

THE EFFECT OF INFLATION, EDUCATION LEVEL, AND LABOR FORCE PARTICIPATION LEVEL ON POVERTY LEVEL IN NORTH SUMATRA PROVINCE

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Abstract

This study aims to analyze the effect of inflation, education level, and labor force participation rate on the poverty rate in North Sumatra Province during 2005–2024. The study uses secondary time-series data obtained from the Central Statistics Agency (BPS) of North Sumatra Province. The analytical method is multiple linear regression using EViews 13. The results show that inflation has a positive and significant effect on the poverty rate, while education level and labor force participation rate have negative and significant effects. Simultaneously, inflation, education level, and labor force participation rate significantly affect the poverty rate. The adjusted R-squared of 0.810563 indicates that 81.05 percent of the variation in poverty is explained by the three independent variables, while the remaining 18.95 percent is explained by other factors outside the model.

Keywords: Inflation, Education Level, Labor Force Participation Rate, Poverty Rate.

1. Introduction

Poverty is a key issue in development because it directly relates to a community's ability to meet basic needs and achieve prosperity. North Sumatra Province boasts significant natural resource potential and economic activity, yet still faces poverty. This situation makes poverty control a crucial component of regional development policy. In this study, the poverty rate is used as the dependent variable (Y), while inflation, education level, and labor force participation rate are the independent variables.

The development of the poverty rate in North Sumatra in the period 2019–2024 shows a downward trend, but not a linear one. The poverty rate was recorded at 8.83 percent in 2019, falling to 8.75 percent in 2020, then increasing to 9.01 percent in 2021. After that, the poverty rate fell again to 8.42 percent in 2022, 8.15 percent in 2023, and 7.99 percent in 2024. The increase in 2021 is related to the continued impact of the Covid-19 pandemic on economic activity, employment, and community income, while the subsequent decline occurred in line with economic recovery and improving labor market conditions.

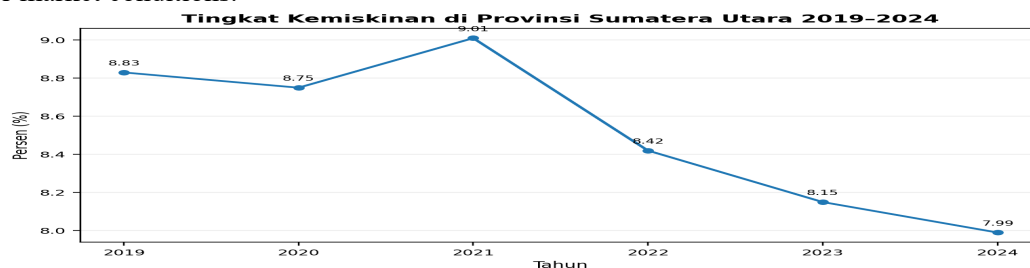


Figure 1. Poverty Rate in North Sumatra Province 2019–2024 (Percent)

Source: Central Statistics Agency of North Sumatra Province (2026), processed.

The first variable suspected of influencing poverty levels is inflation (X1). Inflation describes a general and continuous increase in the prices of goods and services. High inflation can reduce people's purchasing power, especially low-income households whose income is largely used to meet basic needs. Therefore, increasing inflation has the potential to increase poverty because people's real incomes decrease (Siregar et al., 2023).

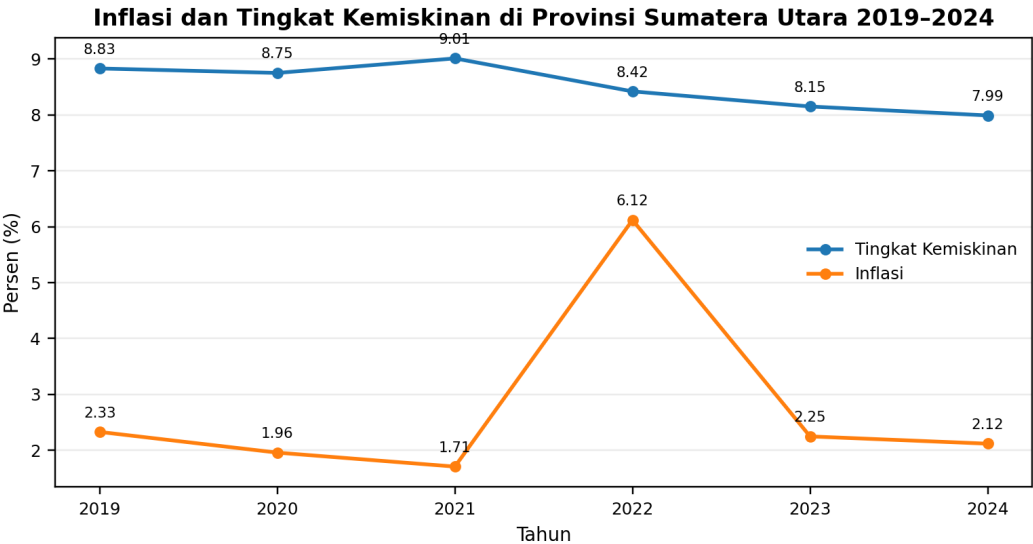


Figure 2. Inflation and Poverty Rate in North Sumatra Province 2019–2024 (Percent)

Source: Central Statistics Agency of North Sumatra Province (2026), processed.

Based on Figure 2, inflation in North Sumatra fluctuated quite sharply. Inflation, which was 2.33 percent in 2019, fell to 1.96 percent in 2020 and 1.71 percent in 2021. In 2022, inflation jumped to 6.12 percent, primarily related to increases in transportation and food prices and adjustments to subsidized fuel prices. In 2023 and 2024, inflation declined again to 2.25 percent and 2.12 percent, respectively. This phenomenon demonstrates that changes in inflation coincide with changes in poverty, therefore, its effect on Y needs to be empirically tested.

The second variable is education level (X2), which in this study is proxied by the School Participation Rate (APS) at the high school level or age group 16–18 years. This indicator was selected based on the role of secondary education in improving knowledge, skills, and readiness to enter the workforce. Higher educational participation rates, greater opportunities for the formation of productive human resources and obtaining better jobs and incomes, thus theoretically reducing poverty (Santika et al., 2023).

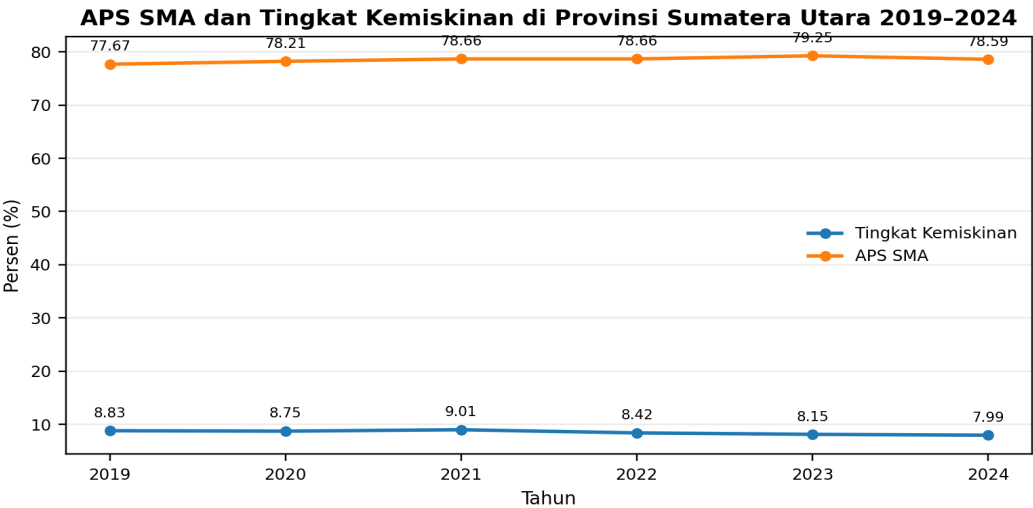


Figure 3. School Participation Rate (SMA) and Poverty Rate in North Sumatra Province 2019–2024 (Percent)

Source: Central Statistics Agency of North Sumatra Province (2026), processed.

Figure 3 shows that the APS for high school students increased from 77.67 percent in 2019 to 79.25 percent in 2023, then decreased slightly to 78.59 percent in 2024. At the same time, the poverty rate generally decreased despite an increase in 2021. This pattern provides an initial indication of a negative relationship between education and poverty, but this relationship still needs to be proven through statistical testing.

The third variable is the Labor Force Participation Rate (X3). The Labor Force Participation Rate (TPAK) indicates the proportion of the working-age population that is active in the labor market, either working or looking for work. A higher TPAK indicates that more people are involved in economic activities, thus increasing their opportunities to earn income. Therefore, an increase in the TPAK can theoretically help reduce poverty by increasing household income.

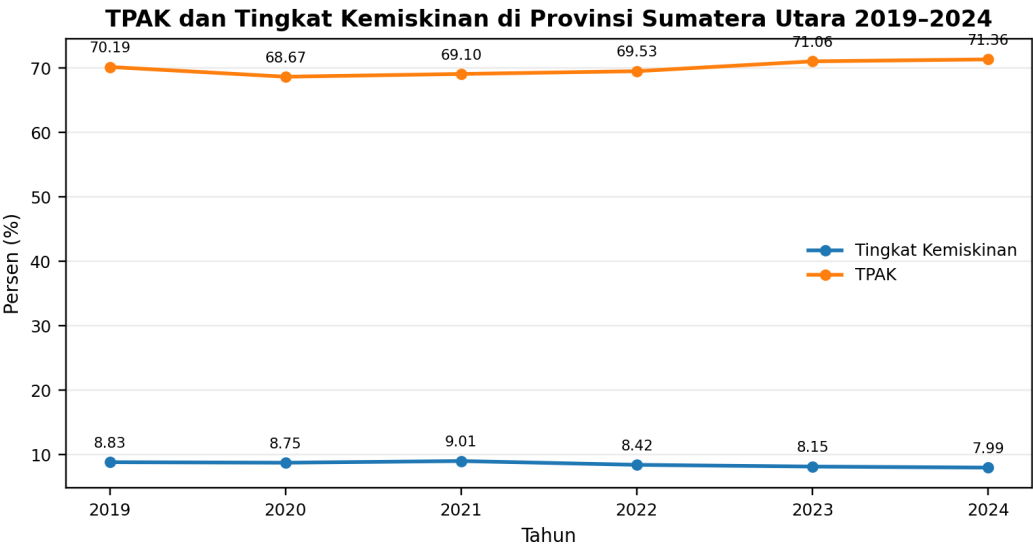


Figure 4. Labor Force Participation Rate and Poverty Rate in North Sumatra Province 2019–2024 (Percent)

Source: Central Statistics Agency of North Sumatra Province (2026), processed.

Figure 4 shows that the TPAK decreased from 70.19 percent in 2019 to 68.67 percent in 2020, then gradually increased to 71.36 percent in 2024. The decrease in 2020 was related to the Covid-19 pandemic, which reduced production activity and caused some companies to reduce their workforce. An interesting phenomenon is that while the TPAK decreased in 2020, the poverty rate also decreased to 8.75 percent. This discrepancy in the pattern indicates that the relationship between TPAK and poverty cannot be explained sufficiently through graphical observation alone and therefore requires regression analysis.

Based on the description, this study places inflation as X1, education level measured through APS SMA as X2, TPAK as X3, and poverty level as Y. The use of these three independent variables simultaneously is intended to see the influence of price stability factors, human resource quality, and population involvement in economic activities on poverty in North Sumatra. The study uses data from 2005–2024 to capture longer-term variations than the preliminary graph phenomenon of 2019–2024. This study is expected to provide an empirical basis for policies to control inflation, increase access to education, and expand employment opportunities as part of a poverty alleviation strategy.

2. Literature Review

2.1 Poverty Level

Poverty is a condition where an individual or group is unable to meet minimum living needs, including food and non-food items. The Statistics Indonesia (BPS) measures poverty using a basic needs approach, using the poverty line. In this study, the poverty rate is the percentage of the population living below the poverty line in North Sumatra Province.

2.2 Inflation

Inflation is a general and persistent increase in the price level of goods and services over a period of time. High inflation reduces purchasing power, especially for low-income groups. Keynesian theory explains that price increases

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that are not matched by increases in real income will suppress household consumption and reduce welfare (Meiriza et al., 2024). Based on this framework, inflation is estimated to have a positive effect on poverty.

2.3 Education Level

Human capital theory views education as an investment that increases knowledge, skills, productivity, and income-earning capacity. Better education increases the chances of finding better employment, thus theoretically reducing poverty. In this study, education level is proxied by the Senior High School Enrollment Rate (APS).

2.4 Labor Force Participation Rate

The TPAK is the ratio of the labor force to the working-age population. A high TPAK reflects a greater proportion of the working-age population actively engaged in economic activities. The greater the population's involvement in the labor market, the greater the opportunity to earn income, so the TPAK is estimated to have a negative impact on poverty.

2.5 Hypothesis

- Inflation (X1) has a positive and significant effect on the poverty rate (Y) in North Sumatra Province.
- Education level (X2) has a negative and significant effect on poverty level (Y) in North Sumatra Province.
- The labor force participation rate (X3) has a negative and significant effect on the poverty rate (Y) in North Sumatra Province.
- Inflation, education level, and labor force participation rate simultaneously have a significant effect on the poverty rate in North Sumatra Province.

3. Methods, Data, and Analysis

This study uses a quantitative approach with secondary data in the form of a time series for the years 2005–2024. The main data source is the Central Statistics Agency of North Sumatra Province. The dependent variable is the poverty rate (Y), while the independent variables consist of inflation (X1), education level proxied by the APS SMA (X2), and TPAK (X3). The analysis was conducted using multiple linear regression with the help of EViews 13.

The multiple linear regression model used can be formulated as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Model testing included tests for normality, multicollinearity, autocorrelation, and heteroscedasticity. Next, a t-test was conducted to determine partial effects, an F-test to determine simultaneous effects, and a coefficient of determination (R^2) to determine the model's ability to explain variations in poverty levels.

4. Results and Discussion

4.1 Statistics Descriptive

Variables	Mean	Maximum	Minimum	Std. Dev.
Inflation (X1)	5.6415	22,4100	1,2300	4.8812
High School APS (X2)	72.8865	79,2500	65,0900	5,5817
TPAK (X3)	69,3215	72,0900	65,9900	1,8041
Poverty (Y)	10,6145	15,6600	7,9900	2,1413

Table 1. Statistics Descriptive Variables Study

Source : EViews 13 data processing (2026).

During the 2005–2024 period, inflation averaged 5.6415 percent, with a maximum value of 22.41 percent and a minimum of 1.23 percent. The average APS for high school students was 72.8865 percent, the average TPAK was 69.3215 percent, and the average poverty rate was 10.6145 percent. The TPAK had the lowest standard deviation, indicating that its distribution was relatively more stable compared to other variables.

4.2 Assumption Test Classic

Testing	Results	Conclusion
Normality	probability > 0.05	Model meets assumptions normality
Multicollinearity	Centered VIF X1=1.411; X2=1.407; X3=1.016	There is no multicollinearity
Autocorrelation	Prob. LM F = 0.1493; Prob. Chi-Square = 0.0927	There is no autocorrelation
Heteroscedasticity	Prob. F = 0.2409; Prob. Chi-Square = 0.2270	There is no heteroscedasticity

Table 2. Summary of Assumption Tests Classic

Source : EViews 13 data processing (2026).

4.3 Multiple Linear Regression Results

Variables	Coefficient	t- Statistics	Probability
Constant	50.662780	5,868279	0.0000
Inflation (X1)	0.112683	2,165504	0.0458
High School APS (X2)	-0.273439	-6.016826	0.0000
TPAK (X3)	-0.299388	-2,506531	0.0234

Table 3. Multiple Linear Regression Results

Source : EViews 13 data processing (2026).

$$TK = 50.662780 + 0.112683 \text{ INF} - 0.273439 \text{ APS} - 0.299388 \text{ TPAK}$$

The inflation coefficient of 0.112683 indicates that a 1 percent increase in inflation, with other variables constant, is associated with a 0.112683 percent increase in the poverty rate. The SMA APS coefficient of -0.273439 indicates that a 1 percent increase in APS is associated with a 0.273439 percent decrease in the poverty rate. Meanwhile, the TPAK coefficient of -0.299388 indicates that a 1 percent increase in TPAK is associated with a 0.299388 percent decrease in the poverty rate.

4.4 Hypothesis Testing

Connection	t- Statistics	Prob.	Decision
Inflation (X1) → Poverty (Y)	2,165504	0.0458	Positive and significant
Education (X2) → Poverty (Y)	-6.016826	0.0000	Negative and significant
TPAK (X3) → Poverty (Y)	-2,506531	0.0234	Negative and significant

Table 4. Partial Test (t-Test)

Source : EViews 13 data processing (2026).

The t-test results show that inflation has a positive and significant effect on poverty levels, with a probability of 0.0458, which is less than 0.05. Education level has a negative and significant effect, with a probability of 0.0000, which is less than 0.05. The TPAK also has a negative and significant effect on poverty, with a probability of 0.0234.

F- statistic	F- table 5%	Probability	Information
28.09907	3.24	0.000001	Significant

Table 5. Simultaneous Test (F-Test)

Source: EViews 13 data processing (2026).

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The F-statistic value of 28.09907 is greater than the F-table of 3.24 and the probability of 0.000001 is less than 0.05. Thus, inflation, education level, and TPAK simultaneously have a significant effect on the poverty rate in North Sumatra Province.

Size	Mark
R-squared	0.840474
Adjusted R-squared	0.810563

Table 6. Coefficients Determination

Source : EViews 13 data processing (2026).

The adjusted R-squared value of 0.810563, or 81.05 percent, indicates that variations in poverty levels can be explained by inflation, education level, and the TPAK (Tax Allowance for Employment) by 81.05 percent. The remaining 18.95 percent is explained by other factors outside the research model.

4.5 Discussion

Inflation (X1) has a positive and significant effect on the poverty rate (Y). These results indicate that increases in the prices of goods and services that are not matched by increases in real income can reduce people's purchasing power. This impact is stronger in low-income households because the proportion of their expenditure on basic needs is relatively large. This finding aligns with Simanungkalit and Suharianto (2026), who found a positive relationship between inflation and poverty. Education level (X2) has a negative and significant effect on poverty levels. These results are consistent with human capital theory, which views education as an investment to increase productivity and income. The increase in the APS for high school students indicates that more people are receiving secondary education, thus increasing the long-term opportunities for entering better jobs. This finding aligns with research by Togatorop *et al.* (2024) and Tobing *et al.* (2023) regarding role education in lower poverty in North Sumatra.

TPAK (X3) has a negative and significant effect on poverty levels. The more working-age people are active in economic activities, the greater the opportunity to earn income to meet living needs. This finding aligns with Matondang *et al.* (2024) who showed that increasing labor force participation can reduce poverty by increasing income opportunities. Simultaneously, all three variables significantly influenced poverty. These results indicate that poverty alleviation cannot be achieved through a single policy. Controlling price stability must go hand in hand with improving the quality of education and expanding employment opportunities. This integrated approach is crucial because poverty is influenced by purchasing power, the quality of human resources, and people's access to sources of income.

5. Conclusion and Suggestions

5.1 Conclusion

- Inflation has a positive and significant impact on poverty levels in North Sumatra Province. Increasing inflation tends to reduce people's purchasing power and increase the risk of poverty.
- Education level, as measured by the APS for high school students, has a negative and significant effect on poverty levels. Increasing educational participation has the potential to increase opportunities for employment and better income.
- TPAK has a negative and significant effect on poverty levels. Increasing the involvement of the working-age population in economic activities increases opportunities for earning income.
- Inflation, education level, and TPAK simultaneously have a significant effect on poverty levels. The model has an adjusted R-squared of 81.05 percent.

5.2 Suggestions

- The North Sumatra Provincial Government together with Bank Indonesia and TPID need to strengthen inflation control, especially the price of basic necessities, through distribution supervision, maintaining supply, and inter-agency coordination.
- Increasing access to and the quality of secondary education needs to be continued so that more people can acquire skills that support productivity and job opportunities.
- Employment policies need to be directed at job creation, skills training, and improving the quality of the workforce so that community economic participation can increase.

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- Further research can consider other variables outside the model, considering that 18.95 percent of the variation in poverty has not been explained by the three research variables.

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