ECONOMETRIC: FACTORS AFFECTING UNEMPLOYMENT IN SUMATERA PROVINCE

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ABSTRACT

Economic growth in a country can be hampered due to several factors, including increasing unemployment and poverty in Indonesia. This study aimed to analyze the factors that cause unemployment in Sumatra using a panel data regression model. The results of the panel data regression show that the minimum wage variable has a positive effect on unemployment in Sumatra, the economic growth variable has a negative effect on unemployment in Sumatra, and the population variable has a positive effect on unemployment in Sumatra. The high unemployment rate in a country will cause many problems, including increasing crime. Therefore, it requires attention from the government to equip the high population with counseling, education, coaching, and job training to increase the productivity of its people.

Keywords: *Econometrics, Economic Growth, Minimum Wage, Unemployment.*

ABSTRAK

Pertumbuhan ekonomi di sebuah negara dapat terhambat dikarenakan beberapa faktor antara lain karena meningkatnya pengangguran dan kemiskinan di Indonesia. Analisis faktor-faktor penyebab pengangguran di Sumatera menggunakan model regresi data panel menjadi tujuan dari penelitian ini. Hasil dari regresi data panel menunjukkan bahwa variabel upah minimum sebuah wilayah memiliki pengaruh positif terhadap pengangguran di Sumatera, variable pertumbuhan ekonomi atau peningkatan nilai barang dan jasa memiliki pengaruh negatif dengan pengangguran di Sumatera, dan variabel jumlah penduduk berpengaruh positif terhadap pengangguran di Sumatera. Tingginya angka pengangguran di sebuah negara akan menimbulkan banyak permasalahan antara lain meningkatkan kriminalitas sehingga membutuhkan perhatian dari pemerintah guna membekali tingginya jumlah penduduk dengan penyuluhan, pendidikan, pembinaan dan pelatihan kerja untuk meningkatkan produktivitas masyarakat.

Kata kunci: *Ekonometrika, Pengangguran, Pertumbuhan Ekonomi, Upah minimum.*

1. INTRODUCTION

The world economy has a main problem that is difficult to solve, namely poverty, especially in Indonesia. Poverty is a problem in a country because of the high unemployment rate and the lack of assistance from the government to eradicate the number of people who do not work or what is called the unemployment rate. Indonesia is one of the countries that still has a poverty rate due to unemployment, namely, unproductive people who are the responsibility of the state (Setya Ningrum, 2017). Unemployment causes changes in the order of life and increases crime.Indonesia has

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several unemployed people, reaching tens of millions; this incident is a problem that the government must solve (Ishak, 2007). Fahri et al. (2020) explain that one of the causes of the increasing unemployment rate, namely, people who are not productive at work in Indonesia, is the COVID-19 pandemic in 2020. This is because COVID-19 caused the economy and the industrial world to paralyze, so many workers were laid off and had difficulty finding work due to health problems, even though COVID-19 was not the main cause of unemployment in Indonesia. This research was conducted to look at other factors that cause unemployment in a country, especially in Indonesia. The variables economic growth, population size, and minimum wage are the measuring factors in this research in the period 2017 to 2021.

Effendy (2019) explains that people as workers need a standard worker wage in Indonesia or minimum wage, and its increase isto increase public consumption it affects people's welfare. The increase and improvement in the economy has shown an increase in the community's economy and welfare through assistance programs from the government to expand employment opportunities so that increased employment ratesfor the community are absorbed. However, different results were shown in studies using the GDP growth variable by Lukis Panjawa & Soebagiyo (2014), which shows the result is that there is a significant negative relationship between Gross Domestic Product growth and the level of society that is unproductive or unemployment. Draper (2001) The equilibrium unemployment rate is influenced by several factors, namely the reduction in the amount of working time, which results in a decrease in people's income levels, and this will have an impact on reducing people's consumption levels. Research conducted by Shabbir & and Alam (2019) revealed that population affects the unemployment rate. If the population increases by 1 unit then unemployment will also increase. The government should be able to allocate resources fairly to provide a controlled population of jobs for equitable resource efficiency.

Prasaja (2013) explains that population numbers have an impact on many people who are less productive or are unemployed in Indonesia, especially in the Central Java region. In his research, when the population increases by 1000 people, educated unemployment will increase by 7.24%. The increase in population resulted in an increase in the search for a workforce in the Central Java region, but what happened was the limited land for jobs, so the workforce was not fully absorbed which had an impact on increasing unemployment in Central Java. Different results were put forward in research by Lindiarta (2014) That the population size shows a significant negative influence on the unemployment rate. Researchers explain that if the population of an area increases, it causes an increase in population, which can reduce the unemployment rate in Malang City, Indonesia. In this research, researchers explain that the minimum wage is negative and has no significant effect in Malang City.

The population growth variable Zulfa (2016)reveals that population growth has no significant effect on unemployment in Lhokseumawe City. Economic growth is also a research variable and it is revealed that the degree of closeness between the two variables and unemployment is 84.5%, so it has a strong relationship. To achieve good economic growth, the government needs to pay attention to macroeconomic variables, especially those related to society's productive work rate which has an impact on unemployment and therefore the economy so that the economy is getting better. Indayani & Hartono (2020) Explain the research discussion that there are events that have a relationship between the unemployment rate and economic growth. This happened during the Covid-19 period,

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namely in 2020. During the Covid-19 period in Indonesia, economic growth experienced an increase compared to the 2019 Covid pandemic. There was a decrease in the rate of economic growth which was explained by researchers, increasing the unemployment rate in Indonesia. This is because the country is experiencing growth in unemployment which has an impact on decreasing household income. This condition affects economic growth in Indonesia because it reduces household consumption.

2. LITERATURE REVIEW

Panel Data Regression Model

Panel data is a combination of data from time series data, individual data, and panel data which briefly can be stated that panel data has dimensions of space and time. Data Pooled is another name for panel data with technical references and computer software that makes it easy to calculate panel data, one of which is using Eviews. Computer software was used in this study. Some of the advantages of panel data are having more information and variety, more degrees of freedom, and more efficiency. Panel data detects impacts that simply cannot be measured by time series data or cross sections and makes it easier to study difficult behavior models.

Model Fixed Effects Least Square Dummy Variable (LSDV*)*

$$C_{it} = \beta_{1it} + \beta_2 Q_{it} + \beta_3 PF_{it} + \beta_4 LF_{it} + \mu_{it} \quad (1)$$

$i = 1,2,\ldots\ldots, 6$

$t = 1,2\ldots\ldots., 15$

The model is known as the fixed effect regression model (FEM) because the intercept is different for each subject which is commonly called time-invariant. FEM assumes that the coefficient (slope) of the independent variable does not differ for each individual and over time so there are conflicting results in the pooled regression models.

Model Random Effect (REM)

$$TC_{it} = \beta_{1i} + \beta_2 Q_{it} + \beta_3 PF_{it} + \beta_4 LF_{it} + \mu_{it} \quad (2)$$

The Random Effect Model or Component Error Model (ECM) produces inconsistent estimates between the regression coefficients, or briefly the Hausman test. The difference between ECM and FEM is that if FEM each cross-section unit has an intercept value (constant), all N values are for each unit cross-section N. Meanwhile, in ECM it represents the average value of each intercept.

Unemployment

Klein (2015) explains the concept of classical and Keynesian unemployment referring to the state of the economy. The unemployment rate in a country can occur due to government policy factors. State government policies are needed to eradicate poverty caused by unemployment. Insufficient government policies to provide jobs, respond to labor demand and minimum labor wages are problems that must to find a solution. Improvements in government policies must be increased to provide solutions to the problem of people who do not work or are called unemployed through various government activities or programs such as improving the wage gap, improving standard wages or minimum wages, and increasing employment opportunities and the availability of labor demand so that there is balance workforce in a country. There is a positive

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relationship There is a positive relationship between labor supply andwages explained by Draper (2001) that an increase in labor supply can effectively increase real wages in a country. However, if you add one additional variable in the form of employment, it will show different results. If wages are increased, domestic prices will relatively increase and competitiveness will decrease, causing sales to decline resulting in an increase in unemploymentdue to decreased employment.

Hills & Schoellner (2004) explained that several developed nations in the world are tackling the problem of unemployment through part-time work. Spain is one of the few countries that has managed to rein in the problem of increasing pressure from unemployment with a growing economy, but if growth slows, changes in policy towards part-time work will have to be followed up. In Germany, changes to regulations regarding part-time work are aimed specifically at retirement groups. There may be expected pressure for more change. Fallahi et al., (2012) explain that there is a negative impact of unemployment rates in a country. This can be related to crime rates, namely theft and robbery. Although there is no evidence to suggest that there is a relationship between robbery and unemployment rates, based on research results it is stated that a country would be better off if it had a labor policy. A country will create balance in the labor market to increase economic stability which will have a positive impact, namely reducing crime rates.

Economic growth

The regional economy grows from the prices of goods and services produced by the population that experiences increases and growth, whereas if the prices or values of goods and services fall, the economy is also said to be declining (Taime & Djaelani, 2021). Adam Smith explained that there are three main functions of the government in supporting the economy, among others by maintaining domestic security and defense, carrying out judicial functions, and providing goods and services that are not available from the private sector, including infrastructure and public facilities. In the context of providing facilities, the government requires a budget with a fiscal policy that reflects a country's economic growth.

Regional Minimum Wage

The minimum wage is the lowest monthly wage consisting of basic wages including fixed allowances. Level 1 Regional Minimum Wage, hereafter referred to as Tk.1 Regional Minimum Wage, is the minimum wage that applies in one province. UMR Tk.1 and UMR Tk.II are determined by considering: a. needs b. consumer price index (CPI); c. capability, development, and sustainability of the company; d. wages in general that apply in certain areas and between regions; e. labor market conditions; f. level of economic development and income per capita. (2) UMSR Tk.1 and UMSR Tk.II are determined based on the considerations referred to in paragraph (1) and taking into account the company's capabilities sectorally. Article 7 (1) states that minimum wages must be paid monthly wages to workers and Article 7 (2) based on an agreement between workers/workers' unions and employers, wages can be paid weekly or 2 weeks with the provision that wage calculations are based on monthly wages (Ministry Regulation No. 01 of 1999, 2000). Balasingam et al. (2020) revealed that the minimum wage policy can help facilitate the country's transformation plans towards a better vision as well as reducing poverty and increasing labor productivity.

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3. RESEARCH METHOD

The data used in this research is secondary data obtained from BPS by identifying as many as 34 provinces in Indonesia with a period of 2017-2021. This study uses four types of variables, namely the dependent variable and independent variable as presented in Table 1.

Table 1 : Dependent Variables and Independent Variables

Variable	Information
Y	Unemployment Rate
X1	Regional minimum wage
X2	Economic growth
X3	Total Population

Table 2 : Sumatera Province

No	Name of Sumatra Province
1	Aceh
2	North Sumatra
3	West Sumatra
4	Riau
5	Jambi
6	South Sumatra
7	Bengkulu
8	Lampung
9	Bangka Belitung Islands
10	Riau Islands

This study uses panel data consisting of time series data from 2017-2021 and cross-section data in the form of 10 provinces in Sumatra, Indonesia. So the total observation used is 50 the amount of data. The steps in the analysis of this study were first to obtain variable data x1, x2, x3, and variable data from 10 provinces using secondary data. The second is to make modeling based on model criteria, the third is to estimate the parameters of the model using the fixed effect model and the random effect model. When the model has been selected then proceed with testing the classical assumptions. The fourth stage is the interpretation of the results obtained .

4. RESULTS AND DISCUSSION

Econometric Modeling : $Yi = \beta i + \beta 1\ X1i + \beta 2X2i + \beta 3X3i + \mu i$

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Test Models

The first step in spatial panel modeling is to do the Likelihood Ratio test and Hausman's test. The results of the Chow Test and Hausman's test show that there is a random effect. The Chow test using the Redundant Fixed Effect Tests Likelihood Ratio shows the following results:

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	29.417010	(9,37)	0.0000
Cross-section Chi-square	104.934559	9	0.0000

Figure 1. Chow Test Results

Chow Test Hypothesis:
H0 = Common Effect Model is better than Fixed Effect Model
H1 = Fixed Effect Model is better than Common Effect Model
Based on the probability results with a significance level of 0.05, it indicates that H0 is rejected because the probability value is <0.05 so the Fixed Effect Model is selected. The next step is to compare the Random Effect Model with Hausman's Test.

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.749803	3	0.2898

Figure 2. Hausman Test Results

Hausman Test Hypothesis:
H0 = Random Effect Model is better than Fixed Effect Model
H1 = Fixed Effect Model is better than Random Effect Model
Prob value> α, then the suitable model is the Random Effect Model, which is equal to 0.7798.

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The Hausman test shows that the random effect is better than the fixed effect, so the Lagrange Multiplier Test is performed to ensure that the selected model is the Random Effect Model.

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	66.28709 (0.0000)	1.160348 (0.2814)	67.44743 (0.0000)

Figure 3. Lagrange Multiplier Test Results

Lagrange Multiplier Test Hypothesis:

H0 = Random Effect Model is better than Common Effect Model

H1 = Common Effect Model is better than Random Effect Model

Breusch Pagan value < α, then the best model is the Random Effect Model.

Classic assumption test

Correlation				
	Y	X1	X2	X3
Y	1.000000	0.392296	-0.408057	0.049234
X1	0.392296	1.000000	-0.415558	-0.168136
X2	-0.408057	-0.415558	1.000000	0.050912
X3	0.049234	-0.168136	0.050912	1.000000

Figure 4. Multicollinearity Test Results

The results of the multicollinearity test showed that there was no high correlation value between the independent variables which did not exceed 0.90 (Ghozali, 2013: 83) so it was concluded that there was no multicollinearity between the independent variables.

Panel Period Heteroskedasticity LR Test
Null hypothesis: Residuals are homoskedastic
Equation: UNTITLED
Specification: Y C LOG(X1) X2 LOG(X3)

	Value	df	Probability
Likelihood ratio	2.694195	10	0.9877

LR test summary:

	Value	df
Restricted LogL	-84.90113	46
Unrestricted LogL	-83.55403	46

Figure 5. Heteroscedasticity Test Results

The results of the heteroscedasticity test showed a prob value of > 0.05 so that the data avoided heteroscedasticity.

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Dependent Variable: Y
Method: Panel EGLS (Cross-section random effects)
Date: 12/26/22 Time: 09:02
Sample: 2017 2021
Periods included: 5
Cross-sections included: 10
Total panel (balanced) observations: 50
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.42447	16.60514	-1.169787	0.2481
LOG(X1)	1.450079	0.961407	1.508288	0.1383
X2	-0.148651	0.039446	-3.768482	0.0005
LOG(X3)	0.256667	0.588804	0.435913	0.6649

Effects Specification	S.D.	Rho
Cross-section random	1.301762	0.8541
Idiosyncratic random	0.538101	0.1459

Weighted Statistics

R-squared	0.430863	Mean dependent var	0.981840
Adjusted R-squared	0.393746	S.D. dependent var	0.696702
S.E. of regression	0.542469	Sum squared resid	13.53653
F-statistic	11.60805	Durbin-Watson stat	0.917903
Prob(F-statistic)	0.000009		

Unweighted Statistics

R-squared	0.215274	Mean dependent var	5.401200
Sum squared resid	90.95356	Durbin-Watson stat	0.136611

Figure 6. Autocorrelation Test Results

Dependent Variable: Y
Method: Panel EGLS (Cross-section random effects)
Date: 12/26/22 Time: 09:02
Sample: 2017 2021
Periods included: 5
Cross-sections included: 10
Total panel (balanced) observations: 50
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.42447	16.60514	-1.169787	0.2481
LOG(X1)	1.450079	0.961407	1.508288	0.1383
X2	-0.148651	0.039446	-3.768482	0.0005
LOG(X3)	0.256667	0.588804	0.435913	0.6649

Effects Specification	S.D.	Rho
Cross-section random	1.301762	0.8541
Idiosyncratic random	0.538101	0.1459

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R-squared	0.430863	Mean dependent var	0.981840
Adjusted R-squared	0.393746	S.D. dependent var	0.696702
S.E. of regression	0.542469	Sum squared resid	13.53653
F-statistic	11.60805	Durbin-Watson stat	0.917903
Prob(F-statistic)	0.000009		

Unweighted Statistics

R-squared	0.215274	Mean dependent var	5.401200
Sum squared resid	90.95356	Durbin-Watson stat	0.136611

Figure 7. Panel Data Regression Test Results

Estimation Command:
==========
LS(?, CX=R) Y C LOG(X1) X2 LOG(X3)

Estimation Equation:
==========

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Y = C(1) + C(2)*LOG(X1) + C(3)*X2 + C(4)*LOG(X3) + [CX=R]

Substituted Coefficients:
==========

Y = -19.4244737078 + 1.4500787378*LOG(X1) - 0.148650561382*X2
0.256667487799*LOG(X3) + [CX=R]

$$Y_i = \beta_i + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \mu_i$$

Y = -19.4244737078 + 1.4500787378*LOG(X1) - 0.148650561382*X2 +
0.256667487799*LOG(X3) + [CX=R]

The Effect of Regional Minimum Wage on Unemployment Rate

Figure 7, it can be seen that the coefficient results have a value of 1.4500. It can be revealed that the regional standard wage or minimum wage has been proven to have a positive effect on the people who don't work or an unemployment rate of 145% in Sumatra. According to Mankiw (2012), A country's wage rigidity can be a cause of unemployment caused by regional minimum wages. Wage rigidity, also known as wage rigidity, is the inability of wages to adjust to an equilibrium point because the supply of labor is equal to the demand for labor. Wage rigidity in a country is the cause of unemployment. This is because there is a problem between job seekers and several jobs available, resulting in an imbalance in the level of job absorption. The number of workers supplies or people looking for work and changing jobs in a country can decrease due to support from the state for increasing regional minimum wages. This resulted in an excess number of labor in the field thereby increasing the level of unemployment as happened in Sumatra. The government wants to be responsive in overcoming unemployment through the addition of direct labor and providing training and entrepreneurship development through community empowerment activities. Channeling capital through increasing investment for entrepreneurs can help indirectly as an effort to reduce the number of people who are not working or unemployed Lukis Panjawa & Soebagiyo (2014)

The Effect of Economic Growth on the Unemployment Rate

Figure 7, From the results of this research, there is a coefficient value of -0.14, economic improvement or a country's economic growth has the opposite impact on the unemployment rate. As many as 14% of this happened on the island of Sumatra. Prawira (2018) explains that the increase or growth of a country's economy is influenced by the level of unemployment absorption. Indonesia must have a solution to these problems to maintain national economic growth.

The Effect of Total Population on the Unemployment Rate

Figure 7 shows the coefficient value of 0.256. This coefficient value can provide the conclusion that population size has a positive influence on the unemployment rate. This influence figure is 25.6% on the island of Sumatra. Prasaja (2013) explains that research on this matter is in line with the classic opinion, namely the statement that in a region of a country, the phenomenon of overpopulation can occur. The population is

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greater and there is an increase in population growth. This can cause a country's economic decline due to decreased productivity. not all residents are productive and produce work. This has a negative impact on a country because national income decreases so people's welfare will also be affected by this. If population growth occurs in a country, it will automatically increase the number of workers so that there will be a need for a large number of jobs. If demand conditions are not the same as supply, job seekers are not going well and properly absorbed in the field, causing unemployment in an area.

5. CONCLUSION

The influence value has a strong predictive ability to explain the response because the value is above 0.5. The coefficient shows how much influence the predictor variables have on the response variable. If the minimum wage is increased by 1% it will affect unemployment by 145%, economic growth which increases by 1% will reduce unemployment by 14% and if the population increases by 1% then it will increase the unemployment rate by 25.6%. The standard error value for each variable is close to 0 so that another guess is close to correct. Dewita Hia (2018) explains that unemployment has the potential for crime because, in conditions of unemployment, people still have to consume electricity, water, and food for basic needs, even for people who have no income. Therefore every citizen has the right to a decent life and policies are needed, among others, by creating jobs that are consistent with the number of residents and providing them with counseling, coaching, and job training by the abilities and interests of the community so that it can increase productivity and welfare.

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