The Unemployment Rate Analysis in Banten Province from 2017 to 2021: A Panel Data Approach

Rida Ariestania[1], Andika Pambudi[1*), Nanda Rembulan Nurdianto[1]
[1]Program Studi Ekonomi, Fakultas Ekonomi dan Bisnis, Universitas Pertamina,
Jakarta Selatan, 12220, Indonesia

*) Corresponding author: andikapambudi@universitaspertamina.ac.id

Abstract

This research aims to analyze the unemployment rate and its influencing factors in Banten Province from 2017 to 2021. The study uses the open unemployment rate as the dependent variable and the minimum wage rate, human development index, gross regional domestic product growth rate, and distance as the independent variables. The research adopts the panel data analysis method with the random effects (RE) model. The panel data includes data from eight districts and cities in Banten Province over the period from 2017 to 2021. The findings reveal that all these factors have significant negative effects on the unemployment rate during the specified years. By examining the intricate relationship between these variables, the research offers valuable insights into the unemployment trends in Banten Province, providing a solid foundation for informed decision-making and policy formulation to create more job opportunities and reduce unemployment rates in the future.

Keywords: Distance, Gross Regional Domestic Product, Human Development, Minimum Wage, Unemployment

Introduction

Banten Province in 2022 will be the first province to have the highest open unemployment rate in Indonesia where the open unemployment rate is at 8.09% or as many as 1,054,531 people are unemployed, while in that year the average open unemployment rate in Indonesia is 5.83%. Based on Figure 1. the open unemployment rate in Banten Province has fluctuated since 2017 with a peak in 2020 where the open unemployment rate was 10.64%, but in terms of the lowest open unemployment rate at 801,800 people due to the pandemic Covid-19 which makes the population decrease. Even though during 2018, 2019 and 2022 the percentage was below 8.5%, in these three years Banten Province became the first province to have the highest open unemployment rate in Indonesia.
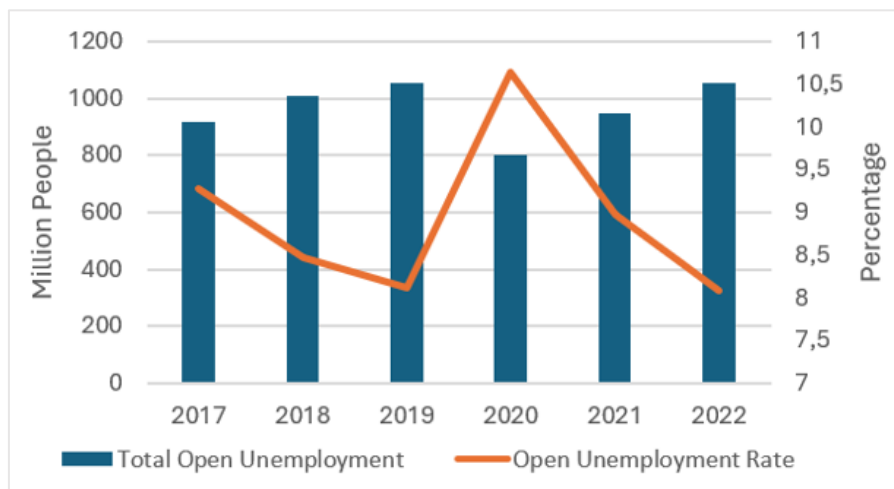

Figure 1. Comparison of total open unemployment and open unemployment rate of Banten Province in 2017-2021

Geographically, Banten Province has a strategic area because it is located at the westernmost tip of Java Island and is directly adjacent to the Sunda Strait and Sumatra Island which makes Merak Harbor a link for sea trade routes between Java and Sumatra islands, then also as a gateway for Asian and international trade because The Sunda Strait is the ALKI route (Indonesian Archipelagic Sea Channels) that connects West Asia and its surroundings with Asia Pacific (Badan Penghubung Provinsi Banten, 2019) and is directly adjacent to DKI Jakarta as the national capital as the center of administration and services in Indonesia. Merak Port in international trade has a higher flow of imports compared to exports where in 2020 the volume of imports is 27,771,000 tons (Badan Pusat Statistik Provinsi Banten, 2021b), while the volume of exports is 10,749,750 tons where the difference is up to 38% (Badan Pusat Statistik Provinsi Banten, 2021a). Based on volume figures as well as its area, Merak Port has a dense mobilization rate so that it has a contribution of 60% of the total national mobilization (Biro Umum dan Perlengkapan Provinsi Banten, 2023b).

Banten Province which is surrounded by sea in the north, west and south makes Banten Province has potential in fisheries and marine affairs with the types of fish produced are anchovies, skipjack tuna, petek fish, and others. In 2020 the total marine fishery production sold at TPI was 6,194,568 kg with the most types of fish produced

being anchovies and skipjack tuna (Badan Pusat Statistik Provinsi Banten, 2021c). Whereas on the mainland Banten Province has potential for horticulture and plantations, in horticulture it produces more fruits and vegetables with the largest production being bananas, melinjo and rambutan, while on plantations the commodities with the largest production are coconut, rubber and kapok (Badan Pusat Statistik Provinsi Banten, 2022b).

In 2019 the number of large and medium industries in Banten Province was 2,927 so that it contributed 10% to the total number of large and medium industries in Indonesia and became the fourth province with the largest number of large and medium industries in Indonesia (Badan Pusat Statistik Provinsi Banten, 2022a). Based on geographical area, port mobilization, and number of industries, Banten Province should be able to absorb many workers, but this has not happened since Banten Province has a high unemployment rate and even ranks as the first province with an unemployment rate in 2022.

The phenomenon of unemployment can be caused by several factors such as inflation, gross domestic product, minimum wage, human development index, investment, and others. In this study using factors from district/city minimum wage variables as seen from their growth rates, HDI, gross regional domestic product (GDP) as seen from their growth rates, and the distance to the type of unemployment used is open unemployment. Open unemployment was chosen because it already includes the number of unemployed in the labor force Badan Pusat Statistik (2023b) where open unemployment consists of residents who are looking for work, residents who are preparing for work, residents who are not working because they have not started working, and residents who do not looking for jobs. The minimum wage is set by the government in Banten Province every year, even though in terms of rupiah the value of the minimum wage is increasing, in terms of growth, the value of the minimum wage is not much different because the increase in value is not significant until 2022 the provincial minimum wage (UMP) is IDR 2,501,203 (Badan Pusat Statistik Provinsi Banten, 2022c), previous research with the minimum wage variable had a negative effect on the unemployment rate conducted by Wahyuningsih et al. (2020), Umar et al. (2020), Marliana (2022), Nuzulaili (2022), and Kuntiarti (2018). However, the opposite result is that the minimum wage has a positive effect on the unemployment rate obtained by Lukis Panjawa & Soebagiyo (2014) due to wage rigidity where there is an imbalance between labor supply and labor demand.

The human development index (IPM) of Banten Province increases every year little by little even though the percentage does not reach 1%, so that in 2022 the HDI of Banten Province will be at 73.32 (Badan Pusat Statistik, 2023a), research with this variable was carried out by Marliana (2022) and Himo et al. (2022) with the results of a negative effect on the unemployment rate. GRDP has also increased every year, which means that the amount of output produced has also increased, in 2022 the GRDP in Banten Province is IDR 487,663,415.44 million (Badan Pusat Statistik Provinsi Banten, 2023b). Research using the GRDP variable has different results where Umar et al. (2020) and Dogan (2019) state that the GRDP variable has a negative effect, while Nuzulaili (2022) states that GRDP has a positive effect. The area with the farthest distance from DKI Jakarta in Banten Province is Pandeglang Regency as far as 141.34 km while the closest area is South Tangerang City with 17.29 km from DKI Jakarta influences the number of unemployed, but according to Gravensen & Ours (2009) distance has an effect whereby

the close distance to the centre of the economy will have an impact on the low unemployment rate in the region.

Banten Province possesses considerable potential, such as its strategic geographical location, opportunities in fisheries, maritime, horticulture, and plantations. In addition, Banten is one of the provinces with the highest number of large and medium industries in Indonesia. Based on these factors, it can be observed that, in terms of geographic area, port mobility, number of industries, and other potentials, Banten should be able to create a significant number of job opportunities and absorb a large workforce. However, this contrasts with the fact that in past few years, Banten has been the province with the highest unemployment rate in Indonesia. This indicates a gap between the potential the province holds and the current reality. This research is crucial to examine why this situation has occurred. The study aims to identify the factors causing the unemployment rate in Banten Province from 2017 to 2021, which could then provide recommendations for policymakers to formulate more effective and targeted policies.

There are differences between previous research and the current study. The first difference lies in the scope of the research, where previous studies used provincial or even national coverage, while the current study focuses on cities/regencies within a single province. The second difference is the period analyzed. The last difference is current study has added the distance variable to examine how distance affects unemployment rates.

This research can contribute to describing the dynamics of unemployment rate development in Banten Province and identifying which districts/cities are underdeveloped and which are more advanced. With this understanding, the government is expected to formulate targeted and effective policies to reduce the unemployment rate in Banten, while adapting interventions to the specific needs of each region. This research also can enrich academic literature related to factors influencing unemployment in Banten Province.

Methodology

Participant

The type of data used in this study uses annual secondary data for five years starting from 2017 to 2021. Data were obtained from BPS Banten Province and BPS district/city levels in Banten Province, namely BPS Pandeglang Regency, BPS Lebak Regency, BPS Tangerang Regency, Serang Regency BPS, Tangerang City BPS, Cilegon City BPS, Serang City BPS, and South Tangerang City BPS.

Analysis

In this study, using the panel data regression method which combines data types between time series data from 2017 to 2021 and cross section data from eight regencies/cities in Banten Province, apart from that method Panel data regression was chosen because it is to see individual developments in each region, so it is because of this that this study uses panel data regression. According to Gujarati (2004) panel data is directly related to individuals, companies, countries, and so on from time to time due to heterogeneity, this is because estimation techniques on panel data can consider the heterogeneity explicitly, another thing is because past events can affect future events so

that with this method one can consider how it will affect (Wooldridge, 2012). The panel data regression model was also chosen because the model is suitable for studying the dynamics of change in a phenomenon (Gujarati, 2004).

Panel Data Regression

The panel data regression model is a model that combines two types of data, namely time series data and cross section data, where the time series data is a collection of time series data on a variable, while the cross section is a collection of place data on a variable (Wooldridge, 2012). The advantage of using the panel data regression model is that with a combination of two data between time series and cross sections it will use more and various data so that it will get a greater degree of freedom. Another advantage is that the combination of the two data will overcome the problems that arise when there is omission of variables or omitted variables (Widarjono, 2005). The panel data regression model equation is written as follows Gujarati (2004):

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + \ldots + \beta_n X_{nit} + \varepsilon_{it} \tag{1}$$

Where Y is the independent variable, β_1 is the intercept, β_2-β_n is the slope, X_2- X_n is the dependent variable, and ε is the residual.

1. Ordinary Least Square (OLS)

The initial step in applying the panel data regression model involves the use of the ordinary least squares (OLS) assumption, which is useful for estimating parameters in regression models with more than two variables (Gujarati, 2004). The OLS model enables the examination of differences between spatial/individual variables and time variables, as it assumes the intercept and slope are identical across all observations. However, this model does not account for the differences in characteristics between time series and cross-sectional data.

2. Fixed Effect Model (FE)

The fixed effect (FE) model technique is used to estimate panel data by employing dummy variables to observe differences in intercepts. As a result, the estimation of the equation depends on assumptions made regarding the intercept, coefficients, and residuals. Since FE focuses on variations in intercepts, it is likely that the intercepts will change, which introduces a limitation in the model, namely a reduced degree of freedom due to multicollinearity arising from the large number of estimated dummy variables (Widarjono, 2005).

3. Random Effect Model (RE)

The random effect (RE) model technique is used to address the issues of estimation uncertainty in the fixed effect (FE) model, where the FE model involves selecting panel data estimations that may result in residuals with potential relationships between time and between locations/individuals. While the FE model includes dummy variables, the RE model incorporates an error term to assume a relationship between the error term and other variables. However, the RE model also has a drawback, namely a reduced degree of freedom due to multicollinearity (Widarjono, 2005).

Significance Test

Based on the several stages above, three models are produced, each of which has its own drawbacks, three of which are the ordinary least square (OLS) model, the fixed effect (FE) model, and the random effect (RE) model. Of the three, one must choose one for panel data regression, so a significance test is needed to determine it.

1. Chow Test

The statistical F test is used to see whether the panel data regression with the use of fixed effects is better than other models, the hypothesis is as follows Widarjono (2005):

H_0: Ordinary Least Square (OLS)

H_1: Fixed Effect (FE)

2. Hausman Test

The Hausman test is a follow-up test from the previous test to see if the fixed effect model results are better. The difference from the previous test, the Hausman test will see which model of fixed effect (FE) and random effect (RE) is better to use as a panel data regression model. The hypothesis of the Hausman test is as follows Widarjono (2005):

H_0: Random Effect (RE)

H_1: Fixed Effect (FE)

3. Classic assumption test

Although according to Gujarati (2004) the panel data regression model has little collinearity between variables so that multicollinearity is unlikely to occur, it is still necessary to test the classical assumptions on the model to ensure that the model is unbiased and reliable. Based on this, there are three classic assumption tests used, namely the heteroscedasticity test, the autocorrelation test, and the multicollinearity test.

3.1 Heteroskedasticity test

Heteroscedasticity can occur if the residual values in the model do not have a constant variance, this often occurs in cross-sectional data (Gujarati, 2004). Heteroscedasticity testing is required to justify the statistical F test for OLS estimation.

3.2 Autocorrelation Test

Autocorrelation can occur due to residuals that are not independent from one observation to another, this occurs because existing errors affect future periods, so this problem occurs in time series data (Gujarati, 2004).

3.3 Multicollinearity Test

Multicollinearity occurs when the regression model has a correlation between the independent variables, causing a standard error for the estimation. If a correlation is found between the independent variables, then one of these variables needs to be removed or replaced with another independent variable. To detect the existence of multicollinearity, it can be seen from the correlation value and the VIF value where if the correlation value

is greater than |0.80000| and the mean variance inflation factor (VIF) is greater than 10, so there is multicollinearity.

Research Model

The model equation in this study is used to analyze the influence of the minimum wage rate, human development index, GRDP rate, and the distance to DKI Jakarta has on the unemployment rate in Banten Province from 2017 to 2021. The author uses the natural logarithm of the independent variables in the model, this is done because there are several considerations according to Wooldridge (2012), there are:

a. Changing the interpretation of the variable coefficient unit to a percentage but this has no effect on the variable coefficient.
b. Natural logarithms are often used for variables that are always positive, especially when there are many variations, for example, rupiah and population.
c. Models using natural logarithms for the dependent variable (log(y)) often fulfill the assumptions of classical linear models such as having the opportunity to become linear, preventing heteroscedasticity, and normality is often more reasonable.

The following is an equation that shows the research model converted into an econometric function:

$$Ln\_TPT_{it} = \beta_0 + \beta_1 LUM_{it} + \beta_2 IPM_{it} + \beta_3 LPB_{it} + \beta_4 DIS_{it} + \varepsilon_{it} \tag{2}$$

Information:

β_0 = Intercept
$\beta_1 - \beta_4$ = Slope
it = Indicates that the model has a combination of cross section (i) and time series (t)
Ln   = Natural logarithm
TPT = Number of open unemployment in districts/cities of Banten Province (Soul)
LUM = Growth rate of district/city minimum wage in Banten Province (%)
IPM = Regency/city human development index of Banten Province (Index)
LPB = Growth rate of district/city gross regional domestic product of Banten Province (%)
DIS = Distance of districts/municipalities in the province of Banten Province to DKI Jakarta (Kilometers)
ε = Error

Results

Determining the Best Model

The first step to be taken is determining the best model, which requires a model fit test. This model fit test consists of three stages: ordinary least square (OLS), random effect (RE), and fixed effect (FE). The first test conducted is the Chow test, which determines the best model between ordinary least square (OLS) and random effect (RE). In this study, the Chow test shows a value of 0.0000, meaning the probability is smaller than the significance level, so the result is to reject H0. Therefore, the best model in this

Chow test is the fixed effect (FE) model. The next stage is the Hausman test, which determines the best model between random effect (RE) and fixed effect (FE). The result of the Hausman test shows a value of 0.9997, meaning the probability is greater than the significance level, so the result is to accept H0. Therefore, the best model in this Hausman test is the random effect (RE) model.

Table 1. Suitability test result

Suitability Test	*Chi-Square* Probability	Best Model Result
Chow Test	0.0000	Fixed Effect (FE)
Hausman Test	0.9997	Random Effect (RE)

Classic Assumption Test

The results of the goodness-of-fit test indicate that the best model is the random effect (RE) model. One advantage of the RE model is that it does not require a classical assumption test, as it is considered to already meet these assumptions. However, to ensure this, the results of the fixed effect (FE) model will be tested through several stages of the classical assumption test:

1. Heteroskedasticity test

The heteroscedasticity test aims to determine whether the FE model exhibits unequal or non-constant variances in its residuals (Widarjono, 2005). Heteroscedasticity is often found in cross-sectional data, while it is rarely encountered in time series data. Since this study uses panel data, which combines cross-sectional and time series data, a heteroscedasticity test is necessary. If the Prob>chi result is greater than the level of significance, it indicates that the FE model does not have a heteroscedasticity problem. However, in this study, the Prob>chi value is 0.0000 which is smaller than the level of significance. Thus, it is proven that the fixed effect (FE) model exhibits a heteroscedasticity problem.

Table 2. Heteroskedasticity test result

Chi (8)	37.74
Prob>chi	0.0000

2. Autocorrelation test

The autocorrelation test examines whether there is a relationship between the residuals of one observation and another (Widarjono, 2005). If the Prob>F result is smaller than the level of significance, it indicates that the FE model does not have an autocorrelation problem. In this study, the Prob>F value is 0.5165, indicating that the fixed effect (FE) model exhibits an autocorrelation problem.

Table 3. Autocorrelation test result

Chi (8)	0.467
Prob>chi	0.5165

3. Multicollinearity test

In the multicollinearity test, the main objective is to determine whether there is a relationship or correlation between independent variables. The threshold indicating the presence of multicollinearity is if the correlation value exceeds |0.80000|. The results of the multicollinearity test are shown in the following table:

Table 4. Multicollinearity test result

	LN_TPT	**LUM**	**IPM**	**DIS**	**LPB**
LN_TPT	1.0000				
LUM	-0.0326	1.0000			
IPM	-0.0628	-0.0346	1.0000		
DIS	-0.3420	0.0058	-0.7946	1.0000	
LPB	-0.2037	-0.0831	0.0150	0.0013	1.0000

Next is the multicollinearity check using VIF (Variance Inflation Factor). The threshold indicating the presence of multicollinearity is if the mean VIF value exceeds 10. The results of the multicollinearity test using VIF show a mean VIF of 5.55, indicating that there is no multicollinearity issue in the model used.

Table 5. VIF result

Variabel	**VIF**
IPM	9.44
LUM	6.99
DIS	3.42
LPB	2.38
Mean VIF	5.55

Determining Model After Classic Assumption Test

In the model suitability test, the best model was the random effect (RE) and after classical assumption test was carried out on the fixed effect (FE) model, heteroscedasticity and autocorrelation problems did occur. Therefore, the best model determination is random effect (RE) which is in accordance with the Hausman test with the following results:

Table 6. Fixed effect and random effect result

	Fixed Effect (FE)		Random Effect (RE)	
Variable	Coef	Prob	**Coef**	**Prob**
LUM	-0.0101825	0.134	**-0.0099866**	**0.092***
IPM	-0.1019476	0.045**	**-0.0993238**	**0.008*****
DIS	0		**-0.0174914**	**0.015****
LPB	-0.025507	0.000***	**-0.0253852**	**0.000**
Konstanta	23.70775	0.000***	**24.70433**	**0.000**
Prob > chi2	-0.0011	0.0011		**0.0000**
R Square	-0.6732	0.0084		**0.4570**

Information: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

The Effect of District/City Minimum Wage Rates on Unemployment Rates

Based on the table from the RE estimation results, it is known that the district/city minimum wage rate has a negative and significant effect on the unemployment rate with a real level of 10%. The magnitude of the influence of the district/city minimum wage rate is that every 1%-point increase from the district/city minimum wage will reduce the unemployment rate by 0.99% assuming other variables are held constant. The results of this estimate are in accordance with the increase in district/city minimum wages in Banten Province and the provincial minimum wage every year, as in 2017 the Banten UMP was Rp1,931,180 and increased to Rp2,460,996 in 2021. This increase in minimum wages is set by the government to fulfill a decent life, improve welfare, and also increase labor productivity, the Banten Provincial Government together with the district government and the city government work together with existing employers to negotiate the minimum wage to be set (Portal Resmi Provinsi Banten, 2023).

Kuntiarti (2018) who conducted a similar study in Banten Province in 2010-2015 also produced the same estimation where the minimum wage has a negative and significant effect on the unemployment rate, according to her, an increase in the minimum wage will make people not choose to look for work because they have sufficient costs. living off the minimum wage. An increase in the minimum wage will affect workers' decisions in choosing a work area because workers will choose a place that will improve their welfare such as being able to make ends meet, so an increase in the minimum wage will make people interested in working. Then research conducted by Nuzulaili (2022) with a focus on unemployment in Java Island in 2017-2020 resulted in an increase in wages set by the government that would increase people's interest in working so that there would be a decrease in the unemployment rate.

The estimation results of this study and research conducted by Nuzulaili and Kuntiarti are in accordance with economic theory on the theory of labor wage effectiveness, where the resulting direction is negative which means that any increase in

wages will have an impact on reducing unemployment due to motivational factors that encourage people to work and be productive. This is also in accordance with the initial hypothesis which suspects that the district/city minimum wage (UMK) will have a negative effect on the unemployment rate in Banten Province during 2017-2021.

The Effect of the Human Development Index (HDI) on the Unemployment Rate

The estimation results on the HDI variable produce a negative and significant relationship to the open unemployment rate in Banten Province in 2017-2021 with a real level of 5%, where every 1-point increase in the HDI index will reduce the unemployment rate by 9.93% assuming other variables are constant. Based on these results, from 2017 to 2021 the government of Banten Province has made policies that meet basic needs for the quality of life of its people, such as in the fields of education and health. This is evidenced by the increase in the HDI every year starting in 2017 at 71.42 increasing to 72.72 in 2021 resulting in an increase of 1.3 in the HDI index for five years. Government programs that support the increase in HDI are educational scholarships for university level where the Provincial Government of Banten collaborates with several state universities such as Sultan Ageng Tirtayasa University, University of Indonesia, and Gajah Mada University, there is also social assistance carried out by the Provincial Government of Banten and Dharma Wanita Persatuan (DWP) by fostering 150 MSMEs to produce quality products (Biro Umum dan Perlengkapan Provinsi Banten, 2023a).

The estimation of the HDI variable in this study is in accordance with Himo et al. (2022) who examined four districts in North Maluku Province where HDI has a significant negative effect on the unemployment rate. However, different results were obtained by Marliana (2022), her research which included Indonesia resulted in no significant effect on HDI, according to Marliana (2022), the higher the quality of public education, the more selective or selective people would be in selecting the type of work and wages to be obtained so that there would be a longer time gap. long time for workers to get the job.

The results of the estimation in this study are in accordance with the economic theory of labor efficiency, where an increase in HDI will increase labor efficiency so that an increase in the amount of production will reduce the number of unemployed. This is because in Banten Province most of the people's work is small and medium enterprises in plantations and fisheries so that it requires a lot of manpower, with high knowledge of the workforce about production it will be more efficient so that it requires more labor because of the large amount to be produced.

The Effect of Distance on the Unemployment Rate

The distance variable has recently been used by many economic researchers to see its effect on the economy (Guerrieri et al., 2006). The focus of the distance variable in this study is to see how the role of the distance between districts/cities in Banten Province to DKI Jakarta in kilometers can affect the unemployment rate. Based on the table from the RE estimation results, distance has a negative and significant effect on the unemployment rate in Banten Province from 2017 to 2021 with a significant level of 5%. The magnitude of this influence is that areas that are 1 km farther from DKI Jakarta have decreased unemployment by 1.74% assuming other variables are held constant. Based on these results it can be concluded that the closer an area is to DKI Jakarta as the administrative and service center in Indonesia does not have an impact on reducing the

unemployment rate, but what happens is the opposite where the farther an area is from DKI Jakarta will reduce the unemployment rate. This is not in accordance with the initial hypothesis where distance is thought to have a positive effect on the unemployment rate, this difference in results can occur because DKI Jakarta is not an economic center for people in Banten Province.

According to data from Badan Pusat Statistik Provinsi Banten (2023) the number of workforces working in Banten Province in 2021 is 5,698,344 people where Tangerang Regency and South Tangerang City have contributed more than 1,000,000 people working in that year. Then, of the 5 million people, Badan Pusat Statistik Provinsi Banten (2023b) recorded that a total of 2,913,800 people worked in Banten Province, and the remaining 2,784,544 people did not work in Banten Province or as many as 52% of the population worked in Banten Province. Of the eight regencies/cities in Banten Province, there are three areas which are located close to DKI Jakarta, namely Tangerang City, South Tangerang City, and Tangerang Regency, where in these three areas many people work in the services sector. South Tangerang City as a service and trade city as much as 92% or 724,578 inhabitants in 2021 work in the services sector so that this sector dominates as the main employment field for its people. Then in Tangerang Regency as an industrial area city as much as 43% or 729,000 people work in the services sector, while in Tangerang City which is also an industrial area city as much as 23% or 238,782 people work in the services sector. From the available data it is assumed that only in the Tangerang City, South Tangerang City, and Tangerang Regency areas do most people work in DKI Jakarta, but the other four areas work more in the industrial, plantation, and fishery sectors in Banten Province.

Based on the estimation results and existing data, it is in accordance with the results of (Marinescu & Rathelot (2013) where more job seekers choose to look for jobs close to their homes. The results of these estimates are not in accordance with the theory of regional economics where the proximity to the economic center is assumed to mean that DKI Jakarta will reduce the unemployment rate. The difference in the results of this estimate can be influenced by several factors, one of which is the skills and knowledge possessed by most people in Banten Province are used more to run their businesses so that they work near their area.

The Effect of GRDP Rate on Unemployment Rate

The results of the estimation of RE on the GRDP rate variable have a negative and significant effect on the unemployment rate where every 1%-point increase in the GRDP rate will have an impact on a decrease in the unemployment rate by 2.53% assuming other variables are held constant. This decrease in the unemployment rate is due to the large GRDP rate which will be in line with the productivity of an area as seen from the amount of its output (Umar et al., 2020). The GRDP variable used in this study is ADHK GRDP in the field of business where every year the GRDP increases, for example in 2017 the ADHK PDRB of Banten Province was Rp412,639,618.30 million and increased to Rp463,469,619.55 million in 2021 (Bank Indonesia, 2022). If seen from the expenditure component, it is dominated by the processing industry of IDR 209,609 billion in 2021 which contributes 31% of the 17 other components where this value has increased compared to the previous year of IDR 195,353 billion, the processing industry referred to according to Badan Pusat Statistik Provinsi Banten (2023b) is an activity that changes raw goods systematically, chemically, or uses workers' hands to become semi-

finished/finished goods. So, from these data it can be seen that an increase in GRDP will have an impact on increasing production, especially in the processing industry in regencies/cities in Banten Province so that it requires more workers.

Umar et al. (2020) who researched Central Java Province during 2017-2019 also had the same results where an increase in GRDP would reduce the unemployment rate, where an increase in GRDP would increase the number of jobs to be able to absorb more workers. Nuzulaili (2022) in his research covering the island of Java also produced the same estimate, which according to him an increase in GRDP would increase the demand for labor for industry so that there would be a decrease in the unemployment rate. Based on the estimation results, data, and the two supporting studies, it can be concluded that an increase in the GRDP rate will have an impact on the large number of outputs or business results. This is in accordance with economic theory.

Conclusion and Suggestion

This study aims to see how the unemployment rate develops and to analyze the factors that influence the unemployment rate in Banten Province during 2017-2021, so that it can be concluded that during 2017-2021 the development of the unemployment rate in Banten Province experienced an increasing trend even though percentage values fluctuate overall. If viewed per region, it is found that Serang Regency has the highest unemployment rate in Banten Province while South Tangerang City has the lowest unemployment rate.

Then by using the panel data method, the best model for this study is the random effect (RE) with the conclusion that the minimum wage variable has a negative and significant effect on the unemployment rate because an increase in wages will motivate workers to look for work, the HDI variable has a negative and significant effect on the unemployment rate, the distance variable has a negative and significant effect on the unemployment rate, and the GRDP rate variable has a negative and significant effect on the unemployment rate in Banten Province during 2017-2021 which will cause an increase in production so that more workers are needed.

Based on the results of the research conducted, there are several recommendations that can be considered to address the unemployment issue in Banten Province in the future, as well as for future studies. For the provincial government of Banten, given the high unemployment rate in the region, effective policies are needed to reduce the unemployment rate. The provincial and local governments need to better understand the advantages of each region before determining the appropriate policies, as each region has its own unique geographical characteristics, and thus not all regions can implement the same policies. Future research could further explore factors potentially influencing unemployment rates. Future researchers are encouraged to investigate additional variables in economics, considering both macroeconomic and microeconomic perspectives.

References

Badan Penghubung Provinsi Banten. (2019). *Potensi Investasi*. Retrieved from https://penghubung.bantenprov.go.id/PotensiInvestasi/topic/82

Badan Pusat Statistik. (2023a). *Indeks Pembangunan Manusia*. Retrieved from https://www.bps.go.id/subject/26/indeks-pembangunan-manusia.html

Badan Pusat Statistik. (2023b). *Tenaga Kerja*. Retrieved from https://www.bps.go.id/subject/6/tenaga-kerja.html

Badan Pusat Statistik Provinsi Banten. (2021a). *Volume Ekspor Menurut Bulan di Provinsi Banten*. Retrieved from https://banten.bps.go.id/id/statistics-table/2/NTA0IzI=/nilai-ekspor-bulanan-menurut-sektor-di-provinsi-banten.html

Badan Pusat Statistik Provinsi Banten. (2021b). *Volume Impor Menurut Bulan di Provinsi Banten*. Retrieved from https://banten.bps.go.id/id/statistics-table/2/MjM3IzI=/volume-impormenurut-bulan-di-provinsi-banten.htm

Badan Pusat Statistik Provinsi Banten. (2021c). *Volume Produksi Perikanan Laut yang Dijual di TPI Menurut Jenis Ikan di Provinsi Banten (KG)*. Retrieved from https://banten.bps.go.id/indicator/56/463/1/volume-produksi-perikanan-laut-yang-dijual-di-tpi-menurut-jenis-ikan-di-provinsi-banten.htm

Badan Pusat Statistik Provinsi Banten. (2022a). *Jumlah Perusahaan Industri Besar dan Sedang Menurut Kabupaten/Kota di Provinsi Banten*. Retrieved from https://banten.bps.go.id/indicator/9/212/1/jumlah-perusahaan-industri-besar-dan-sedang-menurut-kabupaten-kota-di-provinsi-banten.html

Badan Pusat Statistik Provinsi Banten. (2022b). *Produksi Tanaman Buah-Buahan dan Sayuran Tahunan di Provinsi Banten (Ton)*. Retrieved from https://banten.bps.go.id/indicator/55/79/1/produksi-tanaman-buah-buahan-dan-sayuran-tahunan-di-provinsi-banten.html

Badan Pusat Statistik Provinsi Banten. (2022c). *Upah Minimum Kabupaten/Kota per Bulan di Provinsi Banten*. Retrieved from https://banten.bps.go.id/indicator/19/185/1/upah-minimum-kabupaten-kota-per-bulan-diprovinsi-banten.html

Badan Pusat Statistik Provinsi Banten. (2023a). *Jumlah Angkatan Kerja Menurut Kabupaten/Kota di Provinsi Banten (Jiwa)*. Retrieved from https://banten.bps.go.id/indicator/6/151/1/jumlah-angkatan-kerja-menurut-kabupaten-kota-di-provinsi-banten

Badan Pusat Statistik Provinsi Banten. (2023b). *PDRB ADHK Menurut Kabupaten/Kota di Provinsi Banten (Juta Rupiah)*. Retrieved from https://banten.bps.go.id/indicator/52/312/1/pdrb-adhk-menurut-kabupaten-kota-di-provinsi-banten.htm

Badan Pusat Statistik Provinsi Banten. (2023c). *Pekerja Formal Menurut Klasifikasi Daerah di Provinsi Banten (Ribu Jiwa)*. Retrieved from https://banten.bps.go.id/id/statistics-table/2/NDA2IzI=/pekerja-formal-menurut-klasifikasi-daerah-di-provinsi-banten.htm

Bank Indonesia. (2022). *Laporan Perekonomian Provinsi Banten Agustus 2022*. Retrieved from https://www.bi.go.id/id/publikasi/laporan/lpp/PublishingImages/Pages/ Laporan- Perekonomian-Provinsi-Banten-Agustus-2022/Laporan-Perekonomian-Provinsi-Banten-Agustus-2022.pdf

Biro Umum dan Perlengkapan Provinsi Banten. (2023a). *Pemprov Banten Serahkan Bantuan Pendidikan Perlengkapan Sekolah*. Retrieved from

https://biroumum.bantenprov.go.id/berita/pemprov-banten-serahkan-bantuan-pendidikan-perlengkapan-sekol

Biro Umum dan Perlengkapan Provinsi Banten. (2023b). *Wilayah Geografis Provinsi Banten*. Retrieved from https://biroumum.bantenprov.go.id/wilayah-geografis-provinsi-banten

Guerrieri, P., Maggi, B., & Padoan, P. C. (2006). Economic Growth and Diffusion of Knowledge: The Role of Distance. *CIDEI Working Paper*. Retrieved from https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=827b4068504e65653e8766a5c1ecb70eb146b73f

Gujarati, D. (2004). *Basic Econometrics (4 th ed.)*. New York: McGraw-Hill

Himo, J., Rotinsulu, D. Ch., & Tolosang, K. D. (2022). Analisis Pengaruh Indeks Pembangunan Manusia dan Angkatan Kerja terhadap Tingkat Pengangguran Terbuka di 4 Kabupaten di Provinsi Maluku Utara Tahun 2010-2019. *Jurnal Berkala Ilmiah Efisiensi*, *22*(4). https://ejournal.unsrat.ac.id/v3/index.php/jbie/article/view/42238

Kuntiarti, D. D. (2018). Pengaruh Inflasi, Jumlah Penduduk, dan Kenaikan Upah Minimum terhadap Pengangguran Terbuka di Provinsi Banten Tahun 2010-2015. *Jurnal Pendidikan Dan Ekonomi*, *7*(1). https://journal.student.uny.ac.id/index.php/ekonomi/article/viewFile/8241/7832

Marinescu, I., & Rathelot, R. (2013). The Geography of Job Search and Mismatch Unemployment. *Job Market Working Paper*. Retrieved from https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=9189ad3e429dc95eaf405cad12417510c8b0e40b

Marliana, L. (2022). Analisis Pengaruh Indeks Pembangunan Manusia, Pertumbuhan Ekonomi, dan Upah Minimum terhadap Tingkat Pengangguran Terbuka di Indonesia. *Ekonomis: Journal of Economics and Business*, *6*(1). https://doi.org/https://doi.org/10.33087/ekonomis.v6i1.490

Nuzulaili, D. D. (2022). Analisis Pengaruh Inflasi, PDRB, dan UMP terhadap Pengangguran di Pulau Jawa 2017-2020. *Jurnal Ilmu Ekonomi*, *6*(2), 228–238. https://doi.org/https://doi.org/10.22219/jie.v6i2.20473

Portal Resmi Provinsi Banten. (2023). *Sejarah Banten*. Retrieved from https://bantenprov.go.id/profil-provinsi/sejarah-banten

Umar, A. U. A. Al, Lorenza, L., Savitri, A. S. N., Widayanti, H., & Mustofa, M. T. L. (2020). Pengaruh Inflasi, PDRB, dan UMK terhadap Tingkat Pengangguran di Provinsi Jawa Tengah tahun 2017-2019. *Jurnal Ekonomi*, *16*(1). https://core.ac.uk/download/pdf/327110961.pdf

Widarjono, A. (2005). *Ekonometrika: Teori dan Aplikasi*. Yogyakarta: Ekonosia.

Wooldridge, J. M. (2012). *Introductory Econometrics: A Modern Approach*. Ohio: South-Western Cengange Learning