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The impact of economic structure and its effect on economic growth in Indonesia

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ABSTRACT

This study examines the impact of economic structure, particularly the agricultural sector, on Indonesia's economic growth by incorporating investment, education, and health as supporting variables. Using panel data from 34 provinces over the period 2015–2024, the analysis is estimated with a Fixed Effect Model based on Chow and Hausman tests. Economic structure is proxied by the contribution of the agricultural sector to regional GDP. The results indicate that the agricultural sector has a positive and significant effect on economic growth, reflecting its role in employment creation, food security, and intersectoral linkages. Gross Fixed Capital Formation and education also show positive and significant effects, highlighting the importance of productive investment and human capital. In contrast, health exhibits a negative and significant effect, suggesting inefficiencies and unequal access to healthcare across regions. These findings imply that Indonesia's economic growth is shaped by sectoral structure and the effectiveness of supporting factors, with policy relevance for strengthening agriculture, investment, education, and health system reforms.

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Introduction

Economic growth is a key indicator of development performance, reflecting the sustained increase in the production of goods and services within an economy. Achieving sustainable economic growth is a strategic objective because it is closely linked to rising incomes, employment creation, poverty reduction, and improvements in overall quality of life (Bosma et al., 2018; Kritikos, 2024). Classical growth theory identifies capital accumulation, labor force expansion, and technological progress as the main drivers of long-term economic growth (Inoua & Smith, 2019; Maslii, 2024). Among these factors, investment plays a central role as it directly expands production capacity and infrastructure while indirectly supporting improvements in human capital. At the regional level, economic growth is commonly measured by Regional Gross Domestic Product (RGDP), which captures the total value added generated by agricultural, industrial, and service activities within a given period (Sinaga, 2020; Yusupov et al., 2019).

Beyond aggregate factors, the structure of an economy is widely recognized as a crucial determinant of growth dynamics. Economic structure reflects the relative contribution of primary, secondary, and tertiary sectors to total output. In developing economies, structural transformation is typically characterized by a reallocation of labor and resources from agriculture toward industry and services, a process often associated with productivity gains and faster economic growth (Dogan & Inglesi-Lotz, 2020; Leontief, 2018). Such structural changes influence growth through improvements in resource allocation efficiency and sectoral productivity differentials (Diao et al., 2017; Van Neuss, 2019). Consequently, analyzing economic structure is not only academically relevant but also essential for designing effective development policies in developing countries.

Indonesia presents a distinctive case within the structural transformation literature. Although the contribution of the agricultural sector to national Gross Domestic Product (GDP) has declined over the past two decades, agriculture remains a fundamental pillar of the economy. In 2024, the agricultural sector accounted for approximately 12.6% of national GDP and continued to absorb a large share of the workforce, particularly in rural areas. Beyond its direct contribution to output and employment, agriculture plays a strategic role in ensuring food security, supplying raw materials to agro-based industries, and maintaining socioeconomic stability. The economic contraction caused by the COVID-19 pandemic in 2020 highlighted these roles, as Indonesia's subsequent recovery during 2021–2024, with growth stabilizing at around 5%, underscored the resilience of the national economy and the stabilizing function of the agricultural sector during periods of crisis.

Despite the extensive literature on economic structure and growth, most studies emphasize the transition away from agriculture toward industrial and service sectors. Empirical analyses that specifically examine the continuing role of agriculture within the Indonesian growth process remain relatively limited. While Asia et al. (2018) discuss labor transformation, the Indonesian experience suggests that agriculture has not merely been abandoned in the industrialization process but continues to contribute meaningfully to economic performance amid persistent regional disparities, a large agricultural workforce, and dependence on primary commodity exports. This indicates a clear research gap in empirically assessing how the agricultural component of economic structure affects economic growth in Indonesia when regional heterogeneity is taken into account.

In addition to economic structure, several supporting factors are widely acknowledged as important determinants of economic growth, notably investment, education, and health. Investment, measured by Gross Domestic Fixed Capital Formation (GDFCF/PMTDB), reflects additions to productive capacity and infrastructure. Previous studies emphasize that higher levels of productive investment positively affect economic growth, particularly when directed toward infrastructure and manufacturing sectors (Dawood et al., 2024; Meyer & Sanusi, 2019). Education, as a core element of human capital, enhances labor productivity, adaptability to technological change, and innovation capacity (Hanushek & Woessmann, 2020), with empirical evidence consistently showing a positive relationship between education and economic growth (Jorgenson & Fraumeni, 2020; Liao et al., 2019). Health is also a fundamental component of human capital, as poor health conditions can reduce labor productivity and economic participation, while effective health investment contributes to long-term welfare and poverty reduction (Laurens & Putra, 2020; Taruno, 2019).

Based on these considerations, this study aims to analyze the impact of economic structure, with a particular focus on the agricultural sector, on Indonesia's economic growth while incorporating investment, education, and health as supporting variables. Using panel data from 34 provinces over the period 2015–2024, this research seeks to contribute empirically to the literature on structural transformation in developing countries by highlighting the continued relevance of agriculture within a regionally diverse economy. The findings are expected to provide evidence-based insights for policymakers in formulating inclusive and sustainable economic development strategies in Indonesia.

Method

Research Design

This study uses a quantitative descriptive approach with observational methods. The objective is to describe economic phenomena using numerical data objectively, as well as to explain the causal relationship between economic structure and economic growth in Indonesia.

Research Participants

The study was conducted in 34 provinces in Indonesia with data coverage from 2015 to 2024. This period was chosen to describe economic dynamics before, during, and after the COVID-19 pandemic. The research population covers all provinces in Indonesia. Because this study uses panel data that combines time and region dimensions, all provinces (34) were sampled, making this study a secondary data census.

Research Procedure

Data was collected through documentation methods, by taking official data from government publications, international institutions, and national statistical databases.

The data used was secondary data, obtained from official sources, namely: the Central Statistics Agency for data on GRDP, economic structure, education, and health. 1) Ministry of Health for health indicator data; 2) Ministry of Education, Culture, Research, and Technology for education indicators.; 3) World Bank and IMF Database as supporting macroeconomic data.

Data Analysis

The analysis was conducted using panel data regression with the Fixed Effect Model (FEM) and Random Effect Model (REM). EViews/Stata software was used in data processing to obtain coefficient estimates, significance levels, and interpretations of the relationships between variables.

Results and Discussions

Panel Data Regression Test Results

Panel data regression analysis was conducted on 34 provinces in Indonesia for the period 2015–2024. The best model was determined through Chow and Hausman tests, which showed that the Fixed Effect Model (FEM) was appropriate to use. The summary of the regression results is as follows:

Table 1. Panel Data Regression Results for Economic Growth in Indonesia

Independent Variable	Coefficient	t-Statistik	Prob
LOG (Economic Structure)	8.051933	-3.451979	0.0006
Control Variable			
LOG(PMTDB)	2.138174	2.069447	0.0394
Education	1.267009	2.941873	0.0035
Health	-3.814888	-2.955856	0.0034
C	-82.79306	-1.688742	0.0924
	Weighted Statistics		
Adjusted R-squared		0.207449	
Prob(F-statistic)		0	

Based on the table above, it can be seen that the constant value of 82.79 with a negative sign explains that if the economic structure variable and the supporting control variables, namely PMDTB, education, and health, have a fixed value of one, then the economic growth variable will decrease by 82.79%. The coefficient of determination is 0.2074 or 20.74%. The magnitude of the influence of the economic structure variable on economic growth in Indonesia is 20.75%, while the remaining 79.25% is influenced by other variables outside the research model. The economic structure variable has a regression value of 8.051 on economic growth with a positive sign. This means that every 1% increase in Indonesia's economic structure will increase economic growth by 8.051%.

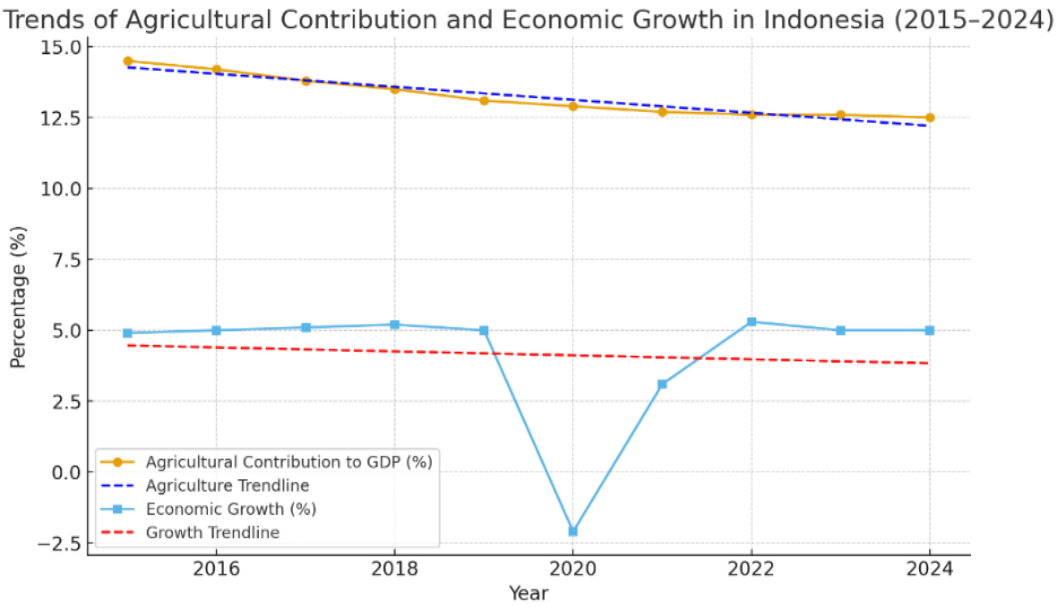

Figure 1. Trends in the Contribution of the Agricultural Sector and Economic Growth in Indonesia, 2015-2024

This is a graph showing the trend in the contribution of the agricultural sector and Indonesia's economic growth (2015–2024) with a linear regression trendline: 1) Blue circle + blue dotted line, contribution of agriculture, which shows a downward trend from year to year; 2) Orange box + red dotted line, economic growth, which shows a relatively stable trend despite a sharp decline in 2020 due to the pandemic.

This visualization helps to confirm that: 1) Agriculture remains an important pillar, even though its contribution to GDP continues to decline; 2) Indonesia's economic growth is relatively stable post-pandemic, with a moderate long-term trend.

The empirical results confirm that economic structure, particularly the agricultural sector, has a significant effect on economic growth in Indonesia. This finding supports the theory of structural transformation, which emphasizes the role of sectoral composition in shaping growth trajectories (Eren et al., 2019). While classical structural transformation suggests a declining role of agriculture as economies develop, the Indonesian case demonstrates that agriculture continues to exert a positive influence on growth despite its decreasing share in national GDP. This indicates that the sector's contribution is not solely determined by its output share, but also by its capacity to support employment, stabilize incomes, and sustain production linkages across sectors. The findings are consistent with Salendu (2021), who shows that improvements in agricultural productivity can stimulate regional economic growth, particularly in areas with high rural dependence.

The positive effect of the agricultural sector can also be interpreted through its multiplier effects on the broader economy. Increased agricultural activity raises rural incomes, strengthens backward and forward linkages with agro-based industries, supports export performance of primary commodities, and contributes to food price stability. These mechanisms align with the argument advanced by Gollin (2023), who emphasizes that agricultural productivity growth is a critical precondition for successful structural transformation in developing economies. In this context, Indonesia's agricultural sector appears to function not as a residual sector, but as a stabilizing and complementary force within the growth process, especially during periods of economic uncertainty.

The results further show that Gross Domestic Fixed Capital Formation (PMTDB) has a positive and significant effect on economic growth, which is consistent with the Solow–Swan growth framework that highlights capital accumulation as a key driver of output expansion. This finding is also in line with empirical evidence provided by Du et al. (2022), who demonstrate that investment in productive sectors, particularly infrastructure, enhances national competitiveness and growth capacity. At the regional level in Indonesia, PMTDB likely captures disparities in infrastructure availability and

production facilities across provinces, suggesting that uneven investment distribution may contribute to heterogeneous growth outcomes.

Education also exhibits a positive and significant relationship with economic growth, reinforcing the importance of human capital accumulation. Improved education levels enhance labor skills, productivity, and innovative capacity, thereby facilitating technology adoption and structural upgrading. This result is consistent with the findings of Faggian et al. (2019) and Golovina et al. (2021), which emphasize education as a central pillar of human-capital-driven growth. However, given Indonesia's regional diversity, this positive effect may mask underlying differences in education quality and access, indicating that growth benefits from education are likely uneven across provinces.

In contrast, the health variable shows a negative and significant effect on economic growth. This outcome diverges from much of the international literature that highlights the growth-enhancing role of health improvements (Bloom et al., 2019). In the Indonesian context, this negative relationship may reflect inefficiencies in healthcare delivery, high treatment costs, unequal access to health services, or measurement issues related to health indicators. Rather than indicating that health investment is inherently detrimental, the result suggests that weaknesses in the health system may constrain labor productivity and economic performance in the short to medium term, posing a critical challenge for policymakers.

Beyond the individual effects of each variable, the findings highlight the importance of considering interactions between sectoral structure and supporting factors. The continued relevance of agriculture implies that investment and education policies may yield higher growth returns when aligned with the needs of the agricultural and agro-industrial sectors. This perspective contributes to the structural transformation literature by showing that sectoral upgrading in developing economies does not necessarily require a rapid abandonment of agriculture, but rather its integration into a broader development strategy.

Nevertheless, several limitations should be acknowledged. First, the panel regression framework captures average relationships across provinces but may not fully reflect nonlinear dynamics or long-term effects. Second, potential endogeneity between economic growth and variables such as investment and human capital cannot be entirely ruled out. Third, the negative health coefficient may be influenced by measurement constraints, suggesting that alternative health indicators or disaggregated health expenditure data could provide further insights.

From a policy perspective, the results suggest that Indonesia's economic growth strategy should not rely solely on industrial and service sector expansion. Strengthening the agricultural sector through productivity-enhancing investments, improved rural infrastructure, and stronger linkages with agro-processing industries remains essential. At the same time, policies aimed at increasing productive investment, improving education quality, and reforming the healthcare system are necessary to ensure that growth is inclusive and sustainable. By addressing these interconnected factors, Indonesia can better leverage its economic structure to support long-term development.

Conclusions

This study concludes that the economic structure, particularly the agricultural sector, still plays an important role and has a positive impact on Indonesia's economic growth, even though its contribution to GDP has declined. Supporting variables such as investment and education also contribute positively, while health hurts labor productivity. Overall, economic growth is determined by a combination of the agricultural sector, investment, education, and health. Therefore, it is necessary to strengthen the agricultural sector, increase productive investment, improve the quality of education, and reform the health system to support inclusive and sustainable growth.

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