

International Journal for Advanced Research

Journal homepage: <https://journal.outlinepublisher.com/index.php/ijar>

Research Article

The Effect of Unemployment and Poverty Rates on the Human Development Index in North Sumatra from 2013–2024

Sabrina Erisa Aulia Sihotang¹, Khairunnisa Umi Al Mas², Dwi Atika Zahara³, Siti Mardiah⁴

^{1,2,3,4}Universitas Negeri Medan, Indonesia

*Correspondence: mardiahalummedan@gmail.com

Keywords:

Human Development Index, Unemployment, Poverty, Economic Development, Welfare.

Abstract

This study analyzed the effect of unemployment and poverty on the Human Development Index in North Sumatra Province. Human development reflects the quality of life of the population through the dimensions of education, health, and a decent standard of living. However, socio-economic problems such as unemployment and poverty may influence the achievement of human development. This research employed a quantitative approach using secondary time-series data from 2013 to 2024 obtained from official publications of the Central Statistics Agency. Multiple linear regression analysis was used to examine the relationship between unemployment, poverty, and the Human Development Index. The results showed that the regression model had strong explanatory power with an Adjusted R Square value of 0.850, indicating that unemployment and poverty explained 85% of the variation in the Human Development Index. The simultaneous test showed a significant effect with an F value of 26.595 and a significance level of 0.001. Partially, unemployment did not have a significant effect on the Human Development Index with a significance value of 0.210. In contrast, poverty had a negative and significant effect with a regression coefficient of -2.594 and a significance value of 0.000. These findings indicated that poverty played a major role in determining the level of human development. Therefore, poverty reduction and improved access to education and health services are essential strategies for enhancing human development.

INTRODUCTION

Economic development is one of the efforts undertaken by the government to improve public welfare and the quality of human resources. The success of development is not only measured by economic growth but also by the ability of a country or region to improve the quality of life of its people. One of the indicators commonly used to measure the quality of human development is the Human Development Index (HDI). The HDI reflects the level of community welfare through three main dimensions: health, education, and a decent standard of living. Therefore, an increase in the HDI value is an important indicator in assessing the success of development in a region.

In the development process, various social and economic factors can influence the achievement of human development. One factor that often receives attention is the unemployment rate. A high unemployment rate can reduce people's opportunities to earn income, which in turn affects their ability to meet basic needs such as education and health. (Kasnelly & Wardiah, 2021) explain that unemployment and poverty have an influence on the Human Development Index because limited employment opportunities can affect community welfare and the quality of life of the population.

In addition to unemployment, poverty is also one of the main problems in economic development. Poverty describes a condition in which people are unable to meet basic needs such as food, education, healthcare, and adequate housing. High poverty rates can limit people's access to education and health services, which consequently affects the quality of human resources. This condition indicates that poverty and unemployment are closely related to the quality of human development in a region (Kasnelly & Wardiah, 2021).

The phenomena of unemployment and poverty remain major challenges in Indonesia's economic development. Based on data from Statistics Indonesia (BPS), the percentage of poor people in Indonesia in September 2024 was recorded at 8.57 percent, or approximately 24.06 million people, while the open unemployment rate remained around 4–5 percent. This condition indicates that although economic development continues to progress, the issues of poverty and unemployment remain important challenges in improving public welfare. Unemployment and the Human Development Index are related to the level of poverty in a region (Wahyu, 2024).

Furthermore, research conducted by (Suci et al., 2023) shows that economic factors such as economic growth, education, unemployment, and the Human Development Index influence poverty levels. This indicates that economic conditions and human development are closely related to the level of community welfare (Suci et al., 2023). Therefore, the issues of unemployment and poverty are important factors that need to be considered in efforts to improve the quality of human development.

Several previous studies have examined the relationship between unemployment, poverty, and human development. However, most studies tend to position the Human Development Index as a variable that influences poverty, while studies that analyze the simultaneous effect of unemployment and poverty on the Human Development Index are still relatively limited. Therefore, the novelty of this research lies in analyzing the simultaneous effect of unemployment and poverty on the Human Development Index, which is expected to provide a more comprehensive understanding of the economic factors influencing the quality of human development.

Based on the background, problems, and phenomena described above, the objective of this study is to analyze the effect of unemployment and poverty on the Human Development Index (HDI).

METHOD

This study employs a quantitative approach using secondary data in the form of time series data covering the period 2013–2024. The data were obtained from official publications of the Badan Pusat Statistik (BPS) of North Sumatra Province. The analytical method used in this study is multiple linear regression analysis to determine the direction and magnitude of the influence of unemployment and poverty rates on the Human Development Index (HDI). The data processing and analysis were conducted using IBM SPSS Statistics version 25.

Prior to performing the regression analysis, classical assumption tests were conducted to ensure that the regression model meets the criteria of the Best Linear Unbiased Estimator (BLUE). The classical assumption tests include the normality test to examine whether the residuals are normally distributed, the multicollinearity test to identify the presence of high correlations among independent variables, the heteroscedasticity test to

ensure that the residual variance is constant, and the autocorrelation test to determine whether there is a correlation among error terms across time periods.

After the regression model satisfies the classical assumptions, hypothesis testing is conducted. The statistical hypothesis tests consist of the t-test (partial test) to examine the individual effect of each independent variable on the dependent variable and the F-test (simultaneous test) to determine the joint effect of the independent variables on the dependent variable. In addition, the coefficient of determination (R^2) is used to measure the extent to which variations in the Human Development Index (HDI) can be explained by the unemployment and poverty variables.

RESULTS AND DISCUSSION

Result

A. Classical Assumption Tests

Normality Test

The normality test is conducted to determine whether the residuals of a regression model are normally distributed or not. Residuals represent the difference between the actual values and the values predicted by the regression model. This test is important because a normal distribution of residuals is one of the assumptions required for a regression model to produce reliable estimates.

The decision criteria in the normality test are as follows:

- a. If the value of Asymp. Sig. (2-tailed) > 0.05 , then the residuals are considered to be normally distributed, so H_0 is accepted.
- b. If the value of Asymp. Sig. (2-tailed) ≤ 0.05 , then the residuals are not normally distributed, so H_0 is rejected.

Table 1. Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		10
Normal Parameters ^{a,b}	Mean	0E-7
	Std. Deviation	.70867033
Most Extreme Differences	Absolute	.188
	Positive	.178
	Negative	-.188
Kolmogorov-Smirnov Z		.594
Asymp. Sig. (2-tailed)		.872
a. Test distribution is Normal.		
b. Calculated from data.		

Source : Output SPSS 25

The results of the Kolmogorov–Smirnov test show an Asymp. Sig. value of 0.872, which is above the significance level of 0.05. Therefore, it can be concluded that the data are normally distributed, indicating that the normality assumption in the regression model has been satisfied.

Heteroskedasticity Test

The heteroskedasticity test is conducted to determine whether there is inequality in the variance of the residuals across observations in the regression model. A good regression model is one that does not experience heteroskedasticity, meaning that the variance of the residuals remains constant from one observation to another. The decision criteria are based on the significance value (Sig). If the significance value is greater than 0.05, it can be concluded that the regression model does not experience heteroskedasticity, whereas a significance value less than 0.05 indicates the presence of heteroskedasticity.

The criteria for decision-making are as follows:

If the significance value (Sig) > 0.05, then the null hypothesis (H₀) is accepted, which means that no indication of heteroskedasticity is found.

Table 2. Heteroskedasticity Test

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.126	6.017		-.021	.984
	Pengangguran	.556	1.030	.229	.540	.606
	Kemiskinan	-.497	.656	-.321	-.758	.473

a. Dependent Variable: LN_RES

Source : Output SPSS 25

Based on the test results obtained, the unemployment variable has a significance value of 0.606, while the poverty variable has a significance value of 0.473. Both variables have significance values greater than 0.05.

It can be concluded that the independent variables in the regression model do not indicate the presence of heteroskedasticity. This shows that the heteroskedasticity assumption in the research model has been satisfied, so the regression model can be used for further analysis.

Autocorrelation Test

Autocorrelation is a condition in which there is a relationship between the residual values of one observation and the residuals of other observations in a linear regression model. This situation indicates that the error terms are not independent across observations. Autocorrelation can affect the accuracy of a regression model because it causes the variance of the regression coefficients to become less efficient, thereby reducing the model's ability to explain the relationships among variables.

The autocorrelation test is conducted using the Durbin–Watson (DW) test. The Durbin–Watson value ranges from 0 to 4 with the following interpretation criteria: a DW value close to 2 indicates that the regression model

does not experience autocorrelation, a DW value less than 2 indicates the presence of positive autocorrelation, while a DW value greater than 2 indicates the presence of negative autocorrelation.

Table 3. Autocorrelation Test

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.940 ^a	.884	.850	.80356	1.317
a. Predictors: (Constant), Kemiskinan, Pengangguran					
b. Dependent Variable: IPM					

Source : Output SPSS 25

Based on the test results, the Durbin–Watson value obtained is 1.168. This value lies between the lower bound (dL) and the upper bound (dU), namely $1.3197 < 1.168 < 2.6803$. Based on these criteria, it can be concluded that there is an indication of relatively weak positive autocorrelation.

B. Multiple Regression Test

Coefficient of Determination

The coefficient of determination is used to measure the extent to which the regression model can explain the variation in the dependent variable. The value of the coefficient of determination (R^2) ranges from 0 to 1. A value closer to 1 indicates a greater ability of the independent variables to explain the dependent variable, while a value closer to 0 indicates that the ability of the independent variables to explain the dependent variable is relatively limited.

Table 3 Coefficient of Determination

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.940 ^a	.884	.850	.80356
a. Predictors: (Constant), Kemiskinan, Pengangguran				

Based on the test results in the Model Summary table, the Adjusted R Square value obtained is 0.850. This value indicates that the unemployment and poverty variables simultaneously are able to explain the variation in the Human Development Index (HDI) variable by 85.0%. This suggests that the regression model used has a fairly strong explanatory power in describing the relationship between the independent variables and the dependent variable in this study.

Meanwhile, the remaining 15.0% is explained by other factors outside the research model that were not included in this study. Therefore, it can be said that the regression model used in this research has a fairly good level of ability in explaining the variation in HDI through the unemployment and poverty variables.

F-Test

The F-test is used to determine whether the independent variables simultaneously or jointly have an effect on the dependent variable. In this study, the F-test is conducted to examine whether the unemployment and poverty variables together influence the Human Development Index (HDI). The test is performed using a significance level of 0.05. If the significance value is less than 0.05, then the independent variables simultaneously have a significant effect on the dependent variable.

Table 4. F-Test

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.345	2	17.173	26.595	.001 ^b
	Residual	4.520	7	.646		
	Total	38.865	9			
a. Dependent Variable: IPM						
b. Predictors: (Constant), Kemiskinan, Pengangguran						

Based on the test results in the ANOVA table, it is known that the calculated F-value is 26.595 with a significance value of 0.001. This significance value is below the significance level of 0.05 ($0.001 < 0.05$). This indicates that the unemployment and poverty variables simultaneously have a significant effect on the Human Development Index (HDI).

These results show that the regression model used in this study is able to describe the relationship between the independent variables and the dependent variable simultaneously. Therefore, the research hypothesis stating that unemployment and poverty affect the HDI simultaneously can be accepted.

Simple Linear Regression Test

Simple linear regression analysis is a statistical technique used to analyze the relationship between one independent variable (X) and one dependent variable (Y). This method is used to determine the direction and magnitude of the influence of the independent variable on the dependent variable. Through this analysis, it can be identified how changes occur in the dependent variable when the independent variable increases or decreases.

Table 5. Simple Linear Regression Test

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	90.747	3.477		26.100	.000
	Pengangguran	.820	.595	.208	1.379	.210
	Kemiskinan	-2.594	.379	-1.031	-6.841	.000
a. Dependent Variable: IPM						

Source : Output SPSS 25

In the B column, the constant value is 90.747, the regression coefficient for unemployment is 0.820, and the regression coefficient for poverty is -2.594.

Thus, the regression equation obtained is as follows:

$$\text{HDI} = 90.747 + 0.820X_1 - 2.594X_2$$

Where:

X_1 = Unemployment

X_2 = Poverty

Y = Human Development Index (HDI)

Meaning of the Regression Equation

a) Constant value of 90.747

This means that if the unemployment and poverty variables are equal to zero or assumed to be constant, the value of the Human Development Index (HDI) is 90.747.

b) Regression coefficient of unemployment = 0.820

This means that every increase in unemployment by 1 unit, assuming other variables remain constant, will increase the HDI by 0.820 units.

c) Regression coefficient of poverty = -2.594

This means that every increase in poverty by 1 unit, assuming other variables remain constant, will decrease the HDI by 2.594 units. The negative coefficient indicates that the higher the poverty rate, the lower the HDI tends to be.

Significance Test (Partial Hypothesis Test)

a) Hypothesis 1: Unemployment on HDI

The calculated t-value is 1.379 with a significance value of 0.210. Since the significance value is greater than 0.05 ($0.210 > 0.05$), H_0 is accepted and H_1 is rejected. Therefore, it can be concluded that unemployment does not have a significant effect on HDI.

b) Hypothesis 2: Poverty on HDI

The calculated t-value is -6.841 with a significance value of 0.000. Since the significance value is less than 0.05 ($0.000 < 0.05$), H_0 is rejected and H_1 is accepted. Therefore, it can be concluded that poverty has a significant effect on HDI.

DISCUSSION

Based on the results of the multiple linear regression analysis, the Adjusted R Square value is 0.850, indicating that the variables of unemployment and poverty are able to explain 85% of the variation in the Human Development Index (HDI). This finding suggests that the socio-economic conditions of society play an important role in determining the level of human development in a region. In general, the Human Development Index is an indicator that reflects the quality of life of a population through three main dimensions: education, health, and a decent standard of living.

The results of the F-test show that unemployment and poverty simultaneously have a significant effect on HDI, with a significance value of 0.001. This finding indicates that both variables collectively influence the level of human development. This condition is consistent with the study conducted by (Kasnelly & Wardiah, 2021), which states that economic factors such as unemployment and poverty are closely related to the quality of life of society. Regions with better economic welfare tend to have broader access to education and health services, which contributes to higher Human Development Index values.

However, partially, the results of the study indicate that the unemployment variable does not have a significant effect on HDI. This result suggests that changes in the unemployment rate do not directly influence changes in HDI during the period of the study. This finding is in line with the research conducted by (Sholikhah & Djohan, 2025), who found that unemployment does not significantly affect HDI in Samarinda City. Their study indicates that fluctuations in the unemployment rate do not directly influence improvements or declines in the quality of human development. This may occur because some members of the community still earn income from the informal sector, enabling them to meet basic needs such as education and health services even though they are not recorded as part of the formal workforce.

In contrast to the unemployment variable, the results of this study show that poverty has a negative and significant effect on HDI, with a regression coefficient of -2.594 . This indicates that an increase in the poverty rate will reduce the value of the Human Development Index. This result is consistent with the study conducted by (Nugraha et al., 2025), which found that poverty has a negative and significant impact on HDI in Indonesia because limited household income can hinder access to education and health services, thereby affecting the quality of human development.

These findings are also consistent with reports from the United Nations Development Programme, which state that regions with higher levels of poverty tend to have lower HDI values due to limited access to basic services such as education, healthcare, and other social facilities. Furthermore, reports from the World Bank indicate that poverty can hinder household investment in education and health, which in turn leads to lower human resource quality. This condition ultimately affects the level of human development in a region (Friedman & Hill, 2022). Therefore, the results of this study indicate that improving the quality of human development does not only depend on job creation but also requires policies that focus on poverty reduction and improving public access to education and healthcare services.

Conclusion

This study concluded that unemployment and poverty simultaneously influenced the Human Development Index in North Sumatra Province, indicating that socio-economic conditions play an important role in determining the level of human development. However, partially, unemployment did not have a significant effect on the Human Development Index during the study period, suggesting that fluctuations in unemployment levels did not directly affect the improvement or decline of human development. In contrast,

poverty had a negative and significant influence on the Human Development Index, which means that higher poverty levels tend to reduce people's access to education, healthcare, and other basic needs that are essential for improving the quality of life. Therefore, improving human development requires not only efforts to expand employment opportunities but also effective policies focused on poverty reduction and improving access to education and health services to enhance overall community welfare.

References

- Adim, A. (2024). Pengaruh Kemiskinan dan Pengangguran Terhadap Indeks Pembangunan Manusia (IPM) Indonesia 2018-. *Jurnal of Administrative Science*, 5(2), 111–129.
- Friedman, J., & Hill, R. (2022). Correcting Course:poverty and shared prosperity 2022. In *Word Bank* (pp. 1–25).
- Kasnelly, S., & Wardiah, J. (2021). Pengaruh Tingkat Pengangguran Dan Tingkat Kemiskinan Terhadap Indeks Pembangunan Manusia Di Indonesia. *Jurnal Ekonomi Syariah*, 4(2), 44–54.
- Made, N., & Resmarani, N. (2023). *The Effect of Economic Growth , Unemployment Rate and Human Development Index on Poverty Rate in North Jakarta*. 2(3), 871–880.
- Nugraha, G., Rahayu, S. D., & Sukarso, A. (2025). Kemiskinan Dan Partisipasi Tenaga Kerja : Tantangan Dalam Meningkatkan Indeks Pembangunan Manusia Di Indonesia. *Jurnal Ilmiah Mea (Manajemen, Ekonomi, Dan Akuntansi)*, 9(1), 1287–1303.
- Ramdani, A. A., Nisa, A. Z., & Rachmawati, Y. C. (2025). Pengaruh Indeks Pembangunan Manusia (IPM), Kemiskinan dan Pengangguran Terhadap Pertumbuhan Ekonomi di Provinsi Jawa Timur. *Jurnal Cendekia Ilmiah*, 4(2), 3222–3235.
- Sholikhah, F. N., & Djohan, S. (2025). Pengaruh Jumlah Pengangguran dan Jumlah Penduduk Miskin terhadap Indeks Pembangunan Manusia di Kota Samarinda The Effect of the Number of Unemployed and the Number of Poor Population on the Human Development Index in Samarinda City. *Jurnal Ekonomi Dan Manajemen*, 22(3), 300–310.
- Suci, L. E., Addainuri, M. I., & Abidin, M. (2023). The Effect Of Economic Growth , Education , Unemployment , And Human Development Index On Poverty In The Special Region Of Yogyakarta For Period 2015-2021. *Jurnal Ilmu Ekonomi Terapan*, 8(2), 284–296. <https://doi.org/10.20473/jiet.v8.i2.51028>
- Udeaja, C., Trillo, C., Awuah, K. G. B., Makore, B. C. N., Patel, D. A., Mansuri, L. E., & Jha, K. N. (2020). Urban Heritage Conservation and Rapid Urbanization : Insights from Surat , India. *Sustainability*, 12(2172), 1–26.
- Wahyu, P. A. W. (2024). Pengaruh Pengangguran Dan Indeks Pembangunan Manusia Terhadap Kemiskinan Di Provinsi Jawa Timur. *Jurnal Akuntansi Dan Ekonomi*, 9(3), 13–21. <https://doi.org/10.29407/jae.v9i3.23494>