Explaining the Relationship Between Islamic Financial Instruments and Economic Growth in the Agricultural, Industrial, and Service Sectors of the Country

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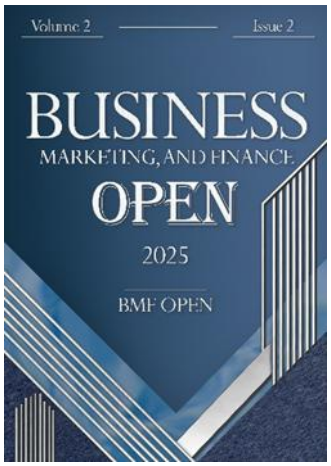

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Abstract: Islamic finance has emerged in the global financial literature with the aim of offering a new model to replace traditional and conventional financial systems and to provide financial, commercial, and investment opportunities aligned with Shariah principles. The main objective of the present study is to examine the impact of Islamic finance on the growth of Iran's economic sectors. To this end, the effect of the volume of issued Sukuk and the volume of issued Islamic debt securities was investigated separately for the three economic sectors, namely industry, agriculture, and services. Accordingly, quarterly data from 2012 to 2023 were analyzed using both time series and panel data approaches. The results of model estimation showed that, under the time series approach, the impact of Sukuk financial instruments on the country's economic growth was greater than that of Treasury bills. In contrast, under the panel data approach, it was found that although the volume of Sukuk and the volume of issued Islamic debt securities had a positive and significant impact on the economic growth of the three sectors, this impact was not substantial and could not serve as a driving force for economic growth in the three sectors. In fact, the findings indicate that Islamic finance has not had a significant impact on the growth of Iran's economic sectors. Numerous control variables have confounded the effectiveness of Islamic financial instruments. Therefore, it is expected that if macroeconomic conditions improve—including increased capital formation, improved labor force participation rates, reduced inflation, and improvements in other macroeconomic variables—the impact of Islamic financial instruments will become more pronounced and significant. Policymakers could, by ensuring the developmental effects of Islamic financial instruments, replace conventional financial instruments with Sukuk and Treasury bills and promote their broader issuance.

Keywords: Islamic finance, Sukuk, Islamic debt securities, economic growth.

1. Introduction

Islamic finance is a financial system whose operations and policies are based on the principles and rules of Islamic Shariah (Shari'ah) and reflect the injunctions of Islam [1]. Four main pillars govern Islamic financial activities. First, riba, or the giving or receiving of interest, is prohibited. Profit should not be gained from the exchange of money for money but rather through the trade of goods and services. However, Islam permits the return on capital, provided that the capital participates in the production process and is exposed

to business risk. The concept of profit and loss sharing (PLS) replaces the concept of interest. Second, Islamic finance prohibits gharar. Gharar refers to economic transactions characterized by uncertainty, risk, or excessive ambiguity in business dealings. Third, maysir (gambling) is forbidden. Maysir involves acquiring money through chance or transactions linked to gambling or betting. Finally, Islam prohibits products such as alcohol, pork, pornography, and similar items [2]. This financial practice is based on ethical principles and solidarity and is considered "pro-poor" [3].

In fact, Islamic finance has emerged in the global financial literature with the aim of offering a new model to replace traditional and conventional financial systems and to provide financial, commercial, and investment opportunities aligned with Shariah principles [4]. Following the successful implementation of interest-free banking in many Islamic countries, Muslim scholars began designing Islamic financial instruments. Extensive studies were conducted on Shariah contracts and their potential for financial instrument development to design Islamic financial tools as substitutes for instruments such as bonds and preferred stocks, which are typically based on interest-bearing loans and riba. Muslim thinkers were able to present a variety of financial instruments in accordance with Shariah regulations and the real needs of Islamic societies [5].

Developing countries, including Iran, can achieve financial development and subsequently economic growth by adopting a forward-looking approach, proper planning, and attention to factors influencing monetary policies. The relationship between inflation and economic growth is important for formulating and guiding monetary policies. Globally, various financial instruments are used to achieve economic growth. However, in Iran, due to the prohibition of riba, many of these instruments cannot be utilized. Consequently, Islamic financial instruments are used in the country as suitable tools for economic and banking transactions [6].

Several studies have examined the relationship between Islamic finance and economic growth across different contexts. Haruna et al. (2024) demonstrated that the effects of Islamic finance on SMEs' innovation capacity are stronger for technological innovation (process and product) than for non-technological innovation (marketing and organizational) [1]. Chiad and Gherbi (2024) emphasized the necessity of expanding Islamic banking's market share in Saudi Arabia through the development of products and services that enhance economic efficiency in line with policies aimed at transforming the financial sector into a strategic driver of development [7]. Ladhem and Mekidiche (2022) proposed adopting Turkey's successful experience in boosting economic growth through expanding Islamic finance in the banking sector [8]. Muhammad et al. (2020) showed that Islamic finance boosts economic growth and meets specific needs unmet by conventional finance, using government expenditure, investment, trade openness, and inflation as control variables [9]. Juhro et al. (2020) indicated that Indonesia's growth experience is best explained by a semi-endogenous growth model driven by Islamic financial activities [10]. Mensi et al. (2019) found that Islamic banking variables contribute quantitatively to economic growth [11], while Gazdar et al. (2019) argued that Islamic finance enhances the influence of macroeconomic variables on economic growth [12]. Boukhatem and Ben Moussa (2018) found robust evidence that financial development fosters growth in MENA countries, although weak institutional frameworks limit Islamic finance's positive effects [13]. Kassim (2016) stressed that Islamic finance, by effectively channeling funds into investment activities, has significantly contributed to the real economy [14]. Ghanbarzadeh (2025) examined Islamic finance's positive impacts on economic growth, poverty reduction, and investment promotion [15]. Ebrahimi et al. (2024) found that Sukuk issuance significantly enhances provincial economic growth, with investment, education, inflation, and trade openness having positive effects, and unemployment, inequality, and mortality rates having negative effects [16]. Amiri et al. (2021) indicated that capital markets and banking positively affect economic growth, while insurance

markets do not [17]. Alavi et al. (2021) showed that the comprehensive financial development index has a strong positive relationship with economic growth in both the short and long term [18]. Askarzadeh Darreh et al. (2021) confirmed that Sukuk had a positive and significant effect on Iran's economic growth. Overall, the development and expansion of Islamic finance mechanisms have been shown across multiple studies to positively influence economic growth, although varying in intensity depending on institutional structures and sectoral contexts [6].

The above discussions highlight the importance of Islamic finance as a suitable alternative to traditional financing. In fact, diversifying financial instruments is one of the key factors influencing the development of financial markets and, consequently, economic growth. Since financing better encourages saving and investment and facilitates real activities and consumption, it plays a significant role in economic growth models. The Islamic Republic of Iran, despite its existing capacities, has not made full use of these Islamic financial instruments to promote the economic growth of its sectors. Meanwhile, numerous scholars have argued that Shariah-compliant assets and markets can act as catalysts for sustaining economic growth.

This study aims to explain the effects of the variables influencing the country's economic growth. Accordingly, while examining Islamic financing methods, the study analyzes the impact of Islamic finance on economic growth separately across different economic sectors. This analysis is conducted using both time series and dynamic panel approaches. Moreover, based on the conducted searches, this method is being applied for the first time in the country.

On the other hand, today, Iran's economy is experiencing a unique situation due to the intensification of international sanctions, particularly the restrictions imposed on financial and banking sectors. The impact of sanctions, akin to a comprehensive economic war, has created financial turmoil. While the sanctions have failed to correct economic policy paths in the domains of money issuance and credit functions of banking institutions, they have incited a range of public and private institutions to exploit profitable opportunities within the chaotic market environment. Given this necessity, the researcher aims to explain the role of Islamic finance in improving the growth of various economic sectors in the country. In line with the stated problem, the researcher seeks to answer the following question:

Does Islamic finance have a significant impact on the growth of Iran's economic sectors?

2. Methodology

In this study, the collected data were analyzed using descriptive and inferential statistics through Excel 2010 and EViews 12 software. The statistical population of the present research comprises various sectors (industry, agriculture, and services) of the country's economy. The time frame of the data spans the years 2012 to 2023, and after seasonal adjustment, 48 observations were analyzed. Data related to the economic growth of the industrial, agricultural, and service sectors, inflation, government expenditures, education, degree of economic openness, investment, and labor force were extracted from the World Bank website. Data related to Islamic finance were extracted from the websites of the Securities and Exchange Organization and the Central Bank.

The purpose of the present study is to examine the impact of Islamic finance on the growth of Iran's economic sectors. In this part of the research, an effort has been made to specify an appropriate model capable of satisfactorily explaining the changes in the dependent variable. The models proposed for both the time series and panel data sections are based on the study by Boukhatem and Ben Moussa (2018).

Considering the main objective of the study, the mathematical function of the current research is represented by Equation (1):

$SG\_it = f(IF\_it, INF\_it, G\_it, EDU\_it, OT\_it, INV\_it, LBR\_it)$ (1)

The regression equation for the economic sectors is represented by Equation (2):

$GRW\_it = \beta_0 + \beta_1 SK\_it + \beta_2 ID\_it + \beta_3 INF\_it + \beta_4 G\_it + \beta_5 EDU\_it + \beta_6 OT\_it + \beta_7 INV\_it + \beta_8 LBR\_it + \varepsilon\_i$ (2)

The dependent variable is the economic growth of the country's various economic sectors, namely industry, agriculture, and services. The data for this variable were extracted from the World Bank website.

GRW: Growth of the industry, agriculture, and service sectors. Economic growth refers to the continuous increase in a country's real per capita production. As a result of economic growth, a country will be better able to meet consumer needs and improve living standards. The economic growth rate is calculated as a percentage.

The first theory of economic growth was presented by Harrod and Domar in 1939, simply demonstrating how savings can determine the economic growth rate. From the mid-1950s to the late 1960s, economic growth was one of the major topics of debate among economists, with several theories being proposed during that period, the most prominent of which was the neoclassical growth theory. The neoclassicists, led by Solow, showed that, assuming constant returns to scale in production and using a macroeconomic production function, the growth rates of production factors (labor and capital) can be influential and decisive determinants of economic growth in the long run.

The main independent variables are the Islamic finance methods, which include two components: Sukuk and Islamic debt securities. Data for these variables were extracted from the Central Bank and the Tehran Stock Exchange websites.

SK: Volume of issued Sukuk, which are securities where the holder owns a proportional share of an asset whose benefits are leased to a consumer or originator under a lease contract. In Ijara Sukuk, the right to use the benefits of an asset or a pool of assets is transferred from the owner to another party in exchange for rental payments (Ahmadi et al., 2018, p. 232). Data on issued Sukuk were obtained from the Tehran Securities Organization and are reported in million rials.

ID: Volume of Islamic debt securities, which are registered or bearer securities issued by the Treasury (Ministry of Economic Affairs and Finance) with a specified maturity. They are issued against the government sector's debts to the Central Bank, the banking network, and contractors under capital asset acquisition plans, and are provided to the Central Bank, creditor banks, contractors, and other creditors at face value (Ahmadi et al., 2018, p. 232). Data on issued Islamic Treasury bonds were obtained from the Tehran Securities Organization and are reported in million rials.

To more clearly explain the impact of independent variables on the dependent variable, six control variables were used. Data for these variables were extracted from the World Bank website.

INF: Inflation, measured by the annual growth rate of the Consumer Price Index (CPI). Data related to inflation were obtained from the World Bank website and are expressed as percentages.

G: Government expenditure, referring to general government final consumption expenditure (percentage of GDP). Data on government expenditures were obtained from the World Bank website and are expressed as percentages.

EDU: Education expenditure, referring to government spending on education relative to current GDP, measured as a percentage. Related data were extracted from the World Bank website.

OT: Degree of economic openness, calculated as the sum of imports and exports divided by GDP at current prices. Related data were obtained from the World Bank website and are expressed as percentages.

INV: Investment variable in this study refers to gross capital formation as a percentage of annual growth, measured as a percentage. The data were obtained from the World Bank website.

LBR: Labor force variable in this study refers to the labor force participation rate, total (% of the total population aged 15–64). This variable is measured as a percentage, and the data were obtained from the World Bank website.

t: The time period under study is from 2012 to 2023.

i: The three sectors: industry, services, and agriculture.

3. Findings and Results

According to the results obtained from descriptive statistics, it was revealed that although the growth of the agricultural sector over the 12-year period experienced fluctuations, it generally exhibited a declining trend. The lowest growth was recorded in 2018 at -2.27%, while the highest growth occurred in 2019 at 9.12%. Moreover, the average growth rate of the agricultural sector was above 3% and showed a significant difference from its median value. The economic growth of the industrial sector over the 12-year period encountered considerable fluctuations. This sector experienced a decline of more than 13% in 2012, while it recorded a growth of more than 17% in 2016. The average growth rate of this sector was low and less than 1%. The economic growth of the industrial sector over the 12-year period was highly volatile. In 2021, more than 6% of the country's gross domestic product (GDP) growth belonged to the service sector, whereas in 2015, the growth of this sector turned negative. The average economic growth of the service sector was approximately 2%. Therefore, it can be concluded that the economic growth of the agricultural sector was higher than that of the other two sectors, while the growth of the service sector was less than 1%.

Table 1. Economic Sector Growth

Economic Sector Growth	Mean	Standard Deviation
Agriculture	3.28	3.62
Industry	0.67	9.21
Services	1.94	2.16

The average volume of Sukuk issued in the industrial sector from 2012 to 2023 exhibited slight fluctuations. Over the 12-year period, less than 52 billion rials of Sukuk were issued annually in the industrial sector on average. The volume of Sukuk issued in the agricultural sector during the same period showed an increasing trend. Over the 12-year period, the annual average volume of Sukuk issued in the agricultural sector was considerable compared to other sectors. The average volume of Sukuk issued in the service sector during the same period showed substantial fluctuations. The annual average volume of Sukuk issued in the service sector was significant compared to that in the industrial sector. Therefore, it can be concluded that the lowest volume of Sukuk was issued for the agricultural sector and the highest for the service sector.

Table 2. Sukuk Issued in Different Economic Sectors

Sukuk Issued	Mean	Standard Deviation
Agriculture	51,200	10,260
Industry	61,996,409	62,736,185
Services	113,000,000	64,184,178

The Islamic Treasury bonds issued in the industrial sector during the years 2012 to 2023 experienced significant growth. No bonds were issued between 2012 and 2014. Over the 12-year period, the annual average issuance of

Islamic Treasury bonds in the industrial sector was 92,659,919 million rials. The Islamic Treasury bonds issued in the agricultural sector during the same period also witnessed remarkable growth. No bonds were issued between 2012 and 2014. The annual average issuance of Islamic Treasury bonds in the agricultural sector was 50,829,960 million rials. Over the 12-year period, the annual average issuance in the service sector reached 160,000,000 million rials. Therefore, it can be concluded that the lowest volume of Islamic Treasury bonds was issued for the agricultural sector and the highest for the service sector.

Table 3. Islamic Treasury Bonds in Different Economic Sectors

Islamic Treasury Bonds	Mean	Standard Deviation
Agriculture	50,829,960	40,131,198
Industry	92,659,919	69,763,169
Services	160,000,000	132,000,000

The summary results for central tendency indicators such as mean and median, dispersion indicators such as standard deviation, skewness, and kurtosis, and the type of distribution are presented in Table 4.

Table 4. Descriptive Statistics of Variables

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Statistic	Probability
Economic growth (Agriculture)	3.28	3.25	9.12	-2.61	3.62	-0.11	2.31	0.26	0.87
Economic growth (Industry)	0.67	2.76	17.24	-13.41	9.21	0.04	2.06	0.44	0.80
Economic growth (Services)	1.94	2.12	6.45	-0.88	2.16	0.55	2.61	0.69	0.70
Sukuk (Agriculture)	51.20	48.07	74.00	39.01	10.26	0.92	2.92	1.70	0.42
Sukuk (Industry)	61,996,409	55,675,956	140,763,000	0	62,736,185	0.08	1.15	1.72	0.42
Sukuk (Services)	113,000,000	114,000,000	224,300,000	15,900,000	64,184,178	0.00	2.06	0.43	0.80
Treasury Bonds (Industry)	92,659,919	123,000,000	181,000,000	0	69,763,169	-0.37	1.42	1.42	0.49
Treasury Bonds (Agriculture)	50,829,960	61,516,418	112,000,000	0	40,131,198	-0.13	1.60	1.01	0.60
Treasury Bonds (Services)	160,000,000	182,000,000	375,000,000	0	132,000,000	0.07	1.74	0.79	0.67
Labor Force Participation Rate	44.73	44.66	47.06	42.53	1.68	0.02	1.60	0.98	0.61
Investment Growth	0.26	2.27	32.81	-38.96	17.31	-0.36	4.03	0.80	0.66
Inflation	27.35	28.95	44.57	7.24	14.36	-0.14	1.46	1.22	-
Government Expenditures	1.11	-0.15	9.04	-5.55	4.61	0.53	2.18	0.89	0.63
Education Expenditures	3.07	3.11	3.61	2.61	0.30	0.09	2.35	0.22	0.89
Degree of Economic Openness	47.14	45.04	58.56	39.42	5.84	0.63	2.41	0.98	0.61

In line with the main objective of the study, the mathematical function of the current study is presented as Equation (3):

$$SG_t = f(LF_t, CP_t, IF_t, INF_t, G_t, EDU_t, OT_t) \quad (3)$$

In the first stage, the significance of the explanatory variables is tested. Subsequently, after eliminating redundant variables, the growth of the different sectors is estimated.

The regression equation for the industrial sector is presented as Equation (4):

$IG_t = \beta_0 + \beta_1 IS_t + \beta_2 IT_t + \beta_3 LF_t + \beta_4 CP_t + \beta_5 INF_t + \beta_6 GE_t + \beta_7 ED_t + \beta_8 OP_t + \varepsilon_i$ (4)

The regression equation for the agricultural sector is presented as Equation (5):

$AG_t = \beta_0 + \beta_1 AS_t + \beta_2 AT_t + \beta_3 LF_t + \beta_4 CP_t + \beta_5 INF_t + \beta_6 GE_t + \beta_7 ED_t + \beta_8 OP_t + \varepsilon_i$ (5)

The regression equation for the service sector is presented as Equation (6):

$SG_t = \beta_0 + \beta_1 SS_t + \beta_2 ST_t + \beta_3 LF_t + \beta_4 CP_t + \beta_5 INF_t + \beta_6 GE_t + \beta_7 ED_t + \beta_8 OP_t + \varepsilon_i$ (6)

The results of the HEGY test for the seasonal data of all dependent and independent variables of the model are shown in Table 5. As observed, among the model's variables, six variables were non-stationary at level and were thus included in the model after differencing:

Table 5. HEGY Test Results

Variable	HEGY	Critical Value 1%	Critical Value 5%	Critical Value 10%	n*	Description
IG	-3.77	-3.68	-3.14	-2.87	33	Stationary at level 0
	2.88	28.60	7.71	3.56		
	-3.96	-2.50	-1.87	-1.57		
	2.71	19.84	5.57	2.85		
	3.14	15.98	5.53	3.79		
AG	-2.59	-2.52	-1.88	-1.58	38	Stationary at level 0
	3.62	30.06	7.90	3.63		
	-6.41	-2.52	-1.88	-1.58		
	3.52	20.78	5.70	2.90		
	3.76	16.31	4.85	2.82		
SG	-3.02	-2.52	-1.88	-1.58	38	Stationary at level 0
	3.13	30.06	7.90	3.36		
	-4.01	-2.52	-1.88	-1.58		
	2.21	20.78	5.70	2.90		
	2.02	16.31	4.85	2.82		
IS	-4.37	-3.75	-3.21	-2.93	42	Stationary at level 0
	3.89	30.68	7.98	3.66		
	-6.54	-2.54	-1.89	-1.59		
	2.40	21.16	5.75	2.92		
	3.58	17.06	5.72	3.90		
AS	-2.90	-2.52	-1.88	-1.58	38	Stationary at level 0
	3.35	30.06	7.90	3.36		
	-4.44	-2.52	-1.88	-1.58		
	2.71	20.78	5.70	2.90		
	2.29	16.31	4.85	2.82		
SS	-2.15	-2.51	-1.87	-1.58	35	Stationary at level 0
	3.95	29.18	7.79	3.59		
	-3.20	-2.51	-1.87	-1.58		
	2.43	20.22	5.62	2.87		
	2.12	15.88	4.80	2.80		
IT	-0.38	-2.54	-1.89	-1.59	42	Stationary after differencing
	32.87	30.68	7.98	3.66		
	-7.40	-2.54	-1.89	-1.59		
	27.97	21.16	5.75	2.92		
	16.75	16.59	4.88	2.84		
AT	-1.35	-2.54	-1.89	-1.59	42	Stationary after differencing
	9.03	30.68	7.98	3.66		
	-6.01	-2.54	-1.89	-1.59		
	24.83	21.16	5.75	2.92		

	18.64	16.59	4.88	2.84		
ST	-1.35	-2.54	-1.89	-1.59	42	Stationary after differencing
	31.42	30.68	7.98	3.66		
	-6.14	-2.54	-1.89	-1.59		
	26.91	21.16	5.75	2.92		
	20.52	16.59	4.88	2.84		
LF	-0.12	-2.54	-1.89	-1.59	44	Stationary after differencing
	25.00	30.71	7.98	3.67		
	-3.55	-2.54	-1.89	-1.59		
	23.17	21.17	5.75	2.93		
	18.09	16.60	4.88	2.85		
CP	-2.66	-2.51	-1.87	-1.58	34	Stationary at level 0
	2.67	28.89	7.75	3.57		
	-5.11	-2.51	-1.87	-1.58		
	2.46	20.03	5.60	2.86		
	2.11	15.74	4.78	2.80		
INF	-0.66	-2.53	-1.88	-1.59	39	Stationary after differencing
	17.58	30.36	4.94	3.64		
	-3.63	-2.53	-1.88	-1.59		
	11.13	20.96	5.73	2.90		
	11.04	16.45	4.86	2.82		
GE	-3.72	-2.52	-1.88	-1.58	38	Stationary at level 0
	3.08	30.06	7.90	3.63		
	-6.35	-2.52	-1.88	-1.58		
	2.70	20.78	5.70	2.90		
	2.62	16.31	4.85	2.82		
ED	-0.14	-2.54	-1.89	-1.59	43	Stationary after differencing
	27.07	30.69	7.98	3.67		
	-4.36	-2.54	-1.89	-1.59		
	11.99	21.17	5.75	2.92		
	17.18	16.60	4.88	2.84		
OP	-3.35	-2.54	-1.89	-1.59	43	Stationary at level 0
	3.79	30.69	7.98	3.67		
	-4.45	-2.54	-1.89	-1.59		
	2.77	21.17	5.75	2.92		
	2.40	16.60	4.88	2.84		

The results show that all three models possess cointegration vectors. Therefore, there is no spurious regression problem, and a long-term relationship exists in the models.

Table 6. Cointegration Test Results

Sector	Prob	Critical Value	Trace	Eigenvalue	No. of CE(s)
Industrial Sector	Industrial Sector – Unrestricted Cointegration Rank Test (Trace)				
	0.00	169.59	214.75	0.59	None
	0.00	134.67	173.25	0.55	At most 1
	0.00	103.84	136.44	0.51	At most 2
	0.00	76.97	103.29	0.45	At most 3
	0.00	54.07	75.69	0.44	At most 4
	0.00	35.19	48.92	0.42	At most 5
	0.01	20.26	23.59	0.34	At most 6
	0.40	9.16	4.05	0.08	At most 7
	Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
	Prob	Critical Value	Trace	Eigenvalue	No. of CE(s)

	0.45	53.18	41.50	0.59	None
	0.39	47.07	36.81	0.55	At most 1
	0.28	40.95	33.14	0.51	At most 2
	0.27	34.80	27.60	0.45	At most 3
	0.08	28.58	26.76	0.44	At most 4
	0.01	22.29	25.33	0.42	At most 5
	0.01	15.89	19.54	0.34	At most 6
	0.40	9.16	4.05	0.08	At most 7
Agricultural Sector	Unrestricted Cointegration Rank Test (Trace)				
	Prob	Critical Value	Trace	Eigenvalue	No. of CE(s)
	0.00	169.59	219.83	0.60	None
	0.00	134.67	177.00	0.55	At most 1
	0.00	103.84	140.26	0.51	At most 2
	0.00	76.97	106.59	0.48	At most 3
	0.00	54.07	76.41	0.42	At most 4
	0.00	35.19	50.63	0.38	At most 5
	0.00	20.26	28.30	0.28	At most 6
	0.00	9.16	12.99	0.24	At most 7
	Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
	Prob	Critical Value	Trace	Eigenvalue	No. of CE(s)
	0.37	53.18	42.82	0.60	None
	0.40	47.07	36.74	0.55	At most 1
	0.26	40.95	33.67	0.51	At most 2
	0.16	34.80	30.18	0.48	At most 3
	0.10	28.58	25.77	0.42	At most 4
	0.04	22.58	22.33	0.38	At most 5
	0.06	15.89	15.31	0.28	At most 6
	0.00	9.16	12.99	0.24	At most 7
Service Sector	Unrestricted Cointegration Rank Test (Trace)				
	Prob	Critical Value	Trace	Eigenvalue	No. of CE(s)
	0.00	208.43	290.49	0.63	None
	0.00	169.59	244.42	0.60	At most 1
	0.00	134.67	202.14	0.56	At most 2
	0.00	103.84	163.91	0.54	At most 3
	0.00	76.97	127.88	0.48	At most 4
	0.00	54.07	97.54	0.47	At most 5
	0.00	35.19	68.30	0.44	At most 6
	0.00	20.26	41.10	0.41	At most 7
	0.00	9.16	16.42	0.30	At most 8
	Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
	Prob	Critical Value	Trace	Eigenvalue	No. of CE(s)
	0.51	59.24	49.07	0.63	None
	0.40	53.18	42.28	0.60	At most 1
	0.31	47.07	38.22	0.56	At most 2
	0.16	40.95	36.03	0.54	At most 3
	0.15	34.80	30.33	0.48	At most 4
	0.04	28.58	29.23	0.47	At most 5
	0.00	22.29	27.20	0.44	At most 6
	0.00	15.89	24.68	0.41	At most 7
	0.00	9.16	16.42	0.30	At most 8

According to the results presented in Table 7, it was found that in the agricultural sector model, the variables government expenditure growth (GE) and education expenditure relative to GDP (ED) exhibit strong correlation

(higher than 30%) with other variables. In the industrial sector model, the education expenditure variable (ED) shows a strong correlation (higher than 30%) with other variables. In the service sector model, the education expenditure variable (ED) also shows strong correlation (higher than 30%) with other variables. Therefore, to avoid spurious regression, this variable must be removed from the models.

Table 7. Correlation Coefficient Between Variables

Sector	Variable	AS	AT	LF	CP	INF	GE	ED	OP
Agricultural Sector	AS	1							
	AT	0.21	1						
	LF	0.20	0.22	1					
	CP	0.24	0.24	0.14	1				
	INF	0.10	0.20	-0.03	-0.08	1			
	GE	-0.05	-0.22	-0.44	-0.12	-0.23	1		
	ED	0.19	0.52	0.77	0.39	-0.08	-0.33	1	
	OP	0.14	0.24	0.21	-0.05	0.24	-0.60	0.40	1
Industrial Sector									
	IS	1							
	IT	0.22	1						
	LF	-0.07	0.12	1					
	CP	0.21	0.26	0.14	1				
	INF	0.24	0.23	-0.03	-0.08	1			
	GE	-0.03	-0.21	-0.24	-0.12	-0.23	1		
	ED	-0.11	0.61	0.77	0.39	-0.08	-0.33	1	
	OP	0.04	0.26	0.21	-0.05	0.24	-0.20	0.40	1
Service Sector									
	SS	1							
	ST	0.10	1						
	LF	0.20	0.20	1					
	CP	0.26	0.20	0.14	1				
	INF	0.21	0.24	-0.03	-0.08	1			
	GE	-0.02	-0.22	-0.24	-0.12	-0.23	1		
	ED	0.44	0.46	0.77	0.39	-0.08	-0.33	1	
	OP	0.08	0.26	0.21	-0.05	0.24	-0.20	0.40	1

After specifying the model and selecting the best estimation method, the estimation results are presented in Table 8.

Table 8. Estimation Output for the Agricultural Sector Model

Variable	Coefficient	t-Statistic	Prob
AS	3.95e-8	2.98	0.00
D(AT)	-6.15e-8	-0.95	0.34
D(LF)	1.81	3.06	0.00
CP	0.05	2.57	0.01
D(INF)	-0.04	-0.73	0.46
OP	-0.52	-2.62	0.00
C	25.63	2.83	0.00
AR(1)	1.68	17.05	0.00
AR(2)	-0.79	-8.33	0.00

Adjusted R-squared = 0.91, R-squared = 0.92, Prob(F) = 0.00, F-statistic = 53.07, Durbin-Watson = 2.03

As observed from the estimation output, the volume of Sukuk issued in the agricultural sector has a positive and significant relationship with the economic growth of this sector. However, the coefficient and intensity of the effect were estimated to be very small. Therefore, it can be claimed that Islamic financial instruments have not been effectively utilized for the growth and development of the agricultural sector. It was also found that the issuance of Islamic Treasury bonds did not contribute to the growth of the agricultural sector. In fact, the volume of issued bonds could not promote growth in this sector. Greater labor force participation and capital formation both had positive and significant relationships with agricultural sector growth, with labor participation having a direct effect with a coefficient of 1.81 and capital formation with a coefficient of 0.05. The inflation rate did not have a significant effect because inflation can both negatively (through increased costs of labor and land) and positively (through higher final product prices) influence growth. Thus, their combined effect during the studied period was not found to be significant. The degree of economic openness, meaning the ratio of imports and exports to GDP, had a negative and significant relationship with agricultural growth, indicating that the net result of trade flows was not favorable for the agricultural sector.

After specifying the model and selecting the best estimation method, the estimation results are presented in Table 9.

Table 9. Estimation Output for the Industrial Sector Model

Variable	Coefficient	t-Statistic	Prob
IS	0.32	5.34	0.00
D(IT)	1.89e-8	1.85	0.07
D(LF)	6.33	3.88	0.00
CP	0.32	9.29	0.00
D(INF)	-0.70	-4.50	0.00
GE	0.42	2.51	0.01
OP	0.16	1.21	0.23
C	-24.80	-3.55	0.00

Adjusted R-squared = 0.83, R-squared = 0.85, Prob(F) = 0.00, F-statistic = 33.60, Durbin-Watson = 2.63

As observed from the estimation output, the issuance of Islamic securities and the utilization of Islamic financial instruments, including both Sukuk and Islamic Treasury bonds, had a positive and significant relationship with the growth of the industrial sector. Specifically, the issuance of Sukuk had a greater impact with a coefficient of 32%. However, the effect of Islamic Treasury bonds was considerably smaller. The relationship between Sukuk issuance and industrial sector growth is accepted at a 99% confidence level, whereas the relationship between Treasury bond issuance and industrial growth is accepted at a 90% confidence level. Greater labor force participation and capital formation both had positive and significant relationships with industrial growth, with labor participation having a direct effect with a coefficient of 6.33 and capital formation with a coefficient of 0.32. Therefore, the role of human resources in the development of the industrial sector is greater than that of capital inputs. Inflation had a negative and significant relationship with industrial growth, where a 70% increase in the general price level had adverse effects on this sector. Government expenditure also had a positive and significant relationship with industrial sector growth, with a coefficient of 42%. The degree of economic openness had a positive and significant relationship with industrial sector growth, indicating that trade flows benefited the industrial sector.

After specifying the model and selecting the best estimation method, the estimation results are presented in Table 10.

Table 10. Estimation Output for the Service Sector Model

Variable	Coefficient	t-Statistic	Prob
SS	7.10e-9	2.34	0.02
D(ST)	5.32e-8	2.73	0.00
D(LF)	0.92	2.36	0.02
CP	0.08	8.05	0.00
D(INF)	-0.10	-1.99	0.05
GE	0.23	3.54	0.00
OP	0.02	0.72	0.47
C	-0.72	-0.47	0.64

Adjusted R-squared = 0.74, R-squared = 0.79, Prob(F) = 0.00, F-statistic = 17.98, Durbin-Watson = 2.49

As observed from the estimation output, the issuance of Islamic securities and the utilization of Islamic financial instruments, including both Sukuk and Islamic Treasury bonds, had a positive and significant relationship with the growth of the service sector. Although the effect was positive, it was relatively small in magnitude. Labor force participation and capital formation both had positive and significant relationships with service sector growth, with labor participation having a direct effect with a coefficient of 0.92 and capital formation with a coefficient of 0.08. Thus, the role of human resources in the development of the service sector is greater than that of capital inputs. Inflation had a negative and significant relationship with service sector growth, where a 10% increase in the general price level adversely affected this sector. Government expenditure also had a positive and significant relationship with the service sector's growth, with a coefficient of 23%. The degree of economic openness did not have a significant relationship with service sector growth. Since many service categories are neither easily exported nor imported, this result is logical and consistent with theoretical expectations.

In the present study, the Correlation LM test was used to examine the first assumption (autocorrelation). As is well known, if the estimated probability is less than 0.05, it indicates the presence of an autocorrelation problem. The test results are presented in Table 11. Based on the estimated probabilities being greater than 0.05, the assumption of no autocorrelation is confirmed for all three models.

Table 11. Correlation LM Test Output

Model	Correlation LM	Critical Value	Estimated Probability
Agricultural Sector	F-statistic	0.13	0.77
Agricultural Sector	Obs*R-squared	1.05	0.28
Industrial Sector	F-statistic	1.22	0.22
Industrial Sector	Obs*R-squared	2.95	0.18
Service Sector	F-statistic	2.33	0.19
Service Sector	Obs*R-squared	2.91	0.16

In this study, the White test was used to examine the homoscedasticity assumption. If the estimated probability is greater than 0.05, it implies that there is no heteroscedasticity problem. The results of this test for all three models are presented in Table 12, and it is observed that the estimated probabilities are greater than 0.05; thus, the models exhibit homoscedasticity.

Table 12. Heteroskedasticity Test Output

Model	Heteroskedasticity	Critical Value	Estimated Probability
Agricultural Sector	F-statistic	22.50	0.54
Agricultural Sector	Obs*R-squared	25.57	0.16
Agricultural Sector	Scaled explained SS	34.66	0.14
Industrial Sector	F-statistic	31.15	0.74
Industrial Sector	Obs*R-squared	26.96	0.88

Industrial Sector	Scaled explained SS	14.06	0.99
Service Sector	F-statistic	33.21	0.42
Service Sector	Obs*R-squared	47.00	0.27
Service Sector	Scaled explained SS	19.80	0.99

Agricultural Sector: Considering that the Jarque-Bera statistic is 2.10 and the computed probability value is greater than 0.05 (0.34), the null hypothesis of normality of the model residuals is accepted.

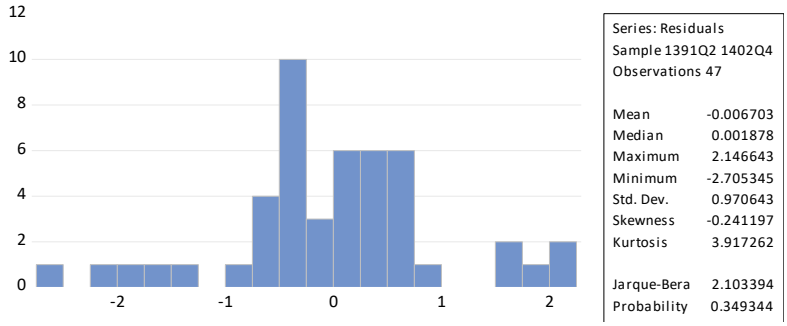

Figure 1. Normality Test of the Residuals for the Agricultural Sector Model

Industrial Sector: Considering that the Jarque-Bera statistic is 2.58 and the computed probability value is greater than 0.05 (0.27), the null hypothesis of normality of the model residuals is accepted.

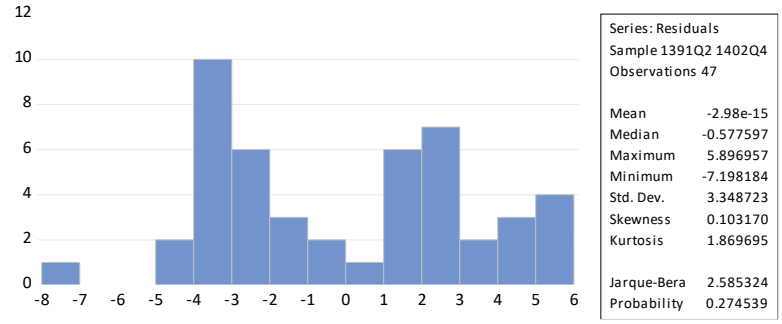

Figure 2. Normality Test of the Residuals for the Industrial Sector Model

Service Sector: Considering that the Jarque-Bera statistic is 1.02 and the computed probability value is greater than 0.05 (0.59), the null hypothesis of normality of the model residuals is accepted.

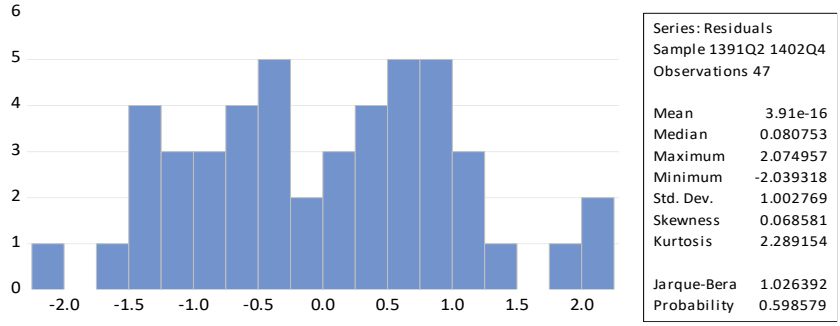

Figure 3. Normality Test of the Residuals for the Service Sector Model

Since misspecification error can pose a serious threat to the interpretation of results, the Ramsey RESET test was used to detect this issue. Based on the results presented in Table 13 and the estimated probability values, it can be concluded that there is no misspecification error in the studied models.

Table 13. Ramsey RESET Test Output

Model	Ramsey RESET	Critical Value	Estimated Probability
Agricultural Sector	F-statistic	0.10	0.90
Agricultural Sector	Log likelihood ratio	0.22	0.89
Industrial Sector	F-statistic	2.69	0.08
Industrial Sector	Log likelihood ratio	1.39	0.14
Service Sector	F-statistic	1.31	0.16
Service Sector	Log likelihood ratio	1.15	0.20

The purpose of this section is to estimate the model using panel data and to more clearly explain the effect of Islamic financing methods on the economic growth of various sectors. Based on the main objective of the study, the mathematical function is specified as follows:

$G\_it = f(S\_it, T\_it, LF\_it, CP\_it, INF\_it, GE\_it, ED\_it, OP\_it)$

The regression equation for the economic sectors is expressed as follows:

$G\_it = \beta\_0 + \beta\_1 S\_it + \beta\_2 T\_it + \beta\_3 LF\_it + \beta\_4 CP\_it + \beta\_5 INF\_it + \beta\_6 GE\_it + \beta\_7 ED\_it + \beta\_8 OP\_it + \varepsilon\_i$

To assess cross-sectional dependence, the Breusch-Pagan LM test and Pesaran tests were used. Based on the estimated probabilities, it was found that there is no time-series or cross-sectional dependence in the model. However, cross-sectional dependence in the panel data is confirmed.

Table 14. Cross-Sectional Dependence Test Results

Test	Statistic	Degrees of Freedom	Probability
Breusch-Pagan LM	5.16	3	0.16
Pesaran scaled LM	0.88	-	0.37
Pesaran CD	-1.19	-	0.23

The results of the Levin, Lin, and Chu test for the model variables are presented in Table 15. As observed, all variables are stationary, and only the variable for the volume of Islamic debt securities became stationary after first differencing.

Table 15. Unit Root Test Results (with Intercept and Trend)

Variable	Test Statistic	P-Value	Null Hypothesis	Test Result
G	-4.41	0.00	Non-stationarity	Stationary at level
S	-2.24	0.01	Non-stationarity	Stationary at level
T	-3.65	0.00	Non-stationarity	Stationary at first difference
LF	-2.10	0.00	Non-stationarity	Stationary at level
CP	-4.20	0.00	Non-stationarity	Stationary at level
INF	-2.93	0.04	Non-stationarity	Stationary at level
GE	-3.03	0.00	Non-stationarity	Stationary at level
ED	-2.00	0.02	Non-stationarity	Stationary at level
OP	-3.88	0.00	Non-stationarity	Stationary at level

Based on the results presented in Table 16, and according to both the Pedroni (PP) and Augmented Dickey-Fuller (ADF) methods, the null hypothesis of no cointegration among the model variables is rejected. These results indicate that the variables form a long-term equilibrium relationship in both tests.

Table 16. Cointegration Test Results

Test Method	Test Statistic (P-Value)	Null Hypothesis	Test Result
Group PP-Statistic	-5.70 (0.00)	No cointegration	Null hypothesis rejected
Group ADF-Statistic	-1.79 (0.03)	No cointegration	Null hypothesis rejected

Initially, to determine whether separate intercepts exist for each economic sector, as explained in Chapter 3, the Limer test must first be examined to choose between pooled data and panel data (fixed effects or random effects). In this test, the null hypothesis (H_0) states the equality of intercepts (pooled method) against the alternative hypothesis (H_1) that intercepts are unequal (panel method).

F_((n-1,nt-n-k)) = ((RSS_R - RSS_UR)/(n-1)) / (RSS_UR/(nt-n-k))

If the computed F statistic exceeds the critical F value with degrees of freedom (n-1) and (nt-n-k), the null hypothesis is rejected. Therefore, the constrained regression is invalid, and different intercepts must be considered in the estimation. In this study, the Likelihood Ratio test was employed to perform this analysis. In EViews software, after conducting the Redundant Fixed Effects-Likelihood Ratio test, if the output p-value is less than 0.05, the panel method is accepted at the 95% confidence level or higher. If greater than 0.05, the pooled method is accepted.

Table 17. LM Test Output

Effects Test	Statistic	d.f	Prob.
Cross-section F	3.43	2,23	0.04

As observed, the pooled method is not accepted. Therefore, differences in the intercepts of cross-sectional units exist. The next question is whether the intercept differences among the industrial, agricultural, and service sectors are fixed or random. To determine fixed or random effects, the Hausman test is typically used. However, since the number of cross-sections (i=3) is less than the number of parameters (β=7), the random effects test could not be performed. Consequently, the regression was estimated using the fixed effects method, and the estimation results are presented in the following table:

Table 18. Model Estimation Output

Variable	Coefficient	t-Statistic	Prob
C	28.76	1.34	0.19
S	4.32e-8	2.86	0.00
D(T)	1.46e-7	10.72	0.00
LF	-0.08	-0.15	0.87
CP	0.06	1.92	0.06
INF	0.16	4.87	0.00
GE	0.59	3.49	0.00
OP	0.57	3.73	0.00

R-squared = 0.69, Adjusted R-squared = 0.57, F-statistic = 5.83, Prob(F) = 0.00, Durbin-Watson = 1.83

As observed from the estimation output, the volume of Sukuk issued has a positive and significant effect on the growth of various economic sectors. Although this impact is small, it is statistically significant and positive. The volume of Islamic debt securities issued also has a positive and significant effect on the growth of various economic sectors. However, the effect of the bonds is not substantial enough to act as a major driver of economic growth in the three sectors. Among the control variables, the growth of capital formation, as one component of economic growth models, has a positive and significant effect. Thus, increasing investment can help boost the growth of key economic sectors in the country. In contrast, the labor force participation rate, as another component of the economic growth model, does not have a significant effect. This is because the labor force participation rate has not experienced substantial growth in recent years and has mostly fluctuated. Another control variable, the general

price level (inflation), positively affects economic growth: with rising general price levels, the nominal value of GDP increases, leading to economic growth. However, this type of growth across different sectors does not necessarily serve genuine economic development. It was also determined that the degree of economic openness and government education expenditures relative to GDP both have approximately equal and significant effects on the economic growth of the three sectors.

Considering the Breusch-Pagan statistic indicating the presence of heteroscedasticity among the variables, it violates classical assumptions. In fact, based on the F-statistic, the null hypothesis of homoscedasticity is rejected at the 5% significance level. Therefore, variances are not homogeneous, and parametric tests can be used to estimate the hypotheses.

Table 19. Homoscedasticity Test Output

Test	F-statistic	Prob
Breusch-Pagan	0.43	0.59

Regarding the statistical assumptions related to the model, the results of the Jarque-Bera test show that the residuals from the estimated model have a probability value greater than 0.05 (0.09), indicating that the residuals are normally distributed at the 95% confidence level.

4. Discussion and Conclusion

In the time series approach and the separate examination of each of the three sectors, it was found that the volume of Sukuk issued in the agricultural and service sectors had a small positive effect on their economic growth. In fact, during the period under review, this financial instrument did not significantly contribute to the growth of these sectors. However, the issuance of Sukuk in the industrial sector had a substantial impact and played an important role in the sector's growth. The issuance of Islamic Treasury bonds did not lead to growth in the agricultural sector. In fact, the volume of issued bonds was insufficient to stimulate growth in this sector. Although the issuance of Treasury bonds in the industrial and service sectors had a positive effect, this impact was very limited. Overall, it can be concluded that the effect of Sukuk on the country's economic growth was greater than that of Treasury bonds. In the panel data approach, it was found that although the volume of Sukuk and Islamic debt securities had a positive and significant impact on the economic growth of the three sectors, this effect was not substantial enough to act as a catalyst for economic growth in these sectors.

In conclusion, Islamic finance has not had a major effect on the economic growth of Iran's sectors. Numerous control variables have obscured the effectiveness of Islamic financing instruments. Therefore, it is expected that, with improvements in macroeconomic conditions, including increased capital formation, higher labor force participation, reduced inflation, and other macroeconomic variables, the impact of Islamic financial instruments will become stronger and more pronounced.

Ghanbarzadeh (2025) examined the role of Islamic finance in economic development and found positive effects on economic growth, poverty reduction, and increased investment. He acknowledged that Islamic finance, as a system aligned with Shariah principles, has played a significant role in the economic development of countries, particularly in Islamic communities [15]. The results of the present study, in terms of impact magnitude, are not consistent with Ghanbarzadeh's findings. Ebrahimi et al. (2024) demonstrated that Sukuk issuance had a positive and significant impact on provincial economic growth. Furthermore, investment, education, inflation, and trade openness showed positive and significant effects, whereas unemployment, economic inequality, and mortality rates

had negative and significant impacts on economic growth. Although the effect of Sukuk was positive in the present study, the magnitude was estimated to be small [16]. However, regarding control variables, the present study aligns with Ebrahimi et al.

Ghaed et al. (2024) argued that Islamic banking initially appears to promise higher economic growth than conventional banking and that an Islamic economic environment, which relies more on participatory and trade-based contracts rather than interest, could lead to greater development with fewer and shorter crises. In this regard, there is no contradiction with the present findings, since both financial instruments were positively evaluated.

The findings are also consistent with those of Amiri et al. (2021), who confirmed the positive impact of Islamic finance on economic growth [17]. The model estimates by Askarezadeh Dareh et al. (2021) showed that Sukuk had a positive and significant effect on Iran's economic growth during the study years [6]. Habibi and Omidi (2020) found a long-term relationship between the variables, with both short-term and long-term effects of the independent variables aligning with the real sector's performance [19].

In most studies, only the effects of Sukuk were examined, and its impact was evaluated as positive, whereas in the present study, the simultaneous impact of Islamic Treasury bonds was also assessed. Moreover, in previous studies, only aggregate national economic growth was considered, while in the current study, the effects of financial instruments were explained separately for three major economic sectors.

Chiad and Gherbi (2024) found that the positive relationship between Islamic banks and economic growth and financial stability is negatively influenced by inflation rates and levels of economic policy uncertainty, which is consistent with the present study, given that inflation was a significant control variable [7]. Ledhem and Mekidiche (2022) showed that Islamic finance has enhanced economic growth in Turkey, reflecting the success of the New Economic Program (2019–2021) aimed at boosting growth through the expanded role of Islamic finance in the banking sector and global markets [8].

Muhammad et al. (2020) found that Islamic finance increased economic growth and met specific needs of economic actors that conventional finance could not meet. They also used control variables such as government spending, investment, trade openness, and inflation [9], consistent with the present study.

Based on the results of the hypotheses tests indicating the effect of financial instruments on sectoral economic growth, the following recommendations are proposed:

- Implement operational measures to increase the awareness and specialized knowledge of financial managers across various economic sectors, including agriculture, industry, and services. For example, training courses should be organized for senior managers and financial managers of small and medium-sized enterprises (SMEs) to provide necessary information regarding Islamic financial instruments. Additionally, effective actions should be taken in cooperation with public organizations to support them. Public understanding of Islamic finance and its benefits should also be promoted through mass media, such as television and radio.
- Another recommendation to improve the effectiveness of Islamic financial instruments on economic growth and development is to ensure proper supervision over their implementation. Therefore, it is proposed that the Securities and Exchange Organization establish committees to monitor compliance with issued guidelines and take appropriate actions.
- Investors should be encouraged to use Islamic debt securities and Sukuk for project financing. Since Islamic finance requires investors to share in potential losses, it results in lower leverage and greater incentives for managing larger risks.

- Monetary and financial authorities should aim to align financial sector development with the economic growth of different sectors by harmonizing monetary and financial service policies with macroeconomic goals such as economic development, inflation control, and employment growth. Regulating financial markets, strengthening financial system resilience, and improving institutional quality in financial institutions would enhance efficiency and support the utilization of Islamic financial instruments for economic growth.
- It is recommended that Islamic law and economics scholars collaborate with policymakers to design and introduce Islamic securities tailored to the goals and preferences of investors and economic actors. The government can take a major step toward implementing the law on interest-free banking by preparing for the use of such financial instruments.
- Policymakers should replace conventional financial instruments with Sukuk and Islamic Treasury bonds, expanding their issuance and integration into the financial system.
- Authorities should adopt policies that direct financial resources toward the real sectors of the economy instead of circulating solely within financial markets, thereby preventing asset price collapses and financial crises. An Islamic economic environment that relies more on participatory and trade-based contracts than on interest-based transactions can lead to higher sustainable development, fewer crises, and greater resilience against global financial shocks.

Furthermore, if the activities of Islamic banks are based on trade contracts, the effects on discount rates, profit expectations, and commodity supply and demand will be more stable. Since these rates arise from real transactions, they will not destabilize the economy. Therefore, economic shocks will be less frequent and less intense. Additionally, since employers will bear less of the potential losses, their demand for investment will rise, leading to higher employment rates and faster progress toward full employment. As total employment and production increase, aggregate supply will rise, resulting in lower general price levels.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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