

# THE IMPACT OF REGIONAL MINIMUM WAGE, ECONOMIC GROWTH, MEANS YEARS OF SCHOOL, AND COVID-19 PANDEMIC ON BANTEN'S OPEN UNEMPLOYMENT RATE 2017-2022

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## ABSTRACT

Unemployment in Banten Province become a crucial issue because the needs to fullfill Sustainable Development Goals (SDGs) to alleviate the unemployment and the high rate of Banten's unemployment. The purpose of this study was to determine the significancy of regional minimum wage, economic growth, years of schools, and COVID-19 impacts to open unemployment rate in Banten 2017-2022. This research will be analyzed using panel data regression method. The data in this study are secondary data. Hypothesis testing that will be conducted is the linearity test or R-squared, simultaeous significancy test, and partial significancy test. The significance variables that affect the open unemployment rate in Banten are economic growth, means years of school, and COVID-19. We suggest that governement must have government fund aid, remote working, and remote schooling to decrease the impact of future pandemic-like crisis.

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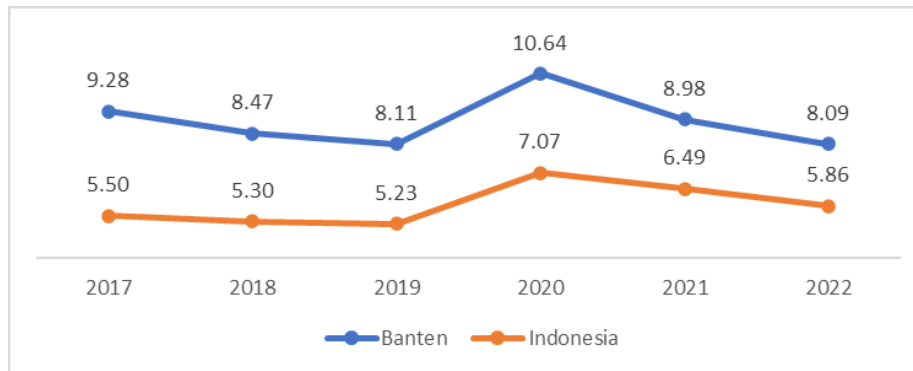
## 1. INTRODUCTION

Countries those are the members of the United Nations (UN) had stated common development goals. Those were written as Sustainable Development Goals (SDGs). There are 17 goals in SDGs and the goal 8 is "Decent work and economic growth." This means that nations which are parts of UN must creates not only sustaining economic growth worldwide but also ensuring the availability of decent employment opportunities for all segments of society (Directorate of Statistical Analysis and Development, BPS, 2022). Thus, the issue of unemployment becomes crucial as it is one of global development targets. Futhermore, researching the unemplyoment is essential because job create income for people and the income will fullfill human basic needs (Mankiw, 2016). Analyzing about unemployment will help policy makers creates certain policies that will provide jobs. This will also assist the government to achieve the number 8 of SDGs goals, growing the economy and decreasing the unemployment.

Indonesia, as one of the UN's members, also must realizes the SDGs, especially the aim to create a sustain economic growth and the purpose to decrease the unemployment. Open Unemployment Rate in Indonesia, which are estimated from August SAKERNAS survey, showed a fluctuating trend between 2017 and 2022. In 2017, Indonesia's Open Unemployment Rate was 5.50 percent, and it declined steadily to 5.23 percent by 2019. In 2020, the COVID-19 Pandemic time, the Open Unemployment Rate of Indonesia increased to 7.07 percent. The next two years the rate slowed down and its reached 5.86 percent in 2022 (Statistics of Indonesia, 2023).

Banten, one of the provincens in Indonesia, is one of the provinces that high open unemployment rate in Indonesia. The Open Unemployment Rate of Banten in 2017 was 5.50 percent, higher than the national rate. This rate is continued to decrease until it reached 8.11 percent in 2019. The rate rose to 10.64 percent when COVID-19 Pandemic happened in 2020. Then, the rate decreased until it became 9.09 percent in 2022.

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Source: Statistics Indonesia

**Figure 1.** Indonesia and Banten's Open Unemployment Rate 2017-2022

Therefore, an analysis of the factors influencing the fluctuations in Banten's Open Unemployment Rate from 2017 to 2022 is conducted. This article has several aims. First, it was purposed to be a reference for future researches. Next, this article intends to explain the factors that contribute to the Banten's Open Unemployment Rate. The last goal is that this study will provide suggestions for government in handling Banten's unemployment issue.

### Literature Review

#### Labor Force

Statistics of Indonesia adopts the labor force concept in accordance with the International Labour Organization's (ILO) standards. This concept categorizes the population into two groups: the working-age population and the non-working-age population. The working-age population consists of individuals aged 15 and above, while the non-working-age population comprises those below 15 years old. The working-age population is further divided into two categories: the labor force and those not in the labor force. Those not in the labor force include individuals attending school, managing households, and not engaged in any work-related activities (Statistics of Indonesia, 2023).

Within the labor force, there are two subgroups. The first group is employed individuals, defined as those involved in economic activities to earn income or contribute to income generation or business profit for at least one uninterrupted hour per week. The second group is the unemployed, which includes those in the labor force not engaged in any work-related activities, income generation, or profit.

Open Unemployment, as one of the labor force indicators, has its own concept. Open Unemployment refers to individuals who do not have a job but are actively seeking employment, those who are not working but preparing for business ventures, those not seeking work due to perceived unavailability of jobs, and those who have found a job but have not yet started working. The Open Unemployment Rate (OUR) is the percentage of the total Open Unemployment against the total Labor Force in a given region (Directorate of Statistical Analysis and Development, Statistics of Indonesia, 2022).

#### Wages and Labor Market

One theory explaining the dynamics of wages in relation to labor supply and demand is the labor market supply and demand curve. Borjas (2013) explains that the equilibrium of supply and demand is influenced by wages and the number of jobs available. The more jobs offered, the higher the wages offered, and vice versa. Labor market equilibrium occurs when the quantity of labor demanded equals the quantity of labor supplied, and the wage offered equals the wage demanded.

To ensure the welfare of its citizens and maintain labor market equilibrium, the Indonesian government establishes Regional Minimum Wages. The latest regulations regarding Regional Minimum Wages are outlined in Republic of Indonesia Law No. 11 of 2020 (*Undang-Undang Nomor 11 Tahun 2020*) on Job Creation. Under this law, local governments are tasked with determining the Regional Minimum Wages (UMK) for workers in their respective regions.

Several studies, conducted on both national and regional levels, have shown varying impacts of minimum wages on employment. Research by Manning (2021) suggests that minimum wages have a negative impact on job availability due to increased production costs in some developed countries. However, a meta-analysis by Broecke et al. (2017) indicates that the negative effects of minimum wages on employment in 14 high-growth economies from 1980 to 2014 were relatively small.

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Furthermore, there are studies focusing on regional effects. A study by Meer & West (2016) suggests a negative impact of minimum wages on employment in U.S. states from 1977 to 2011. In contrast, research in 33 provinces of Indonesia from 2011 to 2015 by Prawira (2018) suggests a positive impact of minimum wages on unemployment.

### **Employment and Economic Growth**

The Okun's Law explains the relationship between economic growth and employment. Okun's Law, proposed by Arthur Okun, states that an increase in unemployment is associated with a decrease in total economic output (Mankiw, 2016). Total economic output refers to the Gross Domestic Product (GDP), which encompasses all economic activities in a region. GDP can be viewed from the consumption side by summing up total consumption by various entities such as the government, households, and trade flows in a region. However, GDP can also be seen from the income side by aggregating the value added from all production activities within a region. GDP growth signifies economic growth in a region.

Various studies have produced different results regarding the relationship between economic growth and employment. Research by Hegelund & Taalbi (2023) covering 10 developed countries from 1913 to 2016 shows a negative relationship between economic growth and employment. On the other hand, a study by Tenzin (2019) on the relationship between economic growth and unemployment in Bhutan suggests that increased economic growth does not have a significant impact on reducing unemployment. Moreover, research in Indonesian provinces during 2011-2015 by Prawira (2018) indicates that economic growth in each province did not significantly affect provincial unemployment rates. A study by Putri (2017) on educated unemployment in districts and cities in Central Java from 2009 to 2013 found that economic growth did not play a significant role in reducing educated unemployment. In contrast, research by Prayitno & Kusumawardani (2022) shows a significant negative influence of economic growth on unemployment rates in East Java from 2006 to 2017.

### **Education and Employment**

One theory explaining the relationship between education and employment is the Human Capital theory (Borjas, 2013). The Human Capital theory posits that an individual's income level increases with higher levels of education. Thus, when an individual enters the labor market, their education level will determine their wage.

Several previous studies have examined the impact of education on employment. Research by Boccanfuso et al. (2015) demonstrates that improvements in education quality resulting from government reforms in Senegal from 2000 to 2007 increased the number of people employed. A study by Mok & Wu (2016) indicates that higher education has a small influence on upward mobility, such as job status and wealth, in China. Research by Dănačică et al. (2023) shows that the phenomenon of an increased number of highly educated individuals after 1989 had a short-term impact on reducing unemployment in Romania from 1991 to 2020. However, research focusing on Indonesia by Prawira (2018) presents different results, suggesting that education levels have a positive impact on unemployment.

### **Shocks and Employment**

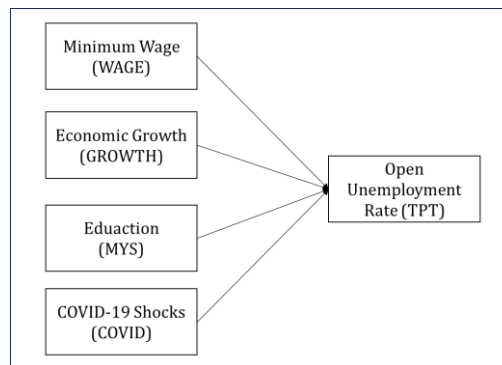
Shocks such as crises can affect labor market dynamics. Mankiw (2016) explains the fluctuations in unemployment levels in the United States during the period from 1967 to 2012, citing the impact of events like the World War I recession, World War II, the Cold War, and the 2008-2009 Global Economic Crisis. The SARS virus outbreak in Korea also led to increased urban unemployment and spillover effects on rural unemployment (Lee & Cho, 2017). Research by Nagore García & van Soest (2017) on the impact of the global economic crisis and the European crisis in Spain from 2005 to 2011 shows an increase in unemployment during crisis periods.

The COVID-19 pandemic has also had far-reaching effects. In the United States, the pandemic increased unemployment, except in sectors unaffected by movement restrictions, such as telemarketing (Shibata, 2021). In China, the COVID-19 pandemic increased unemployment and led to increased disbursement of job seeker assistance funds (Li et al., 2023). Research by Rodríguez-Caballero & Vera-Valdés (2020) suggests that pandemic shocks will have long-term effects on unemployment growth patterns.

### **Conceptual framework**

Based on the literature reviews, the research framework of this study can be described as follows.

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**Figure 2.** Research Framework

### Research Hypothesis

Based on the problem formulation and conceptual framework above, this paper have some research hypotheses as follows:

1. Minimum wage has a negative and significant impact on Open Unemployment.
2. Economic Growth has a negative and significant impact on Open Unemployment.
3. Education has a negative and significant impact on Open Unemployment.
4. Shocks has a positive and significant effect on Open Unemployment.

## 2. METHOD

### Types of research

The method used in this paper is inferential statistics. Inferential statistics will test the hypotheses that has been formulated. The inferential statistics will have an economic model which is Panel Data Regression and will be analyzed by using statistical software. The data that will be used is the secondary data from Statistics of Indonesia's websites.

### Location and Time of Research

This research observed the effect of minimum wage, economic growth, the length of education, and the COVID shock to open unemployment rate from 2017-2022. The 2017-2022 period was chosen because this article want to discover the interaction between variables two years before and after the pandemic. Banten was the research's focus because Banten is one of five province in Indonesia which have the highest Open Unemployment Rate (Statistics of Indonesia, 2023). Five municipalities in Banten Province will be the individual elements of this study.

### Types of Research Data

The variables in this study will be categorized into independent and dependent variables. The Open Unemployment Rate will serve as the dependent variable, where this variable is influenced by other variables in the analytical methodology. This variable is a quantitative variable and calculated by examining the percentage of unemployed individuals in relation to the total labor force.

The rest of variables are the independent variables or variables that affect the dependent variables. The first independent variable is Minimum Wage. Minimum Wage refers to the Regional Minimum Wage determined by local governments. The next variable, Economic Growth, represents the changing economic conditions of a region over time. In this study, Economic Growth is observed through the Gross Regional Domestic Product (GRDP) growth of the municipalities and cities in Banten Province. Next, this research will use Means Years of Schooling (MYS) variable, which is one of the components in the calculation of the Human Development Index for educational development, as the proxy for Education impact to Open Unemployment. Average Years of Schooling represents the average duration required for an individual in a region to complete their education. The Minimum Wage, the Economic Growth, and the MYS are quantitative data.

The COVID variable serves as a shock variable, symbolizing the conditions three years after the COVID-19 pandemic entered Indonesia. COVID data will utilize a Dummy variable, which takes the value of one in the years 2020, 2021, and 2022. The use of a Dummy variable is a common practice in research to describe the influence of specific time-related events, such as shocks or seasonality (Gujarati, 2012).

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### Data Analysis Techniques

This research will use Panel Data Regression. The analysis will use *Eviews 8* as a software analysis tool. Panel Data Regression is used because this statistical analysis covers the individual effect and the time effect in the data (Gujarati, 2012). The econometric model is designed as follows:

$$TPT_{it} = \alpha + \beta_1 WAGE_{it} + \beta_2 GROWTH_{it} + \beta_3 MYS_{it} + \beta_4 COVID_{it} + \varepsilon_{it} \quad (1)$$

The TPT represents Open Unemployment Rate in the *i*-th municipality or city in the Banten Province for the years 2011-2022. GROWTH is the variable indicating the economic growth of municipalities and cities in the Banten Province. The MYS variable represents the Average Years of Schooling of the population in the municipalities and cities of Banten in 2017-2022. COVID is a Dummy variable with a value of 1 if *t* or the year is 2020-2022, and a value of 0 for other years. The coefficient  $\alpha$  or intercept signifies the value of the OUR when there is no influence from independent variables. Meanwhile,  $\varepsilon$  represents the error or residual, signifying the impact of variables not covered in the model.

Panel Data Regression models have three models as follows.

a. *Ordinary Least Squares* (OLS) Model

OLS model have constant intercept and error. Chow Test for the choosing of this model will use these hypotheses.

$H_0$  : OLS model is preferred than Fixed Effect Model

$H_1$  : Fixed Effect Model is preferred than OLS Model

Null Hypothesis or  $H_0$  will be rejected if probability of testing is less than 0.05.

b. Fixed Effect (FE) Model

Fixed Effect Model demonstrates changes in the intercept for each observed individual while keeping the residuals constant. This model will be utilized if the Chow Test results reject the null hypothesis. This model will be chosen if the Hausman Test shows that this model is preferred than the Random Effect Model. The hypothesis is as follows.

$H_0$  : Fixed Effect Model is preferred than Random Effect Model

$H_1$  : Random Effect Model is preferred than Fixed Effect Model

Null Hypothesis will also be rejected if probability of testing is less than 0.05.

c. Random Effect (RE) Model

Random effect model is a panel regression model that shows that the Panel Data Regression Model have constant intercept and changing errors between individuals and periods of time. If Chow Test shows that null hypothesis is not rejected, there will be conducted *Breusch Pagan Lagrangian Multiplier* (BP-LM) test to determine the suitable model between the Random Effect Model and the OLS Model. The hypotheses of BP-LM test are as follows.

$H_0$  : OLS model is preferred than Random Effect Model

$H_1$  : Random Effect Model is preferred than OLS Model

Null Hypothesis will be declined if probability of testing is less than 0.05.

After the best model is determined, the next step is testing the linearity of model. The R-squared of the model will be observed by using the result of software analysis. If the R-square is nearly closed to one, it indicates that the model can effectively describe the changes in dependent variable by modelling the impact of independent variables (Gujarati, 2012).

### Hypothesis test for Independent Variables

The step after determining the suitable models and the linearity is the simultaneous significance test. This test will indicate whether all independent variables collectively have a significant impact on the dependent variable. The null hypothesis will be rejected if the probability of testing is less than 0.05. The hypotheses for this test are as follows:

$H_0$  :  $\beta_1 = \beta_2 = \dots = \beta_k = 0$  (All independent variables have an insignificant impact to the dependent variable.)

$H_1$  : one of the  $\beta_k \neq 0$  (One of the independent variables or more have a significant impact to the dependent variable.)

The last test is the partial significance test. This test will test the significance of WAGE, GROWTH, MYS, and COVID to TPT separately. The null hypothesis will be not accepted if the probability of testing is less than 0.05. This test will have hypotheses as follows.

$H_0$  :  $\beta_1 = 0$  (The WAGE have an insignificant impact to the dependent variable)

$H_1$  :  $\beta_1 \neq 0$  (The WAGE have a significant impact to the dependent variable)

$H_0 : \beta_1 = 0$  (The GROWTH have an insignificant impact to the dependent variable)  
 $H_1 : \beta_1 \neq 0$  (The GROWTH have a significant impact to the dependent variable)

$H_0 : \beta_1 = 0$  (The MYS have an insignificant impact to the dependent variable)  
 $H_1 : \beta_1 \neq 0$  (The MYS have a significant impact to the dependent variable)

$H_0 : \beta_1 = 0$  (The COVID have an insignificant impact to the dependent variable)  
 $H_1 : \beta_1 \neq 0$  (The COVID have a significant impact to the dependent variable)

### 3. RESULT AND DISCUSSION

The result of model testing will be shown in the table 4.1.

**Table 1.** Panel Data Model Testing Results

Test	Probability Test	Interpretation
Chow	0,0000	FE is preferred than OLS
Hausman	0,0000	FE is preferred than RE

Based on the table above, the model chosen for Panel Data Regression analysis is the Fixed Effect (FE) Model. This is because, after conducting the Chow Test and the Hausman Test, the results indicates that the FE model is recommended for analysis when compared to the Random Effect (RE) model. This suggests that the characteristics of each individual, namely municipalities and cities, influence the determination of the change in open unemployment rate in each respective region.

The next steps involve Model Suitability Testing, Simultaneous Significance Test, and Partial Significance Test. The following figure represents the results of the FE model processing by the software. The results will be shown by the Table 4.2.

**Table 2.** Eviews Fixed Effect Model Estimation

Dependent Variable: TPT  
 Method: Panel Least Squares  
 Date: 09/07/23 Time: 18:36  
 Sample: 2017 2022  
 Periods included: 6  
 Cross-sections included: 8  
 Total panel (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	49.17166	10.32035	4.764535	0.0000
WAGE	-1.27E-06	8.35E-07	-1.521084	0.1370
GROWTH	-0.157596	0.058192	-2.708194	0.0103
MYS	-4.110856	1.296618	-3.170444	0.0031
COVID	1.953230	0.629501	3.102823	0.0037

Effects Specification

Cross-section fixed (dummy variables)				
R-squared	0.838090	Mean dependent var	8.958958	
Adjusted R-squared	0.788618	S.D. dependent var	1.865527	
S.E. of regression	0.857700	Akaike info criterion	2.743194	
Sum squared resid	26.48340	Schwarz criterion	3.210994	
Log likelihood	-53.83666	Hannan-Quinn criter.	2.919977	
F-statistic	16.94057	Durbin-Watson stat	2.373990	
Prob(F-statistic)	0.000000			

The linearity test showed R-squared value of 0.838090. This is inferred that the Fixed Effect Model of the independent variables has a good performance in explaining changes of TPT. The next test, the simultaneous significance test, showed Prob(F-statistics) or probability of testing under 0.05. The research thus presented that one or more independent variables have significant impacts to the dependent variable.

The next test is the Partial Test for the WAGE variable. The probability test value of this variable can be seen in the Prob column, Figure 4.2. The probability testing is 0.1370. By this value, we can conclude that minimum wage have insignificant effect to unemployment. For further notice, the

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regression coefficient ( $\beta$ ) value of the WAGE is -0.00001. We can infer that in the 2017-2022, job seekers is need immediate employment, hence they are not overly dependent on wages. It is also suspected that the citizens of Banten's municipalities and cities can endure without employment during 2020-2022 due to the direct cash assistance provided by the government to job seekers and the poor during the pandemic.

The next test is the significance test for the GROWTH variable. The probability test result for this variable shows a value of 0.0103 with a regression coefficient ( $\beta$ ) of -0.157596. This means that the economic growth of districts and cities in Banten has a small negative and significant impact on open unemployment in each municipalities and cities. This phenomenon is suspected to be caused by government policies to maintain economic growth and activities such as remote work policies, phased relaxation of outdoor activities, and the provision of cash transfer to people during the pandemic.

Next, the significance of the MYS variable will be examined. The probability test result showed a significant influence of MYS with a probability test value of 0.0031 and a regression coefficient of -4.1108. This indicates that the labor market still requires educated workers, both before and after the pandemic. The results also can be inferred that the remote schooling policy, which ensure the youths still have education in pandemic times, was helped decrease the open unemployment.

The final Partial Significance Test is for the COVID variable. This variable has a significant probability test value of 0.0037 with an impact of 1.953230. This indicates that the shock caused by the pandemic has influenced the increase in unemployment. Hence, the government must formulate policies that can alleviate the unemployment impact of future shocks.

#### 4. CONCLUSION

This research focuses on analyzing the influence of Minimum Wage, Economic Growth, Years of Schooling, and COVID on the Open Unemployment Rate in Banten Province during 2017-2022. This study employs Panel Data Regression with individual units being districts/cities and the time period spanning from 2017 to 2022. The model testing results indicate that the model can effectively explain the Open Unemployment Rate variable. This research can still be further developed for future studies due to several existing limitations. First, the Open Unemployment Rate only measures the total unemployed population. Therefore, the next research can study the impact of certain independent variables to number of the unemployment population based on age, gender, or other characteristics. Additionally, this study only measures the short-term impact of independent variables and does not measure the long-term impact or the impact of other crises, thus requiring further development for future research to also focus on the impact of other shocks. Furthermore, the variable for the average years of schooling only covers the duration of completed education, hence there is still a need for other variables that better describe the human capital conditions of a certain region. Based on the model selection and analysis results, several recommendations can be drawn for the local government. First, with the selection of the FE model, individuals have special characteristics that determines in the decreasing of unemployment. Thus, the provincial, muncpal, and or city governments need to continue coordinating efforts and policies to achieve the Sustainable Development Goals (SDGs), specifically in reducing unemployment. Next, based on the sgnificance impact of economic growth and the years of school, a growing economy and good education continue to play a role in reducing the unemployment rate. Therefore, in the event of an economic crisis due to other pandemic isolations in the future, the government is advised to continue policies that stimulates economic growth and providing education such as providing direct cash assistance, implementing programs like the "kartu prakerja" (the pre-employment card), and creating the temporary education systems that suitable in the crisis situation. This is because the cash transfers to citizens really helps them handle unemployment effect from a crisis situation like the COVID-19 pandemic and the education level is still needed for getting occupations in pandemic times or after the crisis.. The government should also pay attention to the labor market dynamics that are highly vulnerable to crisis shocks such as pandemics.

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