



Analysis of the Effect of Education, Gross Regional Domestic Product, District Minimum Wage and Population on Open Unemployment Rates in Central Java in 2020–2021

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Abstract. In this analysis, the expected objective is to determine the influence of Education, Gross Regional Domestic Product, District Minimum Wage, and Population on the Open Unemployment Rate of Central Java Province in 35 Regencies/Cities in Central Java Province in 2020–2021. This study used the panel data method. The model which selected is Fixed Effect Model (FEM). Based on the regression of this study shows that the variables of Education, Population Numbers have a large and favorable impact on the open unemployment rate. The District Minimum Wage variable turned out to effected negative and significant. Meanwhile, the variable Gross Regional Domestic Product has a positive and insignificant effect. Based on the simultaneous test of Education, the District Minimum Wage and Population Amount were significant at 93.84% and the remaining 6.16% was impacted by variables other than those considered in the model.

Keywords: Unemployment · Education · District Minimum Wage · Population

1 Introduction

Economic development is essentially a set of policies aimed at improving people's living standards and expanding job possibilities, and achieving economic equality. The development of a developing economy in a country stimulates the country's economic growth. Economic growth is necessary to achieve social progress [1]. It is said that the economy has achieved very high growth due to the very high results of economic activity in the past [2]. As a developing country, Indonesia is still going through stages or processes of building a better economy to become a developed country. One of the serious problems facing Indonesia today is unemployment. Unemployment is a serious employment issue that has reached crisis proportions [3]. Unemployment is generally caused by an imbalance between the number of jobs available in a country and the number of people employed. With rising, unemployment comes a new problem of poverty. High unemployment hurts the economy, the individual, and society. High unemployment prevents people from maximizing achievable wealth, lowering productivity and collective income, leading to poverty, crime, and other social problems [4]. Unemployment is a

problem for all countries, both developing and developed countries. When compared to the number of people working in a country, fewer people are working in a country [5]. According to data from the Central Statistics Agency, Indonesia's unemployment rate (TPK) in February 2022 was 5.83%. (BPS). This proportion decreased compared to the previous year. Please note that the TPK in February 2021 was 6.26%. Recognizing that the unemployment rate is a measure of economic efficiency [6]. If the problem persists, the subsequent input of the supplied labor will not be used, and the product will not be lost. The supply of work is influenced by product development and enterprise development [7].

Central Java is a densely populated province. Central Java is the third most populous province in Indonesia. Based on BPS data, the overall population of Central Java in 2020 was 36,516,035 people, up from 36,742,501 people in 2021. That the unemployment rate published in Central Java was 6.48% during August 2020 and decreased. 5.95% in the financial year ended August 2021. The unemployment rate shows the proportion of the unemployed labor force. The decline in unemployment is a sign of a strong economy.

The problem of unemployment in Central Java is certainly related to many factors that continue to increase unemployment. Factors affecting the open unemployment rate include education, district/city minimum wage, gross domestic product, and population.

2 Bibliography Review

2.1 Definition of Unemployment

A published unemployment rate means the unemployment rate of workers without real jobs. The unemployment rate is certainly the kind of unemployed person with a high unemployment rate. Unemployment is observed to be very real because it is lower than job growth, hence the so-called open unemployment [8].

2.2 Impact of Education on Unemployment

The first to affect unemployment is education. One of the most important qualities of a person's education is his ability to learn, as well as his competence, skills, and professionalism. The study of character is one of the most essential investments a person may make to improve his quality of life [9]. From this we can conclude that the more educated you are, the more likely you are to get opportunities and jobs. Conversely, the lower the education, the harder it is to obtain opportunities and jobs. Education will not give you the necessary skills to get the job done efficiently, but it will allow you to get the job done in a professional environment. In other words, education not only instills knowledge directly in carrying out tasks, but also instills knowledge as the basis for self-development and the ability to make optimal use of it. Facilities and infrastructure around us for the smooth implementation of tasks [10]. Education is expected to produce skilled human resources [11].

2.3 Impact of GRDP on Unemployment

The second that affects unemployment is the Gross Regional Domestic Product. The definition given by GRDP can be broken down into several types of goods that can be used by a business unit for a certain week, or several products and services that can be used by a business unit for a certain week [12]. Using regional Gross Domestic Product (GDP) data that takes into account the prevailing and constant price base to find out the economic condition of the region for some time.

2.4 Impact of District Minimum Wage on Unemployment

The third that affects unemployment is the District Minimum Wage (MSE). High low wages affect unemployment. A high minimum wage leads to a decrease in labor demand [13]. If salaries are too high, unemployment increases, and the production costs of each company rise, the company will reduce the number of workers. Lower wages affect employment. As a result, the number of responses will increase. Wages are one of the elements that influence growth rates, and the rate of change that occurs to a minimum guarantees the continuity of work. Wages are the recompense of the work unit in the form of the amount paid [8].

2.5 Impact of Population on Unemployment

The fourth that affects unemployment is the number of inhabitants. Excessive population growth hinders the process of economic development in developing countries [14]. Residents of Central Java are all people who have lived in the geographical area of Central Java for more than 6 months and/or less than 6 months but want to settle down (Central Statistics Agency, Population Concept, 2021). The age of the population has increased considerably and this population growth creates dynamic problems.

3 Hypotheses Development

3.1 Education

According to Todaro (2006), education is one way to provide knowledge that can be used to advance the standard of human capital. The important role of education in the advancement of economic development is to reduce the unemployment rate and improve the welfare of its people. One of the indicators to illustrate the community's educational level is the average length of schooling [4].

3.2 Gross Regional Domestic Product

GRDP is one of several indicators used to determine the current state of the economy on a given day over some time, with a price range from low to high. In this case, GRDP refers to the total number of goods sold and days sold by each warehousing unit as a whole or the overall number of products sold and the number of days sold per unit in the warehouse as a whole [15].

3.3 District Minimum Wage

Wages are the income that workers receive in the form of money, which includes not only the components of wages or salaries, but also overtime and regularly received benefits such as transportation allowances, meal allowances and other benefits as long as they are received in monetary terms.), excluding allowances. Holiday allowance (THR), annual, quarterly allowance, other non-routine allowances and nature allowances [6].

3.4 Population

The population can be divided into two groups: working and unemployed. The labor force is a resident of the labor force (aged 15 years and over) who are looking for work or have a job but are temporarily unemployed or unemployed. If a person is of working age but not working, Going to school, doing household chores, retiring, and doing activities other than personal activities, it is a non-labor group [16].

4 Research Methods

The research method used is quantitative and the data source Secondary data is used. The data for this study came from the Central Statistics Agency of Central Java Province and the subject's related literature. This study analyzed education, GRDP, minimum wage and population as independent variables with the open unemployment rate as a dependent variable in 35 districts/cities in Central Java from 2020 to 2021. This analysis uses panel data from OLS (Ordinary Least Squares) regression. Analysis tools, hypothesis testing includes f-test, t-test, test-2, and Chow and Hausman tests for the selection of the best model used. Here's the test that Eviews 10 used in this study:

$$UNEMP_{it} = \beta_0 + \beta_1 EDUC_{it} + \beta_2 LOG(PDRB)_{it} + \beta_3 LOG(UMK)_{it} + \beta_4 PO_{it} + \varepsilon_{it}$$

Description:

Information:

UNEMP _{it}	: Open Unemployment Rate
EDUC _{it}	: Education (Percent)
PDRB _{it}	: Gross Regional Domestic Product
UMK _{it}	: District/City Minimum Wage
PO _{it}	: Total Population (Soul)
ε_{it}	: Error term
β_0	: Constant
$\beta_1, \beta_2, \beta_3, \beta_4$: Independent Variable Coefficient
i	: (Data Cross section)
t	: (Data Time Series)

5 Panel Data Regression Estimation Results

The panel data regression technique's estimate results on econometric models. Pooled Least Squares (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM) are shown in Table 1 (REM).

Table 1. Panel Data Regression Estimation

Variable	Koefisien Regresis		
	PLS	FEM	REM
C	-4.138.861	327,1090	3.574.954
EDUC	0.793674	1,347357	0.998415
Log(PDRB)	4.384.084	-38,90770	-1.470.029
Log(UMK)	-1.178.362	7,340866	-0.898936
PO	2.79E-06	7,15E-05	2.95E-06
R^2	0.215253	0,938366	0.141372
<i>Adjusted R²</i>	0.166961	0,862814	0.088533
F-Stat	4.457.319	12,42022	2.675.543
Prob. F Stat	0,003031	0.000000	0,039485

Source: Data analysis, Eviews 10

Table 2. Chow Test Estimation Results

Effect Test	Statistic	d.f.	Prob.
Cross – section F	10.697.143	-34,31	0.0000
Cross-section Chi-square	178.090.221	34	0.0000

Source: Data analysis, Eviews 10

5.1 Chow Test

The Chow test determines whether the Common Effect Model or the Fixed Effect Model is preferable for estimating panel data. Table 2 displays the results of the Chow Test processing.

From Table 2, As may be seen, The likelihood of F is 0.0000, whereas the probability of Chi-square is 0.0000. The hypothesis formulation is as follows, H_0 : Selected model Common Effect Model (CEM). Medium H_A : Selected model Fixed Effect Model (FEM). Determining the criteria if the probability value of F and the probability of Chi-square is less than alpha value, then H_0 is accepted. From the above results, it is found that H_0 is rejected due to the probability value of F and the probability of Chi-square of 0.0000 < 0.05. As a result, the Fixed Effect Model (FEM) is the optimal model to utilize.

5.2 Hausman Test

In panel data estimation, the Hausman test is used to select the best Fixed Effect Model or Random Effect Model model. Table 3 displays the Hausman test processing results.

From Table 3 demonstrates that the probability value is 0.0199. The hypothesis formulation is as follows, H_0 : Selected model Random Effect Model (REM). Medium

Table 3. Hausman Estimation Results

Test Summary	Chi-sq Statistic	Chi-sq.d.f.	Prob.
Cross-section random	11.673.737	4	0.0199

Table 4. Estimation Model for the Fixed Effect Model (FEM)

$$UNEMP_{it} = 327.1090 + 1.347357 EDUC_{it} - 7.340866 PDRB_{it} - 38.90770 UMK_{it} + 7.15E-05 PO_{it}$$

$$(0.0228)** \quad (0.5981) \quad (0.0381)** \quad (0.0972)***$$

$$R^2=0.938366 ; DW =3.888889 ; F=12.42022 ; Prob. F = 0.000000$$

Source : Data analysis, Eviews 10

Description: *Significant at $\alpha = 0.01$; ** Significant at $\alpha = 0.05$; *** Significant at $\alpha = 0.10$; The number in brackets is the t statistic's probability value.

HA: Selected model Fixed Effect Model (FEM). Specifies the criteria if the probability value is less than the value of alpha, then H0 is accepted. From the results above, it is found that H0 is rejected because the probability value is $0.0199 < 0.05$. As a result, the Fixed Effect Model (FEM) is the optimal model to utilize (Table 4).

5.3 Partial Significance Test (t test)

The t-test is secondhand to assess if each independent variable has a real effect on the dependent variable while assuming that the other variable remains constant. For the first econometric model, H0 partial significance test in this study was $\beta_1, 2, 3, 4 = 0$, or EDUC, Log(PDRB), Log(UMK) and PO did not affect UNEMP. Meanwhile, HA, states that $\beta_1, 2, 3, 4 > 0$, or EDUC, Log(PDRB), Log(UMK), and PO affects UNEMP. H0 is accepted if the probability of t-statistics is $> \alpha$ and H0 are rejected when the probability of t-statistics is $\leq \alpha$ (Table 5).

Table 5. Partial Significance Test Results (t test)

Variable	Probabilitas t-statistik	Criterion	Conclusion
EDUC	0,0228	$\leq 0,05$	Signifikan at $\alpha = 0,05$
Log(PDRB)	0,5981	$> 0,10$	Insignifikan
Log(UMK)	0,0381	$\leq 0,05$	Signifikan at $\alpha = 0,05$
PO	0,0972	$\leq 0,10$	Signifikan at $\alpha = 0,10$

Source: Data analysis, Eviews 10

5.4 Simultaneous Significance Test (Test F)

A simultaneous significance test (Test F) is carried out to determine the significance of the effect of all independent factors on the dependent variables separately or simultaneously. H_0 test F is $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ or independent variables together have no real effect on the dependent variables, while H_A states $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$ or independent variables together have a marked effect on the dependent variables. H_0 is not rejected if the probability of F-statistic is $> \alpha$ and H_0 is rejected if the probability of F-statistic is $\leq \alpha$. It is seen that the probability value of F-statistic is 0.0000 (< 0.01) which means it is rejected, as a result, it may be inferred that EDUCATION, Log (PDRB), Log (UMK) and PO have a real effect on UNEMP.

5.5 Interpretation of the Coefficient of Determination

The coefficient of determination (R^2) indicates the predictive or goodness of the estimated model. It can be seen that R^2 is estimated in the econometric model, the Fixed Effect Model (FEM) is valued at 0.938366. This indicates that 93.84 percent of the variation in changes in the Open Unemployment Rate (UNEMP) in Central Java Province is explained by the variations of EDUC, Log (GRDP), Log (UMK) and PO. The remaining 6.16 percent is related by variations in additional variables that aren't admitted in the model.

6 Discussion

According to prior research, education has a favorable and statistically significant influence on the open unemployment rate. If education rises by 1%, the open jobless rate rises by 1%, and vice versa. These findings are consistent with Prawira's research, which discovered that education had a positive and significant influence on the unemployment rate [17]. The research conducted was able to show that student learning achievement is positively correlated with school graduation rates; This is because if the graduation rate of the institution is high, it is very likely that student achievement will also be high. This is one of the factors that causes students who have a high level of education tend to have less education and education than people with a greater degree of education [18].

According to the study's findings, the GRDP has a little but favorable effect on the unemployment rate. If GDP increases by 1%, the open unemployment rate rises by 1%, and vice versa. The findings are consistent with Soebagio's research on Gross Regional Domestic Product (GDP) at constant prices, and they have a positive but negligible influence on the open unemployment rate [11]. The market is unaffected by the value of the gross domestic product. This indicates that GDP expenditures incurred by households, businesses, and the public sector as a whole will provide to the creation of products and services. This is due to the growth of Indonesia's economic structure over a long period, when it lacks the support of the times and the dangerous economic environment [12].

According to the findings of the study The District Minimum Wage has a negative and significant impact on the unemployment rate. If the District Minimum Wage increases by 1%, the unemployment rate decreases by 1%, and vice versa. The research conducted

in conjunction with the Wage Stewards is significant. This is seen in the fact that when Wages are activated they can be used to provide a sense of security, and Wages should also be used in conjunction with the work done by the individuals involved [19]. In another study (Herniawati & Handayani, 2019) Minimum wage has a negative and significant effect [7]. In another study (Nurcholis, 2014) Minimum wage has a significant influence [20].

According to the findings of the study, the population has a favorable and considerable impact concerning the unemployment rate. If the population expands by 1%, so does the unemployment rate. The studies conducted are in line with the research (Herniawati & Handayani, 2019). These findings are consistent with the study. The population variable has a significant and positive impact on the open unemployment rate. This suggests that as the population increases, the unemployment rate will also increase [7]. In another study (Pasuria and Triwahyuningtyas 2022) population numbers had a positive and significant effect [13].

7 Conclusion

The goal of this study is to look at the link between the open unemployment rate and education, GDP, district minimum pay, and population in Central Java Province with 35 Regencies/Cities in Central Java Province in 2020–2021. This study used the panel data method, a selected Fixed Effect Model (FEM). According to the results of this study's regression, the variables Education and Population have a positive and significant effect on the open unemployment rate, the District Minimum Wage Variable has a visible Negative and Significant effect, and the variable Gross Regional Domestic Product has a positive and insignificant effect. The Central Java Provincial Government is anticipated to implement initiatives to minimize the unemployment rate in Central Java as a result of this research. For further research, it is hoped that it can find sources and references for new variables so that the research results are more complete and efficient.

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