



## The Effect Of Population and Economic Factors On Open Unemployment

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**ABSTRACT** - This study aims to analyze the influence of human development index, regional minimum wage, gross regional domestic product, population growth rate on open unemployment in districts/cities in Central Java. This study used a panel data analysis method by taking data at the Central Statistics Agency of Central Java with the scope of research of 35 regencies/cities in Central Java during 2017 to 2021. The results of this study show that the selected model used in this study is the Random Effect Model (REM) by going through testing on the hausman test. In addition, the findings in this study are that HDI has a negative and insignificant relationship with open unemployment. GRDP has a significant negative influence on the open unemployment rate, the minimum wage and the number of inhabitants have a significant positive effect on the open unemployment rate, while the rate of population growth has a positive and significant relationship with the open unemployment rate on regencies/cities in Central Java in 2017-2021.

**Keywords:** Open Unemployment, HDI, Regional minimum wage, GRDP, Population Growth

**ABSTRAK** - Penelitian ini bertujuan untuk menganalisis pengaruh indeks pembangunan manusia, upah minimum regional, produk domestik regional bruto, laju pertumbuhan penduduk terhadap pengangguran terbuka pada kabupaten/kota di Jawa Tengah. Penelitian ini menggunakan metode analisis data panel dengan mengambil data di Badan Pusat Statistik Jawa Tengah dengan ruang lingkup penelitian 35 kabupaten/kota di Jawa Tengah selama periode 2017 sampai 2021. Hasil penelitian ini menunjukkan bahwa model terpilih yang digunakan dalam penelitian ini adalah Random Effect Model (REM) dengan melalui pengujian pada uji hausman. Selain itu, temuan pada penelitian ini adalah IPM memiliki hubungan negative dan tidak signifikan terhadap pengangguran terbuka. PDRB memiliki pengaruh negatif signifikan terhadap tingkat pengangguran terbuka, upah minimum dan jumlah penduduk berpengaruh positif signifikan terhadap tingkat pengangguran terbuka, sedangkan laju pertumbuhan penduduk memiliki hubungan positif dan signifikan terhadap tingkat pengangguran terbuka pada kabupaten/kota di Jawa Tengah tahun 2017-2021.

**Kata Kunci:** Pengangguran Terbuka, IPM, Upah Minimum Regional, PDRB, Laju Pertumbuhan Penduduk

### INTRODUCTION

Economic development is defined as a process of increasing the per capita income of people in a country that lasts in the long term. Development is defined as an increase in national products (GDP, GNP) caused not only by an increase in the quantity of production factors used in the process but also the use of new systems and technologies (Muslim, 2014). According to Todaro (2005) development is something that can improve the quality of life and welfare of a country, especially for people living in that country (Todaro, 2005). Development is carried out in various sectors of life and involves production activities. Meanwhile, economic builders are a process that causes the per capita income of the population to increase in the long run. In

addition, regional economic development is a process of managing resources available by the government and the community, as well as partnerships between the private sector and local governments in creating new jobs and spurring the economic development of a region (Panjawa & Daryono Soebagiyo, 2014). Increasing the number of jobs and types of employment opportunities for people in the regions is the main goal in economic development. whereas, employment not proportional to the labor force will lead to unemployment. The high unemployment rate will be an economic problem because it does not maximize valuable resources and does not take advantage of the production of goods and services that are actually biased towards unemployment (Jones, 2005). The rate of economic growth that increases, the production of goods and services will also increase, thereby increasing the standard of living. A high rate of economic growth will usually expand employment opportunities and lower the unemployment rate. Meanwhile, the wage rate is one of the factors that affect the unemployment rate. Wages are compensation received by one work unit in the form of the amount of money paid. Labor wages are very important for both parties. For producers, wages are production costs that must be reduced as efficiently as possible. For the worker, wages are a source of income for himself, his family and become a source of community spending. High and low wages are an important factor that determines people's living standards.

Currently, education is positioned as a means to improve welfare through the use of existing opportunities and reflects the level of intelligence or achievement of formal education from the population because the higher one's education graduation, the higher one's work making or productivity at work. The ultimate goal of the educational program is the achievement of the expected work. According to the results of research conducted by Mihaela (2020) regarding the relationship of the human development index has a significant and negative influence on the unemployment rate. This explains that the higher the human development index in an area, the more it will cause the unemployment rate to decrease and vice versa if the human development index is low, it will have an impact on the high unemployment rate in the area (Mihaela, 2020).

**Table 1. Open Unemployment Rate By Province in Java Island in 2017-2022**

Province	2017	2018	2019	2020	2021
DKI Jakarta	7.14	6.65	6.54	10.95	8.5
West Java	8.22	8.23	8.04	10.46	9.82
Central Java	4.57	4.47	4.44	6.48	5.95
D.I. Yogyakarta	3.02	3.37	3.18	4.57	4.56
East Java	4.00	3.91	3.82	5.84	5.74
Banten	9.28	8.47	8.11	10.64	8.98

Source: BPS (processed)

Table 1 shows the unemployment rate in Central Java Province in 2021 of 5.98 percent, an increase from 2020. In 2021, the unemployment rate in Central Java Province was low after the Provinces of D.I. Yogyakarta and East Java had open unemployment rates of 4.56 percent and 5.74 percent, respectively. Based on the description above, it aims to see the effect of the Human Development Index, regional minimum wage, population growth rate, and GRDP on open unemployment of regencies/cities in Central Java in 2017-2021, namely: (1) to analyze the effect of the Human Development Index on the open unemployment rate; (2) to analyze the effect of the regional minimum wage on the open unemployment rate; (3) to analyze the effect

of population growth rate on open unemployment rate; (4) to analyze the effect of GRDP on the open unemployment rate.

The study conducted by Mahroji (2019) states that through education investment, it is hoped that it will be able to improve the quality of human resources shown by increasing a person's knowledge and skills. The higher the quality of human beings, the knowledge and expertise will also increase so that it will encourage an increase in work productivity. So that companies will get more results by hiring workers with high productivity with high employment, causing a reduction in the unemployment rate (Mahroji & Madania, 2019). The study of Sirait and Marhaeni (2013) found that economic growth, regional minimum wage and education level had a significant effect on the number of unemployed districts/cities in Bali Province. The results of the study obtained that economic growth has a real positive effect, the regional minimum wage has a real negative effect on the number of unemployed districts/cities in Bali Province, while the level of negative education is not real, and economic growth has the most dominant influence on the number of unemployed districts/cities in Bali Province (Novlin Sirait & A A I N Marhaeni, 2013). Based on the description from the background above, the author is interested in conducting a study with the title "The effect of population and economic factors on open unemployment"

## **LITERATURE REVIEW**

### ***Unemployment***

Unemployment is a state in which a person belonging to the labor force wants to get a job but has not been able to get it. A person who does not work, but does not actively seek work is not classified as unemployed. Unemployment can occur due to imbalances in the labor market. This shows that the amount of labor offered exceeds the amount of labor requested (Todaro, 2005). According to the Central Statistics Agency (BPS) in the employment indicator, unemployment is a resident who is not working but is looking for a job or is preparing for a new business or a resident who is not looking for a job because he has been accepted to work but has not yet started working. This unemployment is a workforce that is truly jobless. This type of unemployment is quite a lot because it has not yet gotten a job even though it has tried its best and as a result of the increase in job vacancies that are lower than the increase in labor. The effect of this situation in a fairly long period of time they do not do a job. So they are unemployed for real and half the time, and therefore called open unemployment. Open unemployment can also exist as a result of declining economic activity, from technological advances that reduce the use of labor, or as a result of the decline in the development of an industry (Mihaela, 2020).

### ***Human Development Index***

According to the *United Nations Development Programme*, human development is the process of enlarging choices for humans "*a process of enlarging people's choices*". The concept of human development explains that development should be analyzed and understood from a human point of view, not just from the point of view of its economic growth. Development is defined as an activity in an effort to improve the welfare of the community in various aspects of life which is carried out in a planned and sustainable manner by utilizing and taking into account the ability of resources, information, and advances in science and technology, as well as paying attention to social development.

According to *the United Nations Development Programme* (UNDP), in the Human Development Index (HDI) there are three indicators used to measure a country's average achievement in human development, namely through the measurement of life expectancy, education which is measured based on the average length of schooling and the literacy rate of the population aged 15 years and over, then the standard of living is measured through the measurement of per capita expenditure which has been adjusted to purchasing power parity. *The Human Development Index* or HDI is one of the approaches to measure the success rate of human development. The Human Development Index can be used as a tool to measure the status of *basic capabilities* but cannot measure all aspects of human development. The Human Development Index is calculated based on four components, namely the life expectancy that represents the health sector, the literacy rate and the average length of schooling for education, and the purchasing power parity of the community towards the amount of basic needs measured from the average per capita expenditure as an income approach that represents the area of decent living standards.

### ***Regional Minimum Wage***

Wages are the price paid to the worker for his services in the production of wealth like any other factor of production, labor is rewarded for his services referred to as wages. The minimum wage is a minimum standard used by employers or industry actors to provide wages to workers in their business environment (Mankiw, 2003). In addition, wages are a very influential factor in labor issues. This is because the desire of people to work is to get a decent wage to meet the needs of life (Agénor & Lim, 2018). If the level of wages offered by the employer is judged insufficient by the worker, then the worker will not accept the job offered. On the contrary, there are also workers who work at any level of wages. Wages are repayment for labor production factors. According to classical economics, wages are the price for labor production factors. The price must be able to meet the needs of life and guarantee a decent life (Sisnita & Prawoto, 2017).

### ***Gross Regional Domestic Product***

Economic growth shows the extent to which economic activity will generate additional income for people in a given period. Increasing the production of goods and services from a region, macro can be seen from the increasing value of Gross Regional Domestic Product (GRDP) every year and micro-based on gross regional domestic product per capita (Doni Mahardiki & Rokhedi Priyo Santoso, 2013). Gross Regional Domestic Product is the net value of final goods and services produced by various economic activities in a region in a given period (Giovanni, 2018). Gross Regional Domestic Product in the statistics presents two assessments, namely the GRDP on the prevailing price, namely the GRDP which includes inflation factors and the GRDP on constant prices, namely the GRDP which does not include inflation factors in it. Gross Regional Domestic Product can describe the ability of a region to manage and develop the potential of natural resources. Therefore, the amount of GRDP of each region has a different value depending on natural resources and production factors (Panjawa & Daryono Soebagiyo, 2014).

### ***Population Growth Rate***

A resident is a person who occupies a geographical area of a country for approximately six months and or is domiciled for approximately six months but aims to settle down (Sisnita & Prawoto, 2017). The 1945 Constitution Article 26 Paragraph 2 states that residents are

Indonesian citizens and foreigners residing in Indonesia. The existence of the population in a country has a very important role. The population plays the main role in economic, governmental, social activities and so on. If a country has no inhabitants then it will be destroyed and lost (Safuridar & Putri, 2019). In general, the development of the population in developing countries is very high and large in number. The problem of population growth is not just a matter of numbers. The problem of the population also concerns the interests of development as well as the welfare of mankind as a whole. In the context of development, the view of the population is divided into two, namely some consider it as an obstacle to development and some consider it as a spur of development with a large number of workers (Abreu & Messiah, 2020).

## METHODS

The population in this study was all regencies/cities in Java Tengah Province, namely as many as 30 regencies and 5 cities. The research time used is 2017-2021. The type of data used is secondary data from the Central Statistics Agency. Research variables include independent variables and dependent variables. Independent variables consist of HDI, regional minimum wage of GRDP, and population growth rate. The dependent variable is open unemployment. This study used a panel data regression analysis tool. In accordance with the objectives of research and development of the theory, the econometric model in this study is as follows:

$$UEMP_{it} = \alpha + \beta_1 HDI_{it} + \beta_2 UMR_{it} + \beta_3 GRDP_{it} + \beta_4 POP_{it} + e_{it}$$

Where:

UEMP : Open Unemployment

HDI : Human Development Index

UMR : Regional Minimum Wage

GRDP : Regional Domestic Product

POP : Population Growth Rate

E : Error Term

### ***Statistical Testing***

#### *R<sup>2</sup> test*

The function of the R<sup>2</sup> test is to show whether an independent variable can explain the variance of the dependent variable well. The value of R<sup>2</sup> reaches the numbers 0 to 1. A *time series* model when R<sup>2</sup> reaches the number 0 means that the independent variable in the model is weak in explaining the dependent variable.

### *F Test (Simultaneous)*

The model exists if all free variables simultaneously have an influence on bound variables. The model existence test is the F test. In this study, the temporary conjecture is  $H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ , free variables simultaneously have no effect on bound variables;  $H_A: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$ , the free variable simultaneously affects the bound variable. The null hypothesis is not rejected if the statistical probability value of  $F > \alpha$ ; the null hypothesis is not accepted if the probability value of  $F \leq \alpha$ .

### *Effect Validity Test*

Partial Test to analyze the level of validity of unbound variables individually or individually. A partial test is a t test. The nul hypothesis on the partial test is  $\beta_i = 0$ , the free variable on the ith order has no significant effect on the influence; and the Alternative Hypothesis  $\beta_i \neq 0$ , the free variable on the ith order has a significant influence. The nul hypothesis is said to be accepted if the probability value  $t > \alpha$ ; The null hypothesis is not accepted if the magnitude of the probability  $t \leq \alpha$ .

### *Model Selection Test*

There are two tests used to determine the most appropriate model to estimate the panel data regression parameters, namely:

#### **Chow Test**

The Chow test is a test used to find out whether the FEM model is better than the PLS model.

- a) Hypothesis formulation  
 $H_0$  : Pls (*Pooled Least Square*) model is better than *Fixed Effect Model*  
 $H_A$  : FEM (*Fixed Effect Model*) model is better than *Pooled Least Square*
- b) Determining the degree of significance ( $\alpha$ ) = 5%
- c) Define test criteria  
 $H_0$  is accepted when the p-value is  $> \alpha$   
 $H_A$  is accepted when the p-value is  $\leq \alpha$

#### **Hausman Test**

The Hausman test is a test to find out whether *the fixed effect* (FEM) model is better than *the random effect* (REM) model.

- a) Hypothesis formulation  
 $H_0$  : REM model (Random Effect Model) is better than FEM (*Fixed Effect Model*)  
 $H_A$  : FEM (Fixed Effect Model) model is better than REM (*Random Effect Model*)
- b) Determining the degree of significance ( $\alpha$ ) = 5%
- c) Determine test criteria  
 $H_0$  is accepted when the p-value is  $> \alpha$   
 $H_A$  is accepted when the p-value is  $\leq \alpha$

## **RESULTS**

### ***Model Selection Test***

#### ***Chow Test (Likelihood Test Ratio)***

The Chow test is a test to determine the best model between the Fixed Effect Model and the *Common Effect Model/Pooled Least Square*. If the results state accept the null hypothesis then the best model used is the Fixed Effect Model, with the test going ongoing to the Hausman Test. The results of the chow test are as follows:

Table 1 Chow Test Panel Data Estimation Results

Effects Test	Statistics	d.f.	Prob.
Cross-section F	19,013	(34,136)	0,000
Cross-section Chi-square	306.213	34 4	0,000

Source : Ouput results regression of panel data using Eviews10

- a) Hypothesis Formulation  
 $H_0$  : *Common Effect Model* Is Better than *Fixed Effect Model*.  
 $H_A$  : *Fixed Effect Model* Is Better than *Common Effect Model*.
- b) Determining the degree of significance  
 Significance ( $\alpha$ ) = 0.05
- c) Testing Criteria  
 $H_0$  is accepted if the p-value > 0.05  
 $H_0$  is rejected if the p-value  $\leq$  0.05
- d) Conclusion

The p-value or probability of F is  $0.0000 < 0.05$  and *Chi Square* is  $0.0000 < 0.05$ . Then  $H_0$  is rejected so that the model used is the *Fixed Effect Model* (FEM).

#### *Hausman Test*

The Hausman test is a test to determine the right *Fixed Effect Model* or *Random Effect Model* to use in estimating panel data. The results of the hausman test are:

Table 2 Hausman Test Panel Data Estimation Results

Test Summary	Chi-Sq. Statistics	Chi-Sq. d.f.	Prob.
Cross-section random	2,389	4	0.665

Source: Processed data from the evIEWS10

- a) Hypothesis formula  
 $H_0$  : *Random Effect Model* Is Better than *Fixed Effect Model*  
 $H_A$  : *Fixed Effect Model* is better than *Random Effect Model*
- b) Determining the degree of significance ( $\alpha$ )  
 Significance ( $\alpha$ ) = 0.05
- c) Testing Criteria  
 $H_0$  is accepted if the p-value > 0.05  
 $H_0$  is rejected if the p-value  $\leq$  0.05
- d) Conclusion

The p-value or probability value of Chi-Square or Cross Section Random is  $0.665 > 0.05$ , then  $H_0$  diterima, so the *Random Effect Model* becomes the selected model, so the model used is the *Random Effect Model* (REM). Based on the results of the panel data estimation to choose the best model using the chow test and hausman test, the best model was chosen, namely the *Random Effect Model*, the estimation results are presented in Table 3.

### **REM Estimation**

Table 3. Panel Data Regression Estimation Results with REM Method

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	-57.360	11.380	-5.040	0.000
HDI	-0.031	0.066	-0.474	0.636
LOG(UMR)	4.448	0.900	4.943	0.000
GRDP	-0.132	0.029	-4.556	0.000
LOG(POP)	0.094	0.024	3.871	0.000

Based on Table 3 , the results of the estimation of the panel data regression equation obtained in this study are:

$$BD_{it} = -57,360 - 0.031IPM_{it} + 4.448\log UMR_{it} - 0.132PDRB_{it} + 0.094\log POP_{it}$$

### **Coefficient of Determination**

The result of data processing obtained a coefficient of determination (R<sup>2</sup>) value of 52.6%. These results show that the variation in open unemployment as a dependent variable in this research model can be explained by variations in other variables outside the studied model of 47.4% human development index, regional minimum wage, gross regional domestic product, population growth rate

### **Test F**

In the estimation results, the p-value, probability, or static empirical significance of F in the model estimate has a value of 0.0000, which means that the  $< 0.01$ ; so  $H_0$  is rejected, the conclusion of the model used in the study exists.



***T Test***

Table 4. T Test Panel Data Regression Results

Variable	Sig. t	Criterion	Conclusion
HDI	0.636	> 0.05	Insignificant
LOG(UMR)	0.000	≤ 0.05 pm	Significant at $\alpha = 0.05$
GRDP	0.000	≤ 0.05 pm	Significant at $\alpha = 0.05$
LOG(POP)	0.000	≤ 0.05 pm	Significant at $\alpha = 0.05$

From Table 4, it can be seen that the value of p (p value), probability, or statistical empirical signification t variable HDI of 0.630 (> 0.05); logumr variable 0.000 (≤0.05); variable PDRB 0.000 (> 0.05); and logPOP variable has a value of p (p value), probability, or statistical empirical signification of t of 0.000 (≤ 0.05). From these results, it can be concluded that the variables logUMR, GRDP, and logPOP individually have a significant influence. While the HDI variable does not have a significant influence.

***Interpretation of Selected Models***

The logUMR variable has a regression coefficient of 4.448. The pattern of the relationship of logUMR independent variables to open unemployment is linear logarithm so that if MSEs increase by one percent, unemployment will increase by 0.04 percent. The GRDP variable has a regression coefficient of -0.132. The pattern of the relationship of the independent variable of GRDP to open unemployment is linear so that if the GRDP rises by one percent, open unemployment will decrease by 0.132 percent. The population growth rate variable has a regression coefficient of 0.094. The pattern of the independent variable relationship of the population rate to open unemployment is linear so that if the population growth rate rises by one percent, open unemployment will increase by 0.001 percent.

**DISCUSSION**

This is in accordance with the theory explained by (Todaro, 2005) that through increasing human capital development and development to increase human productivity. Through education investment, it is hoped that it will be able to improve the quality of Human Resources (HR) which is shown by increasing a person's knowledge and skills so that it will encourage an increase in work productivity. The increase in productivity can affect job opportunities, namely by increasing productivity, there is a decrease in production costs per unit of goods. A decrease in the cost of production per unit of goods will lower the price per unit of goods. If the price of goods falls, the demand for goods rises which will encourage employers to increase the demand for labor, so that with the absorption of more and more labor can reduce the high unemployment rate.

The minimum wage has a significant positive influence on the open unemployment rate according to districts/cities in Central Java in 2017-2021. Where the increase in the minimum wage will lead to an increase in unemployment in the object of study. The cause of unemployment due to wage rigidity is the inability of wages to make adjustments to the point of equilibrium, where the supply of labor is equal to the demand for labor. Unemployment caused by wage rigidity due to adjustments between the number of workers who want work and the number of jobs available. However, the increasing level of wages makes the supply of labor increase, thus making the demand for labor decrease. As a result there is a labor surplus or unemployment. Causes of wage rigidity include: minimum wage regulations, trade unions and wage efficiency (Panjawa & Daryono Soebagiyo, 2014).

Economic growth as measured by nominal GRDP has a negative and significant influence on open unemployment of districts/cities in Central Java. That is, the increase in the unemployment rate is due to declining economic growth. The existence of this flexibility, an economy has unlimited freedom in determining the combination of capital and labor used to produce a certain level of output (Mihaela, 2020).

The population has a positive and significant effect on the open unemployment rate of regencies/cities in Central Java. That is, the growing population will cause unemployment to continue to increase. The number of inhabitants is constantly increasing, causing many residents to fall into the category of labor force. It is different if the labor force increases, it will cause job opportunities to also increase. If this is not accompanied by the creation of new jobs, there will be many residents who do not get jobs (unemployment) (Tour-Prats, 2021).

## **CONCLUSION**

The results of the calculation with panel data to explain the determinants of open unemployment in districts/cities in Central Java can be concluded as follows: First, model testing using the Chow test shows that the FEM model is more appropriate to use than the PLS model. Meanwhile, the Hausman test showed that the FEM model was more appropriate to use compared to the REM model. Therefore, this study decided to use the FEM model because the FEM model is more precise than the PLS and REM models; Second, HDI has a negative and insignificant relationship to open unemployment. GRDP has a significant negative influence on the open unemployment rate, the minimum wage and the population have a significant positive effect on the open unemployment rate, while the population growth rate has a positive and significant relationship with the open unemployment rate in the district /city in Central Java in 2017-2021.

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