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Analyzing The Role Of Stunting, Life Expectancy, And Education On Indonesia's Economic Growth (2016-2023)

Saka Tri Andiko Bowo
sakatb21@gmail.com
Universitas Negeri Jakarta

Abstract:
This study aims to analyze the effect of stunting, life expectancy, and education level on economic growth in Indonesia. A quantitative approach was used, employing secondary data obtained from the Central Bureau of Statistics (BPS) and the Ministry of Health of the Republic of Indonesia. The analysis was conducted using linear panel data regression with EViews version 12. The total number of observations was 272. The data passed the classical assumption tests. The model estimation applied the random effects approach, along with hypothesis testing and coefficient of determination analysis. The results indicate that stunting has a positive and significant effect on economic growth, with a probability value of 0.0000 < 0.05 and a t-statistic of 5.099009, life expectancy has a positive and significant effect on economic growth, with a probability value of 0.0278 < 0.05 and a t-statistic of 2.217053, education level does not have a significant effect on economic growth, with a probability value of 0.1946 > 0.05 and a t-statistic of 1.301530. Simultaneously, the three variables significantly influence economic growth in Indonesia for the period 2016–2023, with a probability value of 0.000013 < 0.05 and an F-statistic of 8.993459.

Keywords: Stunting, Life Expectancy, Education Level, Economic Growth, Panel Data Regression, Classical Assumption, Indonesia.

BACKGROUND

Economic growth is a central indicator used to measure the success of a country's development. However, the acceleration of economic growth cannot be separated from the role of human capital quality as a key driver of economic activities. In this context, investment in health and education becomes a fundamental factor influencing human capital development. A lower stunting rate, a higher life expectancy, and greater access to quality education are widely recognized as crucial foundations for achieving inclusive and sustainable economic growth. Therefore, a study that explores the relationship between these three human development indicators and economic growth is highly relevant in addressing Indonesia’s long-term development challenges.

This study focuses on three main variables stunting rate, life expectancy, and education level and analyzes their relationship with national economic growth in Indonesia during the period of 2016–2023. The scope of this research is macroeconomic in nature, employing a quantitative approach using secondary data sourced from Statistics Indonesia (BPS) and the Ministry of Health. The study not only examines the linear relationships between variables but also considers the potential simultaneous and interdependent effects of human development factors on economic performance. This focus is crucial to produce more targeted public

policies, such as the current initiatives involving free school lunches and early childhood education programs.

Previous studies have provided significant insights into these relationships. (Sari et al., 2020) found that stunting negatively affects long-term economic potential, with a one-way causal relationship from stunting to economic slowdown. Meanwhile, (Sirag et al., 2020) observed a non-linear relationship between life expectancy and economic growth, where the positive impact of increasing life expectancy may diminish beyond a certain threshold. (Deng, 2024) emphasized the role of education in promoting economic growth, although its impact may vary depending on a country's economic readiness. While these studies contribute valuable conceptual insights, there remains a research gap regarding empirical studies that examine the simultaneous impact of these three human development variables on economic growth, particularly in the context of contemporary Indonesia.

This research aims to address this gap by providing a novel contribution through a time-series quantitative approach based on data from 2016 to 2023. The study not only assesses the individual impact of each variable but also investigates their simultaneous contribution to economic growth. Theoretically, this study expands the understanding of human development–driven growth models, while practically, its findings are expected to offer empirical evidence to inform more holistic and sustainable government policy especially in support of the Indonesia Vision 2045. As such, this research serves as a valuable reference for evidence-based decision-making in the fields of economic and social development.

This study aims to analyze the influence of stunting levels, life expectancy, and education level on economic growth in Indonesia during the period 2016–2023. The proposed hypotheses are as follows: H1, stunting levels affect economic growth; H2, life expectancy affects economic growth; H3, education level affects economic growth; and H4, stunting levels, life expectancy, and education level collectively influence economic growth. Theoretically, this research contributes to the development of economic growth theory, particularly regarding the role of human capital factors in fostering economic development in Indonesia. Practically, the findings are expected to serve as a reference for policymakers in formulating more inclusive and evidence-based development policies.

THEORETICAL FRAMEWORK

This study uses a quantitative approach based on secondary data to investigate the influence of stunting rates, life expectancy, and education levels on economic growth in Indonesia. This study emphasizes measurable variables analyzed using statistical techniques, specifically panel data linear regression. Data were collected through the Central Statistics Agency (BPS) and the Ministry of Health of the Republic of Indonesia.

Stunting

Stunting has emerged as a significant determinant in shaping long-term economic outcomes, particularly in developing countries. According to (Ningsih & Ekaputri, 2024), countries with high stunting rates tend to experience slower economic growth due to the declining competitiveness of their workforce and the rising burden of public healthcare expenditures.

. Supporting this, (Suryana et al., 2023) estimate that stunting could lead to an economic loss of up to 11% of Indonesia's GDP and reduce adult wages by 20%. (Sari et al., 2020) further

reveal a one-way causal relationship in which stunting contributes to long-term economic stagnation. These findings underline the macroeconomic implications of child undernutrition, which hampers human capital formation and productivity at scale.

Moreover, various studies highlight the microeconomic consequences of stunting on individual earnings and labor market performance. (McGovern et al., 2017) show that individuals who experienced stunting during childhood tend to earn significantly less as adults, with every additional centimeter in height associated with a 4% wage increase for men and 6% for women. Similarly, (Yendra et al., 2023) assert that improving nutritional status can enhance future workforce quality and promote economic growth. (Alfiah, 2019) supports this perspective by demonstrating that higher education levels are associated with lower stunting rates, suggesting a cyclical relationship between education, nutrition, and macroeconomic development. These studies collectively advocate for investments in early childhood nutrition as a strategy to stimulate long-term economic productivity.

Life expectancy

Life expectancy, as another key indicator of human development, also exhibits complex interactions with economic growth. (Dedat et al., 2021) provide evidence that increased life expectancy positively contributes to economic expansion, particularly in developing nations. (Dedat et al., 2021) also refutes the hypothesis that longer life spans may hinder economic growth, arguing instead that healthier, longer-living populations support workforce continuity and productivity. (Kustanto, 2021) confirms this in the Indonesian context, noting that higher life expectancy correlated with lower stunting rates—contributes to long-term economic growth by as much as 0.57%.

However, not all studies present a uniformly positive outlook. (Sirag et al., 2020) describe the relationship between life expectancy and economic growth as nonlinear, indicating that the benefits of longevity may plateau or even reverse beyond a certain threshold. This is echoed by (Okunade & Osmani, 2020), who find a small but negative effect of life expectancy on economic growth under specific conditions. In a more localized study, (Utari Swastika & Arifin, 2023) observe a significant negative relationship between life expectancy and economic growth in Jakarta from 2016 to 2022. These findings suggest that while life expectancy generally supports economic development, contextual factors such as healthcare costs and aging population dynamics must also be considered.

Education

Education has long been recognized as a catalyst for economic progress. (Saputra & Hamarini, 2019) demonstrate that education significantly contributes to economic growth in Central Java, while (Yanti et al., 2020) highlight the dual benefit of education in reducing unemployment and stimulating economic activity. (Pal, 2023) reinforces these conclusions, indicating that education impacts multiple sectors agriculture, manufacturing, and household income thereby supporting structural transformation. (Bah, 2023), through a cross-country analysis, finds that a 0.1 increase in the education index boosts real GDP per capita growth by 0.8 percentage points, with a stronger effect in low- and middle-income countries.

Further, the qualitative aspects of education particularly secondary and tertiary education are shown to have a more substantial economic impact. (Deng, 2024) notes that investment in education must be aligned with a country's economic structure, as fiscal constraints may affect education spending. (Siddique et al., 2018) similarly argue that secondary and higher education levels significantly drive economic growth in middle-income

countries, while basic education shows limited impact. (Ogunbadejo & Kanwanye, 2020) find that in Nigeria, secondary and tertiary education positively influence economic performance, whereas primary education does not. (Akasumbawa et al., 2021) also confirm the positive influence of education and life expectancy on growth in highly populated countries, reinforcing the notion that improving the depth and quality of human capital is essential for sustainable development.

Conceptual Definition of Variables

Economic growth refers to the increased economic activity of a country, marked by a rise in the production of goods and services over time. It is commonly measured using National Income and year-over-year comparisons (Hasan et al., 2022); (Dende Rukmana et al., 2023).

Stunting is a condition of impaired growth due to chronic malnutrition, especially during the first 1,000 days of life, and is indicated by a child's height being below the age standard (Stellarosa et al., 2023). It reflects long-term nutritional deficiencies.

Life Expectancy (LE) serves as a key indicator of public health, representing the average years a newborn is expected to live. Differences in LE across regions reflect variations in local quality of life (Ginting & Lubis, 2023); (Febiola et al., 2024).

Education is a systematic process of shaping thoughts, skills, and character, occurring both formally and informally. It enables individuals to maximize their potential and contribute to society (Karyati & Julia, 2021).

Previous Research

- The study by (Suryana et al., 2023), titled The Potential of Economic Loss Due to Stunting in Indonesia, highlights the substantial impact of stunting on national economic growth. Stunting not only reduces labor productivity but also contributes to potential economic losses amounting to 11% of Indonesia's GDP and decreases adult workers' income by up to 20%.
- (Utari Swastika & Arifin, 2023), in their study titled The Influence of Average Years of Schooling, Life Expectancy, and Per Capita Expenditure on Economic Growth in Jakarta, found that life expectancy has a negative and significant effect on economic growth in Jakarta during the 2016–2022 period. This suggests that rising life expectancy in the region has not been accompanied by proportional increases in economic productivity.
- In the study conducted by (Saputra & Hamarini, 2019), titled The Influence of Labor, Education Level, and Government Expenditure on Economic Growth in Central Java (2011–2015), it was found that education level has a positive and significant effect on economic growth. This indicates that improving education quality contributes to higher economic output in the region.

Through this research, the findings are expected to contribute to addressing the gaps found in previous studies. This study not only examines the individual effects of each variable on economic growth but also analyzes their simultaneous influence at the national level using provincial panel data over a significant time span (2016–2023). Therefore, this research is anticipated to enrich the existing literature in the field of development economics, particularly regarding the role of human capital factors such as stunting, life expectancy, and education in driving economic growth in Indonesia.

Operational Definitions and Measurement Scales

Each variable in this study was operationalized using several indicators:

- Economic growth in this study is measured by the annual percentage change in Gross Domestic Product (GDP), using secondary data from national or international economic institutions.
- Stunting is measured by the height-for-age index (H/A) with a Z-score below -2 SD according to WHO standards, based on data from the Ministry of Health.
- Life Expectancy (LE) is measured by the average estimated life span of the population per year, using secondary data from Statistics Indonesia (BPS).
- Education is measured by the average years of schooling (AYS) per province, categorized into basic, secondary, and higher education levels.

METHOD

This study examines the influence of stunting levels, life expectancy, and education on economic growth in Indonesia from 2016 to 2023. It involves four variables: Economic Growth (Y), Stunting Levels (X1), Life Expectancy (X2), and Education (X3). The study is conducted in 34 provincial regions across Indonesia, selected because Indonesia is a developing country facing challenges in human resource quality and economic growth. Therefore, this research is significant in exploring the long-term impacts of stunting, life expectancy, and education factors on economic growth.

This research focuses on analyzing the effects of Stunting Levels (X1), Life Expectancy (X2), and Education (X3) on Economic Growth (Y) in Indonesia. The data used are secondary data, which refers to data that have been previously collected and published by official agencies (Sugiyono, 2021). In this study, secondary data was obtained from the websites of the Indonesian Central Statistics Agency (BPS) and the Ministry of Health of the Republic of Indonesia, presented annually.

Data Collection

The data used in this study are secondary data obtained from the Central Statistics Agency (BPS) and the Ministry of Health. Prior to analysis, the data were tested for classical assumptions (normality, multicollinearity, and heteroscedasticity) and panel data regression model estimation using Eviews version 12. Data collection was conducted independently, taking data from the Central Statistics Agency (BPS) and the Ministry of Health.

Unit of Analysis, Population, and Sample

This study covers the influence of stunting rates, life expectancy, and education levels on economic growth in Indonesia from 2016 to 2024. In this study, there are four variables: Economic Growth (Y), Stunting Rate (X1), Life Expectancy (X2), and Education Level (X3). This study was conducted in 34 provinces in Indonesia, which were selected because Indonesia is a developing country with challenges in human resource quality and economic growth. Therefore, this research is important to examine the influence of stunting rates, life expectancy, and education on long-term economic growth.

Multiple Linear Regression Analysis

Panel data linear regression is used to test the effect of two or more independent variables on one dependent variable. The purpose is to provide answers to research questions regarding the interaction of multiple independent variables with the dependent variable. Before running regression analysis, it is necessary to first conduct classical assumption tests to ensure

the model is unbiased. The systematic formulation of the panel data regression equation is as follows: $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$

Panel Data Regression Model Estimation

There are three main approaches for operating panel data:

1. Common Effect Model (CEM)
   This model combines all time series and cross-sectional data into a single whole, without accounting for individual differences among research objects.
2. Fixed Effect Model (FEM)
   This model considers the possibility of omitted variables, which may result in different intercepts across cross-section or time series units. Therefore, it introduces dummy variables to address these intercept changes.
3. Random Effect Model (REM)
   This model applies the Generalized Least Squares (GLS) approach, considering random variability in cross-sections and time series to improve estimation efficiency.

Model Specification Tests

To determine the best model for the research, several model specification tests are conducted:

1. Chow Test: Used to determine whether the Fixed Effect Model is better than the Common Effect Model.
2. Hausman Test: Used to compare the Fixed Effect Model with the Random Effect Model.
3. Lagrange Multiplier (LM) Test: Used when the Chow Test suggests using the Common Effect Model, to decide whether the Random Effect Model is more suitable than the Common Effect Model.

Classical Assumption Tests

These tests are conducted to ensure that the regression model meets the basic linear regression assumptions and provides unbiased estimations. The tests include:

1. Normality Assumption
   The normality test assesses whether the data distribution in a variable is normally distributed.
   - If probability value < 0.05, the data is not normally distributed.
   - If probability value > 0.05, the data is normally distributed.
2. Multicollinearity Assumption
   This test checks whether there is high or perfect correlation among independent variables in the model.
   - Tested using the Variance Inflation Factor (VIF).
   - If centered VIF > 10, reject H_0 and accept H_1 → multicollinearity exists.
   - If centered VIF < 10, accept H_0 and reject H_1 → no multicollinearity.
3. Autocorrelation Assumption
   This test checks whether residuals are dependent across observations.
   - Uses the Breusch-Godfrey LM Test.
   - If p-value Obs*R-squared < 0.05, reject H_0 → autocorrelation exists.
   - If p-value Obs*R-squared > 0.05, accept H_0 → no autocorrelation.
4. Heteroskedasticity Test
   This test examines whether residual variances are unequal across observations.

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- Uses the Glejser Test.
- If p-value < 0.05, reject H_0 → heteroskedasticity exists.
- If p-value > 0.05, accept H_0 → no heteroskedasticity (homoskedasticity present).

Hypothesis Testing

Hypothesis testing evaluates the relationship between independent and dependent variables, both individually and simultaneously:

1. Partial Test (t-test)
   Used to assess the individual significance of each independent variable.
   - If p-value < 0.05, reject H_0 → the independent variable has a significant effect.
   - Hypotheses:
     a. H_0: No significant effect
     b. H_1: Significant effect exists

2. Simultaneous Test (F-test)
   Used to assess the collective significance of all independent variables.
   - Based on Prob(F-statistic) in EViews.
   - If Prob(F-statistic) < 0.05, reject H_0 → all independent variables significantly affect the dependent variable simultaneously.
   - Hypotheses:
     a. H_0: No significant simultaneous effect
     b. H_1: Significant simultaneous effect exists

Coefficient of Determination Test

The coefficient of determination (R^2) explains the degree to which the dependent variable's variation can be explained by the independent variables.

- R^2 ranges from 0 to 1.
- The closer the value is to 1, the better the model explains the dependent variable's variation.

RESULT

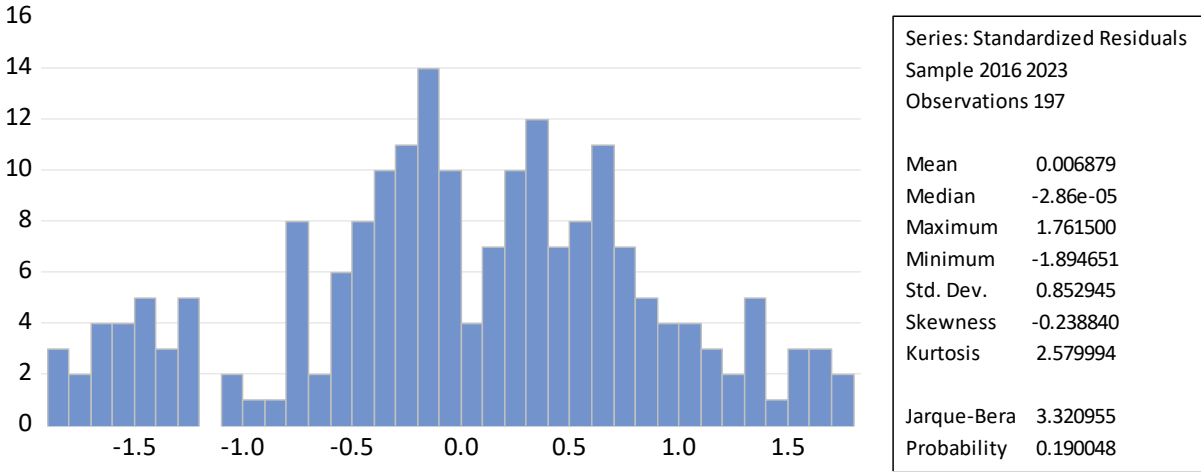
Descriptive Data

	Stunting	Life Expectancy	Education	Economic growth
Mean	26.75239	69.95074	8.554743	4.382353
Maximum	43.82000	75.12000	11.45000	22.94000
Minimum	7.200000	64.31000	6.150000	-15.74000
Std. Dev.	6.458171	2.551521	0.962522	3.692152
Observations	272	272	272	272

The stunting rate variable has a minimum value of 7.20 and a maximum of 43.82, with a mean of 26.75 and a standard deviation of 6.46, indicating a small data distribution because the standard deviation is lower than the mean. The life expectancy variable has a minimum value of 64.31 and a maximum of 75.12, with a mean of 69.95 and a standard deviation of 2.55, which also indicates a small data distribution. The education level variable has a minimum value of 6.15 and a maximum of 11.45, with a mean of 8.55 and a standard deviation of 0.96,

which indicates a relatively small data distribution. Meanwhile, the economic growth variable has a minimum value of -15.74 and a maximum of 22.94, with a mean of 4.38 and a standard deviation of 3.69, which also indicates that the data has a small distribution. Overall, all variables in this study have a fairly homogeneous data distribution with a spread that is not too wide.

Classical Assumption Tests

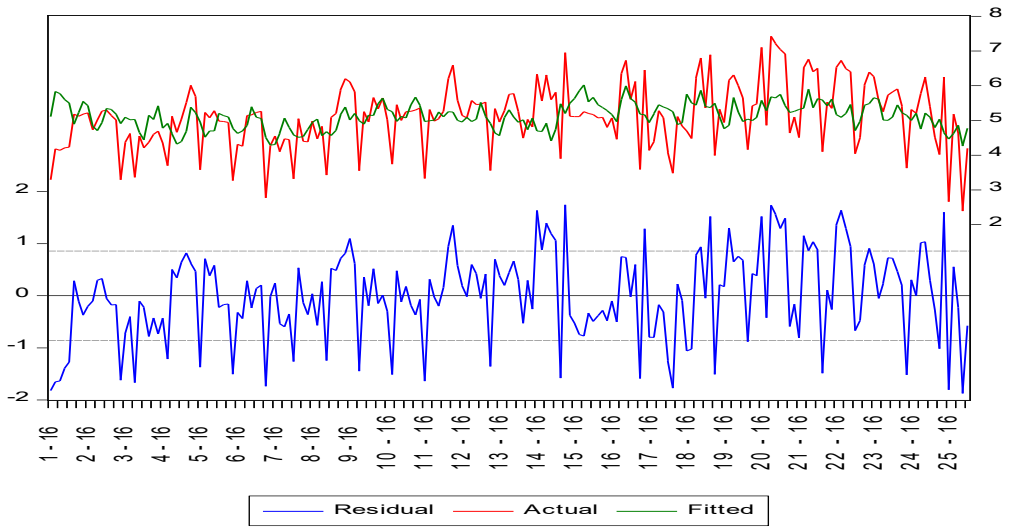


The results of the JB Test normality test after cleaning outlier data produced a probability value or p-value of 0.190048 > 0.05, so H0 is accepted or the residual value is normally distributed. It can be concluded with a 95% confidence level that the error term or residual value is normally distributed.

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	5.561500	1484.170	NA
Tingkat Stunting	0.000162	31.71858	1.705797
Angka Harapan Hidup	0.000928	1220.746	1.509724
Tingkat Pendidikan	0.005355	106.2657	1.337223

The results of the multicollinearity test can be seen in table 4.3. Based on this display, it can be seen that the centered VIF value is lower than 10, so the null hypothesis (H0) is accepted and the alternative hypothesis (H1) is rejected, so it can be concluded that there is no multicollinearity problem.

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The results of the heteroscedasticity test show that the residual values do not form a specific pattern; in other words, the residuals tend to be constant, thus concluding that the heteroscedasticity test is met.

Another method used to test for heteroscedasticity in this study is the Glejser test. If the probability of each independent variable is >0.05, it can be concluded that heteroscedasticity does not occur in the regression model.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.546023	1.404326	1.100901	0.2723
Tingkat Stunting	0.006661	0.007573	0.879570	0.3802
Angka Harapan Hidup	-0.016163	0.018145	-0.890763	0.3742
Tingkat Pendidikan	0.010727	0.043576	0.246165	0.8058

By using the Glejser method in the heteroscedasticity test, it can be concluded that this regression model is free from heteroscedasticity because the variables Stunting Level, Life Expectancy and Education Level have sig values of 0.3802, 0.3742 and 0.8058 respectively, which are greater than 0.05.

R-squared	0.122649	Mean dependent var	2.895475
Adjusted R-squared	0.109011	S.D. dependent var	0.810786
S.E. of regression	0.773812	Sum squared resid	115.5655
F-statistic	8.993459	Durbin-Watson stat	1.905634
Prob(F-statistic)	0.000013		

Based on the autocorrelation test results presented in Table 4.8, the Durbin-Watson (DW) statistic value is 1.905634. This value is in the range of -2 to +2, which is generally considered a safe limit for detecting the presence of autocorrelation in a regression model. Referring to the rule of thumb, if the DW value is close to 2, it can be concluded that there is no autocorrelation, or the correlation between one residual and another in the time series is

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insignificant. In this context, the DW value of 1.905634 is very close to 2, indicating that the residuals in the regression model are independent or uncorrelated.

Panel Data Regression Selection

Redundant Fixed Effects Tests
Equation: EQ01
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.759654	(24,169)	0.0001
Cross-section Chi-square	65.142441	24	0.0000

Chow Test. The results of the redundant fixed effect or likelihood ratio for this model have a probability value greater than Alpha (0.05), so H0 is rejected and H1 is accepted, the appropriate model from these results is the fixed effect (because the probability value is 0.0001 < 0.05).

Correlated Random Effects - Hausman Test
Equation: EQ01
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.563964	3	0.9046

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
X1	0.068622	0.073527	0.000103	0.6287
X2	0.092925	0.091872	0.003032	0.9847
X3	0.068663	0.112961	0.004070	0.4874

Chi Square Hitung (Hausman Test)	Sign	Chi-Square Tabel	Kesimpulan
0.563964	<	5,991	Ho is rejected, so the model chosen is Random Effect

Hausman Test. Ultimately, the Hausman statistical test indicates that the most appropriate model for modeling the panel data in this study is the Random Effects approach.

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Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	19.54239 (0.0000)	0.415167 (0.5194)	19.95756 (0.0000)
Honda	4.420678 (0.0000)	-0.644334 (0.7403)	2.670278 (0.0038)
King-Wu	4.420678 (0.0000)	-0.644334 (0.7403)	1.537596 (0.0621)
Standardized Honda	5.064571 (0.0000)	-0.443601 (0.6713)	-1.115252 (0.8676)
Standardized King-Wu	5.064571 (0.0000)	-0.443601 (0.6713)	-1.824370 (0.9660)
Gourieroux, et al.	--	--	19.54239 (0.0000)

Lagrange multiplier (LM) test. The output above shows that the Breusch-Pagan Prob. (BP) value is 0.0000 (in the third column, "Both"). According to the hypothesis, if BP Prob. (0.0000 < 0.05), then H1 is accepted. In other words, the appropriate model is the Random Effects Model.

Based on pairwise testing of the three panel data regression models, it can be concluded that the random effects model in panel data regression used further in this study is:

No	Metode	Pengujian	Hasil
1	Chow Test	Common Effect Vs Fixed Effect	Fixed Effect
2	Hausman Test	Fixed Effect Vs Random Effect	random effect
3	Lagrange Multiplier	Common Effect Vs Random Effect	random effect

Hypothesis Testing

The coefficient of determination (R2) essentially measures the model's ability to explain the dependent variable. An R2 (R-square) value close to one indicates that the independent variable provides nearly all the information needed to predict the variation in the dependent variable. Therefore, the results of the coefficient of determination calculation are presented in the following table:

R-squared	**0.122649**
Adjusted R-squared	**0.109011**

Based on the calculation results above, it can be seen that the influence of the independent variables on the dependent variable, Economic Growth, is evident from the

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Adjusted R-Squared value of 0.109011 or 10.9011%. This indicates that 10.9011% of Economic Growth can be explained by variations in all independent variables, namely Stunting Rate, Life Expectancy, and Education Level. Meanwhile, the remaining 100% - 10.9011% = 89.0989% is explained by other independent variables not studied.

F-Statistic	8.993459
Prob(F-Statistic)	0.000013

Based on the results above, it can be seen that the F-Statistic = 8.993459 > 2.650 (FTable) and has an F-Statistic probability value of 0.000013 < 0.05. So the model used is suitable to explain the influence of the variables Stunting Level, Life Expectancy and Education Level on the variable Economic Growth. It can be concluded that Stunting, Life Expectancy and Education have a significant effect on Economic Growth.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.237320	3.116575	-1.359608	0.1755
Tingkat Stunting	0.073527	0.014420	5.099009	0.0000
Angka Harapan Hidup	0.091872	0.041439	2.217053	0.0278
Tingkat Pendidikan	0.112961	0.086791	1.301530	0.1946

Based on the t-test at α = 5% in the table above, the probability value for the Stunting Rate variable is 0.0000, or less than 0.05, and it can be concluded that the Stunting Rate significantly influences Economic Growth. The t-table value at an alpha of 0.05 (two-tailed) is 1.972, while the calculated t-value is 5.099009 (positive), thus H1 is accepted. Therefore, it can be concluded that the Stunting Rate has a positive and significant effect on Economic Growth in 34 provinces in Indonesia for the period 2016–2023.

Based on the t-test at α = 5% in the table above, the probability value for the Life Expectancy variable is 0.0278, or less than 0.05, and it can be concluded that Life Expectancy significantly influences Economic Growth. Based on the t-table value at an alpha of 0.05 (two-tailed), it is 1.972, while the calculated t-value is 2.217053 (positive), thus H1 is accepted. Therefore, it can be concluded that Life Expectancy has a positive and significant effect on Economic Growth in 34 Indonesian provinces from 2016 to 2023.

Based on the t-test at α = 5% in the table above, the probability value for the Education Level variable is 0.1946, or greater than 0.05. Therefore, it can be concluded that Education Level does not have a significant effect on Economic Growth.

DISCUSSION

The Influence of Stunting Rate on Economic Growth

Based on the t-test results, the probability value for the Stunting Rate variable is 0.0000, which is less than 0.05. This indicates that the Stunting Rate has a statistically significant effect on Economic Growth. Referring to the t-table at a 0.05 significance level (two-tailed), the critical value is 1.972, while the calculated t-value is 5.099009 (positive). Therefore, H_1 is accepted. Thus, it can be concluded that the Stunting Rate has a positive and significant impact on Economic Growth across 34 provinces in Indonesia during the period 2016–2023.

The Influence of Life Expectancy on Economic Growth

Based on the t-test at a 5% significance level, the probability value for the Life Expectancy variable is 0.0278, which is less than 0.05. This means that Life Expectancy has a significant effect on Economic Growth. The critical t-value at a 0.05 level (two-tailed) is 1.972, and the calculated t-value is 2.217053 (positive). Therefore, H_2 is accepted. It can be concluded that Life Expectancy has a positive and significant effect on Economic Growth in the 34 provinces of Indonesia during the 2016–2023 period.

The Influence of Education Level on Economic Growth

Based on the t-test results at the 5% significance level, the probability value for the Education Level variable is 0.1946, which is greater than 0.05, and the calculated t-value is 1.301530, which is less than the t-table value of 1.972. Statistically, this indicates that the variable is not significant and therefore cannot be concluded to affect Economic Growth. Although the regression coefficient suggests a positive relationship, due to the lack of statistical significance, this relationship cannot be considered as evidence of a real influence of Education Level on Economic Growth in the 34 Indonesian provinces over the period 2016–2023.

The Influence of Stunting Rate, Life Expectancy, and Education Level on Economic Growth

Based on the F-test at a 5% significance level, the probability value of the F-statistic is 0.000013, which is less than 0.05. This indicates that the independent variables collectively have a significant effect on the dependent variable. Furthermore, the calculated F-statistic value of 8.993459 is greater than the F-table value of 2.650. Therefore, it can be concluded that Stunting Rate, Life Expectancy, and Education Level jointly have a significant effect on Economic Growth, and H_4 is accepted.

CONCLUSION

Based on the results of statistical tests, it is known that the stunting rate has a positive and significant effect on economic growth in 34 provinces in Indonesia in the period 2016–2023, with a significance value of 0.0000 (<0.05) and a t-count of 5.099009 (> t-table 1.972). Life expectancy also shows a positive and significant effect on economic growth, with a significance value of 0.0278 (<0.05) and a t-count of 2.217053 (> t-table), which indicates that the higher the life expectancy, the greater the potential contribution of the population to the economy. However, the level of education does not have a significant effect on economic growth, as evidenced by a significance value of 0.1946 (>0.05) and a t-count of 1.301530 (<t-table), which indicates that increasing education has not had a real direct impact on economic growth during the study period. However, the results of the F test show that simultaneously the three variables, namely stunting rate, life expectancy, and education level, have a significant effect on economic growth, with an F-statistic value of 8.993459 and a probability of 0.000013 (<0.05), which means that the combination of the three contributes to variations in economic growth in Indonesia.

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