Does the Human Development Index and Poverty Influence Economic Growth in Indonesia? A Panel Approach

Zaharatun Wara[1], Siti Mainizar[1], Nurul Husaini[1], Nashrillah Nashrillah[1*], Muhammad Saleh[1], Srinita Srinita[1]

[1]Faculty of Economics and Business, Universitas Syiah Kuala, Indonesia
*Corresponding: nashrillah_fe@usk.ac.id

Article Info
Keywords:
Human Development Index
Poverty
Economic growth

Abstract
Economic growth is a crucial component in assessing the success of a country's development, especially for developing countries such as Indonesia. This study investigates the causal relationship between the Human Development Index (HDI), the number of poor people, and Indonesia's economic growth for the 2020–2024 period. We used panel data covering the relevant variables obtained from the Central Statistics Agency (BPS). Our results show that the HDI has a positive and significant effect on economic growth, while the number of poor people has no significant effect. These findings indicate that improving the quality of human resources is essential for promoting sustainable economic growth in Indonesia.

Received: 16 March 2026 *Revision: 13 April 2026* *Accepted: 1 May 2026*

Introduction

Economic growth is a fundamental indicator reflecting a country's capacity to enhance welfare, expand production, and strengthen its overall development performance. In the context of Indonesia, achieving sustainable economic growth remains a challenge due to persistent disparities in human capital quality and socio-economic structures across regions. The Human Development Index (HDI), which captures key dimensions of education, health, and income, plays a pivotal role in shaping labor productivity and economic performance (Gahari & Hasmarini, 2024). Moreover, HDI is closely linked to welfare distribution and inequality, indicating that improvements in human development contribute not only to economic expansion but also to broader social outcomes (Abdullah, 2024). These arguments underscore the critical importance of investing in human capital as a foundation for long-term economic progress (Nurcholifah & Ashar, 2024).

On the other hand, poverty remains a major structural constraint on economic development. Limited access to education, healthcare, and productive assets reduces individuals' capacity to participate effectively in economic activities, thereby constraining aggregate productivity (Harimurti, 2023). At the macro level, poverty and unemployment are often associated with slower economic growth, suggesting that socio-economic vulnerabilities can weaken national economic performance (Yusnuri & Abubakar, 2023). However, the relationship between poverty and economic growth is not uniform across regions. Variations in demographic composition, labor market dynamics, and regional development capacity lead to heterogeneous outcomes within Indonesia (Kasih & Yefriza, 2025). Furthermore, prior studies emphasize the interdependence between

poverty and human development, highlighting their joint influence on long-term economic performance (Syofya, 2018).

Despite a growing body of literature, empirical evidence on the relationship between HDI, poverty, and economic growth in Indonesia remains inconclusive. Several studies find that improvements in HDI significantly promote economic growth, particularly at the provincial level (Pisana et al., 2024). In contrast, other studies report variations in both the magnitude and direction of this relationship due to differences in regional economic structures and institutional conditions (Damara et al., 2025). Similarly, the impact of poverty on economic growth appears to be time-varying, reflecting changes in Indonesia's macroeconomic environment and development policies (Mayaguez et al., 2024). These inconsistencies highlight the need for updated empirical analysis that captures recent economic dynamics.

Therefore, this study aims to examine the influence of the Human Development Index and the number of people living in poverty on economic growth in Indonesia over the period 2020–2024. Specifically, this study addresses the following research questions: Does the Human Development Index significantly affect economic growth in Indonesia? Does poverty have a significant impact on economic growth? By addressing these questions, this study contributes to the literature by providing updated empirical evidence and offering policy-relevant insights into the role of human development and poverty in achieving sustainable economic growth.

Method

This study employs panel data consisting of 34 provinces in Indonesia over the period 2020–2024, combining both cross-sectional and time-series dimensions to provide a more comprehensive analysis. All data used in this study are obtained from the Central Statistics Agency (BPS), ensuring consistency, reliability, and comparability across provinces and years. The dependent variable is economic growth, proxied by Gross Domestic Product (GDP), which serves as a key indicator of regional economic performance and development success. The main independent variable is the Human Development Index (HDI), which reflects the quality of human capital through its three core dimensions: health, education, and standard of living. In addition, poverty (POV), measured by the number of people living below the poverty line, is included as another independent variable, given its role as a structural constraint that may hinder economic activity and productivity. The empirical model is specified as follows:

$$GDP_{i,t} = \delta_0 + \delta_1 HDI_{i,t} + \delta_2 POV_{i,t} + \varepsilon_{i,t}$$

Where i denotes the province and t represents the time period. The term ε captures the error component, which includes omitted variables and random disturbances.

For the estimation strategy, this study utilizes panel data regression techniques, which offer several advantages over purely cross-sectional or time-series approaches,

including increased degrees of freedom, reduced multicollinearity, and improved efficiency of parameter estimates. To determine the most appropriate model specification, a series of model selection tests are conducted. First, the Chow Test is applied to compare the Common Effect Model (CEM) and the Fixed Effect Model (FEM). The results reject the null hypothesis, indicating that the FEM is more appropriate than the pooled model. Subsequently, the Hausman Test is employed to choose between the Fixed Effect Model and the Random Effect Model (REM). The test results also reject the null hypothesis, confirming that the FEM is the preferred model.

Result and Discussion

Panel models require prior testing to select the Fixed Effect Model (FEM) or Random Effect Model (REM). The results of the model selection test are shown in Table 1. The results of the Chow test on the panel data model show the Cross-Section Chi-Square value is 1147.266833 with a p-value of 0.0000. Both values are far below common significance levels ($\alpha = 0.05$ or 0.01). This indicates that H0 is rejected, leading to the conclusion that the Fixed Effect Model (FEM) is more appropriate than the Common Effect Model (CEM). In other words, there are significant differences across cross-sections (such as provinces, districts/cities, or other observed units), meaning that individual effects must be accounted for in the model. Therefore, the next step is to proceed with the analysis using the Fixed Effect Model, or to conduct a further test—namely the Hausman Test—to determine whether the best model is Fixed Effect or Random Effect. Overall, the Chow Test results confirm that the Common Effect approach is not suitable for the data in this study, and that incorporating individual effects is necessary to produce more accurate and reliable estimation results.

Tabel 1. Panel testing

Test	Chi-sq. stat	Prob.	Conclusion
Chow test	1147.266	0.000	FEM
Hausman test	9.205	0.010	FEM

Source: Eviews output (2025).

Tabel 2. FEM estimation

Variables	Coefficient	Std. error	t-stat	Prob.
Constant	5.676208	0.650999	8.719233	0.0000
HDI	0.036919	0.008773	-4.208052	0.0000
POV	-0.003787	0.003902	-0.970652	0.3335

Source: Eviews output (2025). R-square: 0.999. Adj.R-squared: 0.998. F-stat: 3942.28 (0.000)

The Hausman test results for the panel data model show that the Chi-Square Statistic is 9.205422 with a p-value of 0.0100, which is below the common significance level of 0.05. This indicates that H0 is rejected, leading to the conclusion that the Fixed Effect Model (FEM) is more appropriate than the Random Effect Model (REM). Thus, the independent variables in this study are better analyzed by accounting for differences in

characteristics across cross-sections, as individual effects are significant and cannot be ignored. These Hausman test results reinforce the earlier conclusion from the Chow test, confirming that the Fixed Effect Model is the most suitable and accurate model to use in this research.

Based on Table 2, the panel data estimation using the Fixed Effect Model (FEM) reveals that the Human Development Index (HDI) has a negative and statistically significant effect on gross domestic product (GDP). This is indicated by a coefficient of –0.036919 and a p-value of 0.0000, which is well below conventional significance thresholds. Substantively, this implies that a one-unit increase in HDI is associated with a increase in GDP of approximately 0.036 units, ceteris paribus. This finding contrasts with the majority of empirical studies, which generally report a positive contribution of human development to economic growth (Gahari & Hasmarini, 2024; Nurcholifah & Ashar, 2024). A plausible explanation for this inverse relationship is that improvements in HDI may require substantial short-term public investment in education and health, which can temporarily constrain economic output before generating long-term growth benefits. In contrast, the poverty variable (POV) exhibits a negative coefficient (–0.003787) but does not have a statistically significant effect on GDP, as reflected by its p-value of 0.3335, which exceeds the 10% significance level. This suggests that, within the observed period, poverty does not exert a direct influence on economic growth. This result is consistent with studies highlighting that the impact of poverty on growth is often indirect and context-dependent, varying across regions and economic structures (Kasih & Yefriza, 2025; Mayaguez et al., 2024).

Policy and Implication

This study examines the relationship between the Human Development Index (HDI), poverty, and economic growth in Indonesia over the period 2020–2024 using panel data analysis. The estimation results, based on the Fixed Effect Model (FEM) selected through the Chow and Hausman tests, indicate that HDI has a positive and statistically significant effect on economic growth. This finding confirms that improvements in human capital enhance labor productivity and economic efficiency, which in turn stimulate regional economic performance. In contrast, poverty does not exhibit a statistically significant effect on economic growth within the observed period, suggesting that its influence may be indirect or mediated through other socio-economic variables such as employment, inequality, and human capital accumulation.

These findings imply that human development plays a fundamental role in driving sustainable economic growth in Indonesia. Regions with higher levels of HDI are better equipped to generate productive economic activities, adopt technological advancements, and attract investment, thereby reinforcing long-term growth trajectories. From a policy perspective, this underscores the importance of prioritizing investments in human capital, particularly through improving access to quality education, strengthening healthcare systems, and enhancing income opportunities. Such investments not only increase individual capabilities but also contribute to broader economic resilience and competitiveness.

Furthermore, although poverty does not show a direct and significant impact on economic growth in this model, it remains a critical issue that cannot be overlooked. The absence of a direct effect may indicate that poverty reduction alone is insufficient to stimulate economic growth unless accompanied by structural improvements in human development and labor market conditions. Therefore, poverty alleviation policies should be designed in an integrated manner, focusing not only on income support but also on expanding access to education, healthcare, and productive employment opportunities. In the long run, a balanced strategy that simultaneously promotes human development and reduces poverty is essential to achieve inclusive, equitable, and sustainable economic growth in Indonesia.

Conflict Interest: The authors declare no conflict of interest.

Reference

Abdullah, M. G. W. (2024). *The effect of human development index (HDI), inequality and consumption on poverty levels in all provinces in Indonesia*. Jurnal Ilmu Ekonomi Terapan, 9(2), 257–269. https://doi.org/10.20473/jiet.v9i2./59249

Damara, M. D., Noer, M. R., Ananda, B., Sitohang, C. E., & Silaban, P. S. M. J. (2025). *Influence of poverty and HDI on economic growth through unemployment in Sulawesi, 2011–2023*. JEB (Jurnal Ekonomi & Bisnis), 21(1), 136–142. https://doi.org/10.26618/jeb.v21i1./18628

Gahari, R. R. M., & Hasmarini, M. I. (2024). *Do foreign investment, human development index, labor, and poverty influence economic growth in Indonesia?* Journal of Economics Research and Policy Studies, 4(2), 134–145. https://doi.org/10.53088/jerps.v4i2./1034

Harimurti, R. S. D. (2023). *Analisis Pengaruh Dana Desa, IPM, dan Jumlah Masyarakat Miskin Pedesaan Terhadap Pertumbuhan Ekonomi Indonesia*. Jurnal Ilmu Ekonomi (JIE), 7(03), 405-418. https://doi.org/10.22219/jie.v7i03./27055

Kasih, V. D. A., & Yefriza, Y. (2025). *Pengaruh jumlah penduduk, Indeks Pembangunan Manusia, upah minimum provinsi, dan pertumbuhan ekonomi terhadap tingkat kemiskinan di Pulau Sumatera*. Jesya: Jurnal Ekonomi dan Ekonomi Syariah, 8(1), 276–286. https://doi.org/10.36778/jesya.v8i1.1858

Mayaguez, H., Kurniawan, M. K., & Setyanto, A. R. (2024). *Pengaruh indeks pembangunan manusia, tingkat pengangguran dan kemiskinan terhadap pertumbuhan ekonomi Indonesia (2014-2023)*. Salam: Islamic Economics Journal, 5(1), DOI:10.24042/slm.v5i1./23284

Nurcholifah, I., & Ashar, K. (2024). *Pengaruh komponen Indeks Pembangunan Manusia terhadap pertumbuhan ekonomi dan tingkat kemiskinan di Indonesia*. Journal of Development Economic and Social Studies, 3(4), 1166–1180. https://doi.org/10.21776/jdess.2024.03.4./151167

Pisana, A., Qamaruddin, M. Y., & Badewi, M. H. (2024). *The influence of poverty and the human development index (HDI) on economic growth in South Sulawesi Province*. In

Proceedings of the 1st International Conference of Business, Education, Health and SciEn-Tech (ICBENS) (Vol. 1, No. 1, pp. 748-754). Universitas Muhammadiyah Palopo. https://journal.conference.umpalopo.ac.id/index.php/icbens/article/view/81/97

Syofya, H. (2018). Pengaruh tingkat kemiskinan dan pertumbuhan ekonomi terhadap indeks pembangunan manusia Indonesia. *Jurnal Ilmiah Ekonomi dan Bisnis*, 15(2), 177-185. https://journal.unilak.ac.id/index.php/JIEB/article/view/1153/1221

Yusnuri, R. A., & Abubakar, J. (2023). *Analysis of human development index, unemployment and poverty on economic growth in Indonesia*. *International Journal of Social Science, Educational Economics, Agriculture Research and Technology (IJSET)*, 2(8), 346–358. DOI:10.54443/ijset.v2i8.190