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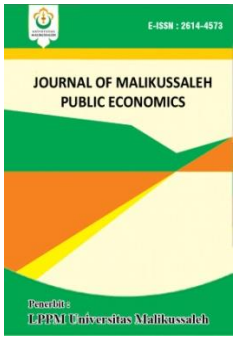
THE EFFECT OF INFLATION, LABOR FORCE PARTICIPATION RATE AND EXPORTS ON ECONOMIC GROWTH IN INDONESIA



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A R T I C L E I N F O R M A T I O N

Keywords:
Economic Growth, Inflation. Labor Force Participation Rate, Exports

A B S T R A C T

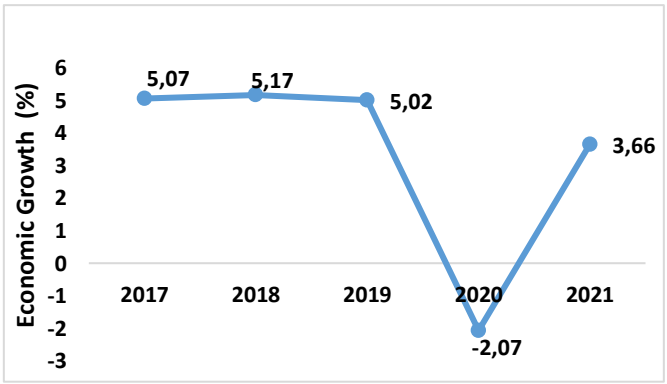
This study examines the effect of inflation, labor force participation rate and exports on economic growth in Indonesia. This study analyzes the data using the Autoregressive Distributed Lag (ARDL) model with time-series data from 1990 to 2021 obtained from the World Bank and the Central Statistics Agency of Indonesia. The results conclude that in the short and long term inflation has a negative and significant effect on economic growth in Indonesia. In the short term, labor force participation rate has a positive and significant effect on economic growth in Indonesia. In the long term, labor force participation rate has a positive but insignificant effect on economic growth in Indonesia. In the short and long term, exports have a positive and significant effect on economic growth in Indonesia. Based on the research results, it is suggested that inflation control, improvement in the quality of the labor force, and export enhancement are necessary.

1. INTRODUCTION

Economic development is a crucial factor for a country. The purpose of economic development based on Pancasila and the 1945 Constitution is to encourage equitable prosperity and high economic growth characterized by advanced industries and optimal utilization of natural resources. Economic growth is a quantitative measure of how the economy has developed in a particular year compared to the previous year. Economic growth is measured based on the growth of gross domestic product (GDP) at constant prices. Gross domestic product can depict a country's ability to manage resources within the country (Ardiansyah, 2022).

If the amount of goods and services produced in the business cycle continues to increase from the previous year, this will indicate that the country has achieved good economic growth. According to Rostow, there are five stages of economic growth: traditional society, the pre-takeoff period, the takeoff period, the transition to maturity, and high mass consumption. This classification is determined by the economic, political and social relationships that exist in society (Mankiw, 2012).

Economic growth in Indonesia over the past 30 years has tended to increase, but in recent years it has decreased. In 1990, economic growth was only 7.22%, but in 2021, it was 3.66%. Indonesia's economic growth from 2017 to 2021 is as follows:



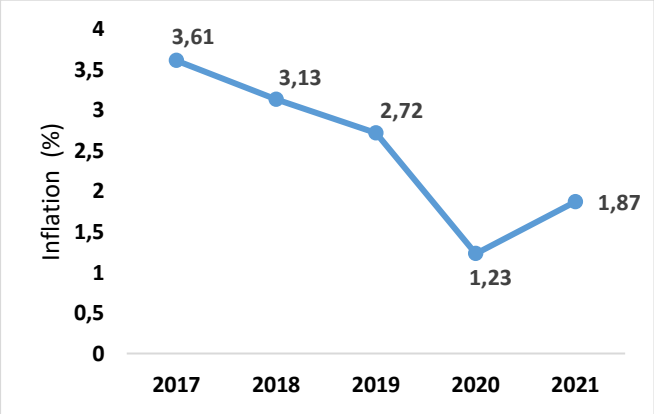
Source: World Bank, 2022

Figure 1.1: Economic Growth of Indonesia during 2017-2021 (percent).

For the past five years, Indonesia's economic growth has been fluctuating. Economic growth reached 5.07% in 2017, but increased to 5.17% in 2018 due to the development of the industrial and tourism sectors as well as infrastructure developments (Central Statistics Agency, 2022). However, economic growth slowed to 5.02% in 2019 due to seasonal effects on the agribusiness sector. In 2020, economic growth

experienced a drastic decrease of -2.07% caused by the Covid-19 pandemic, which slowed global economic activity, decreased market demand, and restricted movement and economic activity in Indonesia. In 2021, economic growth increased by 3.66% due to the government's success in overcoming Covid-19.

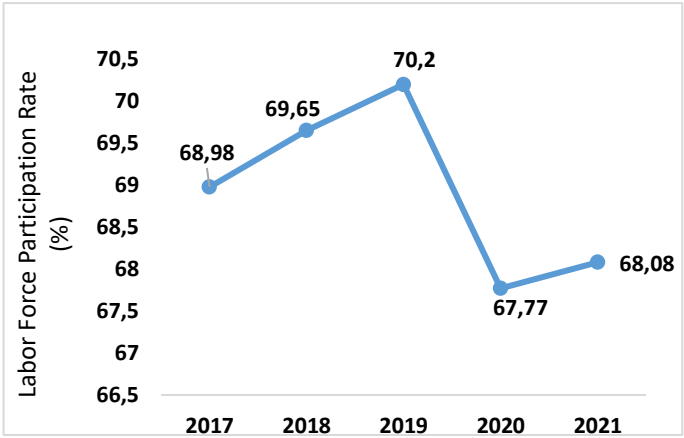
Inflation is one of the most vital monetary events in all countries. Inflation is a general and continuous rise in prices. Inflation is closely related to a country's economic growth rate. When inflation increases, economic growth tends to decrease. Vice versa, if inflation decreases or stabilizes, then economic growth will increase. Low and stable inflation is a prerequisite for sustainable economic growth that benefits the public's welfare. The following is the development of Indonesia's inflation from 2017 to 2021:



Source: Central Staistic Agency of Indonesia, 2022

Figure 1.2. Inflation of Indonesia during 2017–2021 (percent)

The inflation rate in Indonesia decreased from 2017 to 2020 but increased again in 2021. Inflation in 2018 was 3.13% lower than in 2017 due to the appropriate monetary policy implemented by Bank Indonesia, rupiah exchange rate appreciation, and improved productivity in the real sector. Then, in 2019, inflation decreased again by 2.72% due to the influence of the stable rupiah exchange rate throughout that year (Central Statistics Agency of Indonesia, 2020). The lowest point of inflation occurred in 2020 at 1.23%, which was influenced by domestic demand and collaboration between Bank Indonesia and the central and regional governments in maintaining price stability. Inflation in 2021 increased by 1.87%. It was due to weak domestic demand and the limited mobility of the people. Apart from inflation, the labor force also affects economic growth. The neoclassical theory of economic growth developed by Robert Solow emphasizes that economic growth can be enhanced through an increase in the quality and quantity of the labor force (Tien, 2021). Here is the development of Indonesia's labor force participation rate from 2017-2021:

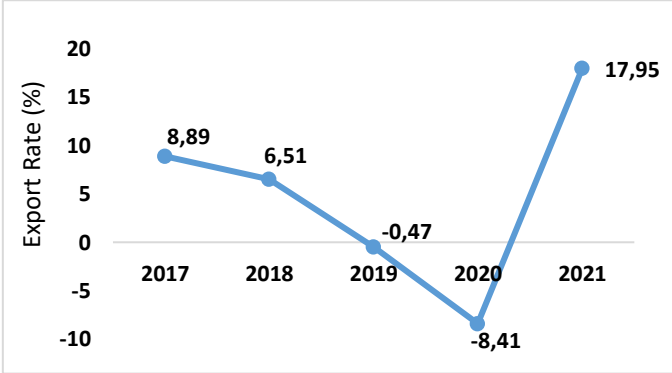


Source: World Bank, 2022

Figure 1.3. Labor Force Participation Rate of Indonesia during 2017–2021 (percent)

Labor force participation rates in Indonesia increased from 2017 to 2019 but decreased from 2020 to 2021. In 2018, the labor force participation rate was 69.65%, higher than in 2017 at 68.98%, due to the government's policy of improving the education sector through infrastructure and training provided in schools. In 2019, the labor force participation rate increased to 70.2%, which showed potential for economic growth due to an increasing labor force supply (Bakar, 2022). The increase was also a result of improvements in the education system. However, in 2020 and 2021, the labor force participation rate decreased to 67.77% and 68.08%, respectively, due to several workers losing their jobs because of the Covid-19 pandemic, social restrictions, and economic activities.

Thomas Munn, a classical economist, states that economic growth is also influenced by exports through international trade. When a country exports more than it imports, it can benefit its balance of payments. Based on this assumption, many countries participate in international trade and cooperate with other countries to increase their exports (Silaban & Rejeki, 2020). Here is the development of Indonesia's export growth from 2017 to 2021:



Source: World Bank, 2022

Figure 1.2. Exports Growth of Indonesia during 2017–2021 (percent)

Export growth in Indonesia experienced a decline from 2017 to 2020 but increased in 2021. Growth in exports in 2018 was 6.51% lower than in 2017, which

was 8.89%. It was due to the decrease in exports of oil and mineral fuel. In 2019, export growth decreased by -0.47% due to the low export of oil and natural gas (Central Statistics Agency of Indonesia, 2019). The significant decrease in export growth in Indonesia in 2020 was a result of movement restrictions imposed on people and international trading access due to the impact of Covid-19. Production volume also decreased, leading to a decrease in export value. However, export growth rose to 17.95% in 2021 due to the government's focus on policies to address Covid-19 and the development of the export sector, such as improving infrastructure quality and quantity, increasing workforce training, and providing export incentives.

There are studies regarding the influence of inflation, labor force participation rates, and exports on economic growth. Mahzalena (2019) concluded that inflation negatively and significantly affected economic growth in Indonesia. Mohseni and Jourzyan's (2016) study found that inflation negatively and significantly affected economic growth and could decrease economic growth in the long term. Bakar's (2022) study demonstrated that labor force participation rates had a negative and significant partial correlation with economic growth. Conversely, labor force participation rates have a positive and significant simultaneous effect on economic growth in five provinces in Indonesia. Dahal's (2019) study found that labor force participation rates positively and significantly affected economic growth. Lesfandra's (2021) study confirmed that exports significantly and positively affected Indonesia's economic growth. Additionally, Nopeline & Simanjuntak's (2017) study found that exports significantly and positively influenced Indonesia's economic growth.

This study aims to analyze the influence of inflation, labor force participation rate, and exports on economic growth in Indonesia using the autoregressive distributed lag (ARDL) model. The ARDL model is a regression model that takes into account the long-term and short-term effects of dependent variables on a unit change in the explanatory variable's value. The difference between this study and previous studies lies in the combination of independent variables and the study period.

2. LITERATURE REVIEW

Economic Growth

According to Sukirno (2015), economic growth is the development of goods and services resulting from economic activities that contribute to improving the welfare of society. There are several economic growth theories proposed by experts:

Classical Economic Growth Theory

Classical economists agreed that four factors influence economic growth: population size, the availability of capital goods, environmental conditions, and the level of technology used. While economic growth depends on various factors, economists tend to focus on the impact of population growth. The classical growth theory was pioneered by several economists, namely Adam Smith, David Ricardo, and Thomas Robert Malthus (Shahid, 2014).

Neo-Classical Economic Growth Theory

Neo-classical growth theory not only focuses on population growth but also emphasizes entrepreneurship and investment, which are considered to influence economic growth. Neo-classical growth theory was pioneered by several economists, namely Schumpeter, Harrod-Domar, and Robert Solow (Sari, 2019).

Historical Economic Growth Theory

Based on this theory, economic growth has stages to achieve maximum growth. Historical economic growth theory was pioneered by several economists, namely Friedrich List, Werner Sombart, Bruno Hildebrand, and Karl Bucher (Mankiw, 2012).

New Growth Theory

A new growth theory was pioneered by Paul M. Romer and Robert Lucas as a criticism of Solow's economic growth theory to explain the growth levels and the significant factors behind them. According to Rostow, the new growth theory is divided into five stages: traditional society, pre-landing, landing, take-off, and high consumption levels (Sukirno, 2015).

Inflation

Samuelson (2001) defines inflation as a condition characterized by a general increase in the prices of goods, services, and production inputs. According to Sukirno (2011), the causes of inflation are demand factors, increasing production costs, high levels of money circulation, inflation expectations, and government policies. While inflation can have a negative impact on the economy, reducing it helps to maintain economic balance. The negative and positive effects of inflation are:

1. Continuous price increases can lead to panic, causing economic activities to perform poorly.
2. This panic results in people withdrawing their savings to buy necessary things, causing many banks to go bankrupt or even close.
3. Inflation can affect output and employment opportunities.
4. The unfair distribution of goods can occur due to the accumulation or concentration of products in certain areas close to the production location.
5. People might become more selective in their consumption.

According to Natsir (2014), the formula used to calculate inflation is:

$$INF_n = \frac{IHK_{n-IHK_n}}{IHK_{n-1}} \times 100\%$$

Information:
INFn : Inflation
CPI : Consumer Price Index for the Base Year
IHKn-1 : Consumer price index in the previous year

Labor Force Participation Rate

According to the Central Statistic Agency of Indonesia, the labor force participation rate is the ratio of the labor force to the population aged 10 years and older. Labor Force Participation Rate in Indonesia is calculated by dividing the labor force (population over 15 years old) by the total population over 10 years old. Factors influencing Labor Force Participation Rate are age composition, wage levels, and educational levels. According to classical thinking, labor is one of the production factors in the economy. The formula for calculating Labor Force Participation Rate is the ratio of the labor force to the total population over ten years old.

$$\frac{X}{Y} \times 100\%$$

Information:
X = labor force (population of working age 15 years and over)
Y = number of residents 10 years of age and over

Export

Export is the activity of sending goods from the customs territory of Indonesia to another country's customs territory (Ginting, 2017). Exporting is beneficial for increasing the state's foreign exchange and creating job opportunities. The government can encourage exports in several ways, including export diversification or adding types of export goods, export subsidies, export premiums, and dumping. Export is divided into several types:

1. Direct export: the sale of goods or services to foreign countries without intermediaries.
2. Indirect export: the sale of goods through intermediaries

The Effect of Inflation on Economic Growth

Inflation is an economic factor that affects the progress of a country's economy. It is closely related to economic growth. There are three groups of theories related to economic growth: quantity theory, Keynesian theory, and structuralist theory (Ismail, 2012). High and unstable inflation rates reflect instability that continuously increases the overall price level and impacts poverty rates. Hyperinflation can cause a decrease in people's purchasing power, which can slow down economic growth. However, relatively low inflation rates can encourage economic growth (Shahid, 2014).

Several studies have explored the relationship between inflation and economic growth. Quddus (2022) concluded that inflation negatively affects economic growth. Dwi (2023) found that inflation positively affects economic growth.

The Effect of Labor Force Participation Rate on Economic Growth

According to Todaro, population growth is traditionally considered one of the positive factors that can stimulate economic growth because population growth can create skilled labor through training or education, which increases productivity and causes faster production growth (Ardyan, 2017). Besides, Adam Smith asserted that labor provision can increase productivity and influence economic growth (Sukirno, 2015).

Several studies have explored the relationship between labor force participation rates and economic growth. Syamsuddin (2021) found that the labor force participation rate has a significant simultaneous and partial effect on economic growth in Aceh Province. Also, Putriana (2022) concluded that LFPR positively and significantly affects economic growth.

The Effect of Exports on Economic Growth

According to Sukirno (2006) by Hodijah and Angelina (2021), an export is the sale of goods and services from one country to another. The Thomas Muun theory states that international trade will benefit a country's balance of payments if exports are higher than imports, which is why many countries establish economic cooperation to increase exports. High export rates can increase national revenue in terms of foreign exchange reserves, thus positively affecting economic growth (Silaban & Rejeki, 2020).

Several previous studies support this theory, including Etahisoa (2020), which concluded that exports positively and significantly affect economic growth. Additionally, Astuti et al. (2018) found that exports positively and significantly affect economic growth.

Conceptual Framework

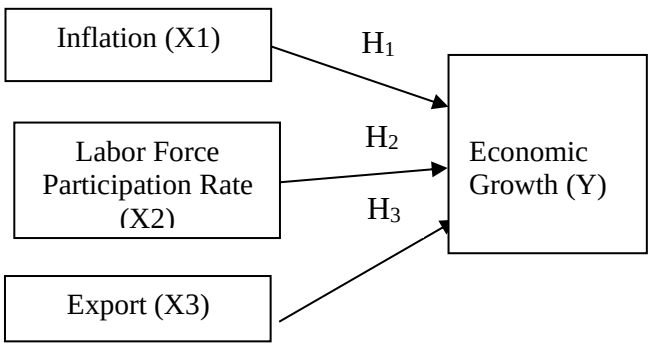


Figure 2.1
Conceptual Framework

It is apparent from Figure 2.1 that inflation (X1), labor force participation rate (X2), and exports (X3) are the independent variables, whereas economic growth is the dependent variable (Y).

Hypothesis

Based on the above description, the research hypothesis, which is a temporary assumption of the study, is formulated as follows:

H1: Inflation has a negative and significant impact on economic growth in Indonesia in the short and long term.

H2: The labor force participation rate (TPAK) has a positive and significant impact on economic growth in Indonesia in the short and long term.

H3: Exports have a positive and significant impact on economic growth in Indonesia in the short and long term.

3. RESEARCH METHODOLOGY

Object and Location

The object of this study is inflation, labor force participation rates, exports, and economic growth, and this study is conducted in Indonesia.

Data Sources

This study uses secondary data in the form of time series. Secondary data is research data obtained indirectly through intermediary sources. For this study, the researchers collected data from the World Bank and the Central Bureau of Statistics (BPS) of Indonesia. The World Bank data includes economic growth, labor force participation rates, and export growth from 1990 to 2021. On the other hand, the BPS data shows inflation rates for the same period.

Method of Collecting Data

The data collection technique used in this study is the documentation method, consisting of reading, copying, and processing data or written records from agencies (institutions) and other journals.

Operational Definition of Variables

This study uses two independent variables and one dependent variable, as described as follows:

a. Economic Growth (Y)
   Economic growth is an increase in the output value of the economic sector in the Indonesian region over one year. Economic growth in Indonesia is measured using the Gross Domestic Product (GDP) based on constant prices (ADHK), expressed in percent.

b. Inflation (X1)
   Inflation is a condition in which the general prices of goods and services experience continuous increases over the course of a year. Inflation in Indonesia is measured using the Consumer Price Index (CPI) indicator, expressed in percent.

c. Labor Force Participation Rate (X2)
   The labor force participation rate (LFPR) is the percentage of the workforce (people aged 15 years or older) to the total population aged 10 years and above. LFPR is expressed in percent.

d. Export (X3)
   Export refers to international trade activities by sending goods or services from Indonesia to other countries. In this study, the data used is export growth data. Export growth is the growth of export value in a particular year compared to the previous year, expressed in percent.

Data Analysis Method

***Autoregressive Distributed Lag* (ARDL)**

The ARDL model is a combination of Auto-Regressive (AR) and Distributed Lag (DL) models. The AR model is a model that uses one or more past time series data points for the dependent variable. In contrast, the DL model is a regression model involving data at present and lagged data for the independent variable.

Stationary Test

To avoid this erratic regression problem is necessary to convert non-stationary data into stationary data. The stationary test can be carried out with the unit root test to determine the stationarity of a variable. If it turns out that it is not yet stationary, then it must be continued through an integration test. In this study, the unit root test with ADF is used. The hypothesis of the data stationary test is**:**

H_0 : Data has a unit root (data is not stationary)
H_1 : Data does not have a unit root (stationary data)

Optimal Lag Determination

Determining the lag in the ARDL model is crucial, and if the lag is too low, the model will not accurately predict the actual errors and will not be able to estimate the standard error correctly. On the other hand, if the determined lag is too high, the degree of freedom will be reduced. Optimal lag determination can be determined by considering the criteria set by Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), Hannan-Quin Information Criterion (HQ), and Likelihood Ratio (LR). In this study, the determination of the lag length appears through the Akaike Information Criterion (AIC) (Gujarati, 2012).

Cointegration Bound Test

The cointegration test is conducted to test whether non-stationary variables at the level of data are cointegrated between one variable and another. This cointegration is formed when a combination of non-stationary variables produces stationary variables. If there is cointegration, then the equation is as follows:

$$y_t = \beta_0 + \beta_1 X_1 + e_t$$

So, the error of the equation can be written as follows:

$$e_t = y_t - \beta_0 - \beta_1 X_1$$

Where:
β_0 : Constant
β_1 : ARDL model coefficients
e_t : Time residual value
y_t : Dependent variable

Classical Assumption Test

The classical assumption test is a statistical requirement in regression analysis. An assumption is an estimation made by humans to simplify a problem. Assumptions are used when analyzing a situation due to certain unknown variables.

Autocorrelation Test

Autocorrelation is a phenomenon where there is a relationship between independent variables or variables that are correlated with themselves. Autocorrelation results in a residual variance that is lower than expected. According to Wooldridge (2005) and Widarjono (2017), one method of analyzing whether there is autocorrelation or not is by performing the Durbin Watson (DW) and Lagrange Multiplier (LM) tests.

Heteroscedasticity Test

The heteroscedasticity test aims to test whether regression model has variance inequality or residuals varying from one observation to another. Heteroscedasticity arises when the disturbance variables have a non-constant variance (Gujarati & Porter, 2012).

ARDL Estimation

The ARDL model represents the influence of variables X and Y over time, including the effect of variables Y from the past on the current value of Y (Fadhilah, 2017). This study uses the Autoregressive Distributed Lag (ARDL) model specification. The general model of ARDL is in the following equation:

$$Y_t = \alpha + \Sigma_{i=0}^{n}\beta_i X1t_{-1} + \Sigma_{i=0}^{m}\gamma_i X2_{t-i} + \Sigma_{i=0}^{p}\varphi_i X3_{t-i} + \epsilon_t$$

Where:
y_t : Dependent variable of year t
$x1_{t-i}$: Independent variable of first year of year t to $t-i$
$X2_{t-i}$: Independent variable of second year to year $t-i$
$X3_{t-i}$: Independent variables of third year to year $t-i$
α : Constants
$\beta_i\gamma_i\varphi_i$: Regression coefficient
ϵ_t : *Error term*

The short-term ARDL equation in this study is as follows:

$$\Delta PE = \alpha + \Sigma_{i=0}^{n}\beta_i \Delta INF_{t-i} + \Sigma_{i=0}^{m}\gamma_i \Delta TPAK_{t-i} + \Sigma_{i=0}^{p}\varphi_i \Delta EKS_{t-i} + \epsilon_t$$

Where:
Δ : *First difference*
ΔPE : *First difference* of economic growth
ΔINF : *First difference* of inflation
$\Delta TPAK$: *First difference* of labor force participation rate
ΔEKS : *First difference* of exports
α : Constants
$\beta_i\gamma_i\varphi_i$: Regression coefficient
ϵ_t : *Error term*

The ARDL model in the long-term equation in this study can be written as follows:

$$\text{PE} = \alpha + \beta_i INF_t + \gamma_i TPAK_t + \varphi_i EKS_t + \epsilon_t$$

Where:
PE_t : Economic growth of year to t
INF_t : Inflation of year to t
$TPAK_t$: Labor participation rate year to t
EKS_t : Export year to t
α : Constants
$\beta_i\gamma_i\varphi_i$: Regression coefficient
ϵ_t : *Error term*

ARDL Stability Test

The stability test of the ARDL model in this study uses the CUSUM test with a 95% confidence level. The CUSUM test results for the ARDL model in this study indicates that the model stability is determined by the position of the blue CUSUM line between the two red 5% significance lines.

4. RESULTS AND DISCUSSION

Stationary Tests

Table 4.1
Stationary Test Results

Variable	Unit Root	ADF T-Statistic	Critical Value (5%)	Probabilty ADF	Information
Economic Growth	Level	-4.076.530	-2.960.411	0.0035	Stationery
	1st *Difference*	-3.893.027	-2.976.263	0.0063	Stationery
Inflation	Level	-5.456.870	-2.960.411	0.0001	Stationery
	1st *Difference*	-1.176.660	-2.998.064	0.0000	Stationery
Labor Force Participation Rate	Level	-2.273.516	-2.960.411	0.1864	Not Stationery
	1st Difference	-5.544.531	-2.963.972	0.0001	Stationery
Exports	Level	-7.156.981	-2.960.411	0.0000	Stationery
	1st *Difference*	-5.929.225	-2.971.853	0.0000	Stationery

Source: Data analysis results, 2023

Table 4.1 above reveals that the variables of economic growth, inflation, and exports are stationary at the level of the 1st difference at a confidence level of 5%, as evidenced by the probability value being lower than 0.05. Conversely, the labor force participation variable is non-stationary at the level but stationary at the 1st difference level, as evidenced by the probability value being higher than 0.05. Therefore, all variables are stationary at the first difference level.

Descriptive Statistics

Table 4. 1
Descriptive Statistics

Variable	Mean	Max	Min	Std.Dev	Observation
Economic Growth	4.679375	8.220000	-13.13000	3.778178	32
Inflation	8.971875	77.60000	1.230000	13.04538	32
Labor Force Participation Rate	68.21250	70.20000	65.87000	1.064394	32
Exports	5.978104	26.48492	-31.80498	10.56614	32

Source: Data analysis results, 2023

Economic growth has a mean of 4.67%, a maximum value of 8.22%, a minimum value of -13.13%, and a standard deviation of 3.77. Based on the mean value and standard deviation of 3.77, which is less than 4.67, the data distribution of economic growth in this case is well-distributed from 32 observations.

Inflation has a mean of 8.97%, a maximum value of 77.60%, a minimum value of 1.23%, and a standard deviation of 13.04538. Based on the standard deviation and mean values of 13.04538 or higher than 8.97%, the data distribution of inflation in this case is not well-distributed from 32 observations.

Labor force participation rate has a mean of 68.21%, a maximum value of 70.20%, a minimum value of 65.87%, and a standard deviation of 1.06 or less than 68.21%. Therefore, the data distribution of TPAK in this case is well-distributed from 32 observations.

Exports have a mean of 5.97%, a maximum value of 26.48%, a minimum value of -31.80%, and a standard deviation of 10.56%. Based on the standard deviation and mean values of 10.56%, which is higher than 5.97%, the data distribution of exports in this case is not well-distributed from 32 observations. It is important to note that the standard deviation of inflation is smaller than the mean value.

Optimum Lag Determination

Table 4.2
Optimal Lag Length Test Results

R-squared	0.864799	Mean dependent var	4.597419
Adjusted R-squared	0.837759	S.D. dependent var	3.811607
S.E. of regression	1.535285	Akaike info criterion	3.867294
Sum squared resid	58.92749	Schwarz criterion	4.144840
Log likelihood	-53.94306	Hannan-Quinn criter.	3.957767
F-statistic	31.98193	Durbin-Watson stat	2.067947
Prob(F-statistic)	0.000000		

Source: Data analysis results, 2023

According to Table 4.3, for the criteria with Akaike Info Criterion (AIC), Schwarz Criterion (SC), and Hannan-Quinn Criterion (HQC) models, the average value is at lag 4 (automatic selection). Therefore, the optimal lag length in this study is 4.

Cointegration Bound Test

Cointegration testing can be done through the long-run form and Bound test. The Bound test for cointegration is based on the stationary residuals in the long-term equation. The results of the Bound Test can be seen in the following table:

Table 4.2
Cointegration Bound Test Results

Test Statistic	Value	Signif.	I(0)
			Asymptotic: n=1000
F-statistic	13.73102	10%	2.37
k	3	5%	2.79
		2.5%	3.15
		1%	3.65

Source: Data analysis results, 2023

Based on Table 4.4 above, the results indicate the presence of cointegration in this study. It is evident from the F-statistic value of 13,731, which is higher than I (0) and I (1) at a significance level of 1%, 5%, and 10%. The selection summary criteria graph model used with the Akaike Information Criterion method (top 20 models) appears in the figure below:

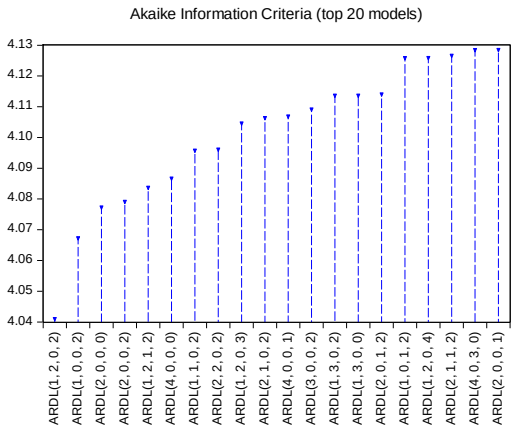


Figure 4.1. ***Model Selection Summary***

In the model of the selection summary criteria graph, the Akaike Information Criterion (AIC) method is used to select the top 20 models. Based on Figure 4.6, the dashed line indicating the lowest value is located at ARDL (1,2,0,2). Therefore, this model is chosen.

Classical Assumption Test

Autocorrelation Test

Table 4.3
Autocorrelation Test Results

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.557643	Prob. F(4,16)	0.6966
Obs*R-squared	3.548249	Prob. Chi-Square(4)	0.4706

Source: Data analysis results, 2023

Table 4.4 shows that the Obs*R-square is 3.55 and the Chi-Square (4) table at α: 5% is 9.48. So, 3.55 < 9.48 means that this model is free from autocorrelation indications. It also appears on the ProbChi-Squared, which is 0.471 > 0.05.

Heteroskedasticity Test

Table 4.4
Heteroskedasticity Test Results

Heteroskedasticity Test: White

F-statistic	1.314261	Prob. F(8,20)	0.2923
Obs*R-squared	9.992386	Prob. Chi-Square(8)	0.2656
Scaled explained SS	6.631392	Prob. Chi-Square(8)	0.5769

Source: Data analysis results, 2023

Based on the table, the results show that the Obs*R-Square value is 9.99, and the Chi-Square (8) table at α: 5% is 15.51. So, 9.99 < 15.51 means that this model is free from indications of heteroscedasticity. It can also be seen from the Chi-Squared Prob of 0.2656 > 0.05

1) ARDL Model Estimation Results

After performing stationary and cointegration tests, data processing is carried out using ARDL analysis. Data processing is divided into short-term and long-term categories. The results of short-term data processing can be seen in the following table.

Table 4.5
Short-term ARDL Estimation Results

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PE(-1))	3.906009	1.265858	3.085662	0.0539
D(PE(-2))	3.031434	0.998956	3.034602	0.0561
D(PE(-3))	0.864941	0.430797	2.007770	0.1383
D(PE(-4))	1.562116	0.532738	2.932242	0.0609
D(INF)	-0.247939	0.019523	-12.70000	0.0011
D(INF(-1))	1.303221	0.416327	3.130278	0.0521
D(INF(-2))	0.850329	0.314481	2.703910	0.0735
D(INF(-3))	0.386857	0.175599	2.203073	0.1148
D(INF(-4))	0.465004	0.158582	2.932269	0.0609
D(TPAK)	3.160359	0.705174	4.481673	0.0207
D(TPAK(-1))	-0.528380	0.596263	-0.886152	0.4408
D(TPAK(-2))	-1.790627	0.743663	-2.407847	0.0952
D(TPAK(-3))	-0.739267	0.461283	-1.602631	0.2073
D(EKS)	0.248755	0.067645	3.677389	0.0348
D(EKS(-1))	-0.757996	0.229484	-3.303042	0.0456
D(EKS(-2))	-0.524878	0.161630	-3.247414	0.0476
D(EKS(-3))	-0.291881	0.099926	-2.920959	0.0614
D(EKS(-4))	-0.291008	0.082748	-3.516797	0.0390
CointEq(-1)*	-4.366166	1.092314	-3.997171	0.0281

Source: Data analysis results, 2023

Based on Table 4.8, the ARDL short-term test results can be formulated as follows:

$$\Delta PE_t = 3.907\Delta PE_{t-1} + 3.031\Delta PE_{t-2} + 1.562\Delta PE_{t-4} - 0.248\Delta INF_t + 1.303\Delta INF_{t-1} + 0.850\Delta INF_{t-2} + 0.466\Delta inf_{t-4} + 3.160\Delta TPAK_t - 1.791\Delta TPAK_{t-2} + 0.249\Delta EKS_t - 0.758\Delta EKS_{t-1} - 0.525\Delta EKS_{t-2} - 0.292\Delta EKS_{t-3} - 0.291\Delta EKS_{t-4} - 4.366\, Ect\,(-1)$$

Based on this model, it is observed that the value of CointEq (-1)/Ect (-1) is -4.36, which is significant at the 5% level, implying short-term and long-term cointegration in this model.

The coefficient of economic growth from 1 year ago is 3.906, indicating that a change in economic growth from the previous year in Indonesia will result in an increase of 3.906 percent in Indonesia's economic growth in the current year. This variable is not significant at the 5% level but significant at the 10% level, with a probability value of 0.053 <0.10. Thus, economic growth in Lag 1 positively and significantly impacts Indonesia's economic growth at the 10% level.

The coefficient of economic growth from 2 years ago is 3.031, indicating that a change in economic growth in Indonesia from 2 years ago will result in an increase of 3.031 percent in Indonesia's economic growth in the current year. This variable is not significant at the 5% level but significant at the 10% level, with a probability value of 0.056 <0.10. Thus,

economic growth in lag 2 positively and significantly impacts Indonesia's economic growth at the 10% level.

The coefficient of economic growth from 4 years ago is 1.562, indicating that a change in economic growth in Indonesia from 4 years ago will result in an increase of 1.562 percent in Indonesia's economic growth in the current year. This variable is not significant at the 5% level but significant at the 10% level, with a probability value of 0.060 <0.10. Thus, economic growth in Lag 4 positively and significantly impacts Indonesia's economic growth at the 10% level.

Inflation at lag 0 has a coefficient of -0.248, which means that a 1% increase in inflation in the current year will cause a decrease of 0.27 percent in Indonesia's economic growth in the same year. This variable is significant at the 1% level and significant at the 5% level, with a probability value of 0.001 <0.01. Hence, inflation at lag 0 negatively and significantly impacts Indonesia's economic growth at the 1% level.

The coefficient of inflation from 1 year ago is 1.303, indicating that a 1% increase in Indonesia's inflation from the previous year will result in a 1.303 percent increase in Indonesia's economic growth in the current year. This variable is not significant at the 5% level but significant at the 10% level, with a probability value of 0.052 <0.10. Thus, inflation at lag 1 positively and significantly impacts Indonesia's economic growth at the 10% level.

The coefficient of inflation from 2 years ago is 0.850, indicating that a 1% increase in Indonesia's inflation from 2 years ago will result in an increase of 0.850 percent in Indonesia's economic growth in the current year. This variable is not significant at the 5% level but significant at the 10% level, with a probability value of 0.073 <0.10. Hence, inflation at lag 2 positively and significantly impacts Indonesia's economic growth at the 10% level.

The coefficient of inflation from 4 years ago is 0.465, indicating that a 1% increase in Indonesia's inflation from 4 years ago will result in a 0.465 percent increase in Indonesia's economic growth in the current year. This variable is not significant at the 5% level but significant at the 10% level, with a probability value of 0.060 <0.10. Therefore, inflation at lag 4 positively and significantly impacts Indonesia's economic growth at the 10% level.

The labor force participation rate at lag 0 has a coefficient of 3.160, indicating that a 1% increase in the labor force participation rate in the current year will result in an increase of 3.160 percent in Indonesia's economic growth. The probability value of this variable is 0.020 <0.05. Hence, labor force participation at lag 0 positively and significantly impacts Indonesia's economic growth at the 5% level.

The coefficient of the labor force participation rate from 2 years ago is -1.791, indicating that a 1% increase in Indonesia's labor force participation rate from 2 years ago will result in a decrease of 1.791 percent in Indonesia's economic growth in the current year. This variable is not significant at the 5% level but significant at the 10% level, with a probability value of 0.095 <0.10. Thus, labor force participation at lag 2 positively and significantly impacts Indonesia's economic growth at the 10% level.

Exports at lag 0 have a coefficient of 0.249, indicating that a 1% increase in exports in the current year will result in a 0.249 percent increase in Indonesia's economic growth. This variable is significant at the 5% level with a probability value of 0.034 <0.05. Thus, exports at lag 0 positively and significantly impact Indonesia's economic growth at the 5% level.

The coefficient of exports from 1 year ago is -0.758, indicating that a 1% increase in Indonesia's exports from the previous year will result in a decrease of 0.758 percent in Indonesia's economic growth in the current year. This variable is significant at the 5% level, with a probability value of 0.045 <0.05. Hence, exports at lag 1 negatively and significantly impact Indonesia's economic growth at the 5% level.

The coefficient of exports from 2 years ago is -0.525, indicating that a 1% increase in Indonesia's exports from 2 years ago will result in a decrease of 0.525 percent in Indonesia's economic growth in the current year. This variable is significant at the 5% level with a probability value of 0.0470.05. Thus, exports at lag 2 negatively and significantly impact Indonesia's economic growth at the 5% level.

The coefficient of exports for 3 years ago is -0.292, indicating that a 1% increase in Indonesia's exports from 3 years ago will result in a decrease of 0.292 percent in Indonesia's economic growth in the current year. This variable is not significant at the 5% level but significant at the 10% level, with a probability value of 0.061 <0.10. Therefore, exports at lag 3 negatively and significantly impact Indonesia's economic growth at the 10% level.

The coefficient of exports from 4 years ago is -0.092, indicating that a 1% increase in Indonesia's exports from 4 years ago will result in a decrease of 0.09 percent in Indonesia's current year's economic growth. The probability value of this variable is 0.0390.05. Therefore, exports at lag 4 negatively and significantly impact Indonesia's economic growth at the 5% level.

Table 4.6
Long-Term ARDL Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF)	-0.261972	0.074235	-3.528942	**0.0016**
D(TPAK)	1.207050	0.837592	1.441096	0.1620
D(EKS)	0.322705	0.122831	2.627227	**0.0145**
C	4.734657	1.299957	3.642164	0.0012

EC = PE - (-0.2620*INF + 1.2070*D(TPAK) + 0.3227*EKS + 4.7347)

Source: Data analysis results, 2023

Based on Table 4.9, the results of the long-term testing model using the ARDL model equation are as follows:

$$PE = 4.735 - 0.262\,INF + 1.207\,TPAK + 0.322\,EKS$$

The constant value of 4.735 means that if inflation, labor force participation rate and exports remain constant over the long term, economic growth will be 4.735%.

The inflation coefficient value of -0.262 means that if inflation increases by 1% in the long run, economic growth in Indonesia will decrease by 0.262%. Inflation negatively and significantly affects economic growth in Indonesia at levels of 1% and 5% because the probability value is 0.001 < 0.01.

The labor force participation rate coefficient value of 1.207 means that if TPAK increases by 1% in the long run, economic growth in Indonesia will increase by 1.207%. labor force participation has a positive but insignificant effect on economic growth in Indonesia because the probability value is 0.162 > 0.05.

The export coefficient value of 0.322 means that if exports increase by 1% in the long run, economic growth in Indonesia will increase by 0.322%. This result shows that increasing exports will increase economic growth. The export variable has a positive and significant effect at a level of 5% because the probability value is 0.014 < 0.05.

Results of Structural Model Stability Tests

The stability of a structural model can be tested using CUSUM (Cumulative Sum of Recursive Residual) and CUSUMQ (Cumulative Sum of Square of Recursive Residual). The following are the results of the CUSUM stability test:

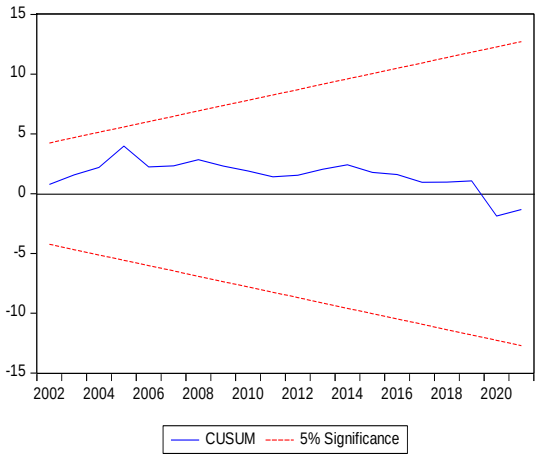


Figure 4.2. CUSUM Test Results

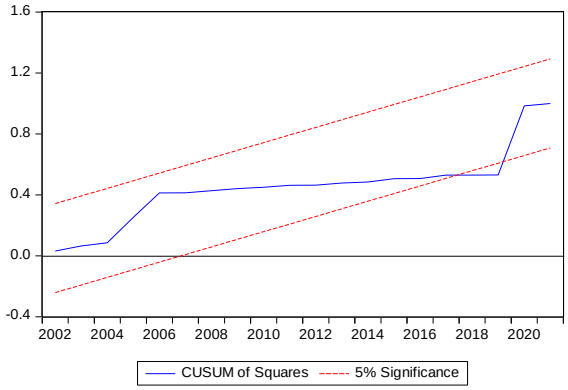


Figure 4.3. CUSUMQ Test Results

Based on Figure 4.8 and Figure 4.10 above, the CUSUM Test results reveal that the Wr quantity plot does not touch the boundary line on the dotted red line at the 5% level. Meanwhile, the results of the CUSUMQ indicate that the Wr quantity plot reachs the boundary line on the dotted red line. It suggests that the CUSUM test results are stable at the 5% level, but the CUSUMQ results are unstable at this level.

The Effect of the Inflation on Economic Growth in Indonesia

Inflation in the short term has a negative an significant on economic growth in Indonesia at the 1% level with a probabilitynvalue of $0.001 < 0.01$. It means that the inflation increases, economic growth in Indonesia will decrease. In lag 1, the inflation variable has a positive and significant effect on economic growth in Indonesia at the 10% level with a probability value of $0.052 < 0.10$. It means that inflation increases in the previous year, then economic growth in Indonesia will increase in the current year. In lag 2, the inflation variable has a positive and significant effect on economic growth in Indonesia at the 10% level with a probability value of $0.073 < 0.10$. It means inflation increases two years prior, the economic growth in Indonesia will increase in the current year. In lag 4, the inflation variable has a positive and significant effect on economic growth in Indonesia at the 10% level with a probability value of $0.060 < 0.10$. It means inflation increases four years prior, the economic growth in Indonesia will increase in the current year.

The results of this research are consistent with the study conducted by Atigala (2022), which concluded that inflation has negative and significant effect on economic growth in the short term. Futhermore, Quddus (2022) study concluded that inflation in tha short term and long term has a negative and significant effet on economic growth.

In the long term, inflation has negative and significant effect on economic growrh in Indonesia at the 1% level wih a probability value of $0.001 < 0.01$. It means inflation increases economic gwoth in Indonesia will decrease.

The results of this research are consistent with the study conducted by Mwakanemala (2013) concluded that inflation has a negative and significant effect on economic growth in the long term. Ardyan (2017) also found that the inflation variable has negative and significant effect on economic growth in East Java.

The Effect of the Labor Force Participation Rate on Economic Growth in Indonesia

In the shor term, the labor force participation rate has a positive and significant on economic growth in Indonesia at the 5% significance level with probability value of 0.020 < 0.05. This indicates that if the labor force participation increases in the short term, economic growth in Indonesia will also increase. In lag 2, the labor force participation has a negative and significat impact on economic growth in Indonesia at the 10% significance level with a probability value of 0.095 < 0.10. This menas that if the LFPR increases two years prior, economic growth in Indonesia will decline.

In the long term, the labor force participation rate has a positive but insignificant impact on economic growth in Indonesia with a probability value of 0.162 > 0.05. This suggest that if labor force participation increases in the long term, it will not affect economic growth in Indonesia. The growth of the population is closely related to the number of labor forces that have been employed and is one of the factors force that influence economic growth ini aregion. The number of job oppurtunities in Indonesia is still limited, so oppurtinities for people to get jobs are similarly limited. If the number of employed labor forces increases every year, then it will definitely increase economic growth (Rozmar et al., 2017)

These results are in line with Keynes's theory, which states that when the number of labor forces increases, wages decrease leading to a reduction in purchasing power in society toward goods or sevices. This can cause producers to suffer losses and prevent the from absorbing the existing labor force.

The finding of this study are consistrent with Rozmar's (2017) study counducted in Jambi Province, which discoveres that the long term labor force participation rate does not affect economic growth in the region. This study also agrees with Afandi's (2023) research, which concludes that the labor force participation rate in the long term has a positif but not significant impact on economic growth ini Ache Province. Similarly, Azzaky's (2022) study concludes that the labor force participation rate in the short term has a positive and significant impact on economic growth in 12 countries in the Asia-Pacific region. Dahal's (2019) study also produced similar results, finding that in the long term, the labor force participation rate has a positif and not significant influence on economic growth.

The Effect of Exports on Economic Growth in Indonesia

In short-term, export have a positive and significant effect on economic growth in Indonesia at a 5% level with a probability value of 0.034, which is less than 0.05. It means that if exports increase in the short term, economic growth in Indonesia will increase. At lag 1, export has a negative and significant effect on economic growth in Indonesia at the 5% level with a probability value of 0.045 or less than 0.05. It indicates that if exports increase a year prior, economic growth will decrease. At lag 2, export has a negative and significant effect on economic growth in Indonesia at the 5% level with a probability value of 0.047 or less than 0.05. It means that if exports increase two years prior, economic growth will also decrease. At lag 3, export has a negative and significant effect on economic growth in Indonesia at a 10% level with a probability value of 0.061 or less than 0.10. Itmeans that if exports increase three years before, economic growth in Indonesia will still decrease. At lag 4, export has a negative and significant effect on economic growth in Indonesia at the 5% level with a probability value of 0.039 or less than 0.05. It reveals that if exports increase four years prior, economic growth will also decrease.

This study is in line with the research conducted by Etahisoa (2020), which concluded that in the short term, exports have a positive and significant effect on economic growth. It means that exports can drive economic growth. Hodijah and Angelina's research (2021) also found that, in the short term, exports have a positive and significant effect on economic growth in Indonesia.

In the long term, exports have a positive and significant effect on economic growth in Indonesia at a 5% level with a probability value of 0.014, which is less than 0.05. It shows that if exports increase in the long term, economic growth in Indonesia will increase.

The results of this study are similar to the research conducted by Abdullahi et al. (2016), which found that in the long term, exports have a positive and significant effect on economic growth in Africa. Furthermore, Lesfandra's research (2021) concludes that exports have a positive and significant effect on economic growth in Indonesia in the long term.

5. CONCLUSIONS AND SUGGESTIONS

Conclusions

Based on the results, we can draw the following conclusions:

1. In the short and long term, inflation has a negative and significant impact on economic growth in

Indonesia. It means that if inflation increases, economic growth will decrease.

2. In the short term, labor force participation rate has a positive and significant impact on economic growth in Indonesia. It means that if the labor force participation rate increases, economic growth will also increase. However, in the long term labor force participation rate has a positive but insignificant impact on economic growth in Indonesia. It means that when the number of workers increases, it does not affect economic growth.
3. In the short and long term, exports have a positive and significant impact on economic growth in Indonesia. It means that if exports increase, economic growth will also increase.

Suggestions

After analyzing the effect of inflation, the labor force participation rate , and exports on economic growth in Indonesia, we have the following suggestions:

1. Monetary and fiscal policies need to be strictly enforced, and production and productivity should be increased to meet the needs of society. Additionally, market interventions should be considered to control the prices of specific goods and services. By keeping inflation under control, economic growth will increase.
2. Improving the quality of education is critical, both formally and informally, to producing a workforce with highly skilled individuals. With skilled labor, the available labor force will be of better quality.
3. The government must maintain the stability of the rupiah and ensure that raw materials and capital goods are readily available in order to increase exports. Moreover, the government should also keep the prices of national products stable within an internationally competitive scope.
4. For researchers who conduct similar research in the future, we recommend adding other variables that can affect economic growth, using different research methods, and expanding the time period when analyzing the data. It will provide a more comprehensive picture of the Indonesian economy and yield better insights for policymakers and stakeholders.

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