



The Effect of Open Unemployment Rate on Poverty Level in North Sumatra Province 2015–2025

Yan Batara Putra Siringoringo^{1*}, Muthia Ferliani Balqis², Enita Dewi Br Tarigan³, Citra Dewi Hasibuan⁴
Universitas Sumatera Utara

Corresponding Author: Yan Batara Putra Siringoringo yan.batara@usu.ac.id

ARTICLE INFO

Keywords: Open Unemployment, Poverty, Simple Linear Regression

Received : 20, February

Revised : 22, April

Accepted: 24, June

©2026 Siringoringo, Balqis, Br Tarigan, Hasibuan: This is an open-access article distributed under the terms of the [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/).



ABSTRACT

Poverty is one of the economic problems that continues to be a concern for the government, including in North Sumatra Province. This study aims to analyze the effect of the open unemployment rate on the poverty rate in North Sumatra Province from 2015–2025. This study uses a quantitative approach that incorporates a straightforward linear regression method. Data were sourced from the Central Statistics Agency (BPS). The results model is $Y = 5.465 + 0.593X$ with an R^2 value of 0.094. The outcomes of the F test and t test suggest that the influence of the open unemployment rate on poverty is not significant. Thus, poverty is influenced by factors other than unemployment.

INTRODUCTION

Poverty is one of the economic and social issues that remains a major concern in regional development in Indonesia, including in North Sumatra Province. High poverty rates can impact declining community welfare, low labor productivity, and hampering regional economic growth. Therefore, poverty alleviation efforts are a crucial focus of national and regional development policies.

One element frequently linked to poverty is the rate of open unemployment. Open unemployment refers to the situation of individuals within the working-age group who are without jobs yet are still in pursuit of employment. In theory, a rise in the unemployment rate can lead to a decrease in incomes for individuals, which may result in a higher count of those living in poverty. Nonetheless, in reality, the link between joblessness and impoverishment is not consistently straightforward, as it is affected by numerous additional elements like price increases, economic development, social support, schooling, and policies enacted by the government.

According to information provided by the Central Statistics Agency (BPS), the rate of unemployment and the incidence of poverty in North Sumatra Province varied over the years from 2015 to 2025. This condition indicates an interesting socioeconomic dynamic to analyze, particularly during the COVID-19 pandemic, which has impacted the labor market. Consequently, this research intends to examine how the open unemployment rate impacts the poverty level in North Sumatra Province through the application of a straightforward linear regression technique.

LITERATURE REVIEW

Open Unemployment Rate

The Open Unemployment Rate represents the ratio of those without jobs in comparison to the entire workforce. As stated by the Central Bureau of Statistics, open unemployment consists of individuals of working age who are not employed, actively looking for employment, and ready to take on work. The Open Unemployment Rate (OPT) serves as a crucial measure for evaluating the state of the job market, the rate of employment absorption, and the overall economic health of an area. An elevated unemployment rate may signify a scarcity of job openings and insufficient economic performance.

Poverty

Poverty refers to a situation in which a person or family cannot satisfy essential requirements, including both food and other necessities. The Central Statistics Agency states that the assessment of poverty is based on the capacity of a community to fulfill its fundamental needs. The poverty rate is an important indicator of community welfare. Elevated levels of poverty can affect living standards and employee efficiency, while also hindering economic development in specific areas.

The Connection Between Open Unemployment Rate and Poverty

In theory, the open unemployment rate correlates with the poverty rate. High unemployment can reduce people's incomes due to reduced opportunities for employment and a steady income. This condition can increase the risk of poverty, especially for households dependent on work income. Nonetheless, the connection between joblessness and poverty is not consistently straightforward, since poverty is affected by various elements including inflation, economic advancement, education levels, and governmental strategies focused on enhancing public well-being.

Simple Linear Regression

Simple linear regression represents a statistical technique utilized for examining the association between a single independent variable and a single dependent variable. This approach seeks to identify both the direction and strength of the impact that the independent variable has on the dependent variable. The typical structure of a simple linear regression equation is:

$$\hat{Y} = a + bx$$

Description:

Y = Dependent Variable.

x = Independent Variable.

a = Constant.

b = Regression Coefficient.

In this research, straightforward linear regression was employed to investigate how the open unemployment rate influences the poverty rate in North Sumatra Province.

Normality Test

The test for normality assesses if the residuals within a regression model follow a normal distribution. This test is important because residual normality is one of the basic assumptions in regression analysis. When the residuals follow a normal distribution, it becomes easier to interpret the outcomes of the statistical tests, and the regression model is viewed as more appropriate for application.

Autocorrelation Test

The autocorrelation examination is employed to assess if a connection exists among the residuals across different observation intervals. This test is especially important in research using time series data. In this research, the Durbin-Watson approach was employed for the autocorrelation assessment to investigate if a connection exists among the residuals across different years that might influence the legitimacy of the regression model.

Coefficient of Determination (R^2)

The coefficient of determination, known as R^2 , assesses how well an independent variable can clarify changes in a dependent variable. The value of R^2 varies between 0 and 1. The bigger the R^2 figure, the more significant the role of the independent variable in accounting for variations in the dependent variable. On the other hand, a low R^2 value suggests that additional elements are affecting the dependent variable.

F test

The F-test serves to evaluate the overall importance of the regression model. Its purpose is to assess if the independent variables affect the dependent variable within the regression framework. In simple linear regression, the F-test is used to assess the feasibility of the analytical model used in the study

T test

The t-test is utilized to assess the individual impact of independent variables on the dependent variable. This assessment is conducted on the regression coefficients to establish the importance of the relationship among the variables. The findings from the t-test show if the independent variables significantly influence variations in the dependent variable within the regression model.

METHODOLOGY

- a. Type of research is quantitative method
- b. Data obtained from the North Sumatra Statistics Office covering the years 2015 through 2025
- c. Variables
 - X = Open Unemployment Rate.
 - Y = Poverty Rate.
- d. Analysis
 - a) Residual normality test.
 - b) Autocorrelation test.
 - c) Simple linear regression.
 - d) F test.
 - e) t test.
 - f) Coefficient of determination.

RESEARCH RESULT

Research Data

Table 1. Research Data

Tahun	TPT (%)	Kemiskinan (%)
2015	6,71	10,53
2016	5,84	10,35
2017	5,6	10,22
2018	5,55	9,22
2019	5,39	8,83
2020	6,91	8,75
2021	6,33	9,01
2022	6,16	8,42
2023	5,89	8,15
2024	5,6	7,99
2025	5,32	7,36

Source: BPS

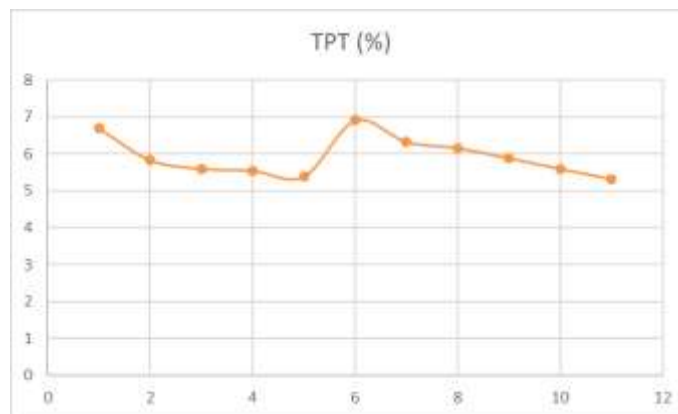


Figure 1. Trends in the Open Unemployment Rate in North Sumatra 2015-2025

The Open Unemployment Rate tended to decline from 2015-2025, but experienced a spike in 2020 due to the COVID-19 pandemic.

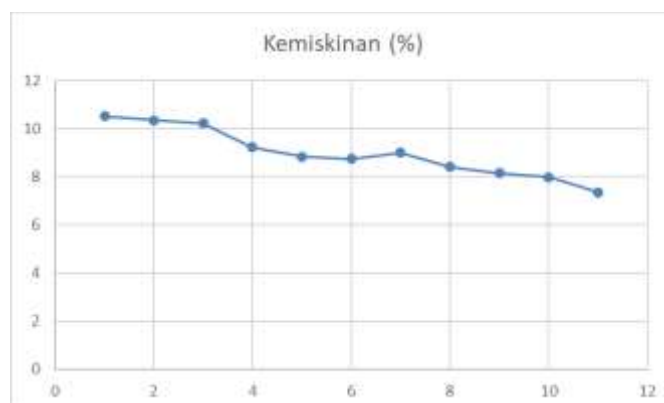


Figure 2. Poverty Rate Trends in North Sumatra 2015-2025

Poverty shows a gradual downward trend, although it increased slightly in 2021.

Classical Assumption Test

a. Residual normality test

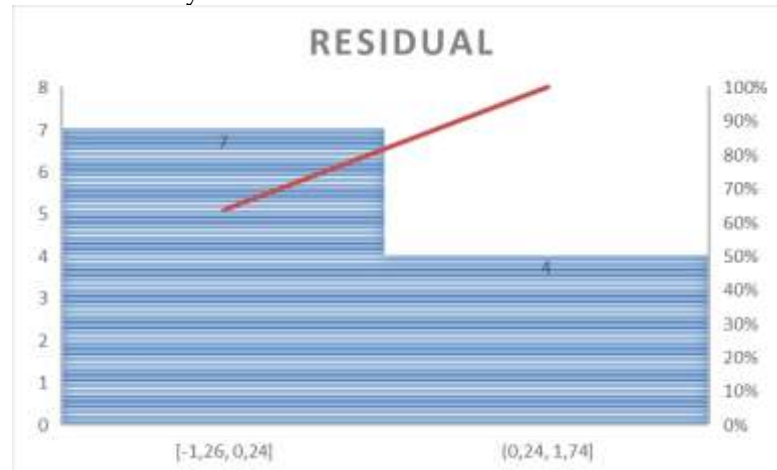


Figure 3. Residual Result

Based on the residual histogram in Microsoft Excel, the residual distribution shows a pattern that approximates a normal curve. This suggests that the assumption of normality for residuals in the regression model is satisfied.

b. Autocorrelation Test

Table 2. Results of Autorelation Test with SPSS

Model	R	R Square	Adjusted R Square	Std. Error	Durbin-Watson
1	0,307	0,094	-0,007	1,031	0,61

Based on the Durbin-Watson test results in SPSS output, a value of 0.61 was obtained. This figure is less than 1.5, suggesting that there is a positive autocorrelation present in the regression model's residuals. This situation is typical as the research utilized time series data that had a restricted number of data points.

Simple Linear Regression Analysis

Table 3. Simple Linear Regression Model with SPSS

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	5,465	3,65		1,497	0,168
TPT	0,593	0,614	0,307	0,965	0,359

The regression model in this study is:

$$Y = 5,465 + 0,593x$$

Where every 1% increase in the Open Unemployment Rate, poverty increases by 0.593%.

Coefficient of Determination (R²)

The value of the coefficient of determination R² is 0.094, indicating that the Open Unemployment Rate accounts for 9.4% of the differences in poverty, with the remaining 90.6% attributed to various other influences.

F Test

Table 4. F Test with SPSS

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	0,991	1	0,991	0,932	0,359
Residual	9,566	9	1,063		
Total	10,557	10			

Based on the findings presented, the F-count is recorded at 0.932, and the significance value is 0.359. Since the significance value exceeds 0.05, it indicates that the model lacks significance.

T Test

The outcomes from the t-test reveal a computed t-value of 0.965 alongside a significance level of 0.359. This figure suggests that the rate of open unemployment does not significantly influence the poverty rate.

DISCUSSION

Following the findings from the study regarding how the Open Unemployment Rate affects the poverty rate in North Sumatra Province from 2015 to 2025, a straightforward linear regression formula was derived, which is:

$$Y = 5,465 + 0,593x$$

This equation indicates that there is a positive correlation between the open unemployment rate and the poverty rate. This indicates that a 1% rise in the open unemployment rate is projected to elevate the poverty rate by 0.593%.

A coefficient of determination (R²) of 0.094 shows that the Open Unemployment Rate variable can explain only 9.4% of the variation in poverty levels, with the rest being affected by other variables not included in the analysis. The results of the F-test indicate a significance value of 0.359, which is greater than 0.05, suggesting that the regression model lacks significance. Furthermore, the t-test findings suggest that the Open Unemployment Rate does not significantly influence poverty levels in North Sumatra Province.

Based on these results, it can be concluded that the open unemployment rate has a positive but insignificant relationship with the poverty rate in North Sumatra Province during the 2015–2025 period.

CONCLUSION AND RECOMMENDATION

Based on the empirical analysis, this study concludes that the Open Unemployment Rate (TPT) had a significant positive effect on the poverty level in North Sumatra Province from 2015 to 2025. A rise in unemployment directly restricts household income, thereby driving more individuals below the poverty line. This indicates that job scarcity remains one of the primary catalysts for poverty in the region over the past decade. Given that reducing unemployment alone may not drastically lower poverty, the government should shift focus toward improving the quality of existing jobs and implementing social safety nets. Recommendations include adjusting the provincial minimum wage (UMP) to better match living costs, controlling inflation on basic food items, and providing targeted subsidies for low-income workers to improve their purchasing power.

ADVANCED RESEARCH

Future researchers are suggested to expand the research model by incorporating other relevant macroeconomic or social variables, such as inflation rates, human development index (HDI), infrastructure development, or digital literacy, to provide a more comprehensive analysis of the factors driving poverty in North Sumatra.

REFERENCES

- Badan Pusat Statistik. (2024). Persentase penduduk miskin Provinsi Sumatera Utara tahun 2015–2025. Badan Pusat Statistik. <https://www.bps.go.id>.
- Badan Pusat Statistik. (2024). Tingkat pengangguran terbuka Provinsi Sumatera Utara tahun 2015–2025. Badan Pusat Statistik. <https://www.bps.go.id>.
- Fadillah, M., & Yusuf, A. (2022). Analisis pengaruh pengangguran dan inflasi terhadap tingkat kemiskinan. *Jurnal Ilmu Ekonomi*, 6(2), 101–110.
- Ghozali, I. (2018). Aplikasi analisis multivariate dengan program IBM SPSS (9th ed.). Badan Penerbit Universitas Diponegoro.
- Hidayat, T., & Rahman, F. (2023). Pengaruh pertumbuhan ekonomi dan pengangguran terhadap kemiskinan daerah. *Jurnal Ekonomi Regional*, 8(1), 55–64.
- Nasution, R., & Siregar, H. (2022). Analisis tingkat pengangguran terbuka terhadap kemiskinan di Sumatera Utara. *Jurnal Kajian Ekonomi dan Pembangunan*, 4(3), 77–86.
- Prasetyo, D., & Lestari, N. (2020). Analisis regresi linear sederhana pada faktor-faktor kemiskinan di Indonesia. *Jurnal Statistika Indonesia*, 12(2), 88–96.
- Siringoringo, Y. B. P. (2025). Analysis of Differences in Average Rainfall Between Regencies/Cities in Yogyakarta in 2022 Using ANOVA. *Journal of Mathematics Technology and Education*, 4(1), 123–127. <https://doi.org/10.32734/jomte.v4i1.22196>.