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Islamic Banking System and Economic Growth: Exploration of D-8 Countries

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Abstract
The aim of this investigation is to look at the effect of the Islamic banking system on the economic growth of D-8 countries as well as their relationship and the causality direction. Annual report time series data were used from 2010–2021. Islamic Banking Financing (IBF) was used as a representation of the Islamic banking sector, while Foreign Direct Investment (FDI), Gross Fixed Capital Formation (GFCF), Gross Domestic Product (GDP), and Trade were used to represent the economic sector. The econometric tools used are the panel unit root test, panel test of cointegration, and the causality test of Granger. The findings showed that, in the short and long run, Islamic banking and economic growth have a positive connection in D-8 countries. Moreover, there is bi-directional causality. That means, there is a two-way causality starting from the growth sector to Islamic banking and Islamic banking to economic growth. It is also discovered that, in the short run, investment (GFCF) and trade activities have an affirmative influence on the development of Islamic banking. Increasing investment formation will thus successfully subsidize the expansion of the Islamic banking segment of D-8 countries. However, the main policy implication is that governments of the D-8 countries can support economic growth by expanding the finance sector through additional liberalization measures. It is recommended to include another variable that is currently not used, such as the quality of the institutions, and moreover, to apply other statistical tools such as ARCH and GARCH to look at profound relationships.

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1. Introduction

Financial expansion is defined as an increase in the size of banks' and financial intermediaries' monetary facilities, as well as the volume of financial transactions on capital markets. Growth is defined as an increase in the goods and services in a given economy over time. The connection involving financial development and economic growth has been a hot topic of debate in the field of development economics. By shifting away from mobilizing savings, the financial sector plays an essential part in fostering growth. This will increase the quantity of investment while also boosting investment efficiency, resulting in higher economic production. As soon as the financial area progresses, further monetary assets can be placed to productive use, and corporal capital can be generated, all of which will help to boost the economic sector.

According to the previous research, there are three kinds of causal linkages concerning economic growth and the financial system. First, there is a supply-leading hypothesis. The establishment of financial institutions and instruments ahead of demand to drive growth is known as a supply-leading relationship (Patrick et al., 1996). This theory aims to improve capital allocation efficiency and create growth incentives inside the financial structure.

Secondly, demand following is known as the consequences of the real sector's expansion, which entails a constant expansion of markets and rising product differentiation, necessitating more effective risk diversification as well as improved transaction cost control (Hermes & Lensink, 1996). That implies that a rise in requests for financial facilities is correlated with development in real production. Thirdly, we have a bi-direction considered as a two-way direction.

Despite the fact that many researches have been conducted, there is no enough effort in the area of Islamic banking in general. The present exploration attempts to fill this vacuum by examining the impact of the Islamic banking system on growth of the economic sector in D-8 countries in the short and long term, and similarly, the connection between the two and the causality direction. We shall use related econometrics tools to accomplish this. The following is a breakdown of the paper's structure: The study's background and literature review will be presented in the second section. In section three, we will talk about the methods, and in section four, we will talk about the results and discussion. Section five will present the conclusion.

2. Literature Review

We will review the literature on the finance and economic growth nexus before delving into the relationship between Islamic banking and economic growth.

2.1. Finance and Growth

Since the pioneering work of Schumpeter (1934), who saw finance as an engine for economic expansion through its impact on creative initiatives, the link between financial expansion and economic growth has been intensively debated in the literature. The purpose of this research was to examine the characteristics of the relationship between financial expansion and economic growth. The finance-growth nexus is based on the idea that a more functional and deeper financial sector promotes economic growth. From a theoretical standpoint, financial institutions and markets make the savings-investment process more efficient. Financial intermediaries exist to mitigate the impact of financial frictions such as information asymmetry costs on the allocation of resources to successful investment opportunities. From Goldsmith (1969), the connection concerning financial expansion and economic growth activities is positive. That is to say, a strong financial scheme will help the economic sector flourish, foster economic growth and technical advancement. Financial development helps mobilize valuable savings and improve risk management by examining projects (King & Levin, 1993). According to Goldsmith (1969), financial progress and economic activity are favourably related. Efficient financial institutions can aid economic growth, but financial depressions can result in a decline in investment due to savings (Huang, 2010). Levine (2005) recently published a study in which he discovered a connection between financial market function and economic progression. Money flows from those who do not have access to profitable investment opportunities to those who do. Financial markets are important for the effective accumulation of funds (the use of wealth, whether financial or physical, to generate further capital), which helps to boost operational efficiency and productivity (Mishkin 2016). Claessens and Leaven (2005) explored the relationship between financial market competition and growth and discovered that stronger banking system competition leads to quicker economic growth. According to this concept, the rise of the banking industry benefits economic growth by increasing savings mobilization, improving resource allocation efficiency, and stimulating technical innovation. Financial development also promotes growth by lowering the impact of financial abrasions such as information and transaction costs on resource allocation to profitable investment opportunities.

However, numerous experts have discovered a negative association concerning financial expansion and growth in recent research. Their findings vary from different samples, regions, periods, and the development stages of the financial

system. Aderses and Tarp (2003) conducted an empirical investigation in which a small number of African and Latin American nations were chosen. He concluded that as the sample size is reduced, the positive relation concerning financial system and growth becomes negative. Gregorio and Guidotti (1992) found a significant negative impact of financial development on growth when the sample was limited to Latin American countries. Fernandez and Galetovic (1994) divided the same data as King and Levine (1993) into two sub-samples (OECD countries and other countries). They demonstrated that the relationship decreases and becomes inconsequential for OECD countries. Financial development had no effect on economic growth, according to Aghion et al.'s findings in 2004. Similarly, Bolbol et al. (2005) examined the situation in Egypt from 1974 to 2002. Their findings demonstrated that while the stock market index has a favourable impact on productivity, the development of banks has a negative impact. Favara's (2003) study found that while financial development appears to be positively related to growth in OLS estimations using cross-section data, this association vanishes when the control variables of financial development are considered using the legal origin as an instrument. Liquid liabilities and private sector credits were utilized as measures of financial progress. In a similar approach, Naceur and Ghazouani (2007) looked at 11 nations in the MENA region and discovered that bank development has a detrimental effect on the economic sector. Significantly, this negative link is caused by the financial sector's lack of expansion, which hinders economic growth.

To summarize, the weak financial systems in certain countries and the high amount of financial repression in others may explain the disparity. The perplexing results could potentially be attributable to the inadequacies of the financial development index, which focuses primarily on financial intermediation activities while ignoring other factors such as banking system financial innovations and financial intermediation efficiency. Some researchers explain this finding by proposing a non-linear link between money and growth that is dependent on the start of development.

Many studies have examined empirical and theoretical models to determine the link between finance and growth. Some of them have discovered a supply-side causation direction between the financial industry and economic growth. This viewpoint backs up the idea that the financial sector promoted economic growth by diverting capital away from low-growth industries and toward higher-growth new regions. As a result, an innovative instrument for the current growth sector is created. Fisman and Love (2003), for example, re-examined Rajan and Zingales' (1998) assumptions as well as the robustness of their findings in the

face of alternative theories and interpretations. The data support the hypothesis that financial development helps high-growth businesses. It also supports their contention that financial development's duty is to reallocate resources to enterprises with strong growth potential rather than those with "technological dependence" on external capital. Similar conclusions are reached by De Gregorio and Guidotti (1995), Caldero, and Liu (2002).

Some researchers showed that the causation that runs from economic growth to the finance sector is reversed. As the growth of the economic sector rises, so does the requirement for financial facilities, which boosts the financial business. Gurlew and Shaw in 1967, Goldsmith in 1969, Jung in 1986, and Masih (1986) supported this viewpoint. This causation follows a demand-driven path. According to the demand-following theory, the financial sector's growth is determined by demand from the real economy. Demand for additional financial products and services rises in tandem with the present economy, making the financial industry a more profitable and sustainable business.

Few scholars, however, have demonstrated a two-way directional causation concerning finance and growth. That is to say, both financial and economic development have an impact on each other. The financial sector promotes economic growth. Likewise, increased economic growth also tends to further develop the financial sector. Oledokun (1992), Luintel and Khan (1999), Blackburn and Harry (1998) all supported this viewpoint. Hassan et al. studied the impact of financial development on economic growth in certain countries in 2011. They discovered that there is no reciprocal causality between finance and growth in the poorest countries; however, in industrialized countries, the reciprocal causal link is observed. As a result, factors such as trade and government spending are crucial in explaining economic progress in emerging markets.

In the field of Islamic banking, there is insufficient research in this context. Some of the limited results derive from Abduh and Omar (2012), Furqani and Mulyany (2009), and Majid and Kassim (2010). However, their conclusions differ in terms of the direction of the causality. Majid and Kassim's (2010) findings support the supply-leading position.

On the other hand, according to Furqani and Mulyany (2009), the link concerning Islamic banking and growth follows the hypothesis of "demand-following," which indicates growth in the current economic sector encourages Islamic finance industries to change and progress. This link is bi-directional, according to Abduh and Omar (2012). it demonstrates that the financial system and growth are reciprocally causative, implying that causality runs in both directions, which is consistent with

the feedback hypothesis, that posits a reciprocal contributory link between the two sectors. As a result, government policies that encourage the development of Islamic finance are important for the economic growth of the country.

Likewise, Imam and Ibrahim (2016) examined the effect of Islamic finance on Nigeria's economy. As a proxy for Islamic finance, the funding credited to the private sector by Islamic banks was employed. Foreign direct investment and trade activities were applied as descriptive factors. The Gross Domestic Product (GDP) was still considered a factor in real economic growth. Their findings support the supply-leading concept, which states that a healthy banking sector promotes economic growth.

Noman Arshed (2016) conducted yet another study to examine the short- and long-term links between the advancement of sharia financial services and Pakistan's economic growth. The author used bound integration tests and error correction models in an autoregressive distributed lag segment to evaluate quarterly data from 2006 to 2013. According to the findings, there is a supply-side relationship between economic growth and Islamic banking in Pakistan. The Islamic banking business has a significant impact on economic growth, as can be observed from the conclusion.

Recently, Ledhem and Mekidiche (2021) studied the link concerning Islamic finance and growth in Turkey. Their conclusions showed that sharia finance is assisting Turkey's economic development. The study's biggest constraint was that Turkey has a dual banking system (conventional and Islamic), both of which could affect the country's real economy.

Related to the general country analysis, some researches were conducted to examine the effects of sharia banking development and growth. Tajgardoon and Behname (2013) looked into the short-run and long-run causality links concerning sharia finance and Asian economic growth. All Asian countries were represented in the data, which spans the years 1980 to 2009. The empirical outcome of the pairwise causality test demonstrated a bi-directional link concerning Islamic finance and the economic sector. Similarly, Zirek et al. (2016) investigated the influence of Islamic finance parameters on the economic sectors in fourteen OIC countries from 1999 to 2011. They looked into both short-term and long-term repercussions using the Panel VAR approach. Their findings show a favourable and substantial rapport concerning sharia financing and economic growth. Meanwhile, this relationship is strong when it comes to a variety of macroeconomic regulators such as government spending, capital stock, unemployment, and inflation. They also found that as the percentage of Islamic securities, assets, and loans in total finance tools rises, so does the economic sector.

Again, Jawad and Christian (2019) used annual data from 24 countries to analyse the traditional hypothesis of causality direction concerning Islamic banking development and growth during an 11-year period (2004–2014). Their findings suggested that the expansion of Islamic finance has an affirmative effect on the economic sector. It revealed a comprehensive study that discovered a long-term link concerning Islamic financial development and growth. Furthermore, the link appears to follow the supply-side model, implying that Islamic finance influences the growth of the economic sector, with no evidence of reverse causality.

Mifrahi and Tohirin (2020) have recently researched the effect of Islamic bank funding on the economic growth in QISMUT countries. The study examined annual panel data for each country from 2005 to 2015. According to their studies, findings revealed no indication of a direct impact of Islamic bank funding on economic growth. However, through investment and consumer spending, it may have a subsidiary effect on economic growth.

Finally, despite the diverse outcomes associated with the notions of supply leading or demand following, and the causation direction between Islamic finance and growth, the financial development strategy is a vital part of the overall development plan. Given the success of Islamic banks, which have grown at an annual pace of more than 11% over the past three decades, some major banking institutions have decided to join the rally by establishing their own Islamic branches, windows, or offices. Some economists believe that contemporary banking is better for financial development and growth than traditional banking. As a result, the development of Islamic banking is becoming increasingly involved in economic growth.

This research will be guided by two questions arising from these studies: Question 1: Does Islamic banking have such a considerable short-run and long-run impact on economic growth in D-8 countries? Question 2: what is the causality link between Islamic banking and economic growth in D-8 countries?

2.2. Islamic Banking in D-8 Countries

The Istanbul Declaration, which was adopted during the first D-8 Summit, established the Developing Eight on June 15, 1997, in Istanbul, Turkey. The D-8 Organization for Economic Cooperation is made up of Bangladesh, Egypt, Indonesia, Iran, Malaysia, Nigeria, Pakistan, and Turkey, and fosters better collaboration among its members. The D-8 Organization for Economic Cooperation's objectives

are to boost member states' global economic positions, diversify and establish new trade opportunities, increase participation in international decision making, and raise living standards. D-8's membership reflects the fact that it is a global organization rather than a regional one.

The eight countries' combined population is over one billion people, or roughly 13% of the world's population, and they cover 7.6 million square kilometres, or 5% of the world's land area. In 2006, the D-8 member states' trade was $35 billion, and by 2010, it had increased to almost $68 billion. The trade between the eight rising countries accounted for 3.3 percent of global trade in 2010.

Recently, a summit was held in Dhaka, Bangladesh on April 2021. The main declaration of the summit was to tap into the immense potential of the 'Blue Economy, which could further broaden and diversify the trade basket not only within the D-8, but, also internationally, thus fuelling economic growth and boosting prosperity across the Member States while safeguarding the ocean's health through sustainable development of its resources. Let us now look at the situation of Islamic finance inside these countries.

Since 1950, the Islamic financial industry has grown in a variety of Islamic countries. This industry has now spread to non-Islamic countries as well. The financial asset of Islamic finance peaked at USD 150 billion in the mid-1990s. Since then, the value has risen to USD 2.88 trillion in 2019 with projection of about USD 3.69 trillion in 2024. Banking accounted for 71.7 % of the total financial asset. Throughout the D-8 countries, there were workshops and seminars held to improve Islamic banking development.

In Kuala Lumpur, Malaysia, on October 28, 2010, the Developing Eight (D-8) held a meeting of the Working Group on the Development of the Islamic Financial Services Industry. The purpose of the gathering was to spark conversation about the importance of Islamic finance and the D-8 member countries' interlinkage policy. This meeting also served as a follow-up to the resolution reached at the D-8 Central Bank Governors'Meeting in July 2010.The Developing Eight (D-8) convened another conference of the Islamic Microfinance Workspace in Indonesia, in 2011. The workshop was arranged in anticipation of the tremendous growth of Islamic finance in recent centuries, as well as to further study and expand Islamic economic potential among the countries' members. The rapid expansion of Islamic finance has attracted the attention of worldwide economic organizations and countries all over the world in terms of elevating Islamic finance's place in the worldwide financial landscape.

3. Methodology

3.1. Data and Selected Variables

We used annual times series data from 2010-2021. The data are collected through the OIC Statistics Database (OIC Stat) and annual report of sharia banking of each country and the World Bank database. To achieve our goals, we used variables, which represent proxies of finance and growth.

For the Islamic financial development sector, we used total Islamic banking financing (IBF). It represents the amount of total sharia-compliant asset financed by the Islamic banks in a year. It is the entire assets of all financial and non-financial assets held by domestic and foreign banking and near-banking entities that provide Islamic financial services. Islamic banking financing, according to a previous study, had a positive impact on economic growth in Bangladesh (Grassa & Gazdar, 2014; Yusof & Bahlous, 2013), Indonesia (Abduh & Omar, 2012), Malaysia (Majid & Kassim, 2015), and the Southeast Asia (Lebdaoui & Wild, 2016)

Therefore, it is proven that increasing the total asset of Islamic banking sector will lead to economic growth in sector. Hence, for this reason we chose total asset of Islamic banking sector to analyse the real impact of Islamic banking system on the economic growth.

For economic growth proxy, we chose the following variables: Gross domestic product (GDP), Gross fixed capital formation (GFCF), Trade activities (Trade), and Foreign direct investment (FDI).

The gross domestic product (GDP) is a monetary indicator of the market value of all finished goods and services produced during a certain time. We used real GDP, which is incredibly important because it offers data on an economy's size and performance.

According to Anwar and Junaidi (2020), there is evidence that Islamic banking and GDP growth have a bidirectional relationship, so it appears to be important to use GDP growth as a proxy for growth in order to study the influence of Islamic banking development on economic growth.

The second variable was gross fixed capital formation (GFCF), also known as investment. GFCF refers to the purchase of created assets (including used assets) as well as the generation of such assets by producers for their own use. Meanwhile, GFCF is a component of gross domestic product (GDP) expenditure that transfers resources to the financial sectors and demonstrates how much new value created in the economy is invested rather than consumed. Furqani and Mulyany (2008) employed Gross fixed capital formation (GFCF) to represent the economic sector and discovered that GFCF Granger causes the development of Islamic banks.

Once more, we utilized Trade activities (Trade) to represent the sum of a country's imports and exports during a given period. It depicts international trade in commodities and services. Customers and nations benefit from global trade because they can get goods and services that are not available or are more expensive in their own countries. This variable was used to evaluate the contribution of Islamic banking to international trade in the form of goods and services imported and exported (Mulyany, 2009).

Finally, we made use of Foreign Direct Investment (FDI). It is defined as when an investor holds a cross-border investment in which a long-term stake in and significant influence over a company from another country from one country exists. Many emerging economies have shown that attracting foreign direct investment increases economic growth by exposing them to new markets. Fazaalloh (2015) analysed the relationship between foreign direct investment (FDI) and Indonesian economic growth, concluding that FDI inflows are driven by economic growth and that this relationship is unidirectional in terms of both short- and long-run FDI inflow levels. This variable was included to examine the ability of Islamic banks in these developing countries to attract foreign direct investment (FDI).

3.2. Method of Estimation

We proceed with the econometric analysis of this research in three steps:

First, we used pooled ordinary least square for panel data to examine the short-term link between Islamic banking and economic growth in D-8 countries. One type of model with constant coefficients, Including intercept and slopes, is the pooled regression model. Researchers can pool all of the data and run an ordinary least squares regression model on it using this method. Pooled regression has more variables, more data, and is more efficient. Indeed, it can assist in determining the short-term impact of Islamic banking on economic growth.

Second, we used the panel unit root test to demonstrate that the time series was stationary. The Augmented Dickey Fulley (1981) and Phillips Perron (1988) tests were employed to arrive at this conclusion. They are common statistical test used to determine whether a time series is stationary or not. It is one of the most extensively used statistical tests for determining if a series is stationary. The ADF and PP tests will be used to examine the series' stationarity for further investigation.

Thirdly, for the dynamic relationship between Islamic financial development and economic growth in the long run, we used the panel co-integration test (Pedroni test).

The panel co-integration test looks at the long-term connection between Islamic banking and economic growth. It is used to determine whether two or more time series are related throughout time. After British economists Paul Newbold and Clive Granger published their fictional regression notion in 1987, Nobel laureates Robert Engle and Clive Granger proposed Co-integration tests. Co-integration tests also discover circumstances in which two or more non-stationary time series are integrated in such a way that they do not drift from equilibrium over time. The tests are designed to see how sensitive two variables are to a certain average price over a set period. The Engle-Granger (1987) cointegration test is one of the most prominent in use. The residuals of a hypothetical regression with variables are examined in this test. If the variables are co-integrated, residuals should be I (0). The residuals will be I if the variables are not co-integrated. Pedroni (1999, 2004) and Kao (2005) extended the Engle-Granger paradigm to panel data testing (1999).

Pedroni (1999, 2004) proposed several co-integration tests that account for varied intercepts and trend coefficients across cross-sections. He constructed seven non-stationary panel test statistics to investigate the null hypothesis of no co-integration. Short-run dynamics as well as long-run slope and intercept coefficients might be heterogeneous appreciations to the panel's seven test statistics.

Finally, we use the panel causality test_the Granger causality with Dumitrescu-Hurlin tests- to examine the direction of causality association between Islamic finance development and economic growth. It considers the cross-sectional interdependence of the countries in the sample. It has the ability to anticipate the causation of two variables. As a result, this test will assist in determining the causation between the development of Islamic banking and economic growth. Furthermore, all of these estimating methods and tests will be performed using eViews.

4. Results and Discussion

4.1. Descriptive Statistics

We start our analysis with the descriptive statistics. In the Table 1 below, we summarise the descriptive statistics parameters. We have mean, median, maximum, minimum and standard deviation. These results show that the variable of Islamic banking financing (IBF) has a maximum value 985200.0, and minimum value 202.3. These values also show that Islamic banking started at 202.3 have

reached higher growth recently. It means that the Islamic financial sector recorded a potential growth inside these countries; this might be due to the strong politics of cooperation applied by the country members in order to promote development of Islamic banking throughout these countries. Therefore, this growth implies huge percentage shares of Islamic banking sector. Similarly, GDP depicts a substantial growth. Starting at 92.6, it has reached higher in recent years, almost about 1.12E+12. Moreover, these results also show that the median of these variables is less than the mean. Therefore, it indicates a positive skewness among all the variables.

Table1: Descriptive statistics

	IBF	GDP	FDI	GFCF	TRADE
Mean	131584.4	2.98E+11	7002.111	1.25E+11	2.14E+18
Median	37777.61	2.52E+11	4677.780	8.20E+10	1.31E+18
Maximum	985200.0	1.12E+12	23883.25	3.62E+11	5.03E+18
Minimum	202.3000	972.6000	-483.0000	2.48E+10	8.18E+16
Std. Dev.	190204.4	3.27E+11	5985.624	9.77E+10	1.61E+18
Skewness	1.955865	1.020689	1.053798	0.904312	0.506438
Kurtosis	6.875194	2.987920	3.110164	2.414263	1.631417

4.2. Pooled Ordinary Least Square Panel Data

Table 2: Panel 1 results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	3.64E-07	6.74E-08	5.395350	0.0000
FDI	-13.30983	4.511807	-2.950000	0.0040
GFCF	-5.92E-07	3.06E-07	-1.933454	0.0563
TRADE	2.73E-14	1.53E-14	1.780591	0.0783
C	132364.5	29865.71	4.431991	

Table 3: Panel 2 results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.27E+11	3.89E+10	5.844564	0.0000
IBF	535272.4	168781.5	3.171392	0.0020

Tables 2 and 3 above present the result of panel ordinary least square. Regression of IBF trough economic sector variables (table 2) and regression of GDP trough Islamic banking sector (IBF) are performed to look at the short run link concerning Islamic banking's development and growth. These results show

positive link concerning Islamic baking and growth. In (Table 2) GDP is statistically significant prob value (0.0000) less than 0.05 at 5% level, and positively affects the Islamic banking sector. Meanwhile increasing 1% in economic sector led to an increase in the Islamic banking sector. Again, GFCF and trade are also significant at 1%. Therefore, it implies that trade activities and the fixed investment both impact Islamic banking development. Likewise, for the second regression (Table 3), Islamic banking financing (IBF) is statistically significant and positively affects the economic growth (GDP). Therefore, based on this result, there is positive evidence of a short-run link concerning Islamic banking and growth. Many scholars such as Levine (2005), Claessens and Leaven (2005), Imam and Ibrahim (2016), Celebi and Hassan (2016) have found comparable result. These findings support the idea that a well-functioning financial sector encourages economic growth. As a result, the banking sector in D-8 countries appears to be well developed. On the contrary, a negative link concerning financial system and growth was found by Aderses and Tarp (2003), Aghion et al. (2004), Bolbol et al. (2005), Naceur and Ghazouani (2007). When we look at theirs research deeply we find that the financial system was not yet fully developed in these countries. Hence, the non-development of a financial system harms a country's economic growth. Moreover, there may be some important variables that were not considered into their analysis, such as the quality of the institutions through the financial system.

Other analyses should be undertaken to determine the dynamic relationship in the long run. In the following section, we conduct the unit root test, co-integration test, and Granger causality test for this purpose.

4.3. Unit Root Test: The ADF Test and PP Test

Table 3 above shows the result of the two tests performed on the variables. The null hypothesis is: H0: there is a unit root (series are non-stationary). If the prob value is less than 0.05 at a 5% significance level, we reject this hypothesis; hence the series is stationary.

At level almost all the five variables are non-stationary in the ADF test (prob values are higher than 0.05), but stationary in the PP test (prob values are less than 0.05). To make these series stationary, we use the differentiation method (1st difference and 2nd difference).

For IBF, GDP, GFCF, FDI and TRADE the p values are respectively, 0.0000, 0.0072, 0.0005 0.0000 and 0.0002. These values are individually less than 0.05 in the ADF test so we reject the null hypothesis and we conclude that these variables are

stationary. Similarly, for the PP test the p values, for each variable are less than the 5% significance level. Globally we conclude that these series are all stationaries. As a result, the co-integration test can be used to investigate the relationship between Islamic banking and economic growth.

Table 3: The ADF test and PP test

Variables	ADF			Philip-perron(PP)		
	Level	1st differ.	2nd differ.	Level	1st differ.	2nd differ.
IBF	0,9995	0.0398	0.0000	1,0000	0.0026	0.0000
GDP	0,6575	0.0524	0.0072	0,6780	0.0067	0.0000
GFCF	0.3032	0.0307	0.0005	0.5916	0.0045	0.0000
FDI	0.3091	0.0031	0.0000	0.3662	0.0000	0.0000
TRADE	0.0931	0.0070	0.0002	0.0000	0.0000	0.0000

probability values, 5% significance level

4.4. Co-Integration Test (Pedroni Test).

Table 4: Result of Pedroni Test

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	5.058523	0.0000	3.055031	0.0011
Panel rho-Statistic	-0.022493	0.4910	2.172735	0.9851
Panel PP-Statistic	-12.59089	0.0000	-4.644556	0.0000
Panel ADF-Statistic	-12.57191	0.0000	-3.917777	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	3.174762	0.9993
Group PP-Statistic	-6.007808	0.0000
Group ADF-Statistic	-4.274668	

Table 4 lists the test type and null hypothesis, as well as exogenous variables and additional test parameters. The null hypothesis is rejected or accepted based on a comparison of the p-values of the data.

At a rate of 5%, eight of the eleven statistics reject the null hypothesis of no co integration, because these statistics have a probability value less than 0.05. As a result, we can conclude that the variables are co-integrated. This means that there is evidence of a long-term link between Islamic banking and economic growth in the D-8 countries.

Globally, for the co-integration test from the two tables, we conclude that there are co-integrating relationships between the variables. It indicates that in the long run there is evidence of a relationship between Islamic banking and economic growth.

Many authors, including Andersen and Tarp (2003), Aghion and Howitt (2004), Abduh and Omar (2012), Furqani and Mulyany (2009), Lawal and Imam (2016), and Arshed (2016), discovered similar results. Therefore, all of these studies came to the same conclusion: there is a link between Islamic banking finance and economic growth.

The causality direction of the relationship varies according to whether it is supply leading, demand following, or bidirectional. In the following section, we shall use pairwise Granger causality tests to discuss causation.

4.5. Pairwise Causality Tests

Table 5: Pairwise causality tests

Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause IBF	56	3.97804	0.0045
IBF does not Granger Cause GDP		2.87386	0.0246
FDI does not Granger Cause IBF	56	0.22264	0.9509
IBF does not Granger Cause FDI		0.11514	0.9884
GFCF does not Granger Cause IBF	56	1.77803	0.1367
IBF does not Granger Cause GFCF		1.63098	0.1713
TRADE does not Granger Cause IBF	56	0.68768	0.6353
IBF does not Granger Cause TRADE		0.31185	0.9033
FDI does not Granger Cause GDP	56	1.45539	0.2233
GDP does not Granger Cause FDI		0.72387	0.6091
GFCF does not Granger Cause GDP	56	0.48344	0.7867
GDP does not Granger Cause GFCF		0.85759	0.5169
TRADE does not Granger Cause GDP	56	0.14919	0.9793
GDP does not Granger Cause TRADE		1.20320	0.3231
GFCF does not Granger Cause FDI	56	0.79602	0.5583
FDI does not Granger Cause GFCF		0.74334	0.5952
TRADE does not Granger Cause FDI	56	0.88045	0.5020
FDI does not Granger Cause TRADE		2.27967	0.0625
TRADE does not Granger Cause GFCF	56	0.31353	0.9023
GFCF does not Granger Cause TRADE		6.95634	

Since the co-integration test demonstrated a long-term association between Islamic banking development and economic growth in D-8 nations, it appears necessary to investigate the nature of the causal relationship between Islamic banking development and economic growth.

Pairwise Granger causality tests are used to determine this causality. The results of this test are shown in Table 5. The null hypothesis H0 is that x1 does not cause x2. If the prob value is less than 0.05, we reject the null hypothesis at the 10% level. The bi-direction causality relationship between Islamic banking and economic growth may be seen in this table. Because the prob value (0.0045) for GDP to IBF is less than 0.05 at the 5% significance level, this suggests there is a two-way direction from economic growth (GDP) to Islamic banking and Islamic banking to economic growth.

Furthermore, the p value (0.0246) for IBF to GDP is less than 0.05 at the 5% significance level. As a result, it can be stated that the expansion of the OIC D-8's economic sector (GDP growth) will lead to the development of the Islamic banking sector, which will increase the economic growth of these nations. Bi-directional is the term for this type of causality. It means that Islamic finance development and economic progress are mutually reinforcing. Economic growth is aided by the Islamic finance system. It acts as financial intermediaries in the economy. That is to say, the Islamic financial system promotes growth by allocating resources overtime and spaces, reducing risk and increasing investor return. Islamic banks help investors to invest in partnership businesses, which can increase their profitability. As a result, the Islamic Financial System is crucial for the effective resource allocation (income, either monetary or real, that is utilized to produce further capital), which boosts overall productivity and efficiency. Once again, the Islamic banking system promotes economic growth by redirecting capital away from low-growth industries into higher-growth new fields. As a result, an innovative instrument for the current growth sector is created.

Increased economic growth, on the other hand, tends to propel the financial sector forward. As the economy grows, so does the need for financial services, which propels the financial industry forward. It appears because of the real estate sector's growth. This implies that markets are always expanding and product differentiation is increasing, necessitating more effective risk diversifications and improved transaction cost control. Abduh and Omar (2012), Tajgardoon and Behname (2013) and Zirek et al. (2016), Sabiu and Abduh (2020) found a similar result.

However, this result differs from the result of Furqani and Mulyany (2009) Majid and Kassim (2010), Mifrahi and Tohirin (2020). For their findings, the causality direction between Islamic banking and economic growth is only a one-way direction, either from Islamic banking to economic growth known as the supply-leading hypothesis (Majid & Kassim, 2010) or from economic growth to

Islamic banking which is considered as "demand-following," hypothesis (Furqani & Mulyany, 2009). This contradiction could be explained by the fact that they used specific country such as Malaysia or Indonesia and the period of study might be quite small compared to our analysis in which we also included the recent pandemic crisis (2010-2021).

Finally, according to Arestis and Demetriades (1997), Demetriades, and Law (2006), different causal links may reflect disparities in the quality of finance, which is dictated by the quality of institutions; for example, monetary control and the rule of law. As a result, the premise that "more finance equals more growth" has become a reality. It has minimal application in terms of financial system corruption or political involvement. Credit could be used for inefficient or even wasteful procedures. In fact, the alternative is better governance and higher growth. This means that, when the financial system is founded on sound ideas, people are more accepting of it. Market forces drive financial development, but so does the framework of institutions. Government and private rights institutions, on the other hand, are essential in funding contracts.

5. Conclusion

The short and long relation between the Islamic banking system and economic growth in the D-8 countries were investigated in this article. For the series' stationarity, we used econometric tests such as the unit root test. For the short-run impact, a pooled panel data analysis was employed, as well as a panel co-integration test for the long-run association between Islamic banking and economic growth in D-8 countries. The Granger causality test was also performed to determine the direction of causality between the variables. We discovered that Islamic banking and economic growth had a beneficial association. The causality in D-8 countries was shown to be bi-directional in both the short and long run. It means that Islamic finance development and economic progress are mutually reinforcing. The Islamic financial system aids economic progress. It acts as financial intermediary in the economy. On the other hand, increased economic growth tends to move the Islamic banking sector ahead. The need for financial services grows in tandem with the economy, propelling the financial industry forward. It was also revealed that, in the near term, investment GFCF and trade operations had a beneficial impact on the development of Islamic banking. Increasing capital formation will thus aid the growth of the Islamic banking sector in the D-8 countries.

It was also found that foreign direct investment (FDI) and trade activities (Trade) have causal relations with the Islamic financial sector only in short run. It suggests that, in the long run, Islamic banks do not have the capacity to attract foreign direct investment (FDI) in D-8 countries. And that enhancing the potential growth level will lead to the development of the Islamic banking sector. Following on, the development of this sector will increase the economic growth of D-8 countries. For the upgrade of the Islamic banking sector, the government should increase cooperation in trade activities to facilitate the circulation of goods and services. For the time being, the main policy implication is that governments in the D-8 countries can support economic growth by expanding the finance sector through additional liberalization measures. Furthermore, this paper suggests that improving Islamic banking system can foster the D-8 countries' economy, welfare, and enhance poverty alleviation in the long run.

One of the limitations of this research is that we only focused on panel analysis. It might also be possible to omit using the variable, given the quality of the institutions inside the countries. A second limitation is that the period of observations was quite limited. Consequently, it is suggested to include a large number of countries to look at the vibrant link between Islamic banking and the economy in a general way and include a wide range of variables that are not currently used, such as the quality of the institutions. It is also proposed to use other statistical tools such as ARCH and GARCH to look deeply into relationships.

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