

## Factors Influencing Unemployment in Indonesia

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### ABSTRACT

This study aims to analyze the factors that influence unemployment in Indonesia. This study uses secondary data obtained from the Central Statistics Agency (BPS) and the Investment and Coordinating Board (BKPM). The data used is panel data from time series data for 2015 – 2021 and cross sections covering 34 provinces in Indonesia. The results of the descriptive analysis show that the male unemployment rate tends to be higher each year than that of the female. In addition, the unemployment rate in urban areas tends to be almost two times higher than the unemployment rate in rural areas. The results of the panel data regression analysis show that the variables of economic growth, inflation, wage rates, and the dummy economic crisis during the Covid-19 pandemic have a significant effect on unemployment in Indonesia.

**Keywords:** *unemployment rate, economic growth, inflation, wage rate, investment, panel data regression*

## INTRODUCTION

Unemployment is one of the main employment problems faced by developing countries, including Indonesia. Muslim (2014) explains that unemployment is a very complex problem because it influences and is influenced by many factors that interact with each other following a pattern that is not always easy to understand. One of the factors is Indonesia's large population which creates a new labor force every year and has an impact on the unemployment rate. Based on the results of the 2020 Population Census conducted by the Central Statistics Agency (BPS), Indonesia's population is 270.20 million people, an increase of 32.56 million compared to the 2010 Population Census. The results of the population projection by the Central Statistics Agency (BPS) in 2035, the total population Indonesia will reach more than 300 million people where the Indonesian population is more dominated by the productive age group, namely between 15-64 years. This has made Indonesia enter the era of demographic bonus where productive age can be utilized in increasing development or becoming a burden to the economy such as increasing unemployment.

The problem of unemployment increased during the Covid-19 pandemic. The problem of unemployment increased during the Covid-19 pandemic. This is in accordance with what has been explained by the International Labor Organization (ILO). According to the ILO (2021), Covid-19 has had a negative impact on the world of work in the form of reduced working hours and loss of jobs. The impact that Covid-19 has had on the world of work is higher than that of the 2009 financial crisis. The ILO shows that nearly 9 per cent of global working hours were lost last year, which in turn equates to 255 million full-time jobs. The Covid-19 pandemic caused a huge loss in global labor income, which is roughly equal to 4.4 per cent of global gross domestic product.

Economic growth and unemployment remain important problems of every country regardless of their economic development level. Countries target their economy policies towards establishing economic growth and reducing unemployment. Although, there is a wide literature about the relationship between economic growth and unemployment, there is not a consensus on the direction and intensity of the relationship. Differences in the economic structures of countries also reflect upon the relationship between economic growth and unemployment to a great extent. The inverse correlation between economic growth and unemployment was first stressed by Okun (1962). Following studies have mostly proposed evidence that is parallel to Okun's study. It is possible to group these studies in the literature into two.

Not only economic growth, another variable that affects unemployment is the inflation rate. The short-run relationship between the inflation rate and the unemployment rate can be explained by using the Phillips curve which was coined by an economist named A. W. Phillips. The Philips curve explains that there is a trade-off or short-term negative relationship between inflation and unemployment. A.W. Phillips describes how the spread of the relationship between inflation and the unemployment rate is based on the assumption that inflation is a reflection of an increase in aggregate demand. With an increase in aggregate demand, according to demand theory, if demand increases, prices will rise. With high prices (inflation), to meet this demand, producers increase their production capacity by adding labor (assuming that labor is the only input that can increase output). As a result of an increase in demand for labor, with rising prices (inflation), unemployment will decrease.

A minimum wage that is set at too high level can have a negative impact on employment. By pushing firms with low value added out of the market, the minimum wage increases inflows to unemployment. By introducing wage rigidity at the bottom of the wage distribution and by preventing firms from offering lower wages, notably to new hires, the minimum wage reduces inflows to employment. Substantial upward adjustments in the minimum wage can also generate general wage pressures as employees seek to re-establish wage differentials above the minimum wage.

The relationship between investment and unemployment can be seen based on Harrod Domar's theory in Kurniawan (2010). Harrod Domar believes that investment not only creates demand but also expands production capacity. That is, the greater the production capacity, the greater the need for a workforce, assuming "full employment". This is because investment is an addition to the factors of production, one of which is labor. That way, the economy as a whole can absorb as much labor as possible, so that labor force participation will increase as well.

Research on the factors that influence unemployment in Indonesia is considered important in a developing country like Indonesia. Moreover, Indonesia will face a demographic bonus in 2030. If the availability of jobs that are lacking for the productive age population in Indonesia is not sufficient, it can be predicted that this will result in a high unemployment rate in Indonesia. This is what causes the topic of factors that influence unemployment in Indonesia to be interesting to study. This study aims to analyze the picture of unemployment in Indonesia. In addition, this study also analyzes the factors that influence unemployment in Indonesia so that it can provide policy recommendations in handling the unemployment problem.

## METHOD

This study uses secondary data obtained from the Central Statistics Agency (BPS) and the Coordination and Investment Agency (BKPM). The data used is panel data from time series data for 2015 – 2021 and cross sections covering 34 provinces in Indonesia. The data in this study are:

Tabel 1. Jenis dan Sumber Data dalam Penelitian

Variabel	Keterangan	Sumber
Unemployment rate	The open unemployment rate for each province in Indonesia	the Central Statistics Agency
Economic growth	GDP Rate at Constant 2010 Prices	the Central Statistics Agency
Inflation	Provincial GRDP deflators in Indonesia	the Central Statistics Agency
Wage rate	Regional minimum wage per province in Indonesia	the Central Statistics Agency
Investment	Total investment (domestic and foreign investment) of each province in Indonesia	the Coordination and Investment Agency

## Analysis Method

The analytical method used in this research is descriptive and quantitative method. The descriptive method is used to explain the general description of unemployment in

Indonesia. Then the quantitative method is carried out with panel data regression analysis to analyze the factors that influence unemployment in Indonesia.

### **Panel Data Regression Analysis**

The linear regression model on panel data can be written as follows:

$$y_{it} = \alpha_{it} + X_{it}\beta + u_{it} ; \quad \text{untuk } i = 1, \dots, N; \quad t = 1, \dots, T \quad (1)$$

where N is the number of individuals (cross-sectional units) and T is the number of time periods. In  $X_{it}$  there are k slopes (not including intercepts) which indicate the number of independent variables used in the model. Meanwhile,  $\alpha_i$  is an individual effect that can have a constant value throughout the t period or even vary for each i-th individual.

There are 3 types of standard estimates for panel data regression, namely the common effects model (pooled regression), fixed effects model and random effects model (Baltagi 2005).

1. Common Effects Model

This model does not pay attention to individual or time dimensions, so it is assumed that individual behavior is the same in various time periods. In this model the assumptions of classical linear regression with the OLS method are fully valid.

2. Fixed Effects Model

This model assumes that the differences between individuals can be accommodated from the intercept differences. However, the intercept of each cross-section is fixed, not random. To estimate the fixed effects model with different intercepts between individuals, the dummy variable technique is used.

3. Random Effects Model

Estimation of panel data with fixed effects through the dummy variable technique often shows the uncertainty of the model used. To overcome this problem we can use the random effects method which assumes that the individual effects are random and are not correlated with the independent variables (Baltagi 2005).

### **Panel Data Estimation Model Selection**

1. Chow Test

The Chow test was carried out using the F test statistic which aims to find out whether the panel data regression technique with fixed effects is better than the panel data regression model without dummy variables (common effects) by looking at the residual sum of squares (RSS).

2. Hausman Test

To determine the best model between fixed effects and random effects, Hausman significance is used.

3. Uji Bruesch-Pagan

To find out whether the random effects model is better than the common effects model, the Lagrange Multiplier (LM) test developed by Bruesch-Pagan can be used.

### Testing the Residual Variance-Covariance Structure

If the selected model is a common effect or fixed effect model, then testing the variance-covariance structure can be carried out. The residual variance-covariance structure is used to test the fulfillment of the assumptions of homoscedasticity and non-cross-sectional correlation. Therefore, a formal assumption test is needed to test these two assumptions, namely the Lagrange Multiplier (LM) test for testing heteroscedasticity and the Lambda Lagrange Multiplier (LM) test for cross-sectional correlation testing. If the residual variance-covariance structure is heteroscedasticity and there is a cross-sectional correlation then the model is solved by using Feasible Generalized Least Square (FGLS)/ Seemingly Uncorrelated Regression (SUR) estimation.

#### Classic assumption test

Assumption test is carried out to determine the requirements of a model to be used. The expected model is an efficient, feasible and consistent model, it is necessary to detect violations of model assumptions. The violations that often appear in the regression equation are residuals not following a normal distribution, there is variation in the residual variance (heteroscedasticity), there is a high correlation between independent variables (multicollinearity) and there is a correlation between observations in one variable (autocorrelation).

#### Model Specifications

This study uses an existing model by modifying it according to research needs. This study refers to the equation model used by Aqil et al. (2014). The model for estimation is determined as follows:

$$YU_{it} = \beta_0 + \beta_1 EG_{it} + \beta_2 INF_{it} + \beta_3 LN\_W_{it} + \beta_4 LN\_INV_{it} + \beta_5 DC_{it} + U_i + \varepsilon_{it} \quad (2)$$

Information:

- $YU_{it}$  : Unemployment rate in province i-t year (in percent),
- $EG_{it}$  : Economic growth in the i-th province in the t-year (in percent),
- $INF_{it}$  : Inflation of the i-th province year t (in percent),
- $LN\_W_{it}$  : Wage rate of the i-th province year t (in percent),
- $LN\_INV_{it}$  : Investment of the ith province of the tth year (in percent),
- $D_{it}$  : dummy economic crisis during the Covid-19 pandemic in the i-th province, year t (before 2020 = 0, 2020 and 2021 = 1),
- $U_i$  : Error component of the i-th province,
- $\varepsilon_{it}$  : Error component for the i-th province of the t-th year.

## FINDING AND DISCUSSION

Based on the results of the August National Labor Force Survey (Sakernas) conducted by the Central Bureau of Statistics, the highest unemployment rate in Indonesia occurred in 2020 reaching 7.07 percent. This happened because of the Covid-19 pandemic which greatly affected the employment sector in Indonesia. When viewed based on gender, it shows that the unemployment rate for men tends to be higher than for women each year. Examining the unemployment rate by area of residence shows that the unemployment rate in urban areas tends to be almost two times higher than the unemployment rate in rural areas. This is influenced by the migration of villagers to cities. If the rate of rural-to-urban migration exceeds the number of new jobs available, then this situation causes a surplus of labor and high unemployment in the city.

Table 2. Indonesia's Open Unemployment Rate in 2015-2021 (percent)

Unemployment Rate	2015	2016	2017	2018	2019	2020	2021
Man	6,07	5,70	5,53	5,40	5,24	7,46	6,74
Woman	6,37	5,45	5,44	5,26	5,22	6,46	6,11
Urban	7,31	6,60	6,79	6,45	6,29	8,98	8,32
Rural	4,93	4,51	4,01	4,04	3,92	4,71	4,17
Total	6,18	5,61	5,50	5,34	5,23	7,07	6,49

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### Best Model Selection

Selection of the best model using the Chow test produces an F-statistic value = 32.75 and a p-value less than alpha 0.05 which is equal to 0.00. Thus, the null hypothesis is rejected, so it can be concluded that the fixed effect model is better than the common effect model. The next test is the Hausman test which produces Hausman-statistic = 26.93 and the p-value is less than alpha 0.05 which is 0.00. The decision taken is to reject the null hypothesis, so it can be concluded that the fixed effect model is better than the random effect model.

Table 3. Best Model Selection Stage

Model Selection	Statistical Value	Prob.
Chow Test	32,75	0,00
Hausman Test	26,93	0,00

Source: Output Eviews 10, processed

### Testing the Linear Regression Model Assumptions

The selected panel data regression equation is the fixed effects model. By using the Lagrange Multiplier (LM) test and the Lambda Lagrange Multiplier (LM) test, it is found that the structure of the residual variance-covariance matrix is heteroscedastic and there is

a cross-section correlation in the residual variance-covariance matrix. To overcome this, the selected fixed effect model uses the FGLS estimation.

Normality and residual (error) assumptions have been met. This can be seen from the Jarque-Bera significance which shows that the probability value of all residual cross-sections is 0.18, more than 5 percent alpha. Therefore, it was decided that the null hypothesis was not rejected, so the conclusion drawn was that the residuals were normally distributed or in other words the assumption of normality in the best model had been fulfilled. The homoscedasticity assumption has been fulfilled. Based on the Glejser test, it was found that the probability value for each independent variable was more than an alpha value of 5 percent. The conclusion generated based on this test is that the estimation model is free from violations of the heteroscedastic assumption. Based on the results of the Durbin Watson test, the assumption of autocorrelation has been fulfilled that the estimation model is free from violations of the autocorrelation assumption. The non-multicollinearity assumption has also been fulfilled. This is shown where the correlation value between independent variables is below 0,80. Therefore, the resulting conclusion is that there is no linear relationship (multicollinearity) between the independent variables.

#### **Regression Model of Unemployment Panel Data in Indonesia**

After going through several test stages, the selected panel data regression equation is the fixed effects model using the FGLS estimation method. From the processing results using Eviews 10, statistical values are obtained which are presented in Table 4.

Adjusted R-squared value of 0,93. This means that the independent variables are able to explain unemployment in Indonesia by 93 percent and the rest is influenced by other variables. The p-value of the F test indicates that there is at least one independent variable that has a significant effect on unemployment in Indonesia with a significant level of 5 percent. Partial testing using t-test statistics results that the variables of economic growth, inflation, wage rates, and the dummy economic crisis during the Covid-19 pandemic have a significant effect on unemployment in Indonesia.

**Table 4. Estimating Results of the Unemployment Model in Indonesia**

Independent Variable	Coefficient	Prob.
C	46,60	0,00
EG	-0,04*	0,00
INF	-0,04**	0,03
LN_W	-2,81*	0,00
LN_INV	-0,03	0,72
DC	1,18*	0,00
Number of Observations		238
R-squared		0,94
Adjusted R-squared		0,93
F-Statistics		80,00
Prob (F-Statistic )		0,00

Description: \*significant at 1 %; \*\* significant at 5 %; \*\*\* significant at 10 %

Source: Output Eviews 10, processed

Economic growth partially has a negative and significant effect on unemployment in Indonesia. If economic growth increases by one percent it will cause a decrease in unemployment in Indonesia by 0,04 percent assuming the other independent variables are constant (*ceteris paribus*). This is in line with Mankiw's explanation (2013) which states that economic growth will encourage increased production of goods and services. The increase in production will encourage the use of production factors, one of which is labor so that economic growth will absorb labor and reduce unemployment.

Inflation has a negative and significant effect on unemployment in Indonesia. In other words, it can be said that if the inflation rate decreases, the unemployment rate will increase. These results indicate that the Phillips curve phenomenon in Indonesia still occurs. Based on these results it can be seen that there is a trade off between inflation and the unemployment rate.

The wage rate has a negative and significant effect on unemployment in Indonesia. These findings support a study conducted by Prakoso (2020) which found the same thing where any increase in the minimum wage will reduce the number of unemployed in Indonesia. The cause of this can be said because the minimum wage set by the government continues to increase, where the increase increases people's purchasing power.

Investment has a negative but not significant effect on unemployment in Indonesia. These results are supported by the fact that the realization of investment in Indonesia is not directly proportional to the absorption of labor in the country. This is because the realization of investment in Indonesia is mostly capital-intensive investment, not labor-intensive. The lack of government support in the development of sectors and



economic activities that absorb labor also contributes to unemployment in Indonesia. The contribution of labor-intensive sectors such as agriculture and industry has decreased every year, while the capital-intensive sectors have increased.

The dummy variable of the economic crisis during the Covid-19 pandemic has a positive and significant effect on unemployment in Indonesia. The Covid-19 pandemic has caused labor conditions to become unstable, as a result of which the unemployment rate in Indonesia has increased. The pandemic caused many workers to experience layoffs as a result of disruption to the company's operational activities. In addition, the number of job vacancies that decreased during the pandemic also caused labor absorption to not be optimal.

## CONCLUSION

The results of the descriptive analysis show that the highest unemployment rate in Indonesia occurred in 2020 due to the Covid-19 pandemic. The unemployment rate for men tends to be higher than for women each year. The unemployment rate in urban areas tends to be almost two times higher than the unemployment rate in rural areas. The results of the panel data regression analysis show that the variables of economic growth, inflation, wage rates, and the dummy economic crisis during the Covid-19 pandemic have a significant effect on unemployment in Indonesia.

The government is expected to encourage investors coming to Indonesia to collaborate with local companies and Micro Small Medium Enterprises (MSMEs) to focus more on labor-intensive industries. The government is also expected to make serious efforts to expand employment opportunities. for example by providing and expanding space and access for job seekers to be able to develop hard skills and soft skills through verified training that has been recognized by companies.

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