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Determinants of Educated Unemployment for University Graduates in 35 Regencies/Cities of Central Java Province 2019-2022

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Abstract:

Educated unemployment refers to individuals who have completed their education but have not yet secured employment. The number of educated unemployed in the districts/cities of Central Java Province fluctuates from year to year, influenced by various factors. This study aims to analyze the impact of each independent variable—economic growth, regional minimum wage, and investment—on the dependent variable, which is the educated unemployment rate of university graduates in the districts/cities of Central Java Province. The study utilizes panel data, which combines cross-sectional data from 35 districts/cities in Central Java and time-series data from 2019 to 2022. The data used comes from the districts/cities in Central Java. The method applied in this research is the GMM dynamic panel. The results show that the variables of economic growth (GDP), district/city minimum wage (UMK), and investment (foreign investment) have a negative impact on educated unemployment in both the short and long term across the 35 districts/cities of Central Java Province during 2019-2022.

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Keywords:

educated unemployment; economic growth; regional minimum wage; investment

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1. Introduction

Development is a process that has the aim of creating community prosperity through economic development. Economic growth, the level of inequality between populations, and economic structure can be benchmark values for the success of development. Creating high growth is the most important goal of economic growth efforts, on the other hand It should also aim to decrease poverty, reduce income disparities, and lower unemployment rates. (Todaro & Smith, 2015). The high level of unemployment is a fundamental problem for employment in developing countries. This can happen because the high increase in the number of workers is not proportional to the availability of employment, as a result the number of existing jobs is not able to absorb workers in developing countries (Indayani & Hartono, 2020). Consequently, the current job opportunities are insufficient to accommodate the

workforce in developing countries (Indayani & Hartono, 2020). Educated unemployment refers to individuals who have completed their education and are seeking employment but have not yet secured a job. Those who are unemployed are typically from the upper-middle class, who, despite being jobless, still lack certainty about their financial stability. The rise in educated unemployment remains inconsistent with the number of available jobs.

According to Junaidi (2016), educated unemployment only occurs when graduates often go through a waiting period, also known as the job search phase, which is categorized as frictional unemployment. The duration of this waiting period can vary depending on the level of education. Generally, the higher the education level of the workforce, the longer the waiting period tends to be. Improving human resource quality through education and wage levels is expected to decrease unemployment, assuming there are sufficient formal job opportunities. This is because a higher level of personal quality increases the likelihood of employment., the wider the opportunities for work. The number of educated unemployment figures in Indonesia increases every year, this happens because the number of new graduates from various universities increases, both private and state universities. (Hidayatullah,2018) believes the primary factor contributing to educated unemployment in Indonesia is because educational development planning is not commensurate with the development of employment opportunities. Insufficient educational planning can be seen in terms of the lack of match between offers and graduates from educational institutions. Another factor that causes high levels of educated unemployment is that there are still job seekers who still choose the type of work they are interested in, as well as the quality of the educated workforce which does not match the needs of job providers. Of course, this results in graduates from higher education institutions still not being able to be absorbed by these jobs.

One of the factors affecting educated unemployment is economic growth (Sari, 2013; Najliah, 2014; Wulandari, Yolamalinda, & Rahmania, 2015). Economic growth refers to the increase in the production of goods and services within an economic region over a given year, compared to the previous year, and is measured using GDP or GRDP at constant prices (BPS, 2021). According to Mankiw (2007), economic growth is inversely related to unemployment, as described by Okun's Law. Okun's Law suggests that unemployment has a direct empirical impact on output, which is determined by the number of workers employed. The more workers there are, the higher the output. in conditions like this it can increase demand for labor and can also create new jobs.

The high wages in an area also have an impact on high levels of educated unemployment. An increase in the minimum wage will cause the company's production costs to rise and have an effect on increasing the price of the products produced, so that demand for products will decrease (Islamia, 2017). With this, when companies reduce their need for labor due to an increase in the minimum wage there will be an increase in educated unemployment. To determine the increase in the minimum wage, the government is working hard to review this matter so that the decision does not increase the number of unemployed which is quite high (Azwar, 2012).

Another factor that can impact educated unemployment is investment. Investment can be defined as the allocation of money or funds with the expectation of generating profits through the invested capital (Umam, 2018). The connection between investment and unemployment is that

investment not only stimulates demand but also enhances production capacity. This implies that as production capacity expands, the demand for labor increases, assuming "full employment." This occurs because investment contributes to production factors, one of which is labor. As a result, the overall economy can absorb more workers, leading to an increase in labor force participation and a reduction in unemployment (Dewi, 2019). Investment spending has the potential to create more job opportunities, and as the demand for goods and services rises, it leads to greater labor demand, thereby lowering the unemployment rate (Kurniawan, 2014). Based on the description above, the aim of this research is to find out the influence of economic growth, regional minimum wages, and investment on educated unemployment of university graduates in the districts/cities of Central Java Province in 2019-2022.

2. Literature Review

a. Educated Unemployment

According to Mankiw (in Rizal, et al, 2020) unemployment is a macroeconomic problem that can directly affect human survival. Tobing (2004 in Adyaksa, 2020), defines educated unemployment as students who have completed their studies and are looking for work but have not found it. In developing countries, where education is centered on people's perspectives, unemployment is closely related to education (Adyaksa, 2020). Education has a significant influence on educated unemployment because the more education one completes, the more job options are available to them, thereby lowering the educated unemployment rate. Only former students who experienced a waiting period called frictional unemployment experienced educated unemployment. In addition, the length of the waiting period varies depending on the level of education (Junaidi 2016 in Barzuwa, 2020). Rising educated unemployment has a number of detrimental impacts. Waste of educational resources and erosion of public trust in education are two problems that may occur. Apart from that, it can result in a decline in community production, especially among educated workers (Veronika & Mafruhat, 2022).

b. Economic growth

According to Kuznets, economic growth is a long-term increase in a country's ability to provide more types of economic goods to its population (Asnidar, 2018). Economic growth, as defined by BPS, is an increase in the production of goods and services in a particular year compared to the previous year's value. This comparison is based on GDP or GRDP which is calculated on the basis of constant prices (Aji Pratama & Setyowati, 2022). Economic development and economic growth are closely related, on the one hand economic development encourages economic growth and on the other hand economic growth facilitates the process of economic development (Mada & Ashar, 2015). The creation of extensive job opportunities is another goal of economic development, with the aim of improving community welfare. Unemployment occurs when there are not enough jobs available for the number of people looking for work, which often occurs in the employment sector. An indicator of how well

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economic development is going is a measure of the unemployment rate (Veronika & Mafruhat, 2022). Okun's Law can be used to describe how a region's unemployment rate and economic growth are related. According to this law, a decrease in national Gross Domestic Product (GDP) will result in an increase in the unemployment rate. Because the working population produces goods and services, and the unemployed do not, there is a strong correlation between economic growth and unemployment (Harsenovia, 2021).

c. Regency/City Minimum Wage (UMK)

Wages are payments made to employees, and wage rates refer to payments made to employees over a certain period of time. There are many different views on what and how a fair salary is, although it is possible to define a high level of income as long as it is sufficient or, in other words, as long as it is fair (Mada & Ashar, 2015). Wages are compensation paid by a business entity or organization to daily employees (non-permanent employees) whose amount has been previously agreed. Usually, wages are determined based on regional minimum wages, which can include: a) minimum wages based on region, district or city, b) minimum wages based on sectors in provinces or districts/cities (Rahmania et al., 2019). The size of a company's wages cannot be determined by just one or a few factors. In other words, several factors determine the salaries of a number of company employees. Sukirno (2003) emphasized that a company's production costs will increase along with an increase in the minimum wage. To offset these costs, companies may choose to employ fewer people to meet their workforce needs at the current minimum wage (Barzuwa, 2020). According to Keynesian ideas, a person with a higher level of education will make it difficult for businesses to lower wage levels. Keynesians also assume that reduced wages cannot be used to create jobs. This is intended to reduce people's purchasing power because wage levels decrease because people's income will also decrease. Companies will decide not to increase production of goods because people's purchasing power is decreasing, but instead focus on labor efficiency which will increase unemployment rates (Harsenovia, 2021).

d. Foreign Investment

Investment is expenditure made by an investment or company to purchase capital equipment and industrial machinery to increase the economy's ability to produce goods and services (Wahyuni & Murtala, 2019). Aqil (2014) emphasized that investment plays an important role in job creation. Investment will increase the stock of capital goods, which will increase production capacity and lead to more employment opportunities and a decrease in the unemployment rate. Investments are categorized into two categories based on their funding sources: investments with foreign capital sources are known as foreign investments, while investments with domestic capital sources are known as domestic capital investments (PMDN) (Des et al., 2022). Suyanto (2003) defines foreign investment as the flow of capital from abroad entering the private sector either directly or indirectly (portfolio). According to dependency school theory, long-term foreign investment from developed countries which are the backbone of the global economic system will harm the ability of developing countries to grow their economies. This occurs as a result of large companies from developed countries penetrating

the economy outside the core of the economic system and being given access to resources that can be used for national development. This supports the idea that the labor and material resources of developing countries help developed countries become richer (Yuliastuti, 2020).

Previous studies that serve as references for this research include Harsenovia (2021), who conducted a study published in the FEB Brawijaya University Student Scientific Journal titled "Analysis of the Impact of Economic Growth, Wages, and Job Opportunities on Educated Unemployment Among University Graduates in Districts/Cities in West Java Province from 2014 to 2019." The research used panel data regression analysis with the Eviews software. The findings of the study indicate that economic growth and job opportunities have a significant negative effect on educated unemployment, whereas wages have a positive effect on educated unemployment.

Azeez & Akhtar (2019) in the International Journal of Education for the 21st Century conducted research entitled "Educated Unemployment: A Case Study of Kerala". Explaining that the swelling unemployment of the educated population has prevented the State from reaping the full social and economic benefits of its educational development. Unemployment is understood not only as a denial of opportunity to individuals. More than a lack of economic growth and the consequences ofinability to invest in education, it is rising unemployment that has set the limit for further public investment in educational development today. The rising unemployment of educated people has weakened the state's willingness to fund education. But growth by itself does not generate employment as is evident from Kerala's experience in the nineties. Driving growth with employment requires changes in the development strategies and supporting policy frameworks followed by the Central and State governments. Solving the unemployment problem also requires the quality of education to be improved substantially. It is felt that low quality has contributed, at least in part, to the unemployment problem in the State by rendering many educated people unable to work in today's changing job market.

Adriani (2019), in a study published by the CESJ (Center of Economic Student Journal), conducted research titled "The Impact of Gross Regional Domestic Product, Education Level, and Minimum Wage on Educated Unemployment." The analysis was carried out using Eviews. The findings of this study revealed that the variables of gross regional domestic product, education level, and minimum wage had a positive and significant effect on educated unemployment in Central Sulawesi.

Adenan et al. (2018), in their study published in the e-Journal of Business Economics and Accounting, conducted research titled "Determinants of Educated Unemployment in East Java." This explanatory research investigates the relationship between dependent and independent variables. The study found that the Regency Minimum Wage, Working Age Population, and Gross Regional Domestic Product significantly and positively impact educated unemployment in East Java.

Rosalina et al. (2018) in the e-Journal of Economic Perspectives and Regional Development conducted research with the title "Factors that influence the level of educated unemployment in Jambi Province". The data used is secondary time series data from 2001 - 2016 and analyzed

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descriptively & in a multiple regression model. The research results/output explain that together/simultaneously the level of education, economic growth, level of employment opportunities, and wages have a significant effect on the level of educated unemployment in Jambi Province. Partially/individually, the level of education & level of employment opportunities have a significant influence, while economic growth and wages have no effect on the level of educated unemployment in Jambi Province.

Rahmania et al. (2018), in a study published in the Journal of Economic Education and Entrepreneurship, conducted research titled "Analysis of Factors Affecting Educated Unemployment in Padang City." The study employed multiple linear regression for analysis. The findings revealed that economic growth, wages, and the productive age population collectively had a significant impact on educated unemployment in Padang City, as indicated by an F-count value of 7.893 and a significance value of 0.000. However, job opportunities did not significantly affect educated unemployment in Padang City. This was attributed to a large number of educated individuals sorting through job options and the prevailing migration culture in the city. Therefore, job opportunities were not deemed relevant for inclusion in the model. This was further supported by the maximum likelihood test for job opportunities, which yielded a calculated X2 value of 3.1933 with a significance of 0.0739. It can be concluded that excluding the job opportunity variable (X3) from the regression equation was appropriate, as the X2 value was lower than the critical value and was significant.

3. Data and Methodology

This study employs panel data, which combines cross-sectional and time-series data. The data used pertains to the districts/cities in Central Java Province from 2019 to 2022. The secondary data is sourced from the Central Statistics Agency, with the variables under investigation being educated unemployment, economic growth (GDP), district/city minimum wages (UMK), and investment. Educated unemployment in this study is represented by the open unemployment rate for university graduates, expressed as a percentage. Economic growth is measured using GDP data at constant prices in millions of rupiah. The district/city minimum wage (UMK) is presented in rupiah, and investment is quantified using foreign investment data in millions of rupiah. The analysis method applied is the GMM dynamic panel.

Setiawan and Kusrini (2010) explain that a dynamic model is a model that uses panel data with a model that does not involve current time, but also uses time in previous eras because unit changes in independent variables can be had in a number of time periods. Dynamic model to determine the results of short-term influences as well as long-term influences. The autoregressive dynamic model is a model where the independent variable has the same relationship as the lag on the dependent variable (Gujarati, 2004). The equation below is an autoregressive dynamic equation model.

$$yt = \beta_0 + \beta_1 x_{it} + \beta_2 x_{it} + \cdots + \beta k x_{kt} + \delta y_{t-1} + \varepsilon_t \quad (1)$$

where:

yt : The t-th time period from which the dependent variable is used

$x_{i,t}$: The i-th data for the t-time period of the independent variable used

y_{t-1} : lag of the dependent variable on the side of the independent variable

δ : Scalar lag of the dependent variable on the independent variable side

k : The number of uses of independent variables

εt : Component error

In the dynamic model coefficient $\beta 1, \beta 2, \ldots, \beta k$ which is the short-term impact of the range of values xi,t as well as $(\beta i/(1-\delta))$ which is the long-term effect of the value range xi,t where i is the number of cross-section data sizes up to N. The scalar on the lag of the explanatory endogenous variable needs to fulfill the condition that it must be between zero and one or the absolute value must be no more than one $|\delta| \leq 1$ or $(0 < \delta \leq 1)$. The dynamic equation model in this research is:

$$lnEducatedUnemployment_{i,t} = \beta 0 + \beta 1 lnEducatedUnemployment_{i,t-1} + \beta 2 lnGDP_{i,t} + \beta 3 lnUMK_{i,t} + \beta_4 lnForeignInvestment_{i,t} + \varepsilon_{i,t} \quad (2)$$

The model specification tests carried out can use the Arellano-Bond GMM estimation to meet the model specifications with the tests that can be carried out are the Arellano and Bond tests (consistency tests) and the Sargan test (instrument validity tests). The Sargan test in the model significance test to examine the valid condition of the instrumental variable has a number that is more than the estimated number (a condition of overidentifying restriction). Hypothesis used for Sargan test:

H0: The state of the instrumental variables in the estimation model being tested is valid

H1: The instrumental state of the variables in the estimation model being tested is invalid

Arellano and Bond (1991) suggest testing whether or not there is a second order serial correlation with error by first difference equations. Hypothesis used for the Arellano-Bond test:

H0: Does not have autocorrelation in the first difference residuals of the second order

H1: Has autocorrelation in the residual first difference of the second order

4. Results and Discussion

Modeling educated unemployment with several variables that are thought to influence using a dynamic panel data model using Arellano-Bond Generalized Method of Moments (GMM) estimation. The results of the initial dynamic panel data model on the use of the Arellano-Bond GMM estimation in the one step estimator can be explained in Table 1.

Table 1. Educated Unemployment Modeling Using Arellano-Bond GMM

Variables	Coefficient	Standard Error	z	p-value
L1. lnEdutacedUnployment	-0.046087	0.226052	-0.20	0.838
ln GDP	-3.767966	5.689605	-0.66	0.008
ln UMK	-3.329208	10.35872	-0.32	0.048
ln Foreign Investment	-0.023791	0.051224	-0.46	0.642
_constant	62.57376	136.5312	0.46	0.647

Source: Stata Results (Processed Data), 2024

Test the economic growth model specifications from the dynamic panel data model using the GMM Arellano-Bond one step estimator method by carrying out the Sargan test and the Arellano-Bond test. The Sargan test in model specifications is used to determine the validity of using instrumental variables that are more than the number of parameters to be estimated (overidentifying restriction conditions). The results of the Sargan test are in Table 2.

Table 2. Sargan test

S	4.634987
P-value	0.3268

Source: Stata Results (Processed Data), 2024

Table 2 shows a statistical value of 4.634987 and a p-value of 0.3268 which is greater than the significance level used, namely 5%, so it passes the Sargan test.

Table 3. Arellano-Bond Test

Orders	z	P-value
1	-2.3359	0.0195
2	0.3721	0.7264

Source: Stata Results (Processed Data), 2024

In Table 3, the resulting second order value is 0.3721 and the p-value is 0.7264, which is greater than the significance level used, namely 5%, so it passes the Arellano-Bond test.

In the significance test, parameters are used to determine the existence of a relationship between variables in the dynamic panel data model. The parameter significance test is carried out using the Wald test and Z test. The Wald test from this research is used to determine whether all independent variables are significant to the dependent variable or determine the suitability of the model. The results of the Wald test can be produced in Table 5.

Table 4. Wald test

Wald	21.58
P-value	0.0002

Source: Stata Results (Processed Data), 2024

The results from Table 4 determine the size of the Wald test at 21.58 with a p-value of 0.0002 less the significance level used at 5% so it passes the Wald test.

Test significance with the Z test using a significance level of 5% with the Z test value exceeding the Z value (table). At a significance level of 5%, it can be concluded that the independent variables from the lag Educated Unemployment (L1.Educated Unemployment), Economic Growth (GDP), District/City Minimum Wage (UMK), and Investment have a significant effect on Educated Unemployment in 35 districts/cities of the Province Central Java 2019-2022.

After testing the dynamic panel data regression model using the Arellano-Bond GMM estimation method, the model obtained can be produced in the following equation:

$$Educated\ Unemployment = 62.57376 - 0.046087\ lnEducatedUnemployment_{i,t-1} - 3.767966\ lnGDPi,t - 3.329208\ lnUMK_{i,t} - 0.023791\ lnForeignInvestment_{i,t}$$

After determining the final model that has been produced, the dynamic panel data regression model can determine the effects of short-term influences as well as the effects of long-term influences on the endogenous variables. Looking for short-term effects and long-term effects using the Microsoft Excel application with short-term effects is$\beta i$and the long-term effect is (βi/ (1−δ)). The following are the results of the short-term influence and long-term influence on each variable in Table 5.

Table 5. Influence of Short-Term Effects and Influence of Long-Term Effects

Variable	Coefficient	Short Term	Long Term
L1. lnEducatedUnemployment	-0.046087	-	
ln GDP	-3.767966	-3.767966	-13.601963
ln UMK	-3.329208	-3.329208	-13.182535
ln Foreign Investment	-0.023791	-0.023791	-8.022743
Constanta	62.57376	-	-

In Table 5, an interpretation of the dynamic panel data model can be produced which can determine short-term effects and long-term effects on educated unemployment which can be explained in the following explanation.

1. The coefficient of the economic growth variable (GDP) is negative, indicating that if GDP increases, educated unemployment will decrease. The coefficient value on GDP is -3.767966, which shows the short-term effect of GDP on educated unemployment, which means that for every 1 percent increase in the value of GDP, it can reduce educated unemployment in the short term by 3.767966 percent, while the coefficient value is 13.601963, which shows the elasticity of the effect. long-term GDP on educated unemployment. In this statement it can be stated that for every 1 percent increase in GDP value, it can reduce educated unemployment in the long term by 13.601963 percent.
2. The coefficient for the district/city minimum wage (UMK) variable is negative, indicating that if the UMK increases, educated unemployment will decrease. The coefficient value for UMK is -3.329208 which shows the short-term effect of UMK on educated unemployment, which means that for every 1 percent increase in the value of UMK, it can reduce educated unemployment in the short term by 3.329208 percent, while the coefficient value is 13.182535 which shows the elasticity of the long-term effect UMK against educated unemployment. In this statement it can be stated that for every 1 percent increase in the value of the UMK, it can reduce educated unemployment in the long term by 13.182535 percent.

The coefficient of the investment variable (Foreign Investment) is negative, indicating that if Foreign Investment increases, it will reduce educated unemployment. The coefficient value for Foreign Investment is -0.023791, which shows the short-term effect of Foreign Investment on educated unemployment, which means that for every 1 percent increase in the value of Foreign Investment, it can reduce educated unemployment in the short term by 0.023791 percent, while the coefficient value is -8.022743, which shows elasticity of the long-term effect of Foreign Investment

on educated unemployment. In this statement it can be stated that every 1 percent increase in the value of Foreign Investment, it can reduce educated unemployment with a long- term effect of -8.022743 percent.

5. Conclusion

The conclusions in this research are based on the analysis that has been carried out, namely that the variables economic growth (GDP), district/city minimum wage (UMK), and investment (Foreign Investment) both in the short and long term have a negative influence on educated unemployment. This means that if the variables of economic growth (GDP), district/city minimum wage (UMK), and investment (Foreign Investment) increase, it will reduce educated unemployment in 35 districts/cities of Central Java Province in 2019-2022.

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