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RESEARCH PAPER

The Impact of Financial Development Indicators on Sukuk Issuances in Indonesia between 2005 and 2021, Using the Autoregressive Distributed Lag (ARDL)

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Abstract

The recent financial development has witnessed the interest of many researchers and specialists in the field of Islamic finance due to the financial services and tools it provides that support the economy. Sukuk are one of the most important products of the Islamic financial industry because of their use in generating savings and raising funds to finance infrastructure projects and meet the requirements of economic development. The study aims to clarify the impact of indicators of financial development on the issuance of instruments in Indonesia between 2005 and 2021. To study the statistical relationship between the study variables, the issuances of instruments were relied upon as a dependent variable and the indicators of financial development as independent variables. (Real interest rate, private sector loans, money supply, investments) based on daddy growth of distruted time gaps, the resultats have demonstrated a morally positive impact for both private sector loans (DCPS) and Money Supply (M2) on SIs in the short term, and there is a moral positive impact for both investment (INV) and loans to the private sector (DCPS) on long-term issuances of instruments (SI). Finally, There is also stability in long and short-term milestones and therefore structural stability in the study model and the data used in the study do not have any structural changes, the study recommended the need to broaden the scope of instruments to ensure their dissemination and to look for factors promoting their development, to follow up on change in the financial system and to study their impact on the issuances of Islamic instruments in Indonesia.

Keywords: Cointegration, Financial Development, Investment, Islamic Sukuk, Money Supply.
JEL Classification: C23, F43, F65.

1. Introduction

Sukuk is an Islamic financial instrument included in an important sub-sector to move the country's and the world economy's wheels. Today, the Sukuk market represents the second-largest Islamic finance industry component after Islamic banking (Basyariah, 2020).

Islamic Sukuk has witnessed remarkable development in many countries due to the positive results achieved by the volume of their issuance in the field of finance, specifically in the economic sectors. It is considered one of the most important products offered by Islamic financial engineering, which contributes

effectively to the development of the financial market by employing financial surpluses. It is based on a set of legitimate formulas, based on the principle of profit and loss sharing. Islamic Sukuk contribute to achieving the requirements of economic development by contributing to financing infrastructure projects and filling the deficit in government budgets. However, they are affected by many indicators, especially economic and financial ones, which allow for many investment opportunities and thus increase the volume of issuance.

Sukuk, as an investment or financial instrument, has long been used in trade, both domestically and internationally, by Muslim traders since the 6th century AD. Sukuk is one of the investment instruments that became popular in the 21st century, which is used to mobilize funds for certain projects according to Sharia by the government and companies. Sukuk or commonly referred to as Islamic bonds, are financing instruments in the Islamic capital market in the form of certificates or proof of ownership based on sharia law (Nur Habibah Asri, 2021).

The rapid change in world economic growth has caused many changes in many aspects of life. One of them is the growth in the Islamic financial system. The Financial Services Authority once said that the Islamic financial system has an indirect contribution to Indonesia's economy. In this modern era, the Islamic financial system can be a source of economic power due to its traits proven during the World Financial Crisis; this financial institution could avoid bankruptcy. There are four main sectors of the Islamic financial system, which consist of full-fledged Islamic banks, Islamic Unit Business, Islamic non-bank institutions, and social and religious funds (Muasia, 2020).

Indonesia as a Muslim-majority country develops the economy by applying sharia principles that began with the establishmentof Bank Muamalah as the first Islamic banking in Indonesia, then currently there are 743 Islamic banks with 1,371 branch opportunities for Muslims and non-Muslims who want to invest in the bank that is following Islamic principles, where the main principle is to provide comfort and confidence in halal transactions (Enny Kartini, 2020) Conventional investment is not the only investment instrument in the Indonesian capital market at this time, but there are also Islamic investment products, namely Sukuk, Islamic mutual funds, islamic exchange traded fund, Islamic asset-backed security, islamic real estate investment trust and islamic stocks. The phenomenon of the existence of Sharia investment products is good news for investors in the Indonesian capital market as a reflection of the corporation's performance. Islamic bonds, counted as Islamic investment instruments, are different from conventional bonds. Since there is an agreement of opinion that interest is usury, then instruments that have an

element of interest are excluded from the list of halal or sharia investments (Muhammad Sahirul Alim, 2022).

Financial development plays an important role in determining the volume of suq issuance through its financial services and instruments that support the country's economy, in addition to the optimal allocation of resources and working to mobilize savings and reallocate them to economic units, resulting in flexible and rapid issuance to convert them into liquidity and thus finance countries' fiscal deficits without resorting to debt. Indonesia, like other countries, continues to strive to develop the volume of issuance of its instruments by providing stimulating methods. In return, it works to monitor changes in economic indicators of financial development to ensure appropriate conditions for achieving the largest possible issuance. On this basis, this study seeks to explain the impact of financial development indicators on the issuance of Sukuk by asking the following main question:

-To what Extent Do Financial Development Indicators Impact the Issuance of Islamic Sukuk in Indonesia?

Through the problems of study, the following question arises:

- There is a statistical effect of the Real Interest Rate Index (IR) on the volume of instrument issuances (SI) in Indonesia.
- There is a statistical effect of Loans to the private sector (DCPS) on the volume of instrument issuances (SI) in Indonesia.
- There is a statistical effect of Money supply (M2) on the volume of instrument issuances (SI) in Indonesia.
- There is a statistical effect of the Investments (INV) on the volume of instrument issuances (SI) in Indonesia.

1.1 Hypotheses

Based on the main problem, the following hypotheses can be formulated:

-There is an impact between indicators of financial development and the long-term issuances of Islamic Sukuk in the long term.

-There is an impact of indicators of financial development and the long-term issuances of Islamic Sukuk in the short term.

1.2 Importance of the Study

The importance of our study lies in our attempt to address:

- Concepts on financial development and Islamic Sukuk.

- The impact of financial development indicators on the issuance of Sukuk in Indonesia between 2005 and 2021.

1.3 The Objectives of the Study

This study aims to:

- Give a comprehensive overview of the experience of Islamic Sukuk in Indonesia.
- Determine the impact and trend of the relationship between financial development and issuance of Sukuk in Indonesia based on previous studies.

1.4 Study Methodology

To test the research hypotheses and achieve its objectives, a descriptive methodology will be used through describing the research variables; and an analytical method by addressing Indonesia's experience with Islamic Sukuk; in addition to the inductive method through the use of statistical analysis methods to study the relationship between financial development indicators and issuance of Sukuk in Indonesia.

1.5 Study Themes

The study included the following topics:

The first axis: the theoretical rooting of the study

The second axis: a standard study of the impact of financial development indicators on the issuance of Sukuk in Indonesia from 2005 to 2021.

1.6 Previous Studies

With regard to previous studies on indicators of financial development and issuances of instruments, the variables used vary, and thus the way they are addressed. The most important previous studies on indicators of financial development and the issuance of Sukuk can be summarized as follows:

Rien Muasia (2019): The purpose of this study is to analyze the impact of macroeconomic factors on the growth of Islamic bonds (Sukuk) in Indonesia. This study uses the Ordinary Least Squares (OLS) method with a monthly time series starting from January 2013 until December 2016. The results of this study indicate that the Production Index (IP) and Bank Indonesia Syariah Certificate (BSBIS) variables positively and significantly affect the growth of state Sukuk issuance in Indonesia, then inflation negatively and significantly affects the growth of state Sukuk issuance, while the Jakarta Islamic Index (JII) variable has a negative effect but not significant on the growth of Indonesian state Sukuk.

Nursilah Ahmad (2021): The study investigates the relationship between macroeconomic indicators and Sukuk market performance for the period 2004 to 2019 in 10 Sukuk issuing countries using a panel data approach. The macroeconomic indicators are Gross Domestic Product (GDP), consumer price index, trade openness, exchange rates, and financial crisis. The findings reveal that GDP, trade openness, and exchange rates have a significant impact on Sukuk market performance. In addition, the study analyses the growth components of GDP in these countries five years before the COVID-19 pandemic outbreak. The countries' performance in terms of changes in the percentage contribution of consumption, investment, government spending, and net export to GDP.

Reifa (2017): This study discusses the impact of Sukuk market developments on the Indonesian economy, and vice versa. It will use the 2009–2016 quarterly longitudinal data of outstanding Sukuk as a proxy of the size of the Sukuk markets, as well as Indonesia's GDP as a proxy of the size of the economy. The basic model used in this study is a VAR model, and a Granger causality test is utilised to determine the direction of causality. The study also uses the impulse response function and variance decomposition to determine the impact of a shock on each variable on the others. The result shows that, in aggregate, the Sukuk market has a positive influence on Indonesian GDP.

Ahmed (2012): This study aimed to show the impact of macroeconomic variables on Sukuk issuance in Malaysia during the period 1996-2011 using the VAR model. To test the impact of inflation rates, GDP, and the product price index on the volume of Sukuk issuance, it was concluded that there is a causal relationship between Sukuk issuance and GDP, meaning that the development of Sukuk causes an increase in GDP. Therefore, decision makers should design new policies to develop the Islamic capital market, and inflation has a positive impact on the development of Sukuk issuance in the short term.

Zanudin (2019): This study aimed to analyze the determinants of institutional macroeconomic stability in the development of the global Sukuk market using the Fixed-effects model to test the impact of trade openness, inflation, and economic growth on the evolution of the size of Islamic instruments. It was found that there is a positive impact of trade openness, inflation, and economic growth rates on the development of Sukuk issuance in the countries studied.

Heba Abdullah Ahmed Suleiman (2022): This study aimed to show the impact of economic determinants on the issuance of Islamic Sukuk, such as inflation rate, exchange rates, size of the economy and size of banking systems, by relying on 277 financial institutions and government agencies located in the Gulf

Cooperation Council countries in addition to Malaysia and Turkey, and that is by using regression analysis. It was concluded that the size of the economy, the rate of inflation, and the size of the banking system have a positive impact on the growth of the Sukuk market, in addition to the lack of a moral relationship between the volume of Sukuk issuance and exchange rates.

Grassa and Said (2013): aim to clarify the economic factors affecting the volume of Sukuk issues applied to the GCC countries during the period 2003-2012, using the least squares method for random effects. It was found that there is a positive effect between the size of the economy, per capita gross income, and the volume of issuance of Sukuk, while interest rates have an intangible negative effect.

Samir Tami, Yassin Hafsi's (2022): This study aims to identify the causal relationship between Sukuk issuance and economic growth in Sudan during the period 2000-2019. Four variables were relied upon (Islamic Sukuk, final consumption expenditure, total fixed capital formation, and GDP, using the Yamamoto and Toda methodology for the long-term causal relationship, in addition to studying the movement of the self-downward vector model VAR. It was found that there is a one-way causal relationship between Islamic instruments and per capita total income in the long term. Through the impulse response, it was found that shocks that occur in terms of the volume of issuance of Sukuk have a weak positive impact on GDP per capita by period. It has become clear that instruments need a long time to show their impact on economic growth rates.

The current study agrees with previous studies that its use is one or more variables. This study differs from previous studies in the variables included in the problem and thus obtains different results (focus on indicators of financial development). It also differs in the use of statistical methods that determine the relationship between indicators of economic development and the issuance of instruments.

2. Theoretical Rooting of the Study

Islamic Sukuk has become an important tool of Islamic finance that is of great interest to many countries because of its importance at the macroeconomic level, whether in terms of stimulating financial markets or financing development projects.

2.1 Islamic Instruments

Islamic Sukuk is considered a contemporary financing tool. Recently, it has experienced rapid growth. This can be attributed to the expansion of the base of Islamic financial products because of their effective role in achieving the requirements of economic development.

2.1.1 The Concept of Islamic Sukuk

The Islamic Financial Services Board defines certificates that represent the holder's proportionate ownership in an undivided part of the underlying asset, where the holder assumes all rights and obligations to such asset (Mahi and Lebig, 2021).

Sukuk is the standard Arabic term for Securities or Bonds structured according to the principles of Sharia and referred to as Sukuk, Islamic bonds, Islamic trust certificates, or Islamic debt securities (Essia, 2014).

In addition, Sukuk are securities that comply with the Islamic Shariah Law and its investment principles, which prohibit the payment, charging of interest. Sukuk are certificates of equal value representing undivided shares in ownership of tangible assets, usufruct, and services, or in the ownership of the assets of particular projects or investment activity (Others, 2015).

Sukuk consider securities have similarity features to conventional bonds, which many reason why the financial media label them those types of securities as Islamic bonds. However, Ariff and Safari showed there are significant differences in the yield of Sukuk against the yield of conventional bonds. In addition, the study did not show a causal relation between the yields of these two types of securities (Ali Said, 2013).

There are two types of Sukuk: ased and asset-backed. Under the asset-based Sukuk, the Sukuk holders have beneficial ownership in the asset. The Sukuk holders have recourse to the originator if there is a shortfall in payments. The beneficial ownership is a legal term where specific property rights, such as its use and title, belong to a person even though the legal title of the property belongs to another person. A common example of a beneficial owner is the owner of funds held by a nominee bank or for stocks held in the name of a brokerage firm. Under asset-backed Sukuk, the Sukuk holders owned the asset and, as a result, do not have recourse to the asset but to the originator if there is a shortfall in payment (Afshar, 2013).

2.1.2 Benefits of Sukuk

Among the benefits of Sukuk, we can refer to these: Sukuk is a tradable capital market product providing medium to long-term fixed or variable rates of return. It

is assessed and rated by international rating agencies, which investors use as a guideline to assess risk/return parameters of a Sukuk issue. It has regular periodic income streams during the investment period with easy and efficient settlement and a possibility of capital appreciation of the Sukuk. Finally, Sukuk are liquid instruments and tradable secondary market (Zolfaghari, 2017).

2.1.3 The Economic Importance of Islamic Instruments

The importance of Islamic Sukuk lies in the fact that they are a financing tool compatible with the pillars of the Islamic economy. Thus, they provide an opportunity for investors to invest financial surpluses and achieve many of the following economic development requirements (Hafsi, 2022):

- Mobilizing savings from those who wish to deal following the provisions of Islamic Sharia.
- Expanding and developing the stock market base through tradability.
- Developing the diversification and variety of Islamic tools to manage its surplus liquidity;
- Help cover the deficit in the state budget.

2.2 Financial Development

The subject of financial development has gained an important place in many developing and developed countries, as it is an important indicator for measuring the development of the financial system and the liberalization of the financial sector. This has resulted in a difference in concepts related to it due to different economic leaders and thinkers.

2.2.1 The Concept of Financial Development

Financial development is a multidimensional process. Over time, financial sectors have evolved across the globe, and modern financial systems have become multifaceted. For example, while banks are typically the largest and most important, investment banks, insurance companies, mutual funds, pension funds, venture capital firms, and many other types of nonbank financial institutions now play substantive roles (Svirydzenka, 2016). Financial development also consists of a range of improvements in financial institutions, ranging from the establishment of a competitive banking system to dynamic financial markets (Eggoh, 2009). It can also be defined as the financial process through which financial transactions appear in both quantitative and qualitative terms. This development is considered through the various products provided by the financial system, whether by

brokerage firms or financial markets (Lynch, 1996). According to Venet is a different concept of financial development. According to his view, financial systems seek to free the financial sector from all restrictions and obstacles, such as setting interest rates, which have a negative impact on the mobilization of savings, in addition to imposing high mandatory reserves that reduce the volume of financing commercial banks and thus restrict their economic activities. Regardless of the liberalization of the financial sector in a way that allows it to keep pace with economic developments by freeing capital movement and foreign investment licenses (Venet, 2000).

2.2.2 Financial Development Indicators

Many economists differed in determining the financial indicators that measure the degree of financial development, including the following (Yaici, 2014):

- The volume of financial intermediation: It expresses the money supply, which represents the sum of money stock about GDP.
- The ratio of total quasi-money to the volume of GDP: This indicator measures the ability of the banking system to attract long and medium-term savings, which reflects the ability of banks to provide financing for long-term investment operations. It reflects the extent to which banks are committed to financing economic development.
- The ratio of loans to the private sector to GDP: This indicator measures the contribution of local banks in granting loans and facilities to the private sector. The higher the percentage of loans that the private sector benefits from concerning GDP, this indicates the development of the banking system, especially its role in collecting information, monitoring managers, diversifying risks, in addition to mobilizing savings and facilitating exchanges more effectively, increases.
- Interest rate margin: This index measures the profitability of the banking sector. It represents the difference between interest rates on loans and deposits provided by banks. It also indicates the level of competitiveness and efficiency of the banking sector. This index allows measuring the effectiveness of financial intermediation activity. The weaker the value of the index, the greater the effectiveness of financial intermediation, meaning that banks provide financial services at the lowest possible cost and vice versa (Shanafa, 2022).

2.3 The Experience of Islamic Instruments in Indonesia

The Islamic banking system in Indonesia has witnessed many developments. It witnessed a composite annual growth of 47% between 2009 and 2013, ahead of

traditional banks that recorded 12% growth in their deposits in 2013. Islamic bank deposits have also witnessed a strong composite annual growth, as a result of initiatives put in place by the Central Bank to develop Islamic banking, which has worked to establish supervision guidelines and precautionary measures and increase efficiency through the support of an Islamic financial market that has been characterized by safety, adherence to international Islamic banking standards and the integration of Islamic banking into the Islamic finance industry. The development plan was also based on growing religious awareness among customers, which helps increase the popularity of Islamic banking products. One of the results of achieving this growth is the provision of government support and improved confidence in Sharia-compliant financial products. In addition to the reasons for this growth are some economic legislations, including not allowing individuals or financial groups to own more than one banking company unless the second one is Islamic, in addition to the abolition of the composite tax law on Islamic banks. The Indonesian Parliament has also passed legislation to allow foreigners to establish Islamic banks in partnership with Indonesian citizens or local entities. It has also provided commercial banks with the option of converting their activities into Islamic banking activities. This legislation, in addition to customer confidence in Islamic banks, has contributed to the opening of eight new banks, bringing the number to 13 Islamic banks that serve about 1440 branches and finance offices in 2013 (Siamat, 2018).

In a move aimed at stimulating the sector, the Indonesian government has launched a national plan to develop the local Islamic finance industry, which is still limited in the world's Muslim population. Despite the launch of Islamic finance activities in Indonesia more than 20 years ago, it has achieved only limited gains in the country with a population of 250 million people, despite multiple regulatory efforts and popular initiatives, according to Sky News. The government of Indonesia is pursuing a set of strategies to fill the budget through the regular issuance of instruments in the international market. These issues have allowed it to find an alternative budget by providing a new source of funding for the government and local companies. The following graph shows the evolution of Sukuk issues from 2005 to 2021.

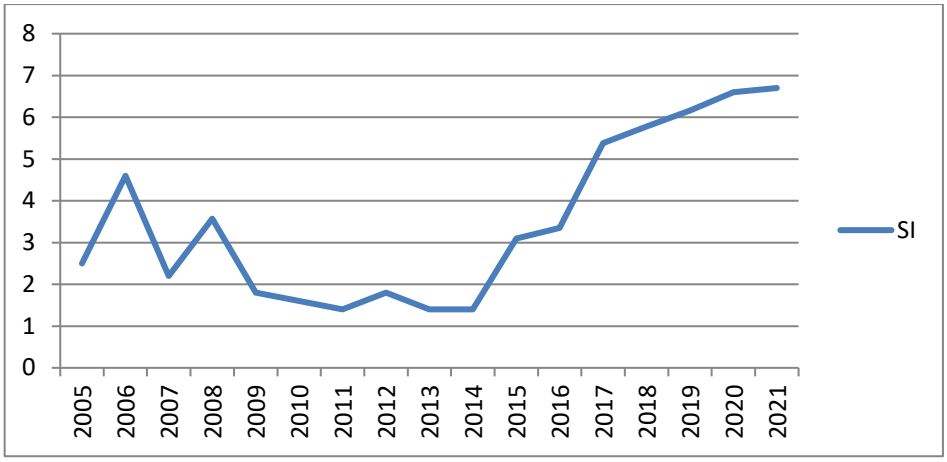

Figure 1. An Evolution of Issuance of Instruments in Indonesia
Source: Research finding, based on IIFM annual reports.

The above figure shows the evolution of Sukuk issues in Indonesia from 2005 to 2021. It was found that the volume of these issues fluctuated throughout the study period. The period 2009-2005 witnessed a fluctuation as a new experience due to several crises, including the mortgage crisis and the global financial crisis. However, the Sukuk market tried to recover every period and improve the pace of its issuance.

While the period 2009-2015 witnessed remarkable growth due to the expansion of the base of issuance of Sukuk, due to the surplus in liquidity in banks, after 2015, issuance has declined and fluctuated due to a sudden decision by the Central Bank to stop issuing short-term Sukuks. The decline in issuance of Sukuks has harmed Islamic banks and reduced the tools required to manage the profitability of their funds and achieve liquidity requirements. The International Monetary Fund has urged governments to ensure regular issuance by integrating Sukuks into local debt management strategies.

The period 2018-2021 witnessed positive growth despite the environmental conditions in this period and despite the slow pace of global economic growth, which affected Islamic financial markets. This growth is due to a series of issues made by the Government of Indonesia through a variety of instruments in addition to company issuances in various sectors. This has made Indonesia one of the main players in the international Sukuk market.

3. An Econometric Study of the Impact of Financial Development Indicators on Sukuk Issuance in Indonesia (2005-2021)

To estimate the relationship between financial development indicators and Sukuk issuances in Indonesia, an econometric study will be carried out using the autoregressive distributed lag (ARDL) model between 2005 and 2021.

3.1 Study Methodology

The study model depends on Indicators of financial development as an explanatory variable for Sukuk issuances, while neglecting the other variables that are included in the model residuals. To determine the effect of the independent variables on the dependent variable, the World Bank's (WDI) data on indicators of financial development were relied upon, and the issuances of instruments were obtained from IIFM (the global standard-setting body of the Islamic Financial). The following formula can be helpful:

$$SI(t) = f(IR(t), M2(t), DCPS(t), INV(t), \varepsilon t)$$

SI(t): Sukuk Issuance
IR(t): Real interest rate
DCPS(t): Loans to the private sector
M2(t): Money supply
INV(t): Investments

The following table presents the variables:

Table 1. Study Variables

Variable	Variable Code	Type	Data source
Sukuk Issuance	SI	Variable dépendante	IIFM
Money supply	M2	Variable indépendante	WDI data
Loans to the private sector	DCPS	Variable indépendante	WDI data
Real interest rate	IR	Variable indépendante	WDI data
Investments	INV	Variable indépendante	WDI data

Source: Research finding.

Investment expresses a percentage of GDP and is calculated by dividing the fixed capital formation by the total GDP. For this, the general model formula of (Bessouyah, 2022) is adopted, which includes the dependent variable SI and the independent variables X, which can be expressed by a set of explanatory variables X1, X2, ..., Xt, as follows:

$$\Delta SIt = c+\sum_{i}^{p} \beta_1 \Delta y_{t-1} + \sum_{i=0}^{q_2} \beta_3 \Delta x_{2_{t-1}} + \ldots + \Delta \sum_{i=0}^{q_k} \beta_k \Delta x_{k_{t-1}} \alpha_1 y_{t-1} + \alpha_2 y_{t-1} + \alpha_3 x_{2_{t-1}} + \cdots + \alpha_k x_{k_{t-1}} + \varepsilon_t$$

where:
c: is any constant;
Δ: first-order difference;
k: the independent variable number;
p: slowdown period of the dependent variable y;
q_1, q_2, ..., q_k: the intervals of the independent variables x_1,x_2,….x_k, respectively;
β_1, β_2,…., β_k: coefficients of short-term relationship;
α_1, α_2,…., α_k: long-term relationship coefficients;
tε: random error.
The steps of the ARDL model can be summarized according to the following:
- Time-series stability test
- Optimum slowdown periods.
- Co-integration Test.
- ARDL Estimation results.
-Stability Test:
-ARDL Validity: Short-run and long-run estimation results.

-Time-Series Stability Test

Before estimating the ARDL model, it is necessary to test whether the time series used in the study are stable or not, in a way that requires the degree of integration for each series must be either of zero rank I(0) or first rank I(1). In this context, it must be ensured that there is no integrated second-order time series. The Augmented Dickey-Fuller (ADF) test for a unit root is used to test whether the time series is stable or not. The results are as follows:

Table 2. Unit Root Test Results Using ADF

Augmented Dickey-Fuller Level			
variable	**None**	**Trend And Intercept**	**Intercept**
SI	-6.069582	-7.074600	-0.989461
	0.0000	0.7745	0.7260
M2	-0.911198	-4.829656	-4.462815
	0.3054	0.0109	0.0050
DCPS	2.701547	-2.352369	-0.912460
	0.9961	0.3822	0.7547
INV	1.115405	-2.714010	-2.504860
	0.9227	0.2462	0.1337
IR	0.515329	-4.794728	-0.747822
	0.8141	0.0090	0.8026

	Augmented Dickey-Fuller		
	First Difference		
variable	**None**	**Trend And Intercept**	**Intercept**
SI	-6.222598	-8.640102	-6.224472
	0.0000	0.0000	0.0002
M2	-3.904546	-3.890896	-3.784061
	0.0008	0.0428	0.0148
DDCPS	-6.431841	-4.601040	-4.836730
	0.0000	0.0175	0.0032
DINV	--5.412512	-4.993463	-5.181064
	0.0001	0.0085	0.0015
IR	-7.690365	-7.541010	-7.833937
	0.0000	0.0002	0.0000

Source: Research finding, using Eviews 12.

Based on the panel unit root test results demonstrated in the above table, it was found that the series of SI, IR, and M2 are stationary in first difference. In describing this, it might say that the series does not contain a unit root and accordingly, it is stationary; it is integral (of degree 1), i.e., I(1).

After making the first-degree differences for the series DINV, DDCPS, and based on the results obtained, we note that the series of the variable DINV, DDCPS are stationary in first difference. This model indicates that the series does not have a unit root and is therefore stationary; i.e., it is integral (of degree 1); i.e., I (1).

3.3 Optimum Slowdown Periods

To determine the optimal slowdown periods, the Akaike information criterion (AIC) was used to reach the optimal model. The results are shown in the following figure:

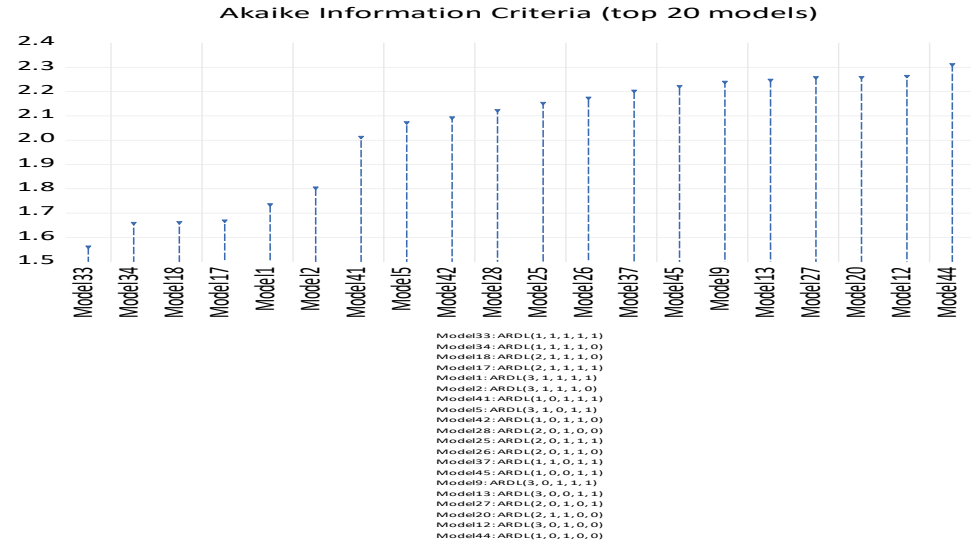

Figure 2. Optimal Slowing Periods for the ARDL Model
Source: Research finding, using Eviews 12.

Based on the results obtained from AIC, it can be concluded that the optimal slowdown periods were represented as follows: ARDL (1,1,1,1,1).

3.4 Co-integration Test

Before applying the ARDL bound test, it is necessary to test the possibility of co-integration between the study variables by doing a bound test to ascertain the existence or absence of a long-run equilibrium relationship between the variables using the following two hypotheses:

$$H0: \quad \eth 0 = \eth 1 = \eth 2 = \eth 3 = 0$$
$$H1: \quad \eth 0 \neq \eth 1 \neq \eth 2 \neq \eth 3 \neq 0$$

To ensure the existence of a long-run equilibrium relationship, the comparison between the F-statistic value and the tabular value is done as follows (Zoutri, 2021).

- If the F statistic is greater than the higher tabular value at a specific level of significance, then the null hypothesis is rejected and the alternative hypothesis is accepted; i.e., there is a long-run relationship between the study variables.
- If the F-statistic value lies between the upper and lower values, then the test result is undetermined; and

- If the F-statistic value is at a lower level than the minimum tabular value at a specific level of significance, the null hypothesis is accepted; i.e., there is no long-run relationship between the study variables.

The following table shows the bound test results for the variables under study:

Table 4. Bound Test Results

F-Bound Test		**Null Hypothesis: No level Relationship**		
Test Statistic	**Value**	**Signif**	**I (0)**	**I (1)**
F-Staristic	9.603232	10%	2.2	3.09
		5%	2.56	3.49
K	4	2.5%	2.88	4.87
		1%	3.29	4.37

Source: Research finding, using Eviews 12.

Based on the bound test results, it is clear that the statistic F-value reached 9.60, which is greater than the upper bound for the critical values at all levels of significance, and therefore the null hypothesis was rejected and the alternative hypothesis was accepted; i.e., there is a long-run relationship between the study variables.

3.5 ARDL Estimation Results

After doing the bound test and determining the optimal slowdown periods, the ARDL model was estimated as follows:

Table 5. ARDL Model Estimation Results

Variable	**Coefficient**	**Std-Error**	**T-Statistic**	**Prob**
SI(-1)	0.334124	0.1811692	0.183955	0.1253
IR	-0090064	0.056120	-1.604831	0.1694
IR(-1)	-0.253641	0.118090	-2.147873	0.0845
DCPS	0.156037	1.77606	0.878557	0.4199
DCPS(-1)	0.355964	1.145357	2.448900	0.0580
M2	0.467665	0.357567	1.307910	0.2478
M2(-1)	-0.918936	0.270833	-3.393003	0.0194
INV	-0.306005	0.150098	-2.038698	0.0970
INV(-1)	-0.193587	0.162052	-1.194593	0.2858
C	21.87457	13.65275	1.602210	0.1700
R-Squared	0.984343	Mean dependent var		3.482667
Adjusted R-Squared	0.956160	S.D dependent var		2.072805
S.E. of Regression	0.434003	Akaike info criterion		1.403190
Sum squared resid	0.941792	Schwarz criterion		1.875223

Log likelihood	-0.523922	Hannan-Quinn criterion	1.398161
F-Statistic	34.92720	Durbin-Watson stat	3.325164
Prob(F-statistic)	0.000549		

Source: Research finding, using Eviews 12.

Based on the results of the ARDL model, it has been noted that the r-value = 0.98; i.e., the independent variables explain the dependent variable by 98%. The Fisher-exact P value (F-statistic) = 0.000549, which explains that the study model is statistically significant. Additionally, Durbin's C statistics reached =3.325164, which indicates the lack of error correlations.

3.5.1 Short-Run Estimation Results

After the ARDL estimation process, we will check whether the ARDL model is free from economic problems. The error correction factor in the ARDL model must be significantly negative, as revealed below:

Table 6. Results of Estimating Short-Term Coefficients

Variable	Coefficient	Std-Error	T-Statistic	Prob
D(IR)	-0.090064	0.027279	-3.301602	0.0214
D(DCPS)	0.156037	0.050446	3.093161	0.0271
D(M2)	0.467665	0.083797	5.580962	0.0025
D(INV)	-0.306005	0.069238	-4.419624	0.0069
CointEq(1)*	**-0.665876**	0.062029	-10.73493	0.0001
R-Squared	0.948974	Mean dependent var		0.140000
Adjusted R-Squared	0.928564	S.D dependent var		1.148204
S.E. of Regression	0.306886	Akaike info criterion		0.736523
Sum squared resid	0.941792	Schwarz criterion		0.972540
Log likelihood	-0.523922	Hannan-Quinn criterion		0.734009
Durbin-Watson stat	3.325164			

Source: Research finding, using Eviews 12.

Through the estimation results shown in the table above, it is clear that the error correction coefficient (CointEq) is negative (0.665876) and has a statistically significant result (P = 0.0001) at a 5% level of significance ($p<0.05$). This reflects the presence of a cointegration relationship between the variables under study, where the obtained value explains the degree of the standard deviation of Sukuk Issuance during the short-term by t-1 from the long-term equilibrium value. Then, approximately 66% of disequilibrium (or imbalance) is corrected in the period t to maintain the long-term equilibrium position.

The results reveal that there is a significant negative impact of Real interest rate (IR) on Sukuk Issuance (in the value of SI) in the short-run, as the decrease in one unit of IR leads to a Sukuk Issuance by 0.090064 units.

There is a significant positive impact of Loans to the private sector (DCPS) on Sukuk Issuance (in the value of SI) in the short run, as the increase in one unit of DCPS leads to an increase in Sukuk Issuance by 0.156037 units.

Additionally, there is a positive impact of Money supply (M2) on Sukuk Issuance (in the value of SI) in the short run, as the increase in one unit of M2 leads to an increase in Sukuk Issuance by 0.467665 units.

Finally, there is a significant negative impact of Investments (INV) on Sukuk Issuance (in the value of SI) in the short run, as the increase in one unit of INV leads to a decrease in Sukuk Issuance by 0.090064 units.

3.5.2 Long-run Estimation Results

To accurately analyze the long-run equilibrium relationship, it would be preferable to clarify the values via the following table:

Table 7. Results of Estimating Long-Term Coefficients

Variable	Coefficient	Std-Error	T-Statistic	Prob
IR	-0.516169	0.288041	-1.792001	0.1331
DCPS	0.768914	0.170262	4.516063	0.0063
M2	-0.677710	0.371047	-1.826480	0.1273
INV	-0.750277	0..219779	-3.41374	0.0190
C	32.85080	18.13975	1.810984	0.1299
EC=SI-(-0.5162* IR+0.7689DCPS-0.6777* M2-0.7503INV+32.8508)				

Source: Research finding, using Eviews 12.

Before presenting the interpretation, it is useful to adopt the values given in the above table to generate the following equation:

EC=SI-(-0.5162* IR+0.7689DCPS-0.6777* M2-0.7503INV+32.8508)

Based on the equation, it can be revealed that there is a significant positive impact of Loans to the private sector (DCPS) on Sukuk Issuance (in the value of SI) in the long run, as the increase in one unit of DCPS leads to an increase in Sukuk Issuance by 0.768914 units.

Additionally, there is a significant negative impact of Investments (INV) on Sukuk Issuance (in the value of SI) in the long run, as the increase in one unit of INV leads to a decrease in Sukuk Issuance by 0.750277units.

As for the two indicators, Money supply (M2), Real interest rate (IR), through the results, we notice that there is no impact on the volume of Sukuk issuances in the long-run (negative and non-significant effect).

3.6 ARDL Validity

To ensure that there are no problems with the model under study, a set of tests (Breusch-Pagan-Godfrey Heteroskedasticity Test and Jarque-Bera Test) would be used.

Table 8. Brush God Fry Test Results

Brush God Fry ARCH Test			
F-statistic	0.217807	Prob F(2.7)	0.7269
Obs*R-Squared	0.147537	Prob ChiSquare(2)	0.7009

Source: Research finding, using Eviews 12.

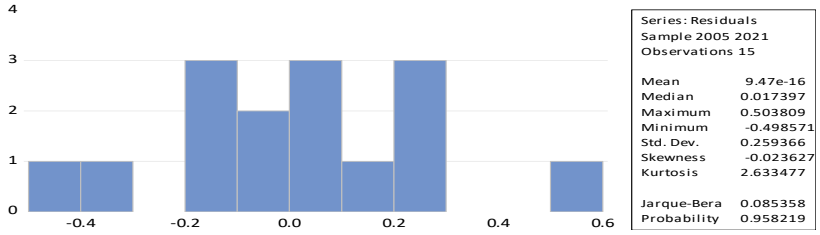

Figure 3. Jarque Bera Residuals Normal Distribution Test Results

Source: Research finding, using Eviews 12.

Based on Breusch-Pagan-Godfrey Heteroskedasticity test results shown in Table 8 revealed that the calculated F-value is greater than the level of Significance ($P > 0.05$), and accordingly, there is no heteroskedasticity.

Again, Jarque-Bera test results are plotted in Figure 2, which shows evidently that the skewness coefficient is 0.06 (≈ 0), and the kurtosis coefficient is 2.63. The results state that Jarque-Bera test statistics are 0.95 ($P > 0.05$), and this means that the residuals follow a normal distribution.

3.7 Stability Test

There is a further need to check the structural changes (or structural breaks) and the long-run and short-run parameters stability. If the value of the test statistic falls inside the critical region, then there is enough evidence that the structural stability is improved at a 5% level of significance (i.e., $p<0.05$). To check the structural stability of the estimated coefficients, the CUSUM and CUSUMSQ tests are used.

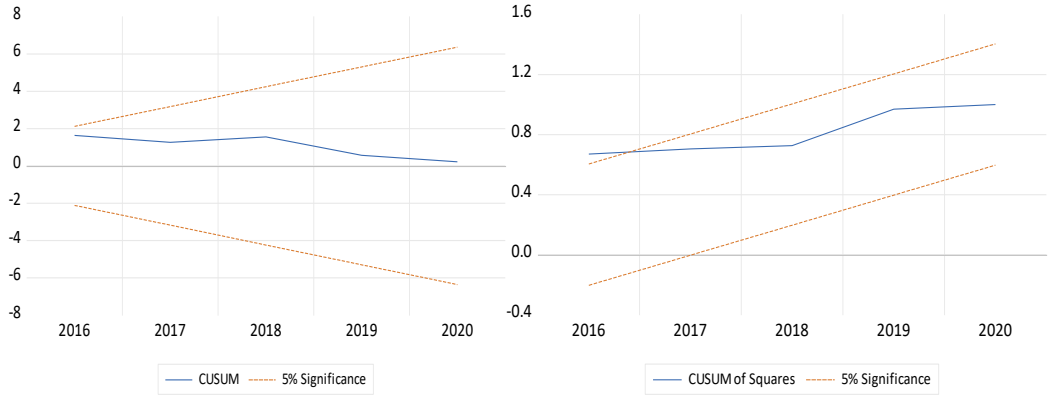

Figure 4. Estimated Model Stability Test
Source: Research finding, using Eviews 12.

It can be seen from the two above figures that the two tests' statistics fall into the critical regions at a 5% level of significance ($p<0.05$), in a way that indicates the parameters' structural stability. This, therefore, confirms that the parameters remain stable over the entire study period.

4. The Results of the Standard Study

Based on standard modelling, time chain stability testing, and the degree of integration of the variables being studied, it has been shown that:

- Based on applying an econometric modelling, testing the stability in time-series data, and determining the degree of integration, it was found that the following:
- All series are complementary of class I(1) and I(0). We can apply the ARDL model to test long-term relationships and estimate parameters.
- Based on the results of the ARDL model estimation, it was found that the slowdown periods were distributed according to the study model equally, i.e., one slowdown period for each of the independent variables and the dependent variable.
-The independent variables (IR, DCPS, INV, M2) explain the dependent variable SI by 98%, and the value of Fisher's probability P(F-Statistic) = 0.000549, that is, the study model is significant and statistically significant. The Durdin–Watson statistic was 3.235164, which indicates the absence of error correlations.
- There is a positive and significant impact of the Private Sector Loans Index (DCPS) on the volume of Sukuk issuances (SI) in the long term, as an increase of one unit of the Private Sector Loans Index leads to an increase in the volume of Sukuk issuances by 0.768914.

- After testing the boundaries of the ARDL model, it was found that there is a long-term relationship between the study variables, there is a positive effect of both the money supply index M2 (and loans granted to the private sector (DCPS) statistically significant in the short term on Sukuk issuances (SI), and a negative effect of the real interest rate index (IR) statistically significant in the short term on Sukuk issuances (SI).
- In the long term, it was found that the indices have an impact on the long-term impact of loans to the private sector (DCPS) and investment (INV) on Sukuk issuances (SI).
- When studying the validity of the ARDL model, to ensure that there are no problems with the model under study, it was found that there were no errors in the stability of the homogeneity of variance; in addition to that, the residuals follow the normal distribution.
- When studying the structural stability of the coefficients, we found that there is stability in the long- and short-term features and therefore, there is structural stability in the study model and the data used in the study are devoid of any structural changes.

5. Conclusion

This research paper presents an econometric modelling of the impact of financial development indicators on Sukuk issuances in Indonesia using the autoregressive distributed lag (ARDL) model for the period, and the results proved (2005-2021). The volume of Islamic Sukuk issuances in Indonesia achieved positive results through its local and even international issuances, making it one of the most important major dealers in the international Sukuk market as a result of the initiatives developed by the Central Bank to develop Islamic banking products. It can be said that the establishment of an Islamic financial market and the development of financial Sukuk compatible with Islamic sharia law have a positive impact on the development of financial indicators and thus attract many savings and attract them to economic development processes. According to the results obtained:

- There is a significant positive impact of Loans to the private sector (DCPS), Investments (INV), on Sukuk Issuance (in the value of SI) in the long-term.
- As for the two indicators, Money supply (M2), Real interest rate (IR), through the results, we notice that there is no impact on the volume of Sukuk issuances in the long run (negative and non-significant effect).

Through the foregoing can be accepted the first hypothesis that: There is an impact between indicators of financial development and the long-term issuances of Islamic Sukuk in the long term.

The results reveal that there is a significant negative impact of Real interest rate (IR), Investments (INV), on Sukuk Issuance (in the value of SI) in the short-term.

There is a significant positive impact of Loans to the private sector (DCPS), Money supply (M2), on Sukuk Issuance (in the value of SI) in the short-term.

Additionally, there is a positive impact of Money supply (M2) on Sukuk Issuance (in the value of SI) in the short-term.

Through the foregoing can be accepted the second hypothesis that: There is an impact between indicators of financial development and the long-term issuances of Islamic Sukuk in the short term.

Based on the above, the following recommendations can be made:

- Achieving financial stability and maintaining financial balance to face all borders and crises.
- Improving the efficiency of Islamic financial markets and introducing innovative products.
- Activating the role of financial markets to raise the levels of issuance of Islamic Sukuk.
- Diversify Islamic Sukuk issuances to ensure more options for customers.
- Follow up on changes in the financial system and study their impact on Islamic Sukuk issuances.

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- Conflict of interest: The authors declare that there is no conflict of interest.

References

Ahmed, E. R. (2014). Islamic Sukuk: Pricing Mechanism and Rating. *Journal of Asian Scientific Research*, *4*(11), 641. Retrieved from doi://http://www.aessweb.com/journals/5003

Ali Said, R. G. (2013). The Determinants of Sukuk Market Development: Do Macroeconomic Factors Influence the Construction. *Journal of Applied Finance Banking*, *3*(5), Retrieved from https://papers.ssrn.com/sol3/Delivery.cfm?abstractid=2318233

Basyariah, N. (2020). Determinants of Sukuk Market Development: Macroeconomic Stability and Institutional Approach. *Journal of Asian Finance, Economics and Business, 8*(2), P201. Retrieved from https://www.academia.edu/download/77370688/JAKO202104142182583.pdf

Bournonville Carole. (1998). Introduction to Organizational Theories. Paris: Foucher. [in French]. Retrieved from https://media.electre-ng.com/extraits/extrait-id/9698336ce0456b1e93d0e878ebfbb3e6d5800c6a13e085f7abcdc55aaa2cb4c4.pdf

Enny Kartini, M. M. (2020). How Sukuk and Conventional Bonds Affect Economic Growth? Evidence from Indonesia. *International Journal of Economics and Finance, 10*(5), Retrieved from https://www.econjournals.com/index.php/ijefi/article/view/10223

Farhat Soulayman Zoutri, A. W. (2021). The Impact of Good Governance Indicators on Economic Growth in Algeria during the Period (1199-2018) using the Distributed Time Period Model ARDL. *Knowledge Groups Magazine, 7*(2), 256-257.

Hafsi, S. T. (2022). Study of the Long-Term Causal Relationship between Islamic Sukuk and Economic Growth in Sudan for the Period 2000-2019. *Journal of Economic Issue Studies, 13*(1), 84.

Muasia, R. (2020). The Influence of Macroeconomic Indicators on the Growth of State Islamic Bonds (Sukuk) in Indonesia. *Advances in Health Sciences Research, 27*, 61-64. Retrieved from https://www.atlantis-press.com/article/125942107.pdf

Muhammad Sahirul Alim, P. S. (2022). The Impact of Financial Performance on Stock Return in the Companies Which Issue Sukuk in Indonesia. *International Journal of Innovative Science and Research Technology, 11*(7), 256-262. Retrieved from https://www.academia.edu/download/98849043/IJISRT22NOV673_201.pdf

Nur Habibah Asri, D. W. (2021). Macroeconomic Variables and Sukuk Outstanding in Indonesia. *Open Access Indonesia Journal of Social Sciences, 4*(6), 612-621. Retrieved from https://journalsocialsciences.com/index.php/oaijss/article/download/101/343

Actouf, O. (1994). *Management between Tradition and Renewal* (3). Montréal: Gaétan Morin. [in French] Retrieved from https://philpapers.org/rec/AKTLME

Others, E. R. (2015). An Empirical Analysis on Legitimacy of Sukuk: An Insight of Malaysian Sukuk. *Asian Social Science, 11*(13), Retrieved from https://www.researchgate.net/

Philippe, B. (2007). *Corporate Communication Management: Theoretical and Practical Aspects*. Paris: Lavoisier. [in French]

Shanafa, J. (2022). The Impact of Financial Development on Economic Growth - An Econometric Study of the Kingdom of Saudi Arabia Using the ARDL Model for the Period 1990-2020. *Journal of Financial, Accounting and Management Studies*, *9*(1), Retrieved from https://www.sciedu.ca/journal/index.php/rwe/article/download/20456/13132

Mahi, S., & Lebig, M. B. (2021). The Application Of Maqasid Al-Shariah In Islamic Sukuk (The Malaysian Case). *Journal of Economics and Human Development*, *12*(2), 149-162. Retrieved from https://asjp.cerist.dz/en/downArticle/275/12/2/197302

Svirydzenka, K. (2016). Introducing a New Broad-based Index of Financial Development. *International Monetary Fund*, Retrieved from https://papers.ssrn.com/sol3/Delivery.cfm?abstractid=2754950

Zolfaghari, P. (2017). An Introduction to Islamic Securities (Sukuk). *Working paper*, Retrieved from https://www.diva-portal.org/smash/get/diva2:1189896/FULLTEXT01.pdf

Appendix

Method: ARDL
Date: 09/11/22 Time: 23:22
Sample (adjusted): 2005 2021
Included observations: 15 after adjustments
Maximum dependent lags: 3 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): IR DCPS M2 INV
Fixed regressors: C
Number of models evaluated: 48
Selected Model: ARDL(1, 1, 1, 1, 1)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
SI(-1)	0.334124	0.181692	1.838955	0.1253
IR	-0.090064	0.056120	-1.604831	0.1694
IR(-1)	-0.253641	0.118090	-2.147873	0.0845
DCPS	0.156037	0.177606	0.878557	0.4199
DCPS(-1)	0.355964	0.145357	2.448900	0.0580
M2	0.467665	0.357567	1.307910	0.2478
M2(-1)	-0.918936	0.270833	-3.393003	0.0194
INV	-0.306005	0.150098	-2.038698	0.0970
INV(-1)	-0.193587	0.162052	-1.194593	0.2858
C	21.87457	13.65275	1.602210	0.1700

R-squared	0.984343	Mean dependent var	3.482667
Adjusted R-squared	0.956160	S.D. dependent var	2.072805
S.E. of regression	0.434003	Akaike info criterion	1.403190
Sum squared resid	0.941792	Schwarz criterion	1.875223
Log likelihood	-0.523922	Hannan-Quinn criter.	1.398161
F-statistic	34.92720	Durbin-Watson stat	3.325164
Prob(F-statistic)	0.000549		

*Note: p-values and any subsequent tests do not account for model

ARDL Long Run Form and Bounds Test
Dependent Variable: D(SI)
Selected Model: ARDL(1, 1, 1, 1, 1)
Case 2: Restricted Constant and No Trend
Date: 09/12/22 Time: 00:40
Sample: 2005 2021
Included observations: 15

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	21.87457	13.65275	1.602210	0.1700
SI(-1)*	-0.665876	0.181692	-3.664860	0.0145
IR(-1)	-0.343705	0.131416	-2.615399	0.0474
DCPS(-1)	0.512001	0.095764	5.346465	0.0031
M2(-1)	-0.451271	0.263027	-1.715681	0.1469
INV(-1)	-0.499592	0.195758	-2.552087	0.0511
D(IR)	-0.090064	0.056120	-1.604831	0.1694
D(DCPS)	0.156037	0.177606	0.878557	0.4199
D(M2)	0.467665	0.357567	1.307910	0.2478
D(INV)	-0.306005	0.150098	-2.038698	0.0970

* p-value incompatible with t-Bounds distribution.

ARDL Error Correction Regression
Dependent Variable: D(SI)
Selected Model: ARDL(1, 1, 1, 1, 1)
Case 2: Restricted Constant and No Trend
Date: 09/12/22 Time: 00:40
Sample: 2005 2021
Included observations: 15

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IR)	-0.090064	0.027279	-3.301602	0.0214
D(DCPS)	0.156037	0.050446	3.093161	0.0271
D(M2)	0.467665	0.083797	5.580962	0.0025
D(INV)	-0.306005	0.069238	-4.419624	0.0069
CointEq(-1)*	-0.665876	0.062029	-10.73493	0.0001

R-squared	0.948974	Mean dependent var	0.140000
Adjusted R-squared	0.928564	S.D. dependent var	1.148204
S.E. of regression	0.306886	Akaike info criterion	0.736523
Sum squared resid	0.941792	Schwarz criterion	0.972540
Log likelihood	-0.523922	Hannan-Quinn criter.	0.734009
Durbin-Watson stat	3.325164		

* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	9.603232	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Model Selection Criteria Table
Dependent Variable: SI
Date: 09/12/22 Time: 00:39
Sample: 20052021
Included observations: 15

Model	LogL	AIC*	BIC	HQ	Adj. R-sq	Specification
33	-0.921504	1.560215	2.016684	1.517960	0.947955	ARDL(1, 1, 1, 1, 1)
34	-2.602092	1.657442	2.068264	1.619413	0.947066	ARDL(1, 1, 1, 1, 0)
18	-1.622522	1.660360	2.116830	1.618106	0.942473	ARDL(2, 1, 1, 1, 0)
17	-0.670015	1.667145	2.169261	1.620665	0.933055	ARDL(2, 1, 1, 1, 1)
1	-0.136212	1.733745	2.281508	1.683039	0.906956	ARDL(3, 1, 1, 1, 1)
2	-1.619055	1.802722	2.304839	1.756242	0.923335	ARDL(3, 1, 1, 1, 0)
41	-5.080375	2.011482	2.422305	1.973453	0.924578	ARDL(1, 0, 1, 1, 1)
5	-3.498886	2.071269	2.573386	2.024789	0.899717	ARDL(3, 1, 0, 1, 1)
42	-6.641551	2.091650	2.456826	2.057847	0.921445	ARDL(1, 0, 1, 1, 0)
28	-6.852274	2.121753	2.486929	2.087950	0.919044	ARDL(2, 0, 1, 0, 0)
25	-5.059575	2.151368	2.607837	2.109113	0.906003	ARDL(2, 0, 1, 1, 1)
26	-6.209293	2.172756	2.583579	2.134727	0.911379	ARDL(2, 0, 1, 1, 0)
37	-6.410689	2.201527	2.612350	2.163498	0.908792	ARDL(1, 1, 0, 1, 1)
45	-7.544264	2.220609	2.585785	2.186805	0.910632	ARDL(1, 0, 0, 1, 1)
9	-4.666982	2.238140	2.740257	2.191660	0.881506	ARDL(3, 0, 1, 1, 1)
13	-5.726150	2.246593	2.703062	2.204338	0.896612	ARDL(3, 0, 0, 1, 1)
27	-6.800023	2.257146	2.667969	2.219117	0.903576	ARDL(2, 0, 1, 0, 1)
20	-6.805283	2.257898	2.668720	2.219868	0.903503	ARDL(2, 1, 1, 0, 0)
12	-6.834547	2.262078	2.672901	2.224049	0.903099	ARDL(3, 0, 1, 0, 0)
44	-9.172133	2.310305	2.629833	2.280726	0.903344	ARDL(1, 0, 1, 0, 0)
32	-9.201907	2.314558	2.634087	2.284980	0.902932	ARDL(2, 0, 0, 0, 0)
10	-6.203920	2.314846	2.771315	2.272591	0.889309	ARDL(3, 0, 1, 1, 0)
21	-6.300435	2.328634	2.785103	2.286379	0.887772	ARDL(2, 1, 0, 1, 1)
38	-8.366116	2.338017	2.703192	2.304213	0.899499	ARDL(1, 1, 0, 1, 0)
46	-9.461911	2.351702	2.671230	2.322123	0.899259	ARDL(1, 0, 0, 1, 0)
29	-7.515457	2.359351	2.770174	2.321322	0.893199	ARDL(2, 0, 0, 1, 1)

Heteroskedasticity Test: ARCH

F-statistic	0.127807	Prob. F(1,12)	0.7269
Obs*R-squared	0.147537	Prob. Chi-Square(1)	0.7009

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/12/22 Time: 00:43
Sample (adjusted): 2005 2021
Included observations: 14 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.060393	0.030117	2.005281	0.0680
RESID^2(-1)	0.102115	0.285636	0.357501	0.7269

R-squared	0.010538	Mean dependent var	0.067197
Adjusted R-squared	-0.071917	S.D. dependent var	0.084355
S.E. of regression	0.087336	Akaike info criterion	-1.906554
Sum squared resid	0.091530	Schwarz criterion	-1.815260
Log likelihood	15.34588	Hannan-Quinn criter.	-1.915005
F-statistic	0.127807	Durbin-Watson stat	2.050306
Prob(F-statistic)	0.726925		

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 09/12/22 Time: 00:41
Sample: 2005 2021
Included observations: 15
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SI(-1)	0.319717	0.103969	3.075134	0.0543
IR	-0.077804	0.030183	-2.577696	0.0819
IR(-1)	-0.064042	0.052492	-1.220031	0.3096
DCPS	-0.040595	0.080527	-0.504115	0.6489
DCPS(-1)	-0.037349	0.065422	-0.570891	0.6080
M2	0.192584	0.153639	1.253485	0.2988
M2(-1)	-0.108374	0.119824	-0.904446	0.4324
INV	0.063658	0.063733	0.998834	0.3915
INV(-1)	0.157211	0.074313	2.115505	0.1247
C	-8.107863	6.059099	-1.338130	0.2732
RESID(-1)	-1.847530	0.406684	-4.542910	0.0200
RESID(-2)	-0.901197	0.370406	-2.432997	0.0931

R-squared	0.896015	Mean dependent var	-2.84E-15
Adjusted R-squared	0.514735	S.D. dependent var	0.259366
S.E. of regression	0.180677	Akaike info criterion	-0.593648
Sum squared resid	0.097933	Schwarz criterion	-0.027208
Log likelihood	16.45236	Hannan-Quinn criter.	-0.599682
F-statistic	2.350017	Durbin-Watson stat	1.739835
Prob(F-statistic)	0.261394		

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	12.92510	Prob. F(2,3)	0. 3354
Obs*R-squared	13.44022	Prob. Chi-Square(2)	0.1200

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IR	-0.516169	0.288041	-1.792001	0.1331
DCPS	0.768914	0.170262	4.516063	0.0063
M2	-0.677710	0.371047	-1.826480	0.1273
INV	-0.750277	0.219779	-3.413774	0.0190
C	32.85080	18.13975	1.810984	0.1299

EC = SI - (-0.5162*IR + 0.7689*DCPS -0.6777*M2 -0.7503*INV + 32.8508)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	9.603232	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
		Finite Sample: n=30		
Actual Sample Size	15	10%	2.525	3.56
		5%	3.058	4.223
		1%	4.28	5.84

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