

## Macroeconomic Determinants of Indonesia's Economic Growth: An ARDL Approach

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### Abstract

*This study aims to analyze the influence of Foreign Debt, Foreign Direct Investment, and the Consumer Confidence Index on Indonesia's short- and long-term economic growth. Quarterly data from 2015 to 2024 are used, with Gross Domestic Product growth as the dependent variable. The analytical method used is Autoregressive Distributed Lag (ARDL) because it can accommodate differences in the stationarity levels of variables and estimate short- and long-term dynamic relationships simultaneously. The Bounds Test results indicate a cointegration relationship among the variables, indicating long-term equilibrium in the model. Short-term estimates indicate that FDI has a significant negative effect on economic growth, while CCI has a positive and significant effect, and external debt shows no significant effect. In the long run, external debt has a significant positive effect on economic growth, while FDI and CCI show no significant effect. Financing through foreign debt has the potential to drive economic growth if managed productively. Consumer sentiment plays an important role in driving economic growth through consumption in the short term. Therefore, economic policy needs to be directed at sustainable debt management, improving the quality of FDI, and maintaining macroeconomic stability, consumer confidence, and strong Indonesian economic growth.*

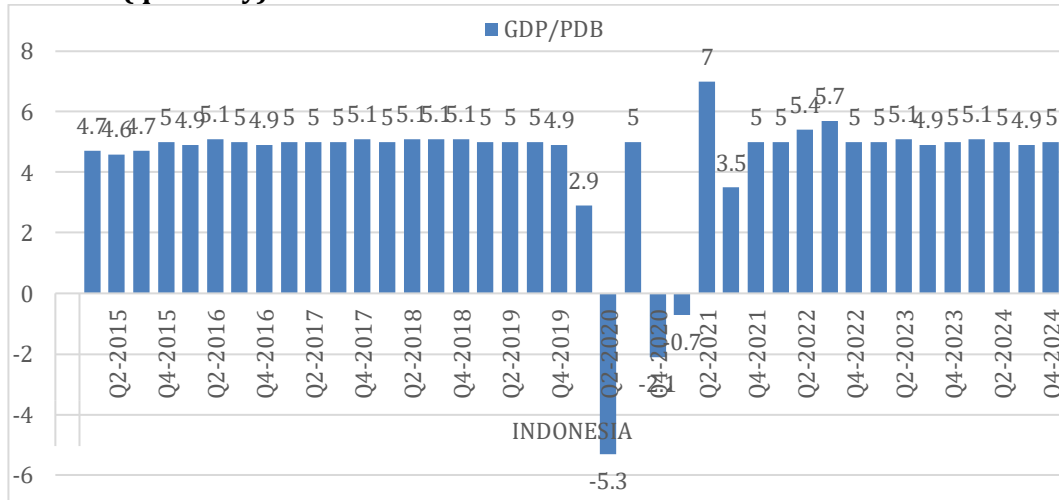
## INTRODUCTION

Indonesia's economic growth faces structural challenges due to dependence on external financing and fluctuations in consumer sentiment; ideally, foreign debt and foreign investment are expected to increase production capacity and productivity, but in practice the impact is not always consistent, while changes in consumer confidence have been shown to affect aggregate demand, so empirical analysis that can distinguish short-term and long-term effects is important for the formulation of sustainable policy (Karsiyaka et al., 2023).

Economic growth is one of the main indicators of a country's development success. Gross Domestic Product (GDP) is commonly used and reflects a country's capacity to produce goods and services over a specific period. In macroeconomic analysis, a country's economic growth rate is determined by the increase in its real Gross National Product, often known as real national income (Triatmanto et al., 2023). Economic growth is essentially an increase in aggregate output (the total goods and services produced by economic activity, or Gross Domestic Product). One indicator of economic growth, when growth conditions are stable, is a reflection of the market

value of all finished goods and services produced by a country during a given period, thus serving as an important indicator of a country's economic performance.

**Figure 1. Graph of Indonesia's Economic Growth (%) for the Period 2015- 2024 (quarterly)**



Source: Central Bureau of Statistics of Indonesia, 2024 (Processed Data)

Indonesia's annual Gross Domestic Product (GDP) growth over the past few years has shown quite positive dynamics, reflecting the fundamental development of the national economy, which has shown a positive trend with an average growth of 4.9% to 5.7%, reflecting strengthening household consumption, investment, and improving export-import performance. In 2020, the COVID-19 pandemic had an impact on national economic performance. In the first quarter of 2020, economic growth slowed, reaching 2.9% in the first quarter of 2020, then experiencing a sharper decline to -5.3% in the second quarter. This fluctuation underscores the significant impact of the pandemic on various productive sectors, particularly trade, services, and manufacturing, which affect GDP output. Then, 2021 marked the start of a recovery period, with the highest positive growth since 2004\*, reaching 7% in the second quarter of 2021. This figure represents a recovery from recession driven by exports and household consumption, making it an ambitious target to demonstrate investment efficiency. Therefore, maintaining stable economic growth is one of the main objectives of national economic policy.

Theoretically, the Solow–Swan Model explains that economic growth is supported by capital accumulation, despite facing diminishing returns without improvements in efficiency and technology (Djulius, 2018). In the Indonesian context, foreign debt and foreign investment serve as sources of external capital to expand production capacity, while the Consumer Confidence Index reflects aggregate demand sentiment through consumption behavior (Ma'rifah, 2022). The interaction of the three determines the dynamics of economic growth in the short and long term.

Several studies have found that the influence of foreign debt, FDI, and consumer confidence on economic growth is contextual and dependent on the timeframe of the analysis. (Jayaraman & Lau, 2009) found that foreign debt has a short-term effect, while Ali & Mustafa (2012) showed a negative impact of debt due to debt overhang. Regarding FDI, Triatmanto et al. (2023) found a positive effect on GDP, and Sutradhar (2020) showed a negative impact due to low productivity and capital outflows. Meanwhile, the findings of Ilmiah & Wonoseto (2021), confirming the important role

of the Consumer Confidence Index (CCI) as a driver of consumption, are consistent with the results of economic growth.

Although the study of foreign debt and FDI is quite extensive, approach Studies that incorporate the Consumer Confidence Index are still limited. Most studies have not simultaneously examined the short- and long-term impacts of external financing factors and consumer sentiment on Indonesia's economic growth.

This research aims to examine the differences in the influence of debt, foreign investment, and consumer confidence on economic growth in Indonesia, in the short and long term. This study considers the possible differences in the transmission mechanisms of impacts over different time horizons. Therefore, this study aims to identify and analyze the short and long-term impacts of external debt, foreign investment, and consumer confidence on Indonesia's economic growth (GDP).

This research is expected to contribute to the academic literature by enriching the economic growth literature through the integration of external financing factors and consumer sentiment within the dynamic ARDL framework. Theoretically, this research strengthens the relevance of the Solow–Swan growth theory and the aggregate demand approach in the context of developing countries. Empirically, the research results provide new evidence regarding the differences in the short-term and long-term impacts of external debt, FDI, and the CCI in Indonesia. Practically, these findings provide the basis for formulating sustainable debt management policies, improving the quality of FDI, and stabilizing consumer sentiment to support economic growth.

## RESEARCH METHODS

This study uses a quantitative approach with explanatory research characteristics, aiming to explain the causal relationship between foreign debt, foreign investment, and the consumer confidence index on Indonesia's economic growth. The quantitative approach was chosen because this study emphasizes numerical measurements, hypothesis testing, and statistical analysis.

The research object in this study is the Indonesian economy, with a focus on the relationship between external debt, foreign investment, and the consumer confidence index on economic growth. The unit of analysis is macroeconomic, namely, national aggregate data representing the overall condition of the Indonesian economy. This research does not focus on specific individuals or institutions, but rather on macroeconomic variables measured quantitatively (Sawitri & Brennan, 2023).

The type of data used in this study is secondary quantitative data. The data analyzed is time series data with a quarterly frequency for the period 2015–2024. Economic growth data is measured using Gross Domestic Product (GDP) growth, foreign debt, and foreign investment data, which are obtained from official publications of Bank Indonesia, Central Bureau of Statistics (BPS), while Consumer Confidence Index (CCI) data is sourced from the Consumer Survey published periodically by Bank Indonesia. The use of data from these official institutions aims to ensure the accuracy, consistency, and credibility of the data so that the research results can be scientifically accounted for.

Research variables in this study consist of the dependent variable of economic growth, measured using the growth of Indonesia's Gross Domestic Product (GDP) in the percentage of quarterly economic growth on a year-on-year (yoy) basis. The independent variables include Foreign Debt (FD), measured using the growth rate of foreign debt in percentage form; Foreign Direct Investment (FDI), measured based on the growth rate of FDI realization in percentage form; and the Consumer Confidence Index (CCI), measured using a numerical index published by Bank Indonesia. This

operational definition aims to ensure uniformity in variable measurement and support quantitative analysis within the framework of the Autoregressive Distributed Lag (ARDL) model.

**Data Analysis Techniques**

Stationarity is an essential prerequisite in econometric models for time series data. In statistics and econometrics, the unit root test is used to determine the stationarity of observational data before performing regression. Time series data can be said to be stationary if its mean and variance are constant over time, and the covariance between two time series depends only on the lag/lag time between the two periods. If the data used in the model is non-stationary, the validity and stability of the data need to be reconsidered, because the regression results derived from non-stationary data will cause spurious regression. Spurious regression is a regression that has a high R<sup>2</sup>, but there is no significant relationship between the two (Kim & Choi, 2017). A commonly used test is the Augmented Dickey-Fuller test. The Dickey-Fuller unit root test is used to determine the stationarity of time series data studied using the E-views 12 program. The formula for the Augmented Dickey Fuller (ADF) test can be expressed as follows:

$$Y_t = \delta Y_{t-1} + U_t \dots \dots \dots (1)$$

If the left and right sides are subtracted,  $Y_{t-1}$  will be obtained:

$$Y_t - Y_{t-1} = \delta Y_{t-1} - Y_{t-1} + U_t \dots \dots \dots (2)$$

$$\Delta Y_t = (\delta - 1) Y_{t-1} - U_t \dots \dots \dots (3)$$

Or it can be stated as follows:

$$\Delta Y_t = \beta Y_{t-1} + U_t \dots \dots \dots (4)$$

Based on equation 4, the hypothesis obtained is:

$H_0: \beta = 0$  (non-stationary)

$H_1: \beta < 0$  (stationary)

The ADF test is conducted with the null hypothesis  $y=0$ . The stationarity of the data is based on the ADF statistical value obtained from the Prob. Value. Augmented Dicky-Fuller (ADF) at a certain unit level, if the Prob. Value is more than 0.05 ( $>0.05$ ), then it can be concluded that the ADF does not pass the Stationary Test or there is cointegration, so an experiment is needed on the first or second difference. However, if the Prob. Value is less than 0.05 ( $<0.05$ ), then the ADF is stationary (Fowler et al., 2024).

Determining the lag length in the ARDL method is crucial because it will affect the accuracy of the estimation results, both in the short and long term. Selecting the right lag allows the model to capture the dynamics of the lag effects of the dependent and independent variables, thus explaining the causal relationships more realistically. If the lag used is too short, the model risks missing important information and producing a biased specification (underfitting). The problem that arises if the lag length is too small will make the model unusable because it is less able to explain the relationship. Conversely, if the lag length used is too large, the degrees of freedom will be greater, so that it is no longer efficient in explaining. In addition, if the lag length is too long, the model can become inefficient because it contains too many insignificant parameters (overfitting), thus reducing the reliability of the estimate. Therefore, determining the optimal lag length using information criteria such as the Akaike Information Criterion (AIC) is an important step in the ARDL method so that the

resulting model can represent the dynamic relationships between variables well. To determine the lag in this study, the AIC criterion was used.  $AIC = -2 * \log\text{-likelihood} + 2 * k$ , where log-likelihood is the natural logarithm of the likelihood function, k is the number of parameters in the model, and a factor of 2 \* k penalizes complex models with more parameters. The optimal lag is determined using an information criterion obtained by selecting the criterion with the smallest value among the various proposed lags (Dao & Staszewski, 2021).

An AR (autoregressive) model is a model that uses one or more historical data from the dependent variable (Y) among the explanatory variables. The DL (Distributed lag) model is a regression model that involves the present time and past time (lag) of the independent variable (X). So a regression model which includes the value of the variable that explains the current or past value (lag) (Laloan et al., 2023).

$$Y_t = \alpha + \phi_1 Y(t-1) + \dots + \phi_p Y(t-p) + \beta_0 X_1(t) + \beta_1 X_1(t-1) + \dots + \beta_q X_1(t-q) + \beta_0 X_2(t) + \beta_1 X_2(t-1) + \dots + \beta_q X_2(t-q) + \beta_0 X_3(t) + \beta_1 X_3(t-1) + \dots + \beta_q X_3(t-q) + \varepsilon_t \dots \dots \dots (5)$$

This model combines elements of autoregressive (lag of the dependent variable) and distributed lag (lag of the independent variable). Its advantage lies in its flexibility in handling time series data with mixed levels of integration, namely several stationary variables at the level I(0) and some others are stationary at first difference I(1).

Limit test or cointegration limit test using the bounds test) used in the Autoregressive Distributed Lag (ARDL) method to test whether or not there is a long-term relationship (cointegration) between variables in a model. This test is important because ARDL can be applied even when the variables are stationary at level I(0), as well as at first difference I(1), as long as there are no stationary variables in second difference I(2). With the presence of cointegration, the ARDL model is considered more valid because the relationship between variables is not only temporary but also consistent in the long term (Phillips, 2018).

This test determines whether the independent variables (e.g., external debt, foreign direct investment, consumer confidence index) have a stable long-run relationship with the dependent variable. If a long-run relationship is found, the study can proceed by constructing a Long-Run Form and Error Correction Model (ECM) to analyze short-run dynamics.

By estimating the first step taken in the ARDL Bound Test approach, to see the F statistic obtained. The F statistic obtained will explain whether or not there is a long-term relationship between variables. The hypothesis in this F test is as follows:  
There is no long-term relationship:

$$H_0 = \alpha_1 = \alpha_2 = \dots = \alpha_n = 0; \dots \dots \dots (6)$$

There is a long-term relationship:

$$H_1 \neq \alpha_1 \neq \alpha_2 \neq \dots \neq \alpha_n \neq 0; \dots \dots \dots (7)$$

If the F statistic value obtained from the calculation of the boundary test is greater than the upper critical value I (1) then reject H0, so that in the model there is a long-term relationship or there is cointegration, if the F statistic value is below the lower critical value I (0) then do not reject H0, so that in the model there is no long-term relationship or there is no cointegration, if the F statistic value is between the upper and lower critical values, then the results cannot be concluded (Kim & Li, 2023).

Long-term equation or long run form equation serves to describe the equilibrium relationship (equilibrium relationship) between dependent and

independent variables over a longer period of time. This means that although in the short term a variable may experience fluctuations due to shocks or imbalances, in the long term these variables will tend to move towards a stable equilibrium point. The long-run equation separates temporary effects (short-run dynamics) from permanent effects. In other words, the long-run coefficient indicates the direction (+/-) and magnitude of the influence of the independent variable on the dependent variable after the short-term adjustment process is complete (Naji Meidani & Zabihi, 2012).

This equation shows the permanent influence (sustainable effect) on the dependent variable. The long-run form is used to examine cointegration between variables. If a cointegration relationship exists, it means that even though the variables fluctuate in the short run, in the long run they will correlate and move together towards equilibrium. The results of the long-run form are more relevant to policymakers, because macroeconomic decisions usually focus on the direction of ongoing relationships rather than just temporary effects.

In ARDL, when a cointegration relationship (stable long-term relationship) is found between variables, the ECM model is used to describe how short-term imbalances will be corrected towards long-term equilibrium. The ECM allows researchers to distinguish between the temporary impacts (short-run dynamics) and the more permanent impacts (long-run equilibrium) of independent variables on the dependent variable (Lutfi et al., 2022). The error correction term (ECT) coefficient in the ECM indicates how quickly deviations from the long-run equilibrium are corrected in the next period. A negative and statistically significant ECT value indicates the presence of a correction mechanism towards the long-run equilibrium. With ECT in the ECM, all coefficients in the long-run equation above are coefficients that relate the dynamic model in the short run that converges to equilibrium, and  $\theta$  represents the speed of adjustment from the short run to the long-run equilibrium. This shows how the imbalance due to shocking the previous year adjusted to the long-term balance this year. The ARDL model not only explains contemporary relationships but also shows that short-term fluctuations adjust to remain consistent with long-term trends (Sulaiman & Rahim, 2018).

Diagnostic testing in the ARDL model is performed to ensure that the model meets the classical assumptions so that the estimation results are valid and can be interpreted econometrically. The normality test aims to determine whether the residuals are normally distributed, which is important for the reliability of the t-test and F-test; this test generally uses the Jarque–Bera test with a probability criterion greater than 0.05. The autocorrelation test is used to detect residual correlations between periods, which often occur in time series data. In ARDL, this is generally performed using the Breusch–Godfrey (LM) test; the model is declared autocorrelation-free if the probability value exceeds the significance level. Furthermore, the heteroscedasticity test aims to ensure that the residual variance is constant (homoscedasticity), because heteroscedasticity can cause estimation inefficiencies and biased standard errors; this test can be performed using the Breusch–Pagan or White test. If all diagnostic tests are met, the ARDL model can be considered suitable for use in short-term and long-term relationship analysis.

As a parameter stability test or stability tester in regression models, especially in time series analysis. This test is used to detect structural changes (structural break) or the instability of the regression coefficients over the study period. Technically, CUSUM calculates the cumulative sum of standardized residuals (errors) at each time point and then plots them on a graph with a certain confidence limit (usually 5%). If the CUSUM line is within the confidence limit, the model is considered stable, and there is no structural change. Conversely, if the CUSUM line exceeds the limit, this

indicates model instability or shifts in the regression parameters. Thus, the main function of CUSUM is to ensure the long-term reliability of the model, so that the estimation results of ARDL or other time series models remain valid for use in policy analysis and decision-making (Tsagris & Pandis, 2021).

**RESULTS AND DISCUSSION**

In the ARDL analysis process, the primary processing step is determining the level of stationarity. The stationarity test is crucial in ARDL because it assesses whether the data is integrated at the first difference, first difference, or second difference level. If the second difference occurs, the ARDL method cannot be used. In this study, the stationarity test was conducted using the Augmented Dickey-Fuller (ADF) test (Laloan et al., 2023).

**Table 1. Stationarity Test**

Variables	Prob.*	Level	First
Foreign debt	0,1039 0,0000	Non-stationary	stationary
Foreign Direct Investment	0,0496	stationary	
Consumer Confidence Index	0,0951 0,0000	Non-stationary	stationary

From the results of the stationarity test in Table 1, foreign debt and consumer confidence index variables at that level are non-stationary with ADF prob values of 0.1039 and 0.0951 greater than 0.05. Then, the foreign direct investment variable in the stationarity test at the level can be said to be stationary because the ADF prob is smaller than 0.05. Although the consumer confidence index and foreign debt variables are stationary at that level, some of these variables will still be tested for stationarity at the first difference level because FDI is stationary at the level. Therefore, the data used in this study are at the first difference and level.

**Table 2. Optimum lag**

Ranking	ARDL Model	AIC Value	Interpretation
1	Model 116	± 3,29	The best model with the lowest AIC value
2	Model 106	± 3,29	Close, but less optimal alternative
3	Model 091	± 3,32	Higher AIC, lower model efficiency
4	Model 491	± 3,33	Complexity begins to increase
5	Model 351	± 3,33	Less efficient than the best models

Based on Table 2. Based on the graph, Akaike Information Criterion (AIC) for the top 20 models, it can be seen that Model 116 has the lowest AIC value, which is around 3,29. In selecting the ARDL model, a smaller AIC value indicates a more efficient model, because it is able to explain data variations with an optimal level of parameter complexity. Model 116 was selected as the lag optimum because it gives the best trade-off between goodness of fit and parsimony, compared to other models with higher AIC values. The increasing difference in AIC values in subsequent models indicates that adding lag no longer significantly improves model quality and even tends to decrease estimation efficiency. Thus, lag structure in Model116 is considered the most appropriate to capture the short-term and long-term dynamics between foreign debt, foreign direct investment, consumer confidence index, and Indonesia's economic growth within the framework of ARDL.

Lag selection criteria are automatically done by EViews, with selection criteria for the minimum AIC value of the 20 best models offered by AIC. The best model selected was ARDL (4,0,1,4) for the value of variable Y = 4 lag, value of variable X1 = 0 lag, variable X2 = 1 lag, and for the value of X3= 4 years. In this study, the results of the lag test indicate that the optimum ensures that all variables in mutual influence equations are up to four periods previously. Then, after the lag test results were obtained, this optimum will be selected, and the model will be used for further testing.

**Table 3. ARDL Estimation Form**

Coefficient	Std. Error	t-Statistic	Prob.*
-0,592024	0,150954	-3,921879	0,0007
0,103712	0,125493	0,826436	0,4170
0,064160	0,128004	0,501233	0,6210
0,28152	0,132182	2,119436	0,0451
0,149606	0,06193	2,485456	0,0206
-0,06211	0,02228	-2,976568	0,0068
0,07965	0,019699	3,602559	0,0015
0,212847	0,028224	7,541290	0,0000
-0,058675	0,03221	-1,941560	0,0645
-0,002470	0,031070	-0,079494	0,9373
0,046786	0,03532	1,532368	0,1391
-0,172863	0,028761	-6,01358	0,0000
1,119813	3,599091	0,311138	0,7585

Based on the estimated results from the ARDL model, the author formulated the ARDL results to explain Foreign Debt (X1), Foreign Investment (X2), and the Consumer Confidence Index (X3) against GDP (Y). The ARDL equation can be written as follows:

$$Y = -0,592023749747 * Y(-1) + 0,103711638489 * Y(-2) + 0,0641599046085 * Y(-3) + 0,280152062464 * Y(-4) + 0,149606090789 * X1 - 0,0602112359134 * X2 + 0,0709651546592 * X2(-1) + 0,212846714516 * X3 - 0,0586752931066 * X3(-1) - 0,00246988717781 * X3(-2) + 0,0467862013228 * X3(-3) - 0,172862775439 * X3(-4) + 1,11981327065 \dots \dots \dots (8)$$

Foreign debt (X1) has a positive coefficient without lag, indicating that increasing foreign debt has the potential to boost economic growth by increasing financing capacity, although the impact is more medium to long-term. Foreign direct investment (X2) shows a negative coefficient in the current period, indicating that the influx of FDI has not directly increased output, but in the first lag (X2(-1)), the coefficient becomes positive and significant, meaning that the benefits of FDI are only felt after one period when the investment begins to be realized and contributes to production. The consumer confidence index (X3) has a positive and significant effect in the current period, and continues to show a positive effect in several early lags, indicating that increasing consumer optimism drives consumption and economic growth sustainably in the short term. However, in the fourth lag (X3(-4)), the coefficient is negative and significant, indicating that the surge in consumer optimism may be followed by medium-term economic adjustments, such as decreased consumption or macroeconomic pressures, thus suppressing economic growth in the following period.

**Table 4. Bound Test**

Test Statistic	Value	Signif.	I(0)	I(1)
Actual Sample Size	36			
		10%	2,618	3,532
		5%	3164	4,194
		1%	4,428	5,816

From the results of the bounds test in Table 4. The decision-making criteria are determined by comparing the F-statistic value to the critical value of the lower limit I(0) and the upper limit I(1). If the F-statistic value is smaller than I(0), then H0 fails to be rejected, and there is no cointegration; if the F-statistic value is greater than I(1), then H0 is rejected and there is cointegration; whereas if the F-statistic value is between I(0) and I(1), then the test results are inconclusive. Since the F statistic is much larger than all I(1) values, it can be said that there is a long-term relationship/cointegration of Foreign Debt, FDI, and Consumer Confidence Index. The ARDL model is valid for use because there is a long-term relationship.

**Table 5. Long-term form**

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
C	1.119813	3.599091	0.311138	0.7585
FD**	0.149606	0.060193	2.485456	0.0206
FDI (-1)	0.010754	0.016197	0.663962	0.5133
CCI (-1)	0.025625	0.040127	0.638593	0.5294

From the results of the long-run form in Table 5. The Foreign Debt variable shows a significant value. Therefore, foreign debt has a positive influence on long-term economic growth. The foreign investment variable shows an insignificant coefficient. FDI does not have a significant impact on GDP in the long run. FDI inflows do not necessarily drive growth, and the Consumer Confidence Index also showed an insignificant value. It can be said that the CCI has no significant effect on long-term GDP.

**Table 6. Error Correction Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
D(FDI)	-0,060211	0,016629	-3.620772	0,0014
D(CCI)	0,212847	0,023872	8.916003	0,0000
D(CCI(-1))	0,128546	0,027160	4.732985	0,0001
D(CCI(-2))	0,126077	0,023514	5.361866	0,0000
D(CCI(-3))	0,172863	0,024612	7.023651	0,0000

From the short-term equation results model in Table 6. The foreign debt variable does not appear in the ECM, because it shows insignificant results in the selected model, so the implication is that foreign debt does not have a significant impact in the short run. The Foreign Direct Investment variable shows that in the short term, increasing FDI actually reduces GDP growth. The Consumer Confidence Index has consistently increased GDP, both now and in the coming periods.

**Table 7. Normality**

Observations	Std. Dev	Jarque-Bera	Probability
36	0,888301	1,239909	0,537969

Based on the results of the Jarque–Bera normality test, the Jarque–Bera statistical value obtained was 1,239909 with probability value 0.537969, which is greater than the 5 percent significance level ( $\alpha = 0.05$ ). Thus, the null hypothesis stating that the residuals are normally distributed cannot be rejected. This shows that the residuals in the research model are normally distributed. This condition indicates that the normality assumption is met, so that the results of statistical tests such as the t-test and F-test in the ARDL model can be considered valid and reliable.

**Table 8. Autocorrelation**

F-statistic	Obs*R-squared	Prob. F	Prob. Chi-Square
0,31182	1,038264	0,7354	0,595

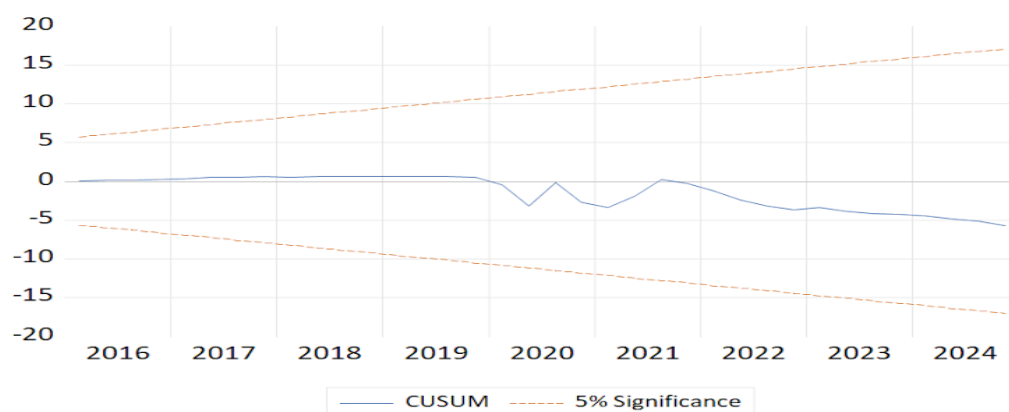
Based on the results of the Breusch–Godfrey autocorrelation test, the value obtained was Prob. F is 0.7354, and Chi-Square Prob. of 0.595, both of which are greater than the 5 percent significance level ( $\alpha = 0.05$ ). Thus, the null hypothesis stating that there is no autocorrelation in the model cannot be rejected. This shows that the residuals are random and uncorrelated between periods. Therefore, the ARDL model has fulfilled the autocorrelation-free assumption, so that the parameter estimates can be considered BLUE (Best Linear Unbiased Estimator) and the statistical test results are reliable.

**Table 9. Heteroscedasticity**

F-statistic	Obs*R-squared	Prob. F	Prob. Chi-Square
2,186215	19,18255	0,0517	0,0842

Based on the results of the heteroscedasticity test, the value obtained is Prob. F is 0.0517 and Chi-Square Prob. of 0.0842, both of which are greater than the 5 percent significance level ( $\alpha = 0.05$ ). Thus, the null hypothesis stating that there is no heteroscedasticity in the model cannot be rejected. This shows that the residual variance is constant (homoscedastic), so that the regression model fulfills classical assumptions and parameter estimates can be considered efficient and reliable.

**Figure 2. CUSUM Graph**



Based on Figure 2. There was a slight decline after 2019–2020, possibly influenced by external factors (a decline during the COVID-19 pandemic) that increased the error. The stability of the model estimate can be seen. From the plot, the blue solid diagram shape is between two dotted lines, the red dotted line is the stability control of the CUSUM value or  $W_r$  quantity (recursive residual), which does not cross the boundary line at the 5% significance level. Which means that the ARDL

(4, 0, 1, 4) Model 116 (3,29) parameters have stabilized. Thus, it can be said that the model used is quite good in explaining the relationship between variables, because the stability of the regression parameters is maintained.

## DISCUSSION

### Foreign Debt

In the short term, the foreign debt variable does not appear significant in the Error Correction Model (ECM) equation. This indicates that changes in foreign debt do not directly affect economic growth in the current period. Economically, this finding makes sense because the proceeds from foreign loans generally take time to be allocated, disbursed, and realized in productive projects. However, in the long run, the estimation results show that foreign debt has a coefficient of 0.149606 with a probability value of 0.0206, which is significant. This figure indicates that a one-unit increase in foreign debt will increase economic growth by 0.1496 units, assuming other factors remain constant (*other things being equal*). This finding supports the Solow-Swan growth theory, which emphasizes that additional capital from external financing can increase national production capacity and output (Adelakun & Ogujiuba, 2023).

### Foreign Direct Investment

The short-term estimation results show that the Foreign Direct Investment variable has a significant and negative coefficient of -0.060211 with a probability of 0.0068. This means that in the short term, an increase in FDI actually reduces Indonesia's economic growth. Economically, this indicates that FDI inflows do not directly increase national output, because in the initial stage, foreign investment is primarily used for imports of capital goods, construction of production facilities, and institutional adjustment processes. However, in the next lag (-1), the coefficient is 0.070965 with a probability value of 0.0015, indicating a positive significance. Thus, FDI inflows actually have a negative impact on economic growth in the short term because there has not been optimal absorption, which means they are significant and have a positive sign. This finding suggests that the benefits of FDI are only felt after a time lag, when the investment begins operating and contributing to production. This is in line with the theory. *Spillover* technology in endogenous growth theory states that technology transfer, improvements in labor skills, and production efficiency take time before having a significant impact on output. In the long run, FDI has a coefficient of 0.0162 with a probability value of 0.5133, indicating it is insignificant. These results indicate that FDI has not been able to drive long-term economic growth in Indonesia, due to the concentration of investment or capital inflows being more concentrated in sectors that do not encourage domestic output, such as extractive sectors, high import consumption, profit repatriation, or the effect of *crowding out* to local industry/when the government incurs too much debt through foreign debt or bond issuance to finance spending, it can reduce financing space for the private sector.

### Consumer Confidence Index

The results of the study indicate that the Consumer Confidence Index has a strong influence in the short term. The current coefficient for the Consumer Confidence Index variable is 0.212847 with a probability value of 0.0000, indicating a high significance. This figure indicates that a one-point increase in the Consumer Confidence Index (CCI) will increase economic growth by 0.21 points. Assuming other factors remain constant, this finding confirms that consumer optimism directly drives

household consumption, which is the largest component of Indonesia's GDP. Furthermore, the CCI coefficients from the first to third lags also show positive and significant signs, indicating that the effect of consumer optimism is a chain (multiplier effect) and persists over several periods (Mazurek & Mielcová, 2017). Changes in consumer confidence levels have a direct impact on people's spending intentions, which in turn influence business and industrial activity and have implications for economic growth. However, the fourth lag (-4) shows a coefficient of -0.172863 with a probability value of 0.0000, indicating a significant negative one year later. Consumer confidence drives GDP in the short term (because consumption increases, which then drives GDP up), which is significant and negative. This indicates that excessive consumer optimism in the short term can be followed by medium-term economic adjustments, such as increased inflation or decreased consumption, thereby suppressing economic growth in the following period. In the long term, the CCI has a coefficient of 0.0256 with a probability value of 0.5294, which means it is not significant. This finding indicates that the CCI plays a larger role as a short-term cyclical factor, rather than as a structural determinant of long-term economic growth. The effect can be negative, because consumer over-optimism triggers excessive consumption, leading to subsequent economic adjustments. This means that if consumer confidence increases, GDP will also rise. This diagnosis is logical because household consumption is a major component of Indonesia's GDP. This suggests that when people are more optimistic about economic conditions, they tend to increase consumption and spending, which ultimately drives economic growth (Kemp-Benedict & Ghosh, 2018).

## CONCLUSION

This study concludes that Indonesia's economic growth exhibits strong temporal dynamics, with growth in the previous period tending to depress short-term growth due to adjustment effects, but still exerting a sustained positive influence in the subsequent period. External debt does not show a significant effect in the short term, but has a positive and significant effect on economic growth in the long term. This finding suggests that financing through external debt can stimulate economic growth if managed productively and directed towards increasing national production capacity. Foreign Direct Investment (FDI) shows a significant negative effect in the short term, but reverses to a positive effect in the subsequent period, reflecting a time lag before foreign investment can contribute to output. Foreign Direct Investment (FDI) has a positive effect on economic growth, although the effect is not significant. This suggests that foreign capital inflows have the potential to increase national output, but their contribution is still limited due to factors such as technology absorption, regulatory quality, and domestic sector capacity. However, in the long term, FDI does not significantly affect economic growth, indicating that the benefits of foreign investment in Indonesia have not been fully optimized (Forcadell & Aracil, 2019). Meanwhile, the Consumer Confidence Index is proven to have a positive and significant influence on economic growth in the short term, with the effect persisting for several periods, although its influence weakens and becomes insignificant in the long term, this confirms that public optimism towards economic conditions can increase household consumption as a key component of GDP formation (Lin & Wang, 2021).

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