encourages economic sectors to perform better and produce more output. Ultimately, this reduces the number of unemployed by absorbing more labor.

This result is consistent with the studies by Kusumaningtyas (2018) and Fahmi (2022), which found that investment has a negative and significant effect on educated unemployment. Investment inflows can increase the stock of capital goods, thereby raising a company's production capacity, which may lead to the creation of new jobs that help reduce unemployment. However, this study contradicts the findings of

Anjarwati and Juliprijanto (2021), which showed that domestic investment has a positive effect on the unemployment of university graduates.

b. The Effect of Regional Government Expenditure on Educated Unemployment

The results of this study indicate that regional government expenditure does not have a significant effect on educated unemployment in Central Java Province during the period from 2019 to 2023. This finding contradicts the hypothesis of this study, which assumes that regional government expenditure has a negative effect on educated unemployment. The variable of regional government expenditure in this study does not affect the number of educated unemployed individuals across the 35 districts and municipalities in Central Java Province. This is because the allocation of regional expenditure has not been focused on job creation sectors.

According to data from the Central Bureau of Statistics, in Central Java Province, most of the regional budget was allocated to general public services (IDR 11,490.3 billion), education (IDR 7,785.7 billion), and health (IDR 3,581.9 billion), which do not directly create jobs for educated workers. In contrast, spending in the economic sector amounted to only IDR 1,950.8 billion, or approximately 7.5% of the total regional expenditure in 2023. As a result, although regional expenditure has increased, it has not had a direct effect on the absorption of educated labor. Therefore, local governments need to reconsider their budgeting strategies and development planning, particularly by focusing on the economic sector and the creation of quality employment opportunities for educated workers.

This finding is not in line with the Aggregate Demand Theory by Keynes, which explains that government expenditure is one of the components of aggregate demand. Low aggregate demand results in high unemployment. Keynes argued that when the private sector reduces its spending, the government must intervene by increasing regional expenditure to stimulate aggregate demand. Government expenditure that is allocated to the education sector, infrastructure, and economic development can support the creation of job opportunities, thereby increasing labor absorption and reducing unemployment levels. However, the findings of this study suggest that the increase in regional expenditure has not yet been able to directly create jobs and adequately absorb the educated workforce.

The findings of this study contradict the results of Nursafitri and Yudha (2020) and Pubra et al. (2024), whose research shows that regional government expenditure negatively affects unemployment. Meanwhile, the study by Soukaina (2023) indicates that public spending has a positive and significant effect on unemployment in sixteen European countries. Similarly, the findings of Nepam (2021) reveal that government expenditure has a positive and significant effect in developing countries. On the other hand, the results of this study are in line with the findings of Hanisah (2024), which show that government spending on capital expenditure allocation does not have a significant effect on the unemployment rate. This suggests that the strategies and policies implemented by local governments have not been optimal in reducing unemployment, as well-targeted and high-quality capital spending can foster economic growth and create new employment opportunities.

c. The Effect of Economic Growth on Educated Unemployment

The results of this study show that economic growth has a negative and significant effect on educated unemployment in Central Java Province during the period 2019 to 2023. This finding is consistent with the research hypothesis, which assumes that economic growth negatively affects educated unemployment. Based on the panel data regression estimation, economic growth has a negative regression

coefficient of -0.038. This indicates that a one percent increase in economic growth will reduce educated unemployment by 0.038 percent.

The economic condition of a region can be reflected by its rate of economic growth. Regional economic growth is indicated by an increase in Gross Regional Domestic Product (GRDP). An increase in a region's economic growth shows a rise in the output of goods and services, which leads to greater utilization of production factors by companies, including labor demand. When the economy expands, sectors such as industry, services, technology, and finance tend to grow. These sectors generally require workers with higher education qualifications, thus increasing the demand for educated labor, particularly those with specialized skills. With maximum labor absorption, the number of educated unemployed individuals in the region can be reduced (Astari et al., 2019).

These findings align with Okun's Law, which states that economic growth is negatively or inversely related to unemployment (Astari et al., 2019). According to this theory, a one percent increase in the unemployment rate may lead to a decrease in economic growth by approximately 2 to 3 percent or more. Conversely, an increase in output and economic growth of 2 to 3 percent or more can reduce the unemployment rate by about one percent or less (Zunaida & Robertus, 2022).

This study's findings are also supported by previous research conducted by Putri (2015), Rosalina et al. (2018), and Fahmi (2022), which state that economic growth has a negative and significant effect on unemployment. Higher regional economic growth, as measured by the increase in GRDP, signals improved economic activity in the area. Additionally, consistent results are also found in the study by Septiana and Asmara (2024), which shows that economic growth has a negative effect on unemployment. However, these findings are not consistent with the research conducted by Wicaksono et al. (2024), which indicates that economic growth has a positive effect on educated unemployment.

d. The Effect of the Number of Industries on Educated Unemployment

The results of this study indicate that the number of industries has a positive and significant effect on educated unemployment in Central Java Province during the 2019–2023 period. This finding contradicts the hypothesis of this study, which assumes that the number of industries has a negative effect on educated unemployment. Based on the panel data regression estimation, the number of industries has a positive regression coefficient of 0.075. This indicates that a 1 percent increase in the number of industries will increase educated unemployment by 0.075 percent.

An increase in the number of industries does not always correlate with a decrease in educated unemployment. In Central Java Province, most districts and cities experienced an increase in the number of industries each year. However, the number of educated unemployed individuals in the region has remained volatile and has not consistently declined over time. This condition may be due to a mismatch between the qualifications of higher education graduates and the needs of the industrial sector. The majority of industries in Central Java fall under the category of micro and small enterprises, which tend to require medium or low-skilled labor rather than highly educated workers. Most of the industries in this region include textile and garment manufacturing, food and beverage production, furniture, and handicrafts. These types of industries typically employ workers with elementary to senior high school education levels rather than university graduates. As a result, the increase in the number of industries does not raise the demand for educated labor, leading to a persistently high or even increasing number of educated unemployed.

This finding is inconsistent with Okun's Law, which explains that rapid economic growth is generally associated with increased output, particularly through industrial development, which in turn raises the production capacity of goods and services and drives firms to hire more workers. Since industries rely on skills and labor in the production process, an increase in the number of industries in a region is expected to boost labor absorption. However, based on the findings of this study, the growth in the number of industries in the region has not yet succeeded in creating sufficient employment opportunities for educated labor.

The result contradicts the findings of Zhu (2019), who stated that industrial diversity has a negative and significant effect on unemployment in Japan. Furthermore, the study by Jolianis et al. (2022) suggests that the types of industries capable of reducing educated unemployment are those in the electricity and gas supply sectors, as well as the financial and insurance service industries. On the other hand, this study's findings align with Simanjuntak and Suhariato (2025), which reveal that the number of large and medium industries has a positive, though not significant, effect on the unemployment rate. This may be due to labor mismatches and the dominance of capital-intensive industries that absorb only a limited amount of labor.

e. The Effect of District Minimum Wage on Educated Unemployment

The findings of this study reveal that the district minimum wage has a positive and significant effect on educated unemployment in Central Java Province during the 2019–2023 period. This result supports the hypothesis of the study, which assumes that the district minimum wage variable has a positive effect on educated unemployment. Based on the panel data regression estimation, the minimum wage variable has a positive regression coefficient of 1.273. This indicates that a 1 percent increase in the district minimum wage will raise educated unemployment by 1.273 percent.

When minimum wages are set too high, they may reduce firms' willingness to hire labor, as businesses face higher production costs to meet the increased wage obligations (Alghofari, 2010). The rise in minimum wages leads to increased production costs, which may subsequently raise output prices. As a result, consumer demand for these outputs declines. To maintain cost efficiency, firms reduce their demand for labor, which ultimately increases the level of educated unemployment in the region (Anjarwati & Juliprijanto, 2021).

These findings are consistent with the Nominal Wage Rigidity Theory proposed by Keynes, which states that wage rigidity in the labor market is one of the primary causes of involuntary unemployment. Strong labor unions and minimum wage legislation can prevent wages from adjusting downward in response to falling labor demand, leading to market disequilibrium. If the minimum wage is set too high, firms tend to reduce labor demand to cut costs, which in turn increases unemployment (Hasan et al., 2020).

This result is also in line with the findings of Rahmania et al. (2016) and Kusumaningtyas (2018), who found that minimum wages have a positive impact on educated unemployment. Increases in the minimum wage policy raise the production costs borne by firms, potentially causing inefficiencies. As a response, firms may undertake cost-cutting measures, including reducing their workforce. This finding is further supported by Susanto & Padilla (2024), who reported that wage levels positively affect the unemployment rate of vocational and higher education graduates. However, this study contradicts the findings of Putri (2015), which suggest that minimum wages have a negative influence on educated unemployment.

CONCLUSION

Based on the results of the study and data analysis using panel data regression, the following conclusions can be drawn: Investment and economic growth have a negative and significant effect on educated unemployment in Central Java Province. Conversely, the number of industries and the district minimum wage have a positive and significant effect on educated unemployment in Central Java Province. Meanwhile, regional government expenditure does not have a significant effect on educated unemployment in the province. This study recommends: (1) Local governments should continuously promote a conducive investment climate through streamlined licensing processes, legal certainty, and improved infrastructure development. (2) Economic growth should be enhanced, particularly in sectors with a high absorption capacity for higher education graduates, such as modern services, finance, and the creative industry. (3) Local governments need to actively support the development of technology-based and innovation-driven industries that can generate more employment opportunities for university graduates. (4) Greater caution is needed when setting district minimum wage policies to ensure a fair balance between the interests of employers and workers.

This study has several limitations. The research period includes the years affected by the COVID-19 pandemic, particularly 2020–2021, which caused economic instability and disruptions in the labor market. This situation led to data distortions, as variables such as educated unemployment, economic growth, and the number of industries experienced extreme fluctuations. As a result, the findings from that period may not reflect conditions under a normal economic situation but rather short-term responses to an economic crisis. Therefore, future researchers are advised to separate the analysis between the pre-pandemic and post-pandemic periods to observe differences in the relationship patterns among variables under crisis and more stable economic conditions.

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