

ANALYSIS OF THE INFLUENCE OF MINIMUM WAGE, POPULATION, AND LEVEL OF EDUCATION ON THE UNEMPLOYMENT RATE IN CENTRAL JAVA

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Abstract

This proposal investigates the influence of regional economic growth, regional minimum wages, number of populations, and expected years of schooling on the unemployment rates across ten regencies in Central Java from 2018 to 2023. The study aims to identify how these factors collectively impact employment levels, with a focus on understanding the dynamics of unemployment in the regional context. Utilizing secondary data and multiple regression analysis on panel data, the research seeks to determine whether higher minimum wages and larger populations increase unemployment, while longer level of education may reduce it. The findings are expected to contribute valuable insights for policymakers to formulate strategies that promote employment and economic growth in the region.

Keywords: Economic Growth, Minimum Wage, Population, Level of Education, Regional Employment

INTRODUCTION

Unemployment is one of the economic development problems faced by developing countries, including Indonesia (Syahrinasyam & Wahab, 2015). The high rate of unemployment is caused by inequality between the number of jobs available and the number of workers. This problem increases every year. Unemployment is when an individual is looking for a job, preparing for a business, or not actively looking for a job for various reasons, such as inability or inhibiting factors. In addition, unemployment also includes those who have found a job but have not started work activities (BPS Sambas, 2015).

Table 1. Seven Provinces with the Highest Unemployment Rates in Indonesia 2019-2023 (Percent)

Province	2018	2019	2020	2021	2022	2023
Aceh	6.34	6.17	6.59	6.30	6.17	6.03
West Sumatra	5.66	5.38	6.88	6.52	6.28	5.94

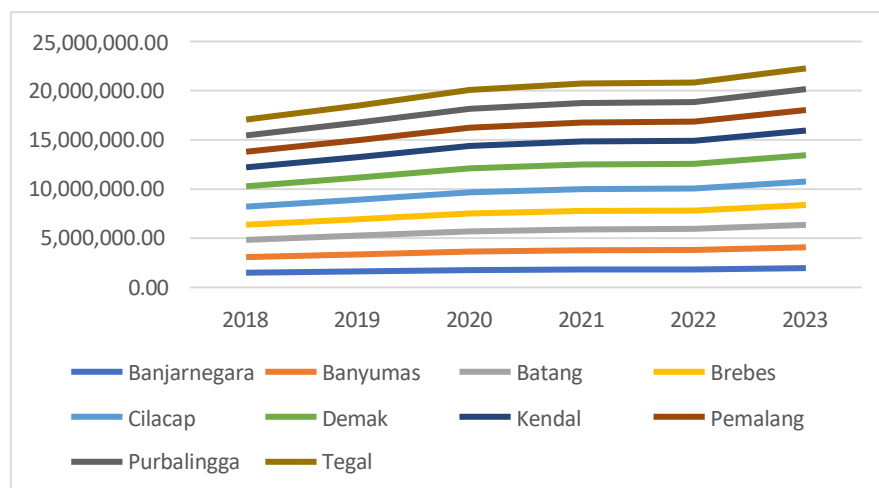
DKI Jakarta	6.65	6.54	10.95	8.50	7.18	6.53
West Java	8.23	8.04	10.46	9.82	8.31	7.44
Central Java	4.47	4.44	6.48	5.95	5.57	5.13
East Java	3.91	3.82	5.84	5.74	5.49	4.88
Banten	8.47	8.11	10.64	8.98	8.09	7.52

Source: BPS-Statistics Indonesia (2025)

It can be seen from Table 1 that Central Java is the province with the second-lowest unemployment rate during the pre-pandemic and post-pandemic periods. The COVID-19 pandemic was one reason the unemployment rate was so high. The impact of the pandemic resulted in many businesses simultaneously laying off their employees, resulting in an unemployment rate. It shows that in Central Java, the unemployment rate increases during the COVID-19 pandemic and then decreases during the recovery period from 2021 to 2023. During the COVID-19 outbreak in 2020, the unemployment rate in Central Java was 6.48%. In 2021, the unemployment rate declined to 5.95%.

Indayani & Hartono (2013) carried out a study related to the factors causing the high unemployment rate during the pandemic. Their study showed that weak economic growth during the pandemic caused the unemployment rate to increase. It implies that the higher the economic growth in a regency, the higher the opportunities for businesses to worth and create job opportunities for people in the regency. Resulting the unemployment rate to decrease. It implies that the higher the economic growth in a regency, the higher the opportunities for businesses to worth and create job opportunities for people in the regency. Resulting the unemployment rate to decrease.

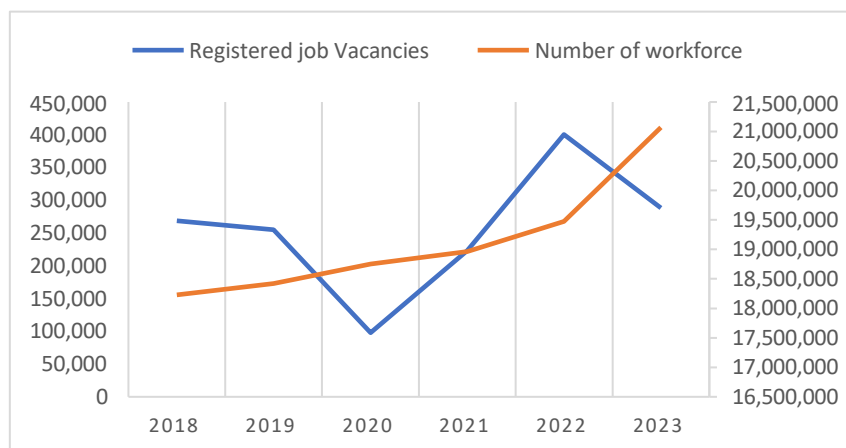
Apart from the rate of economic conditions, the regional minimum wage also plays an important factor in affecting the unemployment rate. According to classical theory, the demand for labor curve slopes down from lower left to right, and the supply of labor curve rises from upper left to right. If the minimum wage set above the market equilibrium market wage, it will cause exceeds labor supply. Above labor can occur because the amount of labor offered is greater than the amount demanded by the Company, resulting in unemployment. Figure 1.1 shows the regional minimum wage in Central Java from 2018 to 2023. The figure shows that the regional minimum wage has continued to increase during and after the pandemic.



Source: (BPS-Statistics Indonesia, 2025)

Figure 1.1 Ten Regencies Regional Minimum Wage in Central Java
 2018 – 2023 (Person)

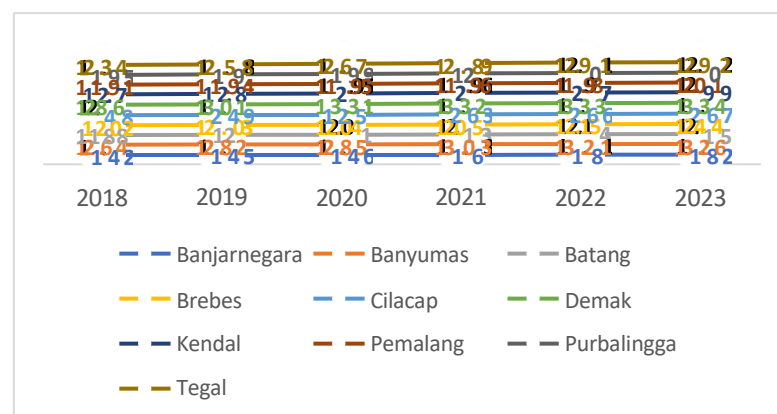
There are other factors that influence unemployment rate besides economic conditions and regional minimum wage, namely number of populations. The increasing number of populations will certainly affect the workforce, meaning the number of people looking for work will also rise. For instance, the larger in the number of in-migration to the regency will cause the supply to labor shipped to the right, resulting in the increase in number of people looking work. Figure 1.2 shows registered job vacancies and the number of workforces in Central Java from 2018 to 2023. The figure shows that the number of workers is much larger than the number of jobs available. Therefore, not all workers can get a job and eventually become unemployed.



Source: (BPS-Statistics Indonesia, 2025)

Figure 1.2 Registered Job Vacancies and Number of Workforce in
 Central Java 2018 – 2023 (Person)

Apart from the above factors, one factor that influences the unemployment rate is the level of education. Andriansyah et al. (2015) state that the higher a person's level of education, the greater their chances of getting a job and the better their skills. Education is one of the investments in human resources, which is called the human capital. Human capital can be assessed after attending education with various types and forms of education, which are expected to increase various forms of value. In the form of increased individual income, work productivity, and rational value (social benefits) of individuals compared to before receiving education. Figure 1.3 shows the Expected Years of Schooling in Central Java from 2018 to 2023. The figure shows that the Expected Years of Schooling continues to increase during and after the pandemic.



Source: (BPS-Statistics Indonesia, 2025)

Figure 1.3 Central Java Expected Years of Schooling by District/City
2018-2023 (Percent)

Based on this research background, this study aims to analyze the effect of regional economic growth, regional minimum wage, number of populations, and Expected Years of Schooling on unemployment rate in 10 regencies in Central Java Province in 2018-2023. The difference between this research and previous research is that previous research mostly uses 3 variables, namely economic growth, regional minimum wage and inflation. This study contains 4 variables combined with population factors as demographics and Expected Years of Schooling as human capital.

This research is expected to be used as additional literature on Development Economics and Unemployment. It can also be used as a research reference regarding regional economic growth, regional minimum wage (UMK), the number of populations, and expected years of schooling towards unemployment. The results of this study are expected to be useful for local governments, especially in terms of reducing unemployment. They are expected to contribute thoughts to establishing policies related to unemployment in Central Java.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

1. Literature Review

A. Unemployment

According to the Internasional International Labor Organization (1982), unemployment included individuals who did not have a job but were ready and actively looking for work even though they had difficulty finding employment for a long time. The unemployment rate, expressed as the percentage of unemployed individuals relative to the total labor force, serves as a key indicator reflecting the state of unemployment. The workforce consists of a combination of the unemployed and the workers, the primary source of labor supply in the labor market.

Unemployment is an economic problem that can directly affect human life. Job loss typically results in a reduction in the standard of living for the majority of individuals. So, unemployment is the most frequently discussed topic in political debates by politicians who examine that the policies they offer will help create jobs (Mankiw, 2000). Macroeconomic theory focuses on analyzing aggregate markets, including aggregate demand and aggregate supply. This theory combines classical and Keynesian economic thought. Classical economics assumes that flexible prices can maintain market equilibrium, thus allowing for full employment. On the other hand, Keynesian economics argues that aggregate demand is the main source of uncertainty in the economy, thus requiring unavoidable government intervention.

The Keynesian economic perspective centers on macroeconomic policy, placing particular emphasis on addressing unemployment. This approach concentrates on cyclical unemployment and contends that involuntary unemployment lacks a substantial foundation. In this view, the creation of a balance between the demand and supply of labor suggests that the skills required for a job should match the skills offered by job seekers.

Meanwhile, the New Classical school of thought argues that increased employment can be achieved through downward wage adjustments. They believe that unemployment occurs when wages in the economy remain higher than the market price should be. As a result, a surplus of unabsorbed labor is created. In this context, the concept of involuntary unemployment becomes relevant. Unemployment has serious impacts on the economy, which can be summarized in two important points: the financial costs incurred by unemployment and the decline in people's purchasing power.

B. Regional Economic Growth

Economic growth is defined as an increase in Gross Domestic Product (GDP), irrespective of whether this increase surpasses population growth or whether there are changes in the economic structure. According to Hasan (2017), Economic growth plays a role as one of the main means of improving people's welfare, through the development of the employment sector in Indonesia.

Arthur Okun (1929-1979) developed the concept of potential output and explained the relationship between output and unemployment. In general, unemployment tends to move with output in the business cycle. This phenomenon of co-movement between output and unemployment resulted in what is now known as Okun's Law. This law examines the relationship between the level of gross domestic product (GDP) and the unemployment rate of a country.

Through economic growth, a country can assess its economic condition. When the economic growth rate is low, it is necessary for the government to implement economic policies aimed at stimulating growth. Conversely, if economic growth is high, the government must strive to maintain and even increase the growth rate and economic development.

C. Regional Minimum Wage

According to Sinambela (2017), Wages are compensation paid based on the number of working days, working hours, or the number of product units produced by employees. Wages can be categorized into two types: first, nominal wages, which is the amount of money received; second, real wages, which refer to the amount of goods and services that can be purchased with the money. In a narrower context, the term wage is used specifically for workers who work for others in an employment relationship, either as employees or laborers.

Classical Wage Theory is an economic theory that explains how labor wages are determined based on market mechanisms, especially the laws of supply and demand of labor. John Maynard Keynes developed Keynesian Wage Theory in his book *The General Theory of Employment, Interest, and Money* (1936). This theory developed as a response to the limitations inherent in the classical wage theory, especially in explaining persistent unemployment in the economy.

D. Number of Population

According to the Badan Pusat Statistik (2020), the population is all individuals who have lived in the geographical area of the Republic of Indonesia for one year or more or those who have lived less than one year but intend to settle. Meanwhile, according to Abidin & Zainal (2012), the population is defined as the number of people residing in an area at a certain time, which is the result of various demographic processes, such as fertility, mortality, and migration.

Dependency Theory and Demography combines the concepts of dependency theory with demographic analysis, especially regarding population growth, development, and unemployment. Muminin & Hidayat (2017) then supported this study by stating that the increase in population will cause growth in the workforce, which, if not balanced with the availability of sufficient employment opportunities, will cause unemployment.

E. Expected Years of Schooling

According to Wirawan (2016), Education level is a process that someone goes through to develop their abilities, attitudes, and behaviors. This process is important to prepare for future life, either through certain organizations or unorganized. The goal is for students to develop their potential actively. Education is essential in developing high-quality human resources equipped to meet the diverse challenges of the labor market. Good quality education can provide knowledge, skills, and competencies needed in the future.

On the other hand, low quality education can have negative impacts, especially on the unemployment rate in a regency (Nurkholis, 2016). According to the Badan Pusat Statistik (2024), education is used to determine the condition of the education system's development, which functions as an indicator of the Human Development Index. The Human Capital Theory, developed by Adam Smith, Theodore Schultz, and Gary Becker, states that education, training, and health are forms of investment in humans that can increase work productivity and income.

2. Research Hypothesis

A. The Influence of Regional Economic Growth on Unemployment Rate

Regional economic development is a key indicator in assessing a regency's economic performance. In general, continued regional economic growth will positively impact the number of workers. Increasing economic development in a regency reflects increased output from various economic activities. When output increases, the need for labor also increases, which has the potential to reduce unemployment.

Arthur Okun (1929-1979) developed the concept of potential output and explained the relationship between output and unemployment. In general, unemployment tends to move with output in the business cycle. This phenomenon of co-movement between output and unemployment resulted in what is now known as Okun's Law. This law analyzes the correlation between a country's Gross Domestic Product (GDP) level and its unemployment rate. Okun's Law posits that for every 2 percent decline in actual GDP relative to potential GDP, the unemployment rate rises by approximately 1 percent. This Law creates a significant relationship between the output and labor markets. For unemployment not to increase, GDP must be increased as high as possible (Samuelson, 2001).

This shows that a country's high or low unemployment rate is related to the growth of its GDP or Gross Regional Domestic Product (GRDP) on a smaller scale, namely the increase in regency income. Okun's Law shows a negative relationship between unemployment and GRDP. An increase in the unemployment rate is associated with a decline in regency economic growth; therefore, a decrease in economic growth leads to higher unemployment. Conversely, an increase in regency economic growth contributes to a reduction in unemployment.

H1: Regional Economic growth has a negative effect on the Unemployment Rate

B. The Influence of Regional Minimum Wages on Unemployment Rate

The second variable that affects unemployment is the UMK. The government, unions, and employers in a country significantly impact the unemployment rate by determining wage levels. The higher the wage set, the fewer people will work in the country. Therefore, higher wages can increase unemployment rates (Kaufman & Hotchkiss, 1999).

Unemployment can result from wage rigidity, which arises from a discrepancy between the labor supply and the available employment opportunities. As wages rise, the supply of labor tends to increase. However, this is often accompanied by a decrease in the demand for labor. As a result, a labor surplus occurs, ultimately leading to unemployment.

On the other hand, according to Ziddan & Sakti (2022), setting a lower minimum wage encourages companies to use more labor, which can help reduce unemployment rates. Some factors that cause wage rigidity include minimum wage regulations, the existence of trade unions, and the concept of wage efficiency, as explained by Mankiw (2003).

H2: UMK has a positive effect the Unemployment Rate

C. The Influence of Number of Population on Unemployment Rate

Population size is one of the indicators that influences the unemployment rate. When an area's population increases, the available workforce will also increase. This results in reduced job opportunities due to the limited number of job opportunities available. Some of the workforce who do not get job opportunities will experience an increase in the number of unemployed people.

The increase in population will impact the increase in the workforce. As more people look for work, unemployment rates are estimated to also increase. Muminin & Hidayat (2017) then supported this study by stating that the increase in population will cause growth in the workforce, which, if not matched by an adequate supply of employment opportunities, it can lead to unemployment. This is supported by research conducted by Cahyani (2019), which shows that population has a positive relationship with and significant effect on the unemployment rate.

H3: Population has a positive effect on unemployment

D. The Influence of Expected Years of Schooling on Unemployment Rate

Education not only adds good work implementation methods but also helps someone make decisions in the work environment. In other words, education imparts knowledge that is not only directly applicable to the tasks performed but also serves as a foundation for personal development. In addition, education enables individuals to effectively utilize available facilities and infrastructure to facilitate the efficient completion of their tasks. According to Merizal (2008), the higher the level of education a person achieves, the greater his ability and opportunity to get a job.

Education constitutes a form of investment in the development of human resources, often referred to as human capital. A high level of education is expected to increase one's chances of getting a job. This is supported by Atmanti (2005), who stated that individuals with a higher level of education, as measured by the length of time spent in school, tend to have better jobs and incomes than those with lower education levels.

Higher levels of education enhance an individual's work capacity and productivity, as formal education serves as a critical qualification that significantly influences access to employment opportunities. Improved education enhances the quality of human resources, which is anticipated to play a role in lowering the unemployment rate, provided that formal employment opportunities are available. The higher the quality of a person as a worker, the higher the likelihood of obtaining employment.

H4: Expected Years of Schooling has a negative effect on the Unemployment Rate

RESEARCH METHODS

This study uses quantitative research methods with secondary data which includes data on the unemployment rate, regional economic growth, regional minimum wage, number of population and expected years of schooling from ten regencies in Central Java from 2018 to 2023 which are sourced mainly from the Central Statistic Agency. The data processing technique used in this study uses an econometric model of multiple linear equations (multiple regression) for panel data which is a combination of cross sections, namely ten regencies in Central Java with a time series of six years (2018-2023). Data processing is aimed at finding the best model. To obtain estimates of each variable and parameter, statistical data and models were processed using software EViews 12.

The form of the multiple linear regression model used in this study was multiple linear regression with the dependent variable being the unemployment rate variable, while the independent variable was the regional economic growth, regional minimum wage, number of population, and expected years of schooling. The equation function of the formulated model is as follows.

$$Y_{it} = b_0 + b_1X_{1it} + b_2X_{2it} + b_3X_{3it} + b_4X_{4it} \dots + b_nX_{nit} + e_{it} \dots \dots \dots (1)$$

Where: Y is Unemployment Rate, X_1 is Regional Economic Growth, X_2 is Regional Minimum Wage, X_3 is Number of Population, X_4 is Expected Years of Schooling, b is regression coefficient of independent variables, i is cross section data in Central Java, and t is data time series 2018-2023.

RESULTS AND DISCUSSION

A. Data Analysis

a) Chow Test

Table 4. Chow Test

Cross-section F	0.0000
Cross-section Chi Square	0.0000

Source: Processed data using EViews 12

As shown in Table 4, the Chi-square probability value is 0.0000, which is less than 0.05. Consequently, based on the Chow test results, the Fixed Effect Model (FEM) is the preferred model.

b) Hausman Test

Table 5. Chow Test

Cross-section F	0.0000
Cross-section Chi Square	0.0000

Source: Processed data using EViews 12

As indicated in Table 5, the probability value from the Hausman Test is 0.0808. Since this value is greater than 0.05 significance level, the null hypothesis is not rejected. Consequently, the Random Effect Model (REM) is identified as the most appropriate model.

c) Lagrange Multiplier Test

Table 6. Lagrange Multiplier

	Test Cross-section	Test Hypothesis Time	Both
Breusch-Pagan	55.15708 (0.0000)	0.150276 (0.6983)	55.30735 (0.0000)

Source: Processed data using EViews 12

As presented in Table 6, the test results a probability value of 0.0000. Since this value is below the 0.05 significance level, the null hypothesis is rejected. Consequently, the Random Effect Model (REM) is chosen as the most suitable model for this panel data regression analysis.

d) Panel Data Regression Model

Table 7. Panel Data Regression Results (Random Effect Model)

Method: Panel EGLS (Cross Section Random Effect)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.949036	5.978932	-0.827746	0.4114
X1	- 0.105777	0.032386	-3.266162	0.0019
X2	7.22E-07	7.62E-07	0.947902	0.3473
X3	3.26E-06	9.47E-07	3.445242	0.0011
X4	0.510182	0.565765	0.901755	0.3711

Source: Processed data using EViews 12

The regression model equation obtained is the model, namely:

$$Y_{it} = b_0 + b_1X1_{it} + b_2X2_{it} + b_3X3_{it} + b_4X4_{it} + e_{it} \dots\dots\dots (2)$$

$$Y_{it} = -4.949035 - 0.105X1 + 7.224X2 + 3.264X3 + 0.510X4 + e_{it} \dots\dots\dots (3)$$

According to (Gujarati & Porter, 2015), GLS refers to the application of Ordinary Least Squares (OLS) to variables that have been transformed to satisfy the classical linear regression assumptions. The resulting estimator, called the GLS estimator, is recognized as the Best Linear Unbiased Estimator (BLUE).

B. Hypothesis Testing and Analysis

a) Coefficient of Determination

Table 8. Determination Coefficient Test (Adjusted R-Square)

R-squared	0.454984
Adjusted R-Square (R^2)	0.415347

Source: Processed data using EViews 12

Based on the output in Table 8, the Adjusted R2 value is 0.415347, which suggests that, after adjusting for the number of independent variables, approximately 41.53% of the variation in the unemployment rate can be explained by GRDP, UMK, number of populations, and HLS. The remaining variation is attributed to other variables not considered in this study.

b) F-Test

Table 9. F-Test

F-statistic	11.47862
Prob(F-statistic)	0.000001

Source: Processed data using EViews 12

The p-value of 0.000001 is less than 0.05. therefore, it can be concluded that the random effect estimation model, with independent variables GRDP, UMK, number of populations, and HLS, has a together and significant effect on the dependent variable, unemployment rate.

C. Discussion

1) The effect of Regional Economic Growth on the Unemployment Rate

Based on the results of the panel linear regression estimation, the variable of Regional Economic Growth statistically significant effecting the unemployment rate. the coefficient exhibits a negative value, indicating an inverse relationship between economic growth and the unemployment rate. This suggests that as economic growth in Central Java increases, the unemployment rate tends to decline.

This finding is consistent with the research conducted by Wee et al. (2024) in their study, the results also showed that the economic growth variable had a negative and significant effect on the unemployment rate. In addition, this finding is also accordance with Okun's Law, which states that there is a relationship between economic growth and unemployment rates.

2) The effect of Regional Minimum Wage on Unemployment Rate

Based on the partial t-test results, the UMK variable is not statically significant in affecting the unemployment rate in Central Java Province. This is consistent with the study by Yoga et al. (2022), which found that minimum wage has a positive but statistically insignificant effect on unemployment. Similarly, the research conducted by Nurfardhan et al. (2025) support this result, showing that UMK has a positive but insignificant effect on the unemployment rate. These findings indicate that the minimum wage does not consistently affect the unemployment rate, either in reducing or increasing it.

A study by Istikharoh et al. (2018) in the Special Region of Yogyakarta found that the informal sector is capable absorbing a substantial number of workers, thereby rendering the impact of the minimum wage on the unemployment rate statically insignificant.

Thus, workers who are not absorbed into the formal sector due to the impact of the minimum wage can shift to the informal sector. Because the informal sector absorbs excess labor from the formal sector and is not subject to minimum wage regulations, changes in the minimum wage do not significantly affect the overall unemployment rate.

According to Ridwan & Lela (2022), if the wage level in an area is relatively low, job seekers tend to be reluctant to work in that area and prefer other areas with higher wages. As a result of this labor mobility, an increase in the minimum wage in a specific region does not automatically cause a significant decrease or increase in unemployment. When job opportunities are limited, job seekers tend not to remain unemployed but instead seek alternative employment in other areas.

Although, in theory, minimum wages can encourage greater labor force participation, their actual impact on unemployment largely depends on labor market flexibility and mobility of workers. Therefore, minimum wages do not always have a significant effect on unemployment rates, as workers often adjust by relocating to regencies that offer more favorable employment conditions.

3) The effect of Number of Population on Unemployment Rate

Based on the results of the panel linear regression test, the Number of Populations variable has a positive and significant effect on the unemployment rate variable in Central Java Province. the positive coefficient indicates a direct correlation between the

number of population and the unemployment rate. Therefore, an increase in the population in Central Java is associated with a higher level of unemployment.

This finding is consistent with demographic theory, which explains that rapid population growth particularly among the working-age (productive) population-can be increase pressure on the labor market, thereby contributing to a rise in unemployment rate.

The increase in the new labor force each year, if not matched by proportional economic growth, will intensify competition for available jobs, potentially leading to higher unemployment. This finding aligns with research by Mahroji & Anwar (2020), which concluded that the population growth has a positive and significant effect on the unemployment rate, both partially and simultaneously. Similar results were found by Muminin & Hidayat (2017), whose study showed that the population variable significantly and positively affects the unemployment rate, further reinforcing the idea that uncontrolled population growth can burden the labor market.

4) The effect of Expected Years of Schooling on Unemployment Rate

Based the t-test results show that the HLS variable does not have a statistically significant effect on the unemployment rate in Central Java Province. This contradicts the hypothesis of this study, which posited that the higher levels of education would have a negative effect on the unemployment rate. One possible explanation is mismatch between educational output and labor market needs, where individuals with higher education may be more selective in job opportunities or face limited job availability that matches their qualifications.

The results of this study are consistent with the finding of Nujum et al. (2024), which concluded that the education level does not significantly affect the unemployment rate.

These finding are further supported by Wulandari & Marwan (2019), who also found that the educational level does not have a significant effect on unemployment rate. However, the contradiction is likely caused by structural mismatches in the labor market, particularly in Central Java, which is dominated by the industrial sector. The demand for labor qualifications in this sector does not in align with the available competencies. Consequently, the impact may be constrained by the labor market's capacity to absorb workers and the degree of alignment between educational outcomes and market needs.

Cristescu (2017) also stated that education can be one of the contributing factors to unemployment. This is attributed to the tendency of individuals with higher levels of education to be more selective when choosing jobs. In addition, highly educated individuals are more likely to seek employment in other regencies that offer wages commensurate with their skills. Therefore, increasing the level of education in a regency does not always have a direct impact on reducing unemployment rates in that regency; instead, it may contribute to lowering unemployment in other regencies.

CONCLUSION

A. Conclusion

The data analyzed in this study indicate that the Regional Economic Growth, UMK, Number of Populations, and HLS on the Unemployment Rate in Central Java from 2018 to 2023, both partially and together; therefore, the following conclusions can be drawn:

1. Regional Economic Growth has negative and significant effect on the Unemployment Rate in 10 regencies in Central Java.
2. Regional Minimum Wage has no effect on the Unemployment Rate in 10 regencies in Central Java.
3. Number of Population has positive and significant effect on the Unemployment Rate in 10 regencies in Central Java.
4. Expected Years of Schooling has no effect on the Unemployment Rate in 10 regencies in Central Java.
5. Based on the results of hypothesis testing using Regional Economic Growth, UMK, Number of Population and HLS together, they affect the Unemployment Rate in 10 regencies in Central Java.

B. Implications

Based on the research results, the following theoretical and practical implications can be put forward:

a. Theoretical Implications

1. The research findings contribute to supporting the theory of economic growth and unemployment. In line with the principles of Okun's law, economic growth has a significant negative effect on the unemployment rate. This strengthens the view that increased economic activity will encourage job creation and reduce unemployment rates.
2. The finding of a mismatch between education level and labor market needs supports the theory of mismatch skill, which states that the education system is not always in line with the demands of the workforce. This is reflected in the results of the study, which show that education level does not have a significant effect on unemployment rates.
3. The influence of demographic factors on unemployment rates is reflected in the finding that population has a significant relationship with unemployment rates. This supports the demographic theory, which states that population growth, especially in the productive age group, can increase unemployment rates if not accompanied by adequate economic growth.

b. Practical Implications

1. The government and policymakers are advised to prioritize efforts to encourage economic growth at the regional level as a strategic step in reducing unemployment rates.
2. Demographic management policies and population growth control strategies can be one solution to reduce pressure on the labor market.
3. Adapting educational output to the specific skills needs of dominant local industries to optimize the contribution of education to increasing employment in the area.
4. Flexibility in minimum wage regulation, policymakers need to recognize the role of the informal sector as a buffer in absorbing labor displaced by minimum wage increases in the formal sector.

C. Research Limitations

This research has several limitations that should be considered:

1. Scope Limitation

The research results are limited to the context of the Regency areas in Central Java Province, so their applicability cannot always be generalized to other areas with different economic and social conditions.

2. Time Limitation

This study uses data for six years (2018-2023). Although this period is quite long, it is possible that long-term patterns, structural changes in the labor market, and seasonal factors have not been fully captured in the analysis.

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