

The Influence of Economic Growth, Socio-Economics and Food Security on the Incidence of Stunting in Toddlers in Indonesia

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ABSTRACT

This study aims to analyze the influence of economic growth, socio-economic factors (expected years of schooling and poverty), and food security on the incidence of stunting among toddlers across 34 provinces in Indonesia. A quantitative method was applied using panel data regression for the 2018-2024 period, with the Fixed Effect Model (FEM) selected as the most appropriate estimation approach. The results indicate that economic growth, expected years of schooling, poverty, and food security simultaneously have a highly significant effect on the fluctuation of regional stunting rates. Partially, expected years of schooling and food security exhibit a negative and highly significant impact on reducing the prevalence of stunting. Poverty increases the risk of stunting, though its direct impact is cushioned by government interventions, rendering it insignificant at the 5% level. Furthermore, macroeconomic growth does not significantly reduce stunting, reflecting the issue of non-inclusive growth. In conclusion, interventions focusing on improving socio-economic conditions and food security are highly necessary and more effective in alleviating stunting than relying solely on aggregate macroeconomic growth, highlighting the need for a more even distribution of economic development.

ABSTRAK

Kata Kunci:

Pertumbuhan Ekonomi

Ketahanan Pangan

Stunting

Sosial Ekonomi

Penelitian ini bertujuan untuk menganalisis pengaruh pertumbuhan ekonomi, faktor sosial ekonomi (harapan lama sekolah dan kemiskinan), serta ketahanan pangan terhadap kejadian stunting pada balita di 34 provinsi di Indonesia. Penelitian ini menggunakan metode kuantitatif dengan analisis regresi data panel pada periode 2018-2024, di mana Fixed Effect Model (FEM) dipilih sebagai pendekatan estimasi yang paling sesuai. Hasil

penelitian menunjukkan bahwa pertumbuhan ekonomi, harapan lama sekolah, kemiskinan, dan ketahanan pangan secara simultan berpengaruh sangat signifikan terhadap fluktuasi angka stunting antardaerah. Secara parsial, harapan lama sekolah dan ketahanan pangan berpengaruh negatif dan sangat signifikan dalam menurunkan prevalensi stunting. Kemiskinan meningkatkan risiko terjadinya stunting, namun pengaruh langsungnya dapat diredam oleh berbagai intervensi pemerintah sehingga tidak signifikan pada taraf 5%. Sementara itu, pertumbuhan ekonomi secara makro tidak berpengaruh signifikan dalam menurunkan angka stunting, yang mencerminkan masih adanya permasalahan pertumbuhan ekonomi yang belum inklusif. Dengan demikian, upaya penanggulangan stunting akan lebih efektif apabila difokuskan pada peningkatan kondisi sosial ekonomi masyarakat dan penguatan ketahanan pangan dibandingkan hanya mengandalkan pertumbuhan ekonomi secara agregat. Temuan ini menegaskan pentingnya pemerataan hasil pembangunan ekonomi sebagai strategi utama dalam menurunkan prevalensi stunting di Indonesia

INTRODUCTION

In a country developing , including Indonesia, stunting or in short Children's height compared to age standards has become an important indicator of nutritional problems . chronic . Indonesia is facing Lots challenge in achieve the target of reducing stunting according to the Sustainable Development Goals (SDGs) 2030 because this country is one of the most stunted in the world. Stunting is not only cause disturbance physical and cognitive in people, but also inhibits potential the country's economy through decline productivity power future work (de Onis & Branca, 2016) . Interaction complex between factor economic , social and resilience food often causes stunting . For understand dynamics this , is required analysis comprehensive about How every factor contribute to the condition nutrition children in Indonesia. Stunting can hinder growth economy and productivity power Work . Evidence shown including the loss of 11% of GDP and the reduction income worker mature up to 20%. Stunting also worsens inequality that causes 10% decrease in total revenue lifelong live and give rise to gap intergenerational (Ministry of Health, 2022) c. WHO considers stunting as focus of the 2025 Global Nutrition Targets and the 2030 agenda for Sustainable Development Goals , so that stunting prevention is very important For reach source Power quality Indonesian people and growth fair economy as well as to cut off chain poverty intergenerational ensure economic development (Kustanto, 2021; Athau) . The high The prevalence of stunting and its relationship to economic growth in several developing countries is a matter of debate. fierce among experts (Biadgilign et al., 2016; Mary, 2018; O'Connell & Smith, 2016; Smith & Haddad, 2015)

Growth economy contribute big to improvement welfare public through creation field

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work, improvement income, and access to service health. A study conducted by (Ruel & Alderman, 2013) showed that growth Product Gross Domestic Product (GDP) per capita correlated positive with decline stunting rates in various countries. However, in Indonesia, although growth economy stable, gap high income still become obstacle main in speed up decline stunting rate (BPS, 2023). Distribution results growth economy that is not evenly cause group poor people do not feel benefit in a way significant. This is impact on low access to food nutritious, especially in areas rural or remote (McGovern et al., 2017). Therefore that, is needed policy fiscal oriented towards equality, such as subsidy food or assistance program direct effective cash.

Apart from the factors economy macro, condition social economy family own influence direct on nutritional status child. Mother's education is one of determinant important stunting incidents, where the level low education often associated with lack of knowledge about nutrition, pattern Eat healthy, and care child (Smith & Haddad, 2015). Poverty also narrows access to service quality health, including immunization, care pregnancy, and treatment early to disease infection. Studies in South Asia show that children from poor families have the risk of stunting is twice as high big compared to children from wealthy families (Stewart et al., 2013; Vilcins et al., 2018).

Resilience food is other dimensions that influence prevalence of stunting, especially in developing countries. Resilience food No only covers availability food but also stability price, accessibility, and diversity food nutritious (Ardian & Utami, 2021; Sari et al., 2020). In Indonesia, the challenges resilience food the more complex consequence vulnerability to change climate, damage environment, and imbalance distribution food inter-regional (Satriawan, 2018). Many regions in Indonesia are experiencing deficit production food, especially animal protein, so that contribute to the height stunting rates in children toddler.

METHOD

The research method used is the quantitative method. quantitative method is a form of research that is carried out systematically systematic, structured, and detailed. In its implementation, this research method focuses on the use of numbers to display the results of data or information obtained. The data in this study consists of One variable the dependent variable is stunting and the three independent variables are economic growth, resilience food and socio-economic. This study uses time series data from 2018 to 2022 by considering data availability. All studies use secondary data series time, selected because this research focuses on the macro level and can be easily accessed. The data is adjusted according to the needs of the applied model. The data source is obtained from Indonesian statistics published by the Central Statistics Agency, the Ministry of Health and nutrition pocket books, scientific journals,

as well as literature related to the research subject . In addition , the author also conducted a study literature to support this research. The influence of two or more variables independent of variables dependent can be evaluated using panel data regression analysis. The analysis was carried out using the Eviews 12 program. Researchers estimating regression models with panel data, namely the approach Common Effect Model (CEM), an approach Fixed Effect Model (FEM), and approaches Random Effect Model (REM).

RESEARCH AND DISCUSSION

Efforts to reduce stunting rates in Indonesia face significant challenges stemming from persistent poverty and unstable regional economic growth, both of which contribute to low purchasing power and limited access to basic nutrition. Conversely, fundamental factors such as increased schooling expectancy and strengthened food security play a crucial role in accelerating the reduction of chronic malnutrition rates across various regions. Table 1 presents summary statistics for each study variable, including mean, median, maximum and minimum values, and standard deviation, to provide deeper insight into data variation over the study period.

Tabel 1. Output statistik deskriptif

	STUNT	PE	HLS	POV	KP
Mean	24.79807	4.25172	1319.02521	10.36378	71.24151
Median	24.90000	4.90000	1312.00000	8.71000	73.17000
Maximum	43.80000	22.94000	1570.00000	27.74000	88.23000
Minimum	0.00000	-15.72000	1083.00000	3.47000	25.13000
Std. Dev.	6.84843	3.77786	74.08462	5.34404	10.91329
Skewness	-0.26477	0.17752	0.49428	1.16019	-1.51106
Kurtosis	4.04999	11.00504	5.83550	4.05594	5.75212
Jarque-Bera	13.71366	636.71632	89.42167	64.45031	165.68093
Probability	0.00105	0.00000	0.00000	0.00000	0.00000
Sum	5901.94	1011.91	313928	2466.58	16955.48
Sum Sq. Dev.	11115.55091	3382.511594	1300781.849	6768.430397	28226.69026
Observations	238	238	238	238	238

Sumber: Data diolah Eviews 13 (2026)

Using panel data covering 34 provinces in Indonesia from 2018 to 2024, this study consisted of 238 observations. Descriptive statistical analysis was used to provide an overview of the characteristics of each variable used in the study: stunting (STUNT), economic growth (PE), expected years of schooling (HLS), poverty (POV), and food security (KP).

Based on the descriptive statistical analysis, the stunting variable had an average value of 24.79, a median of 24.90, a minimum value of 0.00, and a maximum of 43.80, indicating variation in stunting rates across provinces and across the study period, with a standard deviation of 6.84. The economic growth variable had an average value of 4.25, a median of 4.90, a minimum value of -15.72, and a maximum of 22.94, indicating substantial variation in economic growth during the study period, with a standard deviation of 3.77. Furthermore, the expected years of schooling variable has an average of 1319.02 with a median of 1312.00, a minimum value of 1083.00, and a maximum of 1570.00, which indicates a relatively varied level of education between provinces with a standard deviation of 74.08. The poverty variable has an average value of 10.36 with a median of 8.71, a minimum value of 3.47, and a maximum of 27.74, which indicates a significant difference in poverty levels between provinces in the study period with a standard deviation of 5.34. Meanwhile, the food security variable has an average value of 71.24 with a median of 73.17, a minimum value of 25.13, and a maximum of 88.23, which indicates that the level of food security between provinces also has quite large variations with a standard deviation of 10.91. Overall, the results of these descriptive statistics illustrate that each variable in the study has different levels of data variation between countries and research time periods.

Tabel 2 Uji chow dan uji hausman

Hasil Uji Chow			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	9.98500	(33,200)	0.0000
Cross-section Chi-square	231.72288	33	0.0000
Hasil Uji Hausman			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	18.42890	4	0.0010

Sumber: Data diolah Eviews 13 (2026)

Based on the consistency of the Chow and Hausman test results, the Fixed Effects Model (FEM) was determined to be the best model for analyzing the determinants of stunting in this study. Theoretically, the selection of FEM aligns well with the characteristics of the dataset,

which covers the full population of 34 provinces in Indonesia. The FEM approach is considered the most rational because this model is able to accommodate and control for unobserved heterogeneity in each study area. The existence of fundamental, constant differences between provinces—such as variations in geographic conditions, the availability of local health infrastructure, and socio-cultural characteristics of the community—are specific latent factors that directly impact regional health levels. The use of FEM allows the model to capture variations in individual intercepts within each region without producing biased parameter estimates.

After conducting the best model selection test, the results showed that the most appropriate model to use in this study was FEM. Based on these findings, the researchers continued the statistical test according to the selected model in Table 3. Based on the estimation results with the Fixed Effect Model (FEM), the following equation model was obtained:

$$\text{STUNT} = 95.43491 - 0.03105\text{PE} - 0.05066\text{HLS} + 1.05822\text{POV} - 0.20567\text{KP}$$

Based on the estimation results with the Fixed Effect Model (FEM), the constant value is positive at 95.43491 and is significant. This indicates that if the variables of economic growth, expected years of schooling, poverty, and food security are considered constant, the stunting rate is at a baseline value of 95.43. Simultaneously, the variables of Economic Growth (PE), Expected Years of Schooling (HLS), Poverty (POV), and Food Security (KP) have a very significant influence on fluctuations in stunting rates in 34 provinces (probability 0.00000). The coefficient of determination (R^2) value of 0.6828 indicates that 68.28% of the variation in stunting rates between provinces can be explained by this model. The use of FEM empirically is able to capture the unique characteristics and spatial disparities between regions in Indonesia, which is in line with the push for stunting prevention interventions to be carried out specifically based on regional-level risk profiles, rather than simply uniform national policies.

Tabel 3. Estimation results of the fixed effect model

Variable	Coefficien		t-Statistic	Prob.
	t	Std. Error		
C	95.43491	22.32900	4.274035	0.0000
PE	-0.031046	0.086889	-0.357308	0.7212
HLS	-0.050658	0.015213	-3.329992	0.0010
POV	1.058215	0.599462	1.765276	0.0790
KP	-0.205669	0.063304	-3.248903	0.0014
Effects Specification				

Cross-section fixed (dummy variables)

R-squared	0.682808	Mean dependent var	24.79807
Adjusted R-squared	0.624127	S.D. dependent var	6.848435
S.E. of regression	4.198672	Akaike info criterion	5.852788
Sum squared resid	3525.769	Schwarz criterion	6.407184
Log likelihood	-658.4818	Hannan-Quinn criter.	6.076219
F-statistic	11.63600	Durbin-Watson stat	1.945997
Prob(F-statistic)	0.000000		

Sumber: Data diolah, 2026

The economic growth (PE) variable has a coefficient of -0.03105 with a probability of 0.7212, indicating it is not significant at the 5% level. This indicates that a one-unit increase in economic growth will reduce the stunting rate by 0.031, but this effect is not statistically significant. Therefore, economic growth has not been able to directly reduce stunting rates during the study period. This finding confirms that high GRDP expansion in a region does not automatically reduce stunting prevalence if the growth is not inclusive. Empirical evidence from the 2025–2026 nutritional status survey shows that children from the poorest quintile have significantly higher nutritional vulnerability regardless of the magnitude of their region's economic growth (Sari et al., 2020) (Rahmadhani et al., 2026). This means that as long as economic growth fails to create income equality that directly impacts food purchasing power for vulnerable groups, specific health interventions—such as sanitation, nutritional improvements, and maternal education—are far more effective in reducing stunting rates than simply pursuing macroeconomic growth targets. Furthermore, the variable expected years of schooling (HLS) has a coefficient of -0.05066 and is significant at the 1% level with a probability value of 0.0010. This indicates that every one-unit increase in expected years of schooling will reduce the stunting rate by 0.05066. This finding indicates that the higher the community's education level, the lower the stunting rate. It also confirms that longer education duration is directly proportional to increased nutritional literacy, improved parenting patterns, and access to health facilities. This is strongly in line with a recent literature review by Ganie & Anggraini (2026), who synthesized evidence from 2025–2026 and concluded that low parental education is a major determinant of stunting, as it limits families' capacity to absorb health information and make informed decisions regarding child nutrition.

The variable poverty (POV) has a coefficient of 1.05822 with a probability value of 0.0790, meaning it is not significant at the 5% level, but is significant at the 10% level. This indicates that a one-unit increase in the poverty rate will increase the stunting rate by 1.05822. Thus, poverty tends to increase the risk of stunting, although the effect is not statistically strong. Although poverty increases the risk of stunting, the insignificance at the 5% level indicates that

the direct transmission of poverty to stunting is beginning to be mitigated by various government interventions (Athaullah et al., 2026). A mixed-methods study (Mustofa et al., 2026) found that very low-income households must adopt a frugal lifestyle, where conditional social assistance and the Supplementary Feeding Program (PMT) act as buffers to ensure children continue to receive basic protein intake, despite the family's limited independent purchasing power.

The food security (KP) variable has a coefficient of -0.20567 and is significant at the 1% level with a probability value of 0.0013. This indicates that a one-unit increase in food security will reduce the stunting rate by 0.20567. This proves that regions that are able to stabilize food supply and access tend to be more resilient to the risk of chronic malnutrition. A recent study in Indonesia in 2025 and 2026 confirmed this finding; families experiencing moderate to severe food insecurity had a 1.24 to 1.39 times higher risk of having stunted children, especially in rural areas. The success of food security at the provincial level reflects households' affordability of diverse and nutrient-rich foods, which are crucial elements that complement animal protein intake. Thus, food security is a crucial factor in reducing the prevalence of stunting.

CONCLUSION

Socioeconomic conditions and food security have a significant impact on reducing stunting prevalence in Indonesia. Therefore, development interventions and government policies that specifically focus on improving socioeconomic conditions (such as improving education) and strengthening food security stability are absolutely necessary. On the other hand, macroeconomic growth has proven unable to make a significant direct contribution to stunting reduction. This phenomenon indicates a high urgency to achieve more equitable and fair distribution of the results of economic development. Without income equality that directly reaches vulnerable groups, macroeconomic expansion will not have an effective impact on meeting the nutritional needs of toddlers.

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REFERENCE

- Ardian, D., & Utami, ED (2021). The Influence of Demographic Characteristics on the Incidence of Stunting in Toddlers in West Sulawesi Province. *National Seminar on Official Statistics* , 2020 (1), 397–406. <https://doi.org/10.34123/semnasoffstat.v2020i1.365>
- Athaullah, N, A., Sari, D,D,P. & Marissa, F. (2026). The Effect of Human Development Index,

- Foreign Direct Investment, and Technology on Income Inequality in Six Asian Countries. (2026). *Efficient: Indonesian Journal of Development Economics*, 9(1), 1-14.
- Biadgilign, S., Shumetie, A., & Yesigat, H. (2016). Does economic growth reduce childhood undernutrition in Ethiopia? *PLoS ONE*, 11 (8), 1-14. <https://doi.org/10.1371/journal.pone.0160050>
- de Onis, M., & Branca, F. (2016). Childhood stunting: A global perspective. *Maternal and Child Nutrition*, 12, 12-26. <https://doi.org/10.1111/mcn.12231>
- Deepublish. 2023. *Application of SPSS and EViews in research data analysis*. Deepublish.
- Hendra, NS 2021. *EViews: Operational methods and analysis procedures*. BukaBuku.
- Ganie, M, A & Angraini, D, I (2026). Determinants of stunting among children under five years of age in Indonesia: A narrative review of indexed evidence published in 2025-2026. *World Journal of Advanced Research and Reviews*, 30(02), 1784-1790. Article DOI: <https://doi.org/10.30574/wjarr.2026.30.2.1416>
- Ministry of Health. (2022). Results of the 2022 Indonesian Nutritional Status Survey (SSGI). *Ministry of Health*, 1-150.
- Kurniawati, Ria. 2024. *EViews in practice: A practical guide to statistical analysis*. PT Catalyst Development Partners.
- Kustanto, A. (2021). *Machine Translated by Google JDE (Journal of Developing Economics) INDONESIA UMKM EXPORTS AND THE ROLE OF PARTNERSHIP Tulus TH Tambunan* * Machine Translated by Google . 6 (2), 235-252.
- Mary, S. (2018). How much does economic growth contribute to child stunting reductions? *Economies*, 6 (4). <https://doi.org/10.3390/economies6040055>
- McGovern, M.E., Krishna, A., Aguayo, V.M., & Subramanian, S.V. (2017). A review of the evidence linking child stunting to economic outcomes. *International Journal of Epidemiology*, 46 (4), 1171-1191. <https://doi.org/10.1093/ije/dyx017>
- Naomi Nussyana Debatara, Uny Minna Chilin, Evy Sulistianingsih. (2019). Autoregressive Distributed Lag (Adl) Model on Stock Price Data. *Scientific Bulletin of Mathematics, Statistics and Its Applications*, 8 (1), 83-90. <https://doi.org/10.26418/bbimst.v8i1.30535>
- O'Connell, S. A., & Smith, C. (2016). Economic growth and child undernutrition. *The Lancet Global Health*, 4 (12), e901-e902. [https://doi.org/10.1016/S2214-109X\(16\)30250-9](https://doi.org/10.1016/S2214-109X(16)30250-9)
- Rahmadhani, I, N., Sari, D,D,P & Subardin, M. (2025). The Effect of Government Expenditure, Fixed Capital Investment, and Labor on Economic Growth in ASEAN-5 Countries. *Efficient: Indonesian Journal of Development Economics*, 8(3), 294-305. <https://doi.org/10.15294/efficient.v8i3.34806>
- Ruel, M. T., & Alderman, H. (2013). Nutrition-sensitive interventions and programs: How can they help to accelerate progress in improving maternal and child nutrition? *The Lancet*, 382 (9891), 536-551. [https://doi.org/10.1016/S0140-6736\(13\)60843-0](https://doi.org/10.1016/S0140-6736(13)60843-0)

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(Sari, et al.)

- Sari, DDP, Sukanto, S., Marwa, T., & Bashir, A. (2020). The Causality between Economic Growth, Poverty, and Stunting: Empirical Evidence from Indonesia. *Journal of Regional Financing and Development Perspectives* , 8 (1), 13–30. <https://doi.org/10.22437/ppd.v8i1.8834>
- Satriawan, E. (2018). National Strategy for Accelerating Stunting Prevention 2018-2024. *National Team for Accelerating Poverty Reduction (TNP2K) Secretariat of the Vice President of the Republic of Indonesia* , November , 1–32. http://tnp2k.go.id/filemanager/files/Rakornis_2018/Sesi_1_01_RakorStuntingTNP2K_Stranas_22Nov2018.pdf
- Smith, L. C., & Haddad, L. (2015). Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era. *World Development* , 68 (1), 180–204. <https://doi.org/10.1016/j.worlddev.2014.11.014>
- Stewart, C.P., Iannotti, L., Dewey, K.G., Michaelsen, K.F., & Onyango, A.W. (2013). Contextualising complementary feeding in a broader framework for stunting prevention. *Maternal and Child Nutrition* , 9 (S2), 27–45. <https://doi.org/10.1111/mcn.12088>
- Vilcins, D., Sly, P. D., & Jagals, P. (2018). Environmental risk factors associated with child stunting: A systematic review of the literature. *Annals of Global Health* , 84 (4), 551–562. <https://doi.org/10.29024/aogh.2361>