

The Effect of Education, HDI, Economic Growth, and Minimum Wage on Unemployment: A Study of 10 Provinces in the Sumatra Region

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Article Info

Received May 12, 2024

Revised June 14, 2024

Published June 20, 2024

Keywords :

Unemployment, Education, HDI, Economic growth, Minimum wage

Abstract

Unemployment is a very complex problem, especially in the Sumatra region with an average unemployment rate that exceeds the average in Indonesia. The purpose of this quantitative research is to analyze the effect of education, the human development index, economic growth, and minimum wage on unemployment in Sumatra region. This study uses secondary data obtained from the Indonesian Central Bureau of Statistics and analyzed using panel data regression by applying the Fixed Effect Model. The results showed that education and economic growth have a negative effect and HDI and minimum wage have a positive effect on unemployment. In this study, it was found that HDI and economic growth have a significant influence on unemployment, while education and minimum wage have an insignificant influence. Based on the R-squared value of 0.9137 which interprets that the independent variable affects the dependent variable by 91.37%, the remaining 8.63% is influenced by other variables outside this study. The results of this study are expected to be used as a basis for policy-making and as a literature review in further research related to unemployment.

INTRODUCTION

The study of Human Resource (HR) economics addresses complex economic theories and issues that include human resource planning, labor economics, and population economics [1]. Economic problems, especially in labor, still occur in many developing countries such as Indonesia. Unemployment

is one of the most complex problems because it does not only cover the economy but includes many other social aspects. Unemployment affects individuals directly, and affects the economic stability of a country. In the Sumatra region, the challenge of unemployment has become one of the main focuses in an effort to improve community welfare and regional economic growth.

Unemployment occurs when a person who is already in the labor force actively seeks a job with a certain wage level but is unable to obtain it [2]. According to Syahril (2014) Unemployment, an economic problem that has a significant impact on economic growth, occurs when employment opportunities are not in line with the number of available workers. This causes many individuals to be unable to find jobs that match their skills and needs. The following presents data on the open unemployment rate in 10 provinces in the Sumatra region.

Table 1. Development of Open Unemployment Rate in Sumatra Region

Province	Unemployment Rate (%)				
	2018	2019	2020	2021	2022
Aceh	6,36	6,20	6,59	6,30	6,17
Sumatera Utara	5,56	5,00	7,00	6,33	6,16
Sumatera Barat	5,55	5,33	6,88	6,52	6,28
Riau	6,20	5,97	6,31	4,42	4,37
Kepulauan Riau	7,12	6,91	10,34	9,91	8,23
Jambi	3,86	4,19	5,13	5,09	4,59
Bengkulu	3,51	3,39	4,07	3,65	3,59
Sumatera Selatan	4,23	4,48	5,51	4,98	4,63
Kep. Bangka Belitung	3,65	3,62	5,25	5,03	4,77
Lampung	4,00	4,03	4,67	4,69	4,52

Source: BPS Indonesia (2022)

Unemployment is still a very big problem in Indonesia, especially in the Sumatra region. The Sumatra region consists of 10 provinces spread across the island of Sumatra and small islands in the Sumatra region. The average open unemployment rate in the Sumatra region is 5.33% in 2022, this figure exceeds the average open unemployment rate in Indonesia which is 4.96% in the same year. With the indicators of education, Human Development Index (HDI), economic growth, and minimum wage which are believed to have a significant influence on the unemployment rate.

In order to achieve employability, one must fulfill the most influential technical requirement that must be completed, which is education. Currently,

human capital development requires education linked to labor productivity. Higher education has not been fully recognized as the main determining factor in assessing the quality of formally educated individuals.

According to Elfindri (2001) education level plays an important role in determining a person's employment. The higher a person's level of education, the more likely he or she is to get a quality job that is adequate to fulfill life's needs. It can also help reduce the unemployment rate, as individuals who have higher education tend to find jobs more easily than those with lower education. They can also expect better wages, at least around the minimum wage threshold. Therefore, an increase in the number of individuals who have a good education can help reduce the overall unemployment rate.

According to the principle of Okun's Law, an increase in the human development index is expected to lead to higher economic growth [6]. With increased economic growth, it is expected that more job opportunities will be created and the demand for labor will increase, which in turn can reduce the poverty rate by absorbing more people into the labor market.

According to Saputra (2011) the Human Development Index figure is used to assess the progress of human development by taking into account several fundamental factors in life that can affect individual productivity. The HDI considers three main dimensions in improving development, namely ensuring access to good health and longevity, improving access to education and the ability to achieve a decent standard of living.

According to Adam Smith's classical theory, rapid and high economic growth can reduce the unemployment rate in a region because economic growth and the unemployment rate tend to move in tandem [2]. When a region's economy grows, the production process also increases, which requires more labor to meet the increased production demand. Thus, this labor absorption can reduce the poverty rate in the region. One important indicator in looking at a country's economic development is the poverty rate.

Economic growth plays a role in increasing labor productivity. Okun's law theory states that an increase in economic growth will stimulate labor absorption, leading to a decrease in the unemployment rate [8]. On the other hand, the Harrod-Domar theory states that investment not only generates demand but also

increases production capacity [9]. Consequently, this will affect the use of labor, as the larger the production capacity, the higher the demand for labor.

Kaufman & Hotchkiss (1999) argued that when the government sets a higher wage rate, it reduces the amount of labor in a country. Wages represent the compensation received by units of labor in the form of monetary payments [8]. The setting of wage rates by the government, labor unions, and employers affects the unemployment rate. Higher wage setting correlates with a decrease in the labor force participation rate.

Mankiw (2008) suggests that one of the factors affecting unemployment is wage rigidity, where wages fail to adjust until labor supply equals demand. Lowering the minimum wage can encourage firms to hire more labor, thereby reducing unemployment. Keynes argued in his "General Theory" that employment increases only when wages decline.

The demand for labor is determined by the value of marginal product (VMP), which is calculated by multiplying the Marginal Physical Product (MPP) by the price of the product. MPP signifies the increase in total output resulting from the addition of one unit of labor [11]. Consequently, an increase in the wage rate leads to a decrease in the amount of labor demanded.

Quality education can improve the skills and competitiveness of the workforce, while the HDI reflects the social conditions and welfare of the community. Increased economic growth can generate additional employment opportunities, while minimum wage plays a role in determining labor costs for employers. This study aims to analyze the effect of education, HDI, economic growth, and minimum wage on the unemployment rate in 10 provinces in the Sumatra region. By deepening the understanding of the relationship between these factors, it is hoped that more effective policies can be found in addressing the unemployment problem and make an important contribution to the regional economic literature, particularly in the context of the Sumatra region.

METHODS

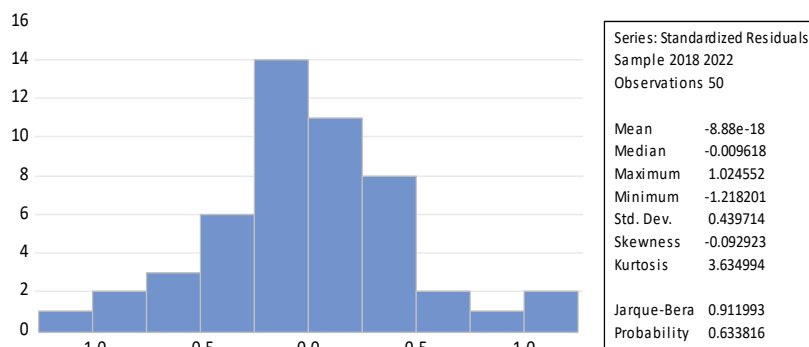
This research is included in quantitative research which has the aim of finding and examining the relationship between the independent variable and the

dependent variable in a certain period of time by using data in the form of numbers as an instrument to analyze the variables under study [12]. The independent variables in this study include the level of high school education completion (X1), HDI (X2), economic growth through GRDP/K (X3), and provincial minimum wage (X4) and use the open unemployment rate as the dependent variable (Y). The data used in this study are sourced from secondary data obtained from the publication of the Indonesian Central Bureau of Statistics. Secondary data refers to research data obtained by researchers through intermediary media, namely data that has been collected and recorded by other parties [13].

The data in this study were analyzed using panel data regression by applying the Fixed Effect Model method (passing the Chow and Hausman Tests) and EViews 12 as the analysis tool. Panel data is a combination of cross section data and time series data, where the same cross section unit is observed at various points in time. In other words, panel data is data from some of the same individuals observed over a period of time [14]. The data analysis process includes regression estimation, selection of panel data regression estimation methods, classical assumption testing and panel data regression assumptions, as well as panel data regression model feasibility testing, which is then used to conclude the research results.

RESULTS AND DISCUSSION

Classical Assumption Test



Source: Data Processed Using EViews ver. 12 (2024)

Figure 1. Normality Test

In Figure 1 it can be seen in the prob. value of $0.6338 > 0.05$. So it can be concluded that the data is normally distributed and is in accordance with the basis for decision making.

Table 2. Multicollinearity Test

	Education	HDI	EG	MW
Education	1.0000	0.7523	0.4535	0.3144
HDI	0.7523	1.0000	0.6309	0.3913
EG	0.4535	0.6309	1.0000	0.3323
MW	0.3144	0.3913	0.3323	1.0000

Source: Data Processed Using EViews ver. 12 (2024)

Based on table 2 of the multicollinearity test results, it is found that the correlation matrix values between independent variables such as Education, Human Development Index, Economic Growth, and Provincial Minimum Wage have values less than 0.80. Therefore, it can be concluded that there is no multicollinearity problem in the model.

Table 3. Heteroscedasticity Test

Variable	Prob.	Description
C	0.8484	
Education	0.1154	Pass the test
HDI	0.8189	Pass the test
EG	0.4114	Pass the test
MW	0.4161	Pass the test

Source: Data Processed Using EViews ver. 12 (2024)

The heteroscedasticity test in table 3 uses the Panel Least Squares (PLS) method with ABSRES as the dependent variable. From this test, the prob. value of each variable is above 0.05 so it can be concluded that there are no symptoms of heteroscedasticity in the data.

Panel Data Regression

Table 4. Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-27.8983	9.8720	-2.8260	0.0076
Education	-0.0225	0.0259	-0.8687	0.3907
HDI	0.5203	0.1788	2.9090	0.0062
PE	-0.0665	0.0128	-5.1712	0.0000
MW	0.4463	1.1106	0.4018	0.6901

Source: Data Processed Using EViews ver. 12 (2024)

Based on the panel data regression in table 4 using the Fixed Effect Model, the following equation can be written:

$$UI_{it} = -27.8983 - 0.0225E_{1it} + 0.05203HDI_{2it} - 0.0665EG_{3it} + 0.4463MW_{4it} + e_{it}$$

The coefficient of the panel data regression equation above can be interpreted: the constant value of -27.8983 indicates that the unemployment rate variable will decrease by 278.98% if there is no independent variable in this study. The education coefficient value of -0.0225 indicates that if the value of other variables remains the same and the education variable increases by 1%, the unemployment rate variable will decrease by 2.25%, and vice versa, the unemployment rate variable will increase by 2.25% if other variables remain the same and the education variable decreases by 1%.

With the HDI variable coefficient of 0.520360, if the value of other variables does not change and the HDI variable increases by 1%, the unemployment rate variable will increase by 52.03 percent. Conversely, if the value of other variables does not change and the HDI variable decreases by 1%, the unemployment rate variable will decrease by 52.03 percent.

The coefficient of the economic growth variable is -0.066595, which means that if the value of other variables is constant and the economic growth variable increases by 1%, the unemployment rate variable will decrease by 6.65%. Conversely, if the value of other variables is constant and the economic growth variable decreases by 1%, the unemployment rate variable will increase by 6.65%.

The coefficient of the provincial minimum wage variable is 0.446336, the unemployment rate variable will increase by 44.63% if the value of other variables is constant and the minimum wage variable decreases by 1%. Conversely, if the value of other variables is constant and the minimum wage variable decreases by 1%, the unemployment rate variable will decrease by 44.63%.

T-test (Partial)

Based on table 4, we can obtain information that the education variable has a t-statistic of $0.8687 < t\text{-table } 2.6030$ with a prob. value of $0.3907 > 0.05$, which indicates that education has no significant effect on unemployment. This is the same as the minimum wage variable which has a t-statistic of $0.4018 < t\text{-table } 2.6030$ with a prob. value of $0.6901 > 0.05$ where this variable has no significant effect on unemployment.

Unlike the education and minimum wage variables, HDI and economic growth variables have a significant influence on unemployment. This is evidenced by the t-statistic value of HDI of $2.9090 > t\text{-table } 2.6030$ with a prob. value of

$0.0062 < 0.05$ and the t-statistic value of economic growth of $5.1712 > t\text{-table}$ 2.6030 with a prob. value of $0.0000 < 0.05$.

F-test (Simultaneous)

Table 5. Hypothesis Test

Cross-section fixed (dummy variables)	
R-squared	0.9137
F-statistic	29.3198
Prob(F-statistic)	0.0000

Source: Data Processed Using EViews ver. 12 (2024)

The F test is used to assess whether the independent variables as a whole have a significant impact on the dependent variable. Based on table 5, it can be concluded that the variables of education, HDI, economic growth, and minimum wage together have a significant influence. This is evidenced by the f-statistic value of $29.3198 > f\text{-table}$ 5.1921 and prob. $0.0000 < 0.05$.

Coefficient of Determination

The Coefficient of Determination (R²) is used to measure how much variation in the independent variable can be explained by the dependent variable. The higher the R² value indicates that a greater proportion of the variation in the dependent variable is influenced by the independent variable. This study has an R-squared of 0.9137 which can be seen in table 5, where this figure interprets that the independent variable affects the dependent variable by 91.37%, the remaining 8.63% is influenced by other variables outside this study.

The Effect of Education on Unemployment

One of the factors affecting the economy is the level of education; education is one of the basic human capital required for sustainable economic development. Employability, also known as employability, increases with one's level of education.

In this study, education has a negative effect on unemployment; if other variables are constant, a 1% increase in education will result in a 2.25% decrease in the unemployment rate. There is no significant correlation between education and unemployment in Sumatra because many people are highly educated but do not have jobs. This can be influenced by a person's attitude in choosing their job and the lack of opportunity to work.

The results of this study are the same as research Arifin & Firmansyah (2017); Suhendra & Wicaksono (2020), which states that education has no

significant effect on the unemployment rate. who said that education has no significant effect on the unemployment rate. In research conducted by Linggawati & Wenagama (2022) said that education has a negative effect on the unemployment rate, which is the same as the results of this study. In contrast to the results of this study, research conducted by Anwar (2023) who said that education has a positive influence on the unemployment rate.

Effect of HDI on Unemployment

The Human Development Index (HDI) is a metric used to measure the progress of human development, taking into account various important aspects of the quality of life that affect the level of productivity of individuals [19]. New Growth Theory emphasizes the importance of government intervention, especially in enhancing human capital development and boosting human productivity.

This research shows that HDI has a positive and important impact on the unemployment rate. If HDI increases by 1 HDI, the unemployment rate will increase by 52.03% if other variables are constant. The development of HDI generally always increases where HDI measures the welfare of the community. Welfare also arises for those who do not yet have a job, because in general, people who are included in open unemployment are still borne by other family members.

This research is in line with research conducted by Arizal & Marwan (2019); Palindangan & Bakar (2021), where HDI has a positive influence on the unemployment rate. Research Marlina (2022); Muhammad Baihawafi & Asnita Frida Sebayang (2023); Pratiwi & Kuncoro (2016) are different from the result of this study which states that HDI has a negative influence on the unemployment rate.

Effect of Economic Growth on Unemployment

Economic growth refers to an increase in the production capacity of an economy which is reflected in an increase in national income. The increase in income is expected to create new employment opportunities and absorb existing labor.

This study shows that economic growth has a negative impact on the unemployment rate. It was found that if economic growth increases by 1%, then the unemployment rate will decrease by 6.65%, assuming other variables remain constant. This shows that economic growth has a significant influence on

unemployment, this happens because a decrease in the unemployment rate results in an increase in state income through labor and can encourage economic growth.

The results of this study are in line with research Arizal & Marwan (2019); Sembiring (2020) where economic growth has a negative and significant effect on unemployment because an increase in economic growth will always be accompanied by an increase in labor demand. In contrast to this study, according to the results of research Romhadhoni, Faizah, & Afifah (2019) that economic growth has a positive effect on unemployment, this is due to the high level of urbanization in the object of the study, where job providers are more likely to prioritize capital intensive than labor intensive. If not properly regulated, this can have a negative impact on the community's economy.

The Effect of Minimum Wage on Unemployment

According to Kaufman & Hotchkiss (1999) higher wages set by the government will lead to a decrease in the labor force participation rate. Wages were found to have a positive but insignificant impact on unemployment in this study. Where an increase in minimum wage by 1% will affect the increase in unemployment by 44.63%. This happens because an increase in the minimum wage encourages companies to economize on production factors such as labor. An increase in the minimum wage also has no significance on unemployment, because wages are only intended for those who are already working.

Previous research that is in line with the results of this study was conducted by Aswanto (2021); Yuni (2020); Mahardika and Badriyah (2024) who said that an increase in wages if it is not accompanied by an increase in company revenue will result in a reduction in labor and in general Indonesian people work in the informal sector so that an increase in wages does not have a significant effect on unemployment.

CONCLUSION

Based on the research findings using panel data regression analysis, it is proven that education, Human Development Index (HDI), economic growth, and minimum wage together have a significant influence of 91.37% on unemployment in 10 provinces in Sumatra region. The regression results explain that education through high school completion rate has a negative and insignificant effect on

unemployment. Where an increase in the quantity of education completion can reduce the unemployment rate, because the better a person's education will increase the use value of that person as a production factor.

The regression result of the Human Development Index (HDI) variable in this study has a positive and significant effect on unemployment. HDI as an indicator of the quality of human life that generally increases gives an increasing influence on unemployment. The increase is because in Indonesia, especially in the Sumatra region, there are still many people who do not work but have a good quality of life, where the quality of life is supported by families who have jobs. Just like HDI, economic growth has a significant influence on unemployment, but has a negative relationship. An increase in economic growth through regional income per capita tends to reflect an increase in employment.

The minimum wage variable has a positive influence on unemployment. An increase in the minimum wage tends to encourage capital owners to streamline production factors by cutting labor if this is not accompanied by an increase in business income. The minimum wage also has an insignificant effect on unemployment because in general, people in the Sumatra region work in the informal sector and an increase in the minimum wage only has a big effect on people who have worked. The results of this study are expected to be used as a basis for policy making and as a literature review in further research related to unemployment.

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