


Fakultas Ekonomi Dan Bisnis

Analysis of the Impact of Value Added in the Manufacturing Industry on Economic Growth in Indonesia

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ABSTRACT

Keywords:

Economic Growth, Value Added in Manufacturing Industry, and Indonesia

This study investigates the impact of specific factors on Indonesia's economic growth across different time frames using the ARDL analysis model in Eviews 10 software. The research reveals that in the long term, increases in value added from the manufacturing sector and foreign direct investment are associated with positive and notable effects on economic growth. In the short term, enhancements in manufacturing value added, government expenditure, population growth, and foreign direct investment similarly contribute positively and significantly to economic growth. Conversely, inflation exerts a negative influence on economic growth in the short term. These findings are instrumental in comprehending the drivers of economic growth in Indonesia and provide valuable insights for policymakers and stakeholders aiming to devise effective strategies to foster economic development.

ABSTRAK

Studi ini menyelidiki dampak faktor-faktor tertentu terhadap pertumbuhan ekonomi Indonesia dalam berbagai jangka waktu menggunakan model analisis ARDL dengan perangkat lunak Eviews 10. Penelitian ini mengungkapkan bahwa dalam jangka panjang, peningkatan nilai tambah dari sektor manufaktur dan investasi langsung asing memiliki dampak positif dan signifikan terhadap pertumbuhan ekonomi. Di sisi lain, dalam jangka pendek, peningkatan nilai tambah manufaktur, belanja pemerintah, pertumbuhan penduduk, dan investasi langsung asing juga memberikan kontribusi positif dan signifikan terhadap pertumbuhan ekonomi. Namun, inflasi memiliki pengaruh negatif terhadap pertumbuhan ekonomi dalam jangka pendek. Temuan ini penting untuk memahami pendorong pertumbuhan ekonomi di Indonesia dan memberikan wawasan berharga bagi pembuat kebijakan dan pemangku kepentingan dalam merancang strategi efektif untuk mendorong pembangunan ekonomi.

INTRODUCTION

Economic growth serves as an indicator to monitor the fluctuations in a country's economy over a one-year or quarterly period, which can experience both declines and increases. When a country undergoes economic growth, it generally fosters stability in commodity prices and approaches full employment conditions. This trend has been noted in numerous countries worldwide, Indonesia being among them. Economic growth is typically assessed using Gross Domestic Product (GDP), which quantifies the total value of goods and services produced. Based on Indonesia's GDP, the economy has continued

to grow in recent years. However, from 2019 to 2020, there was an economic contraction due to the Covid-19 pandemic affecting several countries, including Indonesia.

Indonesia's GDP (Gross domestic product) development from 1961 to 2021 has displayed vacillations that reflect financial shakiness. The pinnacle Gross domestic product development happened in 1968 at 10.92%, while the absolute bottom was kept in 1998 with a constriction of 13.13%. The year 2020 denoted a basic period as Indonesia's Gross domestic product shrunk by 2.7% because of the effect of the Coronavirus pandemic. Nonetheless, the next year, 2021, saw a positive development pattern of 3.69% in Gross domestic product. To accomplish and support long haul financial development, it is significant to comprehend the affecting variables and to relieve hindrances to development. The Indonesian government has carried out different approaches to help monetary recuperation post-Coronavirus, including procedures to improve esteem included the assembling area through downstreaming, import replacement, and coordinating the modern area into worldwide stock chains.

Indonesia's economic transformation from the post-independence recovery period to the current era of globalization, including the development of the manufacturing sector, has been a major driver of economic growth. Besides significantly contributing to GDP, the manufacturing sector also holds substantial potential to enhance national economic competitiveness and reduce dependence on the primary sector. Overall, Indonesia's manufacturing sector has undergone significant transformation from its early stages of industrialization to adapting to global challenges and technological advancements in recent years.

Moreover, the advancement of economic conditions heavily relies on the development of production factors such as capital (through investments and government expenditure), labor, and technology (Hellen et al., 2018). Therefore, economic growth, as reflected in the expansion of Gross Domestic Product (GDP), is closely associated with government spending on public goods, domestic investment, foreign direct investment (FDI), and other factors. During the Covid-19 pandemic, Indonesia experienced a decline in economic growth. As stated by the Coordinating Minister for Economic Affairs, Airlangga Hartarto, on February 8, 2022, specific sectors and factors played a beneficial role in supporting Indonesia's economic recovery in 2021 (Limanseto, 2022). Hence, the objective of this study is to examine the impact of manufacturing value added, government expenditure, population growth, inflation, and foreign direct investment (FDI) on Indonesia's economic growth from 1961 to 2021. The research methodology used in this study is the Autoregressive Distributed Lag (ARDL) approach, which evaluates both short-term dynamics and long-term cointegration, as well as causal relationships among these variables.

LITERATURE REVIEW

The ascent in GDP (Gross domestic product) as a proportion of monetary development, whether at a neighborhood or public level, doesn't solely depend on the general populace size and doesn't require a change in financial system (Athallah et al., 2013). Because GDP calculates the value of products produced within a specific period using a flow concept, this makes GDP growth a measure used to evaluate economic growth, where the value of products from previous periods is not included in the calculation (Soleh, 2014).

According to the definition provided by the Central Bureau of Statistics (2017), industry is a business entity that transforms raw materials into products with economic value, through mechanical, chemical processes, or human labor. On the other hand, manufacturing is a series of processes aimed at converting raw materials into physical products using energy and various other resources such as human labor, machinery, and supporting equipment. This process includes stages like product design, raw material selection, production planning, manufacturing processes, product quality assurance, as well as product management and marketing.

Hellen et al. (2018), As indicated by the State Spending plan of the Republic of Indonesia, government uses are arranged into two essential classes. First is routine spending, which covers annual expenditures. The second category is development spending, which comprises government expenditures aimed at supporting both physical and non-physical development to enhance community economic welfare. According to the research by Pratama & Utama (2019) expenditures on administration and venture capital together have an impact on economic growth.

Rochaida (2016) Populace growth is portrayed as the peculiarity of expanding the quantity of people inside a characterized time period and topographical region, impacted by variables like ripeness (births), mortality (passings), and relocation (development of individuals). According to Adam Smith in Rochaida (2016) view population growth can positively contribute to economic growth in a region. Inflation is a condition where prices of goods generally increase over a specific period of time (Yuniarti & Khoirudin, 2023). Inflation increases when domestic commodity prices rise, followed by a decrease in exporter interest in domestic goods, ultimately leading to a reduction in trade surplus (Faudzi & Asmara, 2023). During inflationary periods, national income tends to be higher compared to the amount of goods and services produced.

Foreign direct investment (FDI) involves the transfer of financial resources from one country to another to achieve profit for investors (Rizky et al., 2016). A rise in FDI is anticipated to boost job opportunities. Kurniawan & A'yun (2022) underscore that Indonesia considers export-oriented FDI pivotal for its economic growth.

METHOD

This study examines Indonesia's economic growth using time-series data from 1961 to 2021 obtained from the official World Bank website. Table 1 details the specific variables used in this analysis

Table 1 Variable Descriptions

Proxy Variables	Description	Symbol	Source
Economic Growth	Economic growth denotes the yearly expansion rate of Indonesia's Gross Domestic Product (GDP) from 1961 to 2021, expressed as a percentage (%).	GDP	World Bank
Manufacturing value added	Net output after summing all outputs and subtracting inputs in the manufacturing sector in Indonesia from 1961 to 2021, measured in percentage (%).	M	World Bank
Government Expenditure	Government Expenditure refers to the total final expenditure by the government in Indonesia from 1961 to 2021, measured in percentage (%).	PP	World Bank
Population Growth	Population Growth refers to the growth rate of Indonesia's population from 1961 to 2021, measured in percentage (%).	PO	World Bank
Inflation	Measured inflation based on the Consumer Price Index to obtain a basket of goods in Indonesia from 1961 to 2021, measured in percentage (%).	I	World Bank
Foreign Invesment	Additional fixed asset costs and net inventory percentage in Indonesia from 1961 to 2021, measured in percentage (%).	PMA	World Bank

In this study, the Auto Regressive Distributed Lag Model (ARDL) analysis is conducted using the EViews application. The ARDL model is an econometric approach used to estimate a linear regression model, specifically designed for assessing long-term

relationships through cointegration tests among time series variables (A'yun et al., 2023). Additionally, this model includes lags for both dependent and independent variables simultaneously. The ARDL estimator produces consistent long-term coefficients and is constructed using standard normal asymptotic theory (Rahmasari et al., 2019). The standard equation format for the ARDL model is as follows:

$$\begin{aligned} \Delta \ln GDP_t = & \alpha_0 + \sum_{i=1}^{n1} \alpha_1 \Delta \ln GDP_{t-1} + \sum_{i=1}^{n1} \alpha_2 \Delta \ln M_{t-1} + \sum_{i=1}^{n1} \alpha_3 \Delta \ln PP_{t-1} \\ & + \sum_{i=1}^{n1} \alpha_4 \Delta \ln PO_{t-1} + \sum_{i=1}^{n1} \alpha_5 \Delta \ln I_{t-1} + \sum_{i=1}^{n1} \alpha_6 \Delta \ln PMA_{t-1} \\ & + \delta_7 \ln GDP_{t-1} + \delta_1 \ln GDP_{t-1} + \delta_2 \ln M_{t-1} + \delta_3 \ln PP_{t-1} + \delta_4 \ln PO_{t-1} \\ & + \delta_5 \ln I_{t-1} + \delta_6 \ln PMA_{t-1} + \mu_t \end{aligned}$$

Employing the Auto Regressive Distributed Lag (ARDL) model in econometric analysis provides several benefits. It can effectively manage a combination of variables that show stationary patterns at the level, in first differences, and those that are non-stationary. This flexibility allows for a comprehensive analysis of relationships over time. Secondly, the ARDL model accommodates different lag structures for independent variables, providing insights into their varying impacts over time. Thirdly, compared to other econometric models, ARDL is relatively straightforward, making it easier to interpret and communicate findings.

Concentrates on utilizing the ARDL model regularly follow an organized cycle. At first, unit root tests are performed to decide the stationarity of factors in both their unique and differenced structures. Subsequently, the ARDL model is assessed, choosing slack lengths in light of standards like the Akaike Data Rule (AIC). Consequently, center movements to examining the Blunder Revision Term (ECT), where a measurably critical negative coefficient, ordinarily underneath 0.05, shows the speed at which factors change towards long haul balance.

Subsequent phases involve checking for autocorrelation through methods like the Lagrange Multiplier (LM) Test to ensure the independence of error terms. Cointegration tests using the Bound Test approach are then employed to confirm the presence of long-term relationships among variables (Kurniawan et al., 2023). Further stages involve testing for autocorrelation using methods such as the Lagrange Multiplier (LM) Test, ensuring that error terms are independent. Cointegration tests using the Bound Test approach are then performed to validate the existence of long-term relationships among the variable.

RESULT AND DISCUSSION

Result

Descriptive data analysis involves calculating fundamental statistics for the variables being studied, including measures like mean, minimum, maximum, skewness,

and standard deviation. The study utilizes secondary data spanning from 1961 to 2021 on economic growth, manufacturing value added, government expenditure, population growth, inflation, and foreign investment in Indonesia. These data are subsequently analyzed using the Auto Regressive Distributed Lag (ARDL) model.

Table 2 Descriptive statistics

<i>Var</i>	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>Skewness</i>	<i>Std. Deviation</i>
<i>GDP</i>	61	-13.12673	10.91518	5.107776	-2.798254	3.401332
<i>M</i>	61	-11.43651	22.16728	7.023346	0.089748	5.844212
<i>PP</i>	61	-27.50000	38.96552	5.476689	0.253389	10.70582
<i>PO</i>	61	0.694718	2.787447	1.853358	0.033894	0.619122
<i>I</i>	61	-164.5094	627.7439	43.27369	6.52.1907	105.3928
<i>PMA</i>	61	1.560130	1136.254	21.71037	4.027025	150.5657

Source: Data processed, 2024.

Based on statistical analysis, economic growth, manufacturing value added, and population growth exhibit high variability in this model, with means higher than their standard deviations. On the other hand, government expenditure, inflation, and foreign investment show lower variability, with means below their standard deviations. The skewness of economic growth data tends towards the left, while the skewness of other variables tends towards the right. Economic growth, manufacturing value added, government expenditure, inflation, and foreign investment have kurtosis values above 3, indicating more extreme data distributions, whereas population growth has kurtosis below 3.

Table 3 Result of ADF and PP unit root test

<i>Variable</i>	<i>ADF</i>	<i>Note</i>	<i>Phillips-Perron</i>	<i>Note</i>
	<i>t-Statistik</i>		<i>t-Statistik</i>	
<i>GDP</i>	-6.559519***	Stasioner	-20.85664***	Stasioner
<i>M</i>	-6.928796***	Stasioner	-19.89270***	Stasioner
<i>PP</i>	-12.78307***	Stasioner	-31.14787***	Stasioner
<i>PO</i>	-2.815319***	Stasioner	-4.215423***	Stasioner
<i>I</i>	-8.165662***	Stasioner	-23.47029***	Stasioner
<i>PMA</i>	-7.117019***	Stasioner	-31.18027***	Stasioner

Source: Data processed, 2024.

Table 3 displays the outcomes from unit root tests conducted using the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) techniques. According to the results,

variables such as economic growth, manufacturing value added, government expenditure, population, inflation, and foreign investment exhibit stationarity after undergoing first differencing. This is indicated by significant t-statistics at the 1%, 5%, and 10% confidence levels, with probabilities below 0.05. Hence, it can be inferred that these variables are integrated over time.

Furthermore, additional cointegration tests were carried out to assess the appropriateness of the model utilized and to determine whether there exists a long-term relationship among the variables. The adequacy of the model was assessed by analyzing the F-statistic, which needs to surpass both the lower and upper critical values or exceed the 5% critical threshold.

Table 4 Cointegration Bound tests analysis

Test Statistic	Value	K
F-Statistic	7.280969	5
Critical Value Bounds		
Significance	I (0)	I (1)
10%	2.08	3
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

Source: Data processed, 2024.

The outcomes from the Limits Test cointegration examination in the table demonstrate that the F-measurement worth of 7.280969 outperforms the basic upsides of I(0) and I(1) at importance levels of 10%, 5%, 2.5%, and 1%. This proposes the presence of a drawnout relationship or harmony among the factors being scrutinized, including financial development, fabricating esteem added, government consumption, populace development, expansion, and unfamiliar venture development. These factors are supposed to change over the long run, reflecting associations between momentary vacillations and long haul harmony. Blunders in the model are rectified to reestablish long haul balance, as confirmed by the Mistake Revision Term (ECT) worth of - 0.565193, demonstrating a rectification time of roughly 5.7 quarters.

Table 5 Long-term coefficient

Variable	Coefficient	T-Tabel	T-Statistic	Prob.	Note
M	0.784520	2.0049	2.488548	0.0235	Significant
PP	-0.147650	2.0049	-0.663677	0.5158	Not significant
PO	-3.042154	2.0049	-1.069226	0.2999	Not significant
I	-0.101648	2.0049	-0.785618	0.4429	Not significant
PMA	0.022155	2.0049	2.102484	0.0507	Significant

Source: Data processed, 2024.

The table presents the discoveries of the variable assessments. The coefficient for assembling esteem added is 0.784520, demonstrating that assuming assembling esteem added increments by 1%, financial development will ascend by 0.785% in the long haul. This proposes a positive and measurably huge effect on monetary development, upheld by a t-measurement of 2.4885 and a likelihood of 0.0235, which is under 0.05.

Interestingly, the coefficient for government consumption is - 0.147650. Nonetheless, its likelihood is 0.5158, surpassing 0.05, and the t-measurement is - 0.6638, underneath the basic t-worth of 2.0049. Consequently, government use doesn't altogether affect financial development in the long haul.

The coefficient for populace development is - 3.042154, with a likelihood of 0.2999 and a t-measurement of - 1.0692, higher than the basic t-esteem. This demonstrates that populace development doesn't adversely affect monetary development in the long haul.

Essentially, expansion has a coefficient of - 0.101648, with a likelihood of 0.4429 and a t-measurement of - 0.7856, both surpassing the basic t-esteem. Consequently, expansion likewise doesn't fundamentally block monetary development in the long haul.

Finally, unfamiliar direct venture (FDI) has a coefficient of 0.022155, with a likelihood of 0.0507 and a t-measurement of 2.1025, outperforming the basic t-esteem. This exhibits that FDI emphatically and altogether impacts financial development in the long haul.

Table 6 Short-term coefficient

<i>Variabel</i>	<i>Coefficient</i>	<i>T-Tabel</i>	<i>T-Statistic</i>	<i>Prob.</i>	<i>Keterangan</i>
GDP (-1)*	-0.565193	2.0049	-2.540138	0.0211	Significant
M (-1)	0.443405	2.0049	2.390738	0.0287	Significant
D (GDP (-5))	0.471723	2.0049	4.019771	0.0009	Significant
D (M (-3))	0.292788	2.0049	2.469072	0.0244	Significant
D (PP (-1))	0.372935	2.0049	4.273545	0.0005	Significant
D (PP (-2))	0.278772	2.0049	2.822112	0.0117	Significant
D (PO (-2))	67.00070	2.0049	3.195907	0.0007	Significant
D (PO (-3))	-73.29487	2.0049	-4.143390	0.0040	Significant
D (PO (-4))	42.65660	2.0049	3.329315	0.0300	Significant
D (I (-4))	0.009484	2.0049	3.306362	0.0042	Significant
PMA	0.012522	2.0049	4.884851	0.0001	Significant
D (M)	0.526075	2.0049	7.394237	0.0000	Significant
D (PP)	0.162492	2.0049	3.314201	0.0041	Significant
D (PO)	37.33059	2.0049	2.593087	0.0189	Significant
D (I)	-0.082568	2.0049	-2.368847	0.0300	Significant
CoinEq(-1)*	-0.565193	2.0049	-8.303918	0.0000	Significant

Source: Data processed, 2024.

The table summarizes the findings of short-term assessments for each variable. The coefficient for economic growth is 0.0009, indicating that economic growth from a

year ago positively affects current economic growth, with a coefficient of 0.471723. The foreign direct investment variable has a coefficient of 0.012522, suggesting that a 1% increase in foreign direct investment leads to a 0.0125% increase in economic growth. This variable shows significant positive short-term effects as the t-statistic of 4.884851 exceeds the critical t-value of 2.0049, with a probability of 0.0001, less than 0.05.

Meanwhile, the coefficient for manufacturing value added is 0.526075, indicating that a 1% increase in manufacturing value added results in a 0.526% increase in economic growth. This variable demonstrates significant positive short-term impact as the t-statistic of 7.394237 exceeds the critical t-value of 2.0049, with a probability of 0.0000, less than 0.05. Three years ago, manufacturing value added also positively impacted economic growth with a probability of 0.0244, below 0.05.

The government expenditure variable has a coefficient of 0.162492, indicating that a 1% increase in government expenditure boosts economic growth by 0.162%. This variable shows positive and significant effects in the short term as the t-statistic of 3.314201 exceeds the critical t-value of 2.0049, with a probability of 0.0041, less than 0.05. In the previous year, government expenditure also positively and significantly affected economic growth with probabilities of 0.005 and 0.0117, below 0.05.

The population growth variable has a coefficient of 37.33059, indicating that a 1% increase in population growth leads to a 37.33% increase in economic growth. This variable demonstrates significant positive effects in the short term as the t-statistic of 2.593087 exceeds the critical t-value of 2.0049, with a probability of 0.0189, less than 0.05. Three years ago, it showed negative impacts, while one year ago it showed positive effects on economic growth.

The inflation variable has a coefficient of -0.082568, indicating that a 1% increase in inflation reduces economic growth by -0.08%. This variable has negative and significant effects in the short term as the t-statistic of -2.368847 is smaller than the critical t-value of -2.0049, with a probability of 0.0300, less than 0.05. Four years ago, inflation positively affected economic growth with a probability of 0.0042, below 0.05.

The Error Correction Term (CoinEq (-1)) in the table shows a coefficient of -0.565193 and a probability of 0.0000. This indicates that in the short term, if there is imbalance, the model will correct towards long-term equilibrium within approximately 5.7 quarters or around 6 years.

Discussion

The ARDL examination confirms that both assembling esteem added and monetary development display eminent beneficial outcomes over both short and extensive stretches, despite challenges presented by the Coronavirus pandemic in 2021. Indonesia's assembling area supported positive development by acclimating to advertise requests, taking on cutting edge creation advancements, growing commodities of clinical

and food items, and profiting from government support through financial boost measures and foundation improvement drives. These findings align with research by Behun et al (2018), Su & Yao (2017), and Agustin & Nahar (2020) demonstrating that manufacturing value added contributes to economic growth through increased job opportunities, infrastructure investment, and more efficient human resource management in developing countries.

Examination utilizing the Auto Backward Conveyed Slack (ARDL) technique uncovers that administration consumption has a positive and genuinely massive impact on monetary development for the time being. In 2021, the public authority allotted improvement assets for different purposes like obtaining Coronavirus immunizations, medical services hardware, and framework advancement. Expanded government spending straightforwardly animates the economy by assembling yields from these activities and upgrading interest for labor and products. In any case, over the long haul, the effect of government spending on financial development might be obliged by dependence on unstable incomes and difficulties like regulatory failures or defilement in reserve the board. These discoveries line up with past examinations by Ichvani & Sasana (2019) and Anitasari & Soleh (2015), which correspondingly reasoned that administration use decidedly and altogether impacts financial development.

Examination utilizing the Auto Regressive Distributed Lag (ARDL) strategy correspondingly shows that populace development affects financial development temporarily. An ascent in populace reinforces the workforce and lifts interest for labor and products, in this way invigorating utilization and improving modern ability to address market issues. While urgent in the short run, the supported effect of populace development on financial extension depends on progressions in labor force quality, accomplished through interests in schooling, preparing, and human asset advancement.

According to the Auto Regressive Distributed Lag (ARDL) analysis, inflation does not exert a lasting influence on economic growth. Nevertheless, in the short term, inflation significantly hampers economic growth. Increased production costs, such as wages and raw materials, contribute to inflationary pressures, prompting consumers to allocate more of their budgets to goods and services. This situation can potentially lead to uncontrollable inflationary cycles, which might diminish aggregate demand and erode confidence among consumers and investors in the market. Ardiansyah (2017) similarly argues that inflation negatively impacts economic growth.

Based on the Auto Regressive Distributed Lag (ARDL) analysis, foreign direct investment (FDI) positively and significantly influences short-term economic growth. FDI enhances corporate investments, introduces advanced technologies, and implements new management systems. The influx of foreign capital also increases labor productivity, creates new job opportunities, and stimulates overall economic growth. Previous research aligns with these findings, highlighting FDI's substantial contribution to the economy

through technology transfers and infrastructure enhancements. Ultimately, FDI's positive impact on economic growth stems from the advancement of knowledge and technological innovation driven by research and development activities across both public and private sectors (Nasir et al., 2021).

CONCLUSION

The findings from the analysis conducted using the Auto Regressive Distributed Lag (ARDL) method are as follows:

1. The growth of manufacturing value added significantly and positively influences Indonesia's economic growth over both short and long periods. This underscores the role of the manufacturing sector in expanding markets, enhancing productivity, diversifying the economy, and fostering innovation and technological advancements, crucial for sustainable economic development.
2. Increased government expenditure in the short term has a positive and substantial impact on economic growth. By allocating funds towards infrastructure, stimulus packages, and public services, the government can stimulate economic activities that bolster overall economic growth.
3. Population growth positively affects economic growth in the short term. An expanding population stimulates demand for goods and services, enlarges markets, and promotes economic growth through heightened consumption, workforce expansion, and increased investment.
4. Inflation exerts a negative and significant influence on short-term economic growth. Escalating inflation rates may curtail investment and consumption, introduce economic uncertainty, and potentially impede economic expansion.
5. Foreign direct investment (FDI) demonstrates a positive and significant impact on economic growth across both short and long timeframes. Substantial FDI inflows can inject capital, generate employment opportunities, fortify infrastructure and technology, all contributing to sustainable economic growth.

Therefore, the findings from the ARDL analysis indicate that these variables exert significant and varied impacts on Indonesia's economic growth, spanning both short and long time horizons.

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