

Islamic Finance, Financial Deepening and Economic Growth: Evidence from Twelve OIC Member Countries

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ABSTRACT

This study aims to examine the impact of Islamic finance and financial deepening on the economic growth in twelve OIC (Organization of Islamic Cooperation) member countries. Shariah-compliant financing of the Islamic banks is used as an indicator of growth in Islamic finance, whereas the total assets of Islamic banks are used as representative of financial deepening. The impacts of these indicators are examined within the framework of neoclassical production function. The unavailability of data on Shariah-Compliant financing and assets of the Islamic banks constrained us to choose a sample size spanning from 2012-2019. The Hausman test preferred to use the random-effects estimator. To confirm the empirical estimates of random-effects, we also employed the Robust Least Squares and panel DOLS (dynamic ordinary least square) estimators. The empirical findings revealed that growth in Islamic finance and financial deepening are essential for stimulating the economic growth in these countries. These findings suggest that the management authorities of these countries need not to consider the Islamic banking industry as a niche market disconnected from the mainstream policy; rather, they should treat it as an integral part of the financial system and should emphasize on its growth and development.

ملخص

تهدف هذه الدراسة إلى استكشاف تأثير التمويل الإسلامي والتعميق المالي على النمو الاقتصادي في اثني عشر دولة عضو في منظمة التعاون الإسلامي. ويتم استخدام التمويل المتوافق مع الشريعة الإسلامية للبنوك الإسلامية كمؤشر على النمو في التمويل الإسلامي، في حين يتم استخدام إجمالي

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أصول البنوك الإسلامية كمؤشر للتعميق المالي. ويتم فحص تأثيرات هذه المؤشرات في إطار وظيفة الإنتاج الكلاسيكية الجديدة. وقد أجبرنا عدم توفر البيانات حول التمويل المتوافق مع الشريعة الإسلامية وأصول البنوك الإسلامية على اختيار حجم عينة تمتد من 2012-2019. وفضل اختبار هاوسمان استخدام مقدر التأثيرات العشوائية. ولتأكيد التقديرات التجريبية للتأثيرات العشوائية، استخدمنا أيضاً مقدري المربعات الصغرى للانحدار القوي والمربعات الصغرى الديناميكية (DOLS). وكشفت النتائج التجريبية أن النمو في التمويل الإسلامي والتعميق المالي ضروريان لتحفيز النمو الاقتصادي في هذه البلدان. كما تشير هذه النتائج إلى أن السلطات الإدارية في هذه البلدان لا تحتاج إلى اعتبار الصناعة المصرفية الإسلامية سوقاً متخصصة منفصلة عن السياسة السائدة؛ بدلاً من ذلك، يجب أن يتعاملوا معها كجزء لا يتجزأ من النظام المالي ويجب أن يركزوا على نموها وتطويرها.

ABSTRAITE

This study aims to examine the impact of Islamic finance and financial deepening on the economic growth in twelve OIC (Organization of Islamic Cooperation) member countries. Shariah-compliant financing of the Islamic banks is used as an indicator of growth in Islamic finance, whereas the total assets of Islamic banks are used as representative of financial deepening. The impacts of these indicators are examined within the framework of neoclassical production function. The unavailability of data on Shariah-Compliant financing and assets of the Islamic banks constrained us to choose a sample size spanning from 2012-2019. The Hausman test preferred to use the random-effects estimator. To confirm the empirical estimates of random-effects, we also employed the Robust Least Squares and panel DOLS (dynamic ordinary least square) estimators. The empirical findings revealed that growth in Islamic finance and financial deepening are essential for stimulating the economic growth in these countries. These findings suggest that the management authorities of these countries need not to consider the Islamic banking industry as a niche market disconnected from the mainstream policy; rather, they should treat it as an integral part of the financial system and should emphasize on its growth and development.

Key Words: Islamic finance; Economic growth; Panel data; OIC member countries

JEL Classification: F3; O4; C2

1. Introduction

Islam is a religion which covers each aspect of human life, including spiritual, moral, ethical, political, social, and economical aspects. Similarly, Islam has its own code of conduct for operating the financial matters of human life. Islamic finance is an emerging source of finance, ethical finance or an aspect of Islamic moral economy – in addressing major socio-economic challenges as well as a source of funding to combat the issue of poverty and economic inequality (statistical yearbook on OIC member countries, 2019). Keeping in view the significance of banking sector in the prevailing financial system, researchers are persistently advising the management of Islamic banking sector to channelize the modes of Islamic finance for accelerating the growth process of their economies (Hassan, Sanchez, & Hussain, 2010; Jafarli, 2017; Kamalu & Ibrahim, 2021). It is also worth mentioning that the persistent growth rate and stability of Islamic financial sector, during the global economic crises of 2008, have attracted the attention of policy makers and financial experts worldwide (Tabash & Dhankar, 2014). Consistency of the banking environment with the Islamic Jurisprudence was the main factor behind their insulation from these crises (Imam & Kpodar, 2015). In this regard, the governing bodies of the conventional banking system were also advised to properly implement the Islamic finance system in order to restore the confidence of their clients who were affected by the global crises of 2008 (Totaro, 2009). Majority of the scholars believe that Islamic banking industry has established itself as a promising alternative to the prevailing banking system. It is believed that within the next decade, the Islamic banking industry will cover more than half savings of the Islamic countries (Hossein, 2012).

The foundation of Islamic banking is laid upon the notions of asset-based activities and risk-sharing transactions. Rahman (1999), Anwar (2001) and Yousof et al. (2009) investigated the tools of Islamic finance and stressed on the use of Mudarabah-Institution for combating the problem of unemployment and inflation. They were of the view that Mudarabah-financing is an asset-based and risk-sharing financial instrument that can help in creating the employment opportunities by investing the proceeds in various forms of SMEs. Such types of financing will not only contribute towards increasing the aggregate demand but will also raise the living standard of the citizenry. Statistics on the OIC member countries reveal that the employment ratio of Islamic banks in selected OIC member

countries has increased by about 320% between 2013 and 2019. The Islamic economic system also offers a variety of instruments (monetary and fiscal) that are used for distribution of wealth, increase in demand, and expansion of businesses (Ben Ammar, 2022). In an Islamic financial system, money creation is backed by productive investment, that's why the resulting change can be seen with "zero change" in inflation (Shahbaz, 2012). Annas et al. (2017) found that the financial performance of the Islamic banking industry is contributing a significant role in accelerating the economic growth in the OIC countries.

Islamic banks, together with other Shariah-Compliant financial institutions, have become more popular in the last decade. Based on the data of twelve OIC member countries, the share of Islamic banking sector is growing day by day while gaining universal acceptance in every financial system across the world. The annual statistics of the Islamic banking and finance (issued by IFSB PSIFIs Database¹) demonstrate that total assets of the Islamic banks in the OIC member countries (excluding Islamic banking windows) have grown by nearly 200% between 2013 and 2019. The two international financial organizations, the IMF and the World Bank, believe that the assets of the Islamic banking sector are expected to cross the \$4 trillion mark in 2020 (Boukhatem & Moussa, 2018). The statistics of 2019 demonstrate that assets of the Islamic banks, during the period of 2012-2019, were in billions of US dollars: Bangladesh (\$37.423), Brunei (\$7.982), Indonesia (\$35.145), Jordan (\$14.833), Iran (\$573.012), Kuwait (\$109.794), Malaysia (\$194.328), Pakistan (\$20.069), Saudi Arabia (\$425.005), Sudan (\$39.542), Turkey (\$41.563), and UAE (\$164.062). Similarly, major contribution in Shariah-Compliant financing came from Iran, contributing 34.46% of total Shariah-Compliant financing, Saudi Arabia 25.55 %, Malaysia 11.68 %, UAE 9.86 %, and Kuwait 6.60 %. Table 1 highlights the industry progress of the Islamic banks, whereas Figure 1 and Figure 2 demonstrate a brief summary of the whole discussion in terms of assets and financing of the Islamic banking industry and GDP of the selected OIC member countries.

¹ https://www.ifsb.org/psifi_03.php

Table 1: Industry Progress of the Islamic Banks (2012-2019)

Description	2012	2013	2014	2015	2016	2017	2018	2019
Total Assets *	938	1097.8	1212.4	1270.6	1379.3	1509.5	1594.1	1662.8
Total Shariah-Compliant Financing *	546	703.7	797.7	840.9	920.3	994.4	1054.5	1119.9
Islamic banking branches (number)	24,021	25,216	28,569	29,666	29,512	29,318	29,569	30,554
Conventional banks branches with Islamic banking windows (number) **	3,542	3,636	3,828	4,057	4,268	4,532	4,865	4,838
Employees working in Islamic banks (number)	3,14,521	3,47,344	3,69,717	3,89,140	3,82,508	3,84,102	3,87,795	3,90,072
Employees working in Islamic banking windows (number) ***	1,28,530	1,30,812	1,25,410	1,21,044	1,21,138	1,22,244	1,22,462	1,22,843

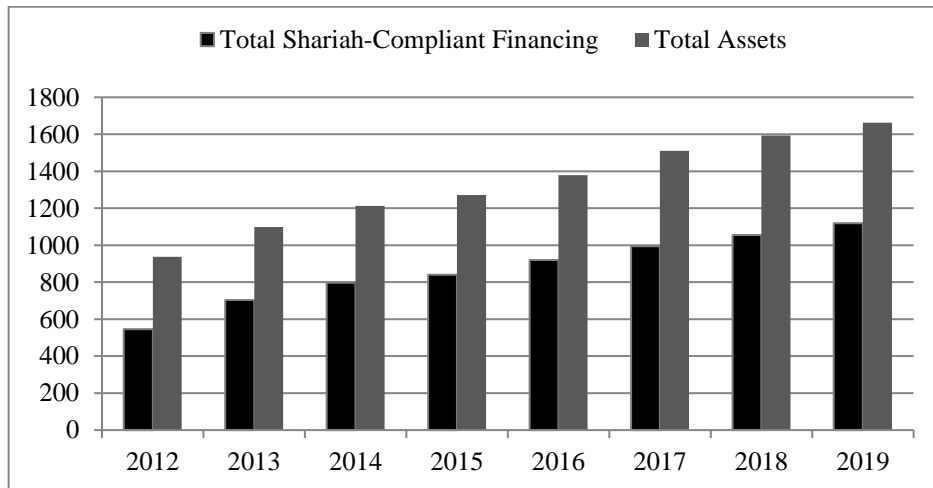
* Data is in billions US dollar

** Data was available only for six OIC member countries including Bangladesh, Indonesia, Kuwait, Malaysia, Pakistan and Saudi Arabia.

*** Data was available only for four OIC member countries including Bangladesh, Indonesia, Malaysia and Pakistan.

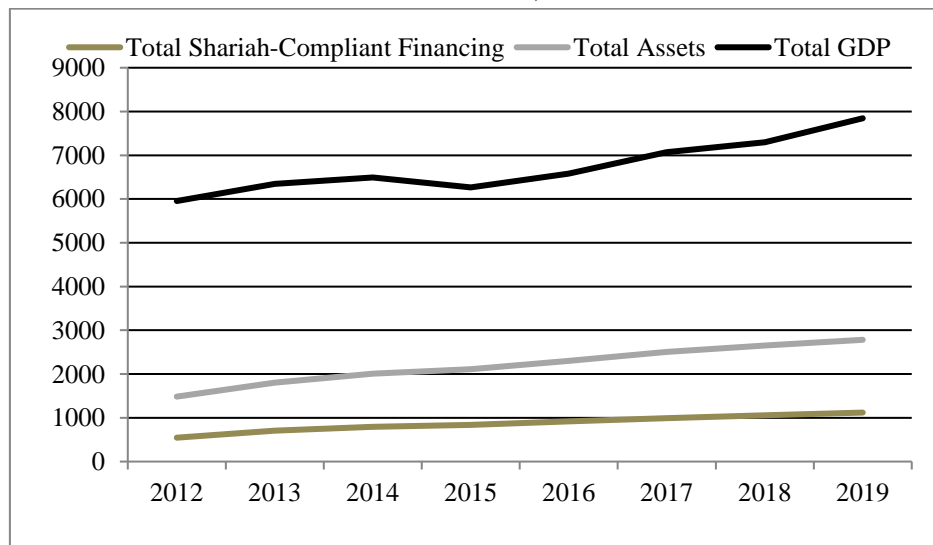
Data Source: Islamic Financial Information Service database, (2020)

Figure 1: Total Shariah-Compliant Financing & Total Assets of the Islamic Banking Industry in the Selected OIC Member Countries (Billions USD, 2012-2019)



Data Source: Islamic Financial Information Service database, (2020)

Figure 2: Total Shariah-Compliant Financing of the IBI, Total Assets of the IBI, and Total GDP of the Selected OIC Member Countries (Billions USD, 2012-2019)



Sources: Islamic Financial Information Service database (2020), World Development Indicators, (2020)

Since all OIC member countries are from developing economies, that's why growth in each sector of the economy is contributing significantly to economic growth. Empirical studies investigating the correlation between growth and Islamic financial sector are many, but specific studies on this topic, especially in OIC countries, are few. To the best of our knowledge, it is the first study that has incorporated and analyzed the impact of Shariah-Compliant financing and financial deepening on the economic growth of OIC member countries, simultaneously. Majority of the studies (Fuqani & Mulyany, 2009; Tajgardoon et al., 2012-13; Imam & Kpodar, 2015; Wahab et al., 2016; Anass et al., 2017; Boukhatem & Moussa, 2018; Rafay & Farid, 2019; Ledhem & Mekidiche, 2020; Sabiu & Abduh, 2020) are of the view that Islamic finance affects the economic growth positively. However, there are some scholars who believe that there is no relationship between the two. For instance, Hachicha and Ammar (2015) and Yuksil and Canoz (2017), found no relationship between these two for Malaysia and Turkey. In contrast, Wahab et al. (2016) and Yuksel and Canoz (2017) detected that Islamic finance is contributing towards economic growth in Malaysia and Turkey, respectively. The reasons behind this fusion may be the choice of route investigating the relationship between the two or the choice of variables, or the evaluation techniques. Therefore, the correct link among these variables cannot be elucidated without conducting an essential econometric scrutiny. Obviously, it generates a need that this area may be re-examined and investigated.

This study is aimed to analyze the impact of Shariah-Compliant financing and financial deepening on the economic growth of the twelve OIC member countries. Indeed, this study contributes to the literature of Islamic finance and financial deepening in four aspects: First, this study is different from previous one in terms of time period, selection of countries, and specification of the model. Second, it has the privilege to estimate the effects of Shariah-Compliant financing and financial deepening on economic growth simultaneously. Third, this is the first study that has utilized the panel Robust Least Squares and Dynamic Least Squares estimators for the stated purpose. Finally, and most importantly, instead of using the investment tools of Islamic banking industry, our point of departure is to investigate the link between Islamic financial instruments, disbursed through different modes of Islamic financing, and economic growth in the OIC member countries.

This study is organized in the following manner. Section 1 provides a comprehensive introduction to the research question. Also, it highlights the significance of the study and its main objectives. Section 2 provides a solid base to the research topic through review of extensive literature and explores the research gap. Section 3 focuses on the foundation of the theoretical and conceptual framework. Section 4 presents empirical methodology and detailed description of the variables. Section 5 portrays the results and discusses the research findings. Section 6 concludes the empirical investigation in terms of conclusions and policy implications.

2. Literature Review

Literature relating Islamic finance and financial deepening with the economic growth are quite limited, yet growing, for two reasons: first, the unavailability of the Islamic finance data and, second, poor understanding of the Islamic finance variable. In literature, we find that most of the scholars have used different proxies as representative of Islamic finance. Furqani and Mulyany (2009) were the first who initiated work on this topic for Malaysia. They used the finances of Islamic bank as a proxy for growth in financial sector and found that Islamic finance is causing growth in productivity and helps in accumulation of capital. Yazdan and Sadar (2012) and Tajgardoon et al. (2012) also used the finances of Islamic banks as representative of growth in Islamic finances. They found a strong bidirectional association between these variables. Tajgardoon et al. (2013), while working on the same topic, used the credits of Islamic banks as indicator of growth in Islamic finance and found a strong correlation between the target variables in twelve Asian countries.

Abduh and Omar (2012) also analyzed this relationship for Indonesia. They used GDP and GFCF variables as indicators of growth in the economy, and Islamic finance as indicator of growth in Islamic financial sector. Their results also demonstrated a significant bidirectional relationship between these variables. Tabash and Dhankar (2014a, 2014b and 2014c) adopted the same procedure for showing the impact of Islamic finance in UAE, Qatar and Middle East. For UAE, they used FDI and GFCF in combination with the GDP as proxy variable for showing growth in productivity, while investment of the Islamic banking as a proxy for growth in Islamic finance. For Qatar, they used GFCF in combination with the GDP as indicator of growth in output. For the Middle East, a pioneering study on the subject matter, they used GDP as an indicator of

growth in the real sector while deposits of Islamic banks as representative of growth in Islamic finances. The results of all these studies demonstrated that growth in Islamic finance is contributing a considerable role in boosting these economies.

Al-Oqool et al. (2014) used two models for this purpose; deposit model and finance model. The deposits and finances of Islamic banks were used as indicators of growth in Islamic financial sector. This study also ended with a positive and bidirectional causality of these variables with the economic growth. Imam and Kpodar (2015) investigated this relationship for 52 developing economies. They used three ratios as proxies for showing growth in Islamic banking industry; ratio of loans to GDP, ratio of assets to GDP, and ratio of deposits to GDP. In addition, they also used the return-on-assets and return-on-equity ratios as indicators of capitalization and profitability of the Islamic banks. Results of the Fixed-effects and GMM models portrayed that economic growth is positively connected with growth in Islamic banking industry. Hachicha and Amar (2015) also investigated this relationship for Malaysia through incorporation of three indicators of growth in Islamic finance in the neoclassical production function. They used PPP-based GDP as an indicator of growth in real income while depth of the Islamic banking as an indicator of growth in Islamic finance. The financial depth was measured through summation of three ratios: ratio of Islamic bank's loans to commercial bank's loans, ratio of Islamic bank's loan to GDP, and the ratio of Islamic bank's loans to private investment. In addition, they incorporated the labor force (L) variable in their model and replaced the capital (K) with GFCF, as an indicator of variation in stock of physical assets. The result of all these modeling and modifications depicted that real income is not sensitive to Islamic finance.

Kalim et al. (2016) used the ARDL model and found that Islamic financing is positively affecting the economic growth in Pakistan. Kalayci and Tekin (2016) investigated the interaction between economic growth and Islamic finance for Turkey. They found bilateral causality between growth in Islamic banking and economic productivity. Wahab et al. (2016), on other hand, tried to evaluate this link by incorporating the Islamic finance variable in the neoclassical growth model. They found that Islamic finances help in accelerating the growth process in Malaysia. However, in the case of Pakistan, this relationship was found to be insignificant. Jobarteh and Ergec (2017) followed the methodology

adopted by Al-Oqool et al. (2014) and found that Islamic financing is significantly affecting the growth of the Turkish economy. In contrast, Yuksel and Canoz (2017) also used the same methodology but found no connection between Islamic finance and economic growth for Turkey over the same period. Anass et al. (2017) used the assets and investments of the Islamic banks as proxy variables for representing growth in Islamic finances. In addition to GMM, they also deployed the FEM and REM panel estimators. The findings of this study concluded that Islamic banking helps in boosting the level of economic growth.

Boukhatem and Moussa (2018) established a considerable theoretical framework for creating a link between Islamic finances and economic growth for a group of countries in the MENA region. The loans of Islamic banks were tried to link with the growth rate of GDP per capita. Pooled FMOLS regression technique was used for this purpose. They also found that financial deepening is essential for promoting economic growth. Similarly, Ahmad and Ihsan (2018) also concluded that a well-functioning Islamic banking system supports economic growth. Rafay and Farid (2019) tried to dig-out the consequences of monetary shocks on the real economy through channels of Islamic banking in Pakistan. They used the discount rate as a representative of the monetary policy decisions while deposits, financing, and investments of Islamic banks as indicators for showing their role in the monetary transmission process. They also found that Islamic banks are significantly contributing to the transmission of financial decisions to the real market.

Osmanovica et al. (2020) conducted qualitative research by reviewing the existing literature on the linkage between Islamic finance and economic growth. They found that Islamic banks help in stimulating economic growth in the UAE. Ledhem and Mekidiche (2020) tried to investigate the impact of growth in Islamic financing on the economic growth of 5 OIC member countries. They applied panel GMM to a quarterly data set of 2014-2018. Financial performance of the Islamic banking industry (measured by three ratios) was used as representative of growth in Islamic banking. They also found that profitability of the Islamic banking is affecting the economic growth significantly. Sabiu and Abduh (2020) also found a significant positive relationship between Islamic finance and economic growth. Kamalu and Ibrahim (2021) declared growth in the Islamic banking essential for promoting the financial inclusion in the OIC

member countries. Table 2 presents a brief summary of the selected literature on the subject matter.

In most of these studies, researchers have tried to investigate the correlation between growth and Shariah-Compliant financing. We find no study that has analyzed the impact of both Shariah-Compliant financing (the five modes of Islamic financing) and financial deepening (total assets of the Islamic banking industry) on the economic growth of OIC member countries. These studies also differ from each other in terms of the proxies used for the Islamic finance variables, which do not match the basic concept and theory of Islamic finance. The growth models used in a few studies have also been miss-specified, as they have omitted key variables (especially K and L) from the growth model. Similarly, we also find inconsistencies in their results as most of them advocate a positive correlation between Islamic finance and economic growth, while others believe in the "neutrality of Islamic finance". The reasons behind this fusion may be the choice of route investigating the relationship between the two or choice of variables, or estimation techniques. Therefore, the correct link among these variables can't be enlightened without conducting essential econometric scrutiny. This study aims to fill these gaps and explore the impact of both Islamic Finance and financial deepening on the economic growth in the selected twelve OIC member countries.

Table 2: Summary of the Empirical Evidence

Author/s	Sample Period	Methodology	Dependent Variable(s)	Key Independent Variable(s)	Findings
Osmanovica et al. (2020)	UAE	Qualitative research (review of existing literatures)			Islamic banks are positively affecting the economic growth
Ledhem & Mekidiche (2020)	5 OIC countries ^a 2014-2018	Panel GMM	GDP	ROA,ROE and net profit margin	Economic growth is positively affected by profitability of the Islamic banks
Rafay & Farid (2019)	Pakistan 2007-2017	J. J. co-integration, IRF, VDC	Large scaled manufacturing index	Deposits, finances and investments of Islamic banks	Islamic financial sector is affecting the output positively and significantly
Boukhatem & Moussa (2018)	MENA countries ^b 2004-2014	Pooled FMOLS	GDP	Islamic finances and conventional finance	Both these variables help in accelerating the economic growth
Ahmad & Ihsan (2018)	Pakistan 2006-2015	JCT, GCT	GDP	Lending and assets of Islamic banks	Long run positive association among the targeted variables
Anass et al. (2017)	9 OIC countries ^c 2010-2016	GMM, FEM,REM	GDP per capita	Total assets, investment accounts and financial assets of Islamic banks	Economic growth is positively affected by these variables
Yuksel & Canoz (2017)	Turkey 2005-2016	JCT, GCT	GDP	Islamic finances	Growth in GDP is not sensitive to Islamic finances
Jobarteh & Orgec (2017)	Turkey 2005-2015	ARDL, JCT, GCT, ECM	GDP	Islamic finance and deposits of Islamic banks	Growth in GDP was found sensitive to these variables
Wahab et al. (2016)	Malaysia & Pakistan 2006-2014	ARDL, ECM, GCT	GDP and GFCF	Islamic finances	Positive for Malaysia Not sensitive for Pakistan
Kalayci & Tekin (2016)	Turkey 2002-2014	JCT, GCT	GDP and FDI	Deposits of Islamic banks	Deposits of Islamic banks were found to affect the endogenous variables positively
Kalim et al. (2016)	Pakistan 2016-2013	ECM, ARDL	GDP and GFCF	Islamic finances	Same as above

Lawal & Imam (2016)	Nigeria 2012-2015	OLS, GCT, JCT	Real GDP	Islamic finances	Growth in real GDP is positively correlated with growth in Islamic finances
Hachicha & Ammar (2015)	Malaysia 2001-2011	J.J. Cointegration, ECM	GDP and GFCF	Ratios of IB loans to GDP and investment	Growth in GDP and GFCF has no relationship with these indicators
Imam & Kpodar (2015)	52 developing countries ^d 1990-2010	GMM, Pooling and FEM	GDP per capita	Ratios of loans, deposits and assets of IB to GDP	All these indicators help in promoting the economic growth in these countries
Tabash & Dhankar (2014)	Middle East 1990-2010	GCT, JCT	GDP	Deposits of Islamic banks	Bidirectional causality (positive) was detected for these variables
Tajgardoona et al. (2013)	12 Asia Countries ^e 1980-2009	GCT, REM	GDP and Trade	Credits of Islamic banks	Positive correlation among the targeted variables
Abduh & Omar (2012)	Indonesia 2003-2010	ARDL, ECM	GDP and GFCF	Islamic finances	Same as above
Tajgardoona et al. (2012)	Nine OIC countries ^f 1995-2010	GCT, GMM	FDI	Assets of Islamic banks	Bidirectional causality (positive) was detected for these variables
Yazdan & Sadar (2012)	Iran & Indonesia 2000-2010	ARDL, GCT, ECM	GDP and GFCF	Islamic finances	Same as above
Furqani & Mulyany (2009)	Malaysia 1997-2005	VCM, GCT	GDP per capita, GFCF and Trade	Islamic finances	Islamic finances are affecting the economic growth positively and significantly

Note: IRF - impulse response function; VDC - variance decomposition analysis; FMOLS – fully modifies ordinary least squares; GCT – granger causality test; JCT – Johansen Co-integration Test; VCM – vector correction model ^aFive OIC countries are: Malaysia, Indonesia, Brunei, Turkey and Saudi Arabia ^bThirteen MENA countries are Sudan, Syria Arab Republic, Qatar, Saudi Arabia, Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Tunisia, United Arab Emirates and West Bank Gaza ^cNine OIC countries included are Bahrain, Saudi Arabia, Emirate, Kuwait, Malaysia, Indonesia, Qatar, Turkey, and Pakistan. ^dTwenty-nine of them belong to the member countries of OIC ^eThese countries are Kuwait, Oman, Turkey, Saudi Arabia, Qatar, Iraq, Bahrain, Iran, Malaysia, United Arab Emirates, Pakistan, and Yemen ^fCountries included were UAE, Qatar, Pakistan, Kuwait, Saudi Arabia, Bahrain, Iran, Malaysia and Turkey

3. Theoretical Underpinning

The development of Islamic financial market is conditional to the volume of payment credited to the private sector through different modes of Islamic finance and total assets of the Islamic Banking Industry. The modes of Islamic finance, referred as Shariah-Compliant financing, can be further classified in two broader categories: first, the profit-loss sharing instruments, the combination of Mudarabah (sleeping partner) and Musharakah (equity financing), and second, the smooth cash outlay, where the client enters into an arrangement with the Islamic bank in the forms of Murabaha (mark-up with deferred payment), leasing (hire-purchase) and Diminishing-Musharakah (equity financing with the element of ownership transformation) which enables him to smooth his cash outlay. These innovations are helpful to the economic development in the OIC member countries as they provide access to interest-and-speculation free instruments of financing that have captured the attention of investors and policy makers around the world extensively.

Similarly, the total assets of the Islamic banking industry (referred as financial deepening) measures growth in the financial assets of Islamic banks to a country's GDP/output (Moore, 1986). Financial deepening (i.e. growth in assets) encourages investments, promotes growth and boosts the living standards (Arabadi & Kharabsheh, 2016). The causal relationship of these two variables (Shariah-Compliant financing and assets of the Islamic banks) with the economic growth can be represented in the following hypothetical diagram (Figure-3).

4. Empirical Methodology

This study is focused on analyzing the impact of Shariah-Compliant financing and financial deepening on the economic growth of twelve OIC member countries namely, Bangladesh, Brunei, Indonesia, Jordan, Iran, Kuwait, Malaysia, Pakistan, Saudi Arabia, Sudan, Turkey and UAE. The sample size is constrained by, first, extremely low participation ratio by most of the OIC member countries in Shariah-Compliant financing and, second, unavailability of data on Islamic finance and assets of the Islamic banking industry. Data sources are the Islamic Financial Information Service database (2020), the OIC Statistics database (2020), and the World Development Indicators (2020). We begin our analysis through

presentation of the theoretical foundation for the augmented Solow growth model.

4.1. Model Specification and Estimation Tools

Furqani and Mulyany (2009) were the first who initiated work on this topic for Malaysia by incorporating the Islamic finance variable in the augmented Solow growth model. Tajgardon et al. (2012) added assets of the Islamic banks in the same neoclassical growth model and applied the GMM tools for testing its validity for nine OIC member countries. Later on, he (i.e., Tajgardon, 2013) replaced the assets of Islamic banks with credits of the Islamic banks and applied the random-effects model for investigating this issue in 12 Asian countries. Imam and Kpodar (2015) added three indicators in the growth models namely loans of IBI, deposits of IBI, and assets of IBI. They used the GMM and FEM for investigating the impact of these indicators on the economic growth of 52 developing countries. Similarly, Anass et al. (2017) included the assets plus accounts of Islamic banks as development indicators in the growth model. They applied the GMM, FEM and REM for analysis of the issue at hand. Boukhatem and Moussa (2018) added the Islamic finance variable in the finance-growth model and applied the pooled FMOLS technique for its estimation in MENA countries. Rafay and Farid (2019) added the deposits, finances, and investments of Islamic banks as indicators of growth in Islamic financial sector and applied the impulse response function, variance decomposition, and cointegration techniques for investigating the impact of growth in Islamic banking on the large-scale manufacturing (total output) in Pakistan. Ledhem and Mekidiche (2020) tried to examine this relationship, for 5 OIC member countries, by incorporating the indicators of financial performance in the exogenous growth model. They found that Islamic finance is significantly contributing towards economic growth in these countries.

We are in agreement with their estimations, but our point of deviation is to analyze the impact of Shariah-Compliant financing and financial deepening of the Islamic banks on the economic growth of twelve OIC member countries within the framework of augmented Solow growth model. Shariah-Compliant financing and total assets of the Islamic banking industry are used as indicators of growth in Islamic finance, whereas growth in GDP per capita is added to this model for reflecting the economic growth. Regarding the estimation tools, the Hausman test

prefers to use the REM as panel estimator. In addition, as a matter of comparison, this study is using the Dynamic OLS and Robust Least Squares tools of estimation for testing the same model on pooled data. Importantly, this study is focused to find the general pattern of relationship among the targeted variables, not the specific one that can be differentiated by country-specific analysis.

The set of control variables includes FDI, GFCF, literacy rate, unemployment rate and inflation rate. Data sources and description of variables are listed in Table 3. In line with the above discussion, the following random-effects model becomes a base-line growth model for this study.

$$\begin{aligned} \ln GDP_{it} = & \alpha_{j[i]} + \beta_1 \ln SFIBI_{i,t-1} + \beta_2 \ln AIBI_{i,t-1} + \beta_3 \ln FDI_{i,t-1} \\ & + \beta_4 \ln GFCF_{i,t-1} + \beta_5 \ln LR_{i,t-1} + \beta_6 \ln UNE_{i,t-1} \\ & + \beta_7 \ln INF_{i,t-1} \\ & + \epsilon_{it} \alpha_j \text{ follows } N(\mu^2, \delta_f^2); \epsilon_{it} \text{ follows } N(0, \delta_f^2) \end{aligned} \quad (1)$$

Where¹:

ϵ_t	= Error term with zero mean and constant variance
Lag (t-1)	= Used for the independent variables to alleviate the problem of endogeneity
Subscript (i,t)	= Country and time period
\ln	= Log operator

Growth in GDP per capita is a statistical value which represents the economic performance of a country during a particular year. Studies related to finance-growth synthesis have used this variable as a principal variable reflecting economic growth (Furqani & Mulyany, 2009; Imam & Kpodar, 2015; Anass et al., 2017; Minhaj-ud-Din et al. 2020; Minhaj-ud-Din et al. 2020). We therefore expect that Shariah-Compliant financing and financial deepening will positively contribute in accelerating the economic growth.

Shariah-Compliant financing is the total amount of money credited to the general public and institutions through different modes of Islamic finances. It is used as an appropriate proxy for finding the role of Islamic

¹ Table 3 presents the description of all these variables in detail

finance sector in determining the growth process, because the Islamic banks are engaged in real trade activities that arise from asset backed financing and lead to the circulation and accumulation of wealth. Most of the studies have incorporated this variable in its true meaning (Furqani & Mulyany 2009; Yazdan & Sadar, 2012; Abduh & Umar, 2012; Yuksel & Canoz, 2017; Boukhatem & Moussa, 2018). In contrast, few researchers (Tajgardon et al., 2012; Tabash & Dhankar, 2014; Imam & Kpodar, 2015; Kalayci & Tekin, 2016; Anass et al., 2017) have used some other proxies (like deposits, assets, and investments of Islamic banks) as indicators of growth in Islamic financial sector.

Total assets of the Islamic banks are used as an indicator of financial deepening which measures increase in the financial assets of the Islamic banking to a country's GDP/output (Moore, 1986). Financial deepening boosts the level of investments and accelerates the growth process (Alrabadi & Kharabsheh, 2016). Numerous studies like Tajgardoon et al. (2012), Imam and Kpodar (2015), Anass et al. (2017), and Ahmad and Ihsan (2018) have used this variable in their studies for investigating its impact on economic growth. This study also intends to incorporate this variable in the neoclassical production function and investigate its impact on economic growth over the long run.

Foreign direct investment measures the inflow of long-term capital which, in turn, increases economic growth by diffusing technologies, increasing managerial skills, creating employment opportunities, and fostering innovations. Tajgardoon et al. (2012), Tabash and Dhankar (2014), and Kalayci and Tekin (2016) used this variable in the finance-growth model and found that FDI is helpful in boosting economic growth. Similarly, Gross Fixed Capital Formation is an economic indicator which measures the flow of net new investment in fixed assets during a particular year (Tabash & Dhankar, 2014). Furqani and Mulyany (2009), Yazdan and Sadar (2012), Abduh and Omar (2012), Tajgardoon et al. (2012), Tabash and Dhankar (2014), and Hachicha and Ammar (2015) used this variable in the finance-growth model and concluded that it promotes the level of economic growth. Both these variables are added to the exogenous growth model while forecasting the same results.

Literacy rate is the accumulation of human capital, represented by different proxies like primary school enrolment, secondary school

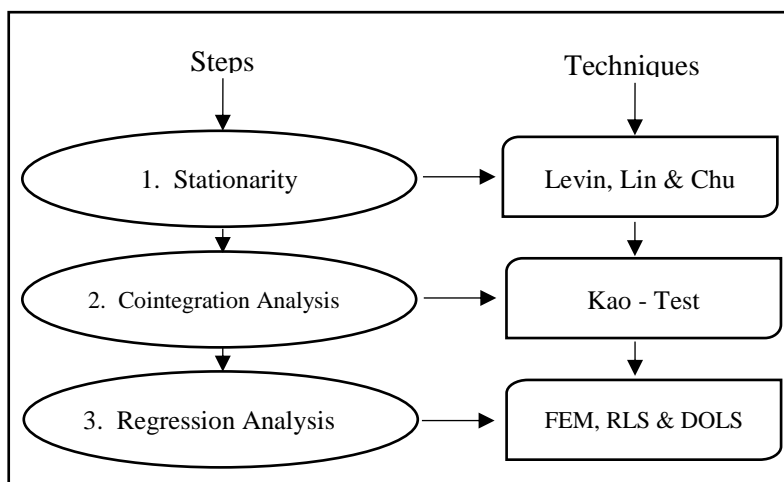
enrollment, average year of schooling, and annual expenditure on education in the growth models. We find only two studies (Imam & Kpodar, 2015; Boukhatem & Moussa, 2018), who have incorporated this variable in the finance-growth model. This study is using primary school enrollment as representative of human capital in the finance-growth model. Inflation rate and unemployment rates are also deployed as indicators of macroeconomic stability/instability of a country. It is argued that lower inflation and higher employment increase the growth of real output (Imam & Kpodar, 2015; Anass et al., 2017; Boukhatem & Moussa, 2018; Minhaj-ud-Din et al., 2020; Minhaj-ud-Din et al., 2020). It is expected that higher inflation and higher unemployment will foster negative repercussions on the economic growth in these countries¹.

Table 3: Description of variables and data sources
(Endogenous variable is growth rate of GDP per capita)

Variables	Definition and Unit	Data Source	Sign
GDP	Growth rate of GDP per capita	World Development Indicator, 2020	
SFIBI	Shariah-Compliant financing of the Islamic banks, as % of GDP	Islamic Financial Information Service database, 2020	+
AIBI	Assets of the Islamic banks, as % of GDP	OIC Statistics database, 2020	+
FDI	Foreign Direct Investment: as % of GDP	World Development Indicator, 2020	+
GFCF	Gross Fixed Capital Formation: as % of GDP	World Development Indicator, 2020	+
LR	Literacy rate, primary school enrollment: as % of all eligible children	OIC Statistics database, 2020	+
UNE	Unemployment rate: as % of total labor force	World Development Indicator, 2020	-
INF	Inflation rate: in % as measured by CPI	World Development Indicator, 2020	-

Figure 3: Conceptual Framework
Source: Author's Compilation

¹**Data Availability Statement:** Data used are openly available, and can be provided upon request. Data sources are: (a) Islamic Financial Information Service Database (IFSB-2020), http://ifsb.org/psifi_03.php, (b) OIC Statistics database (2020), <http://sesric.org/oicstat.php>, <http://sesric.org/publications-syb.php>, and (c) World Development Indicators (2020), <http://data.worldbank.org/country>.

Figure 4: Analytical Framework/Flow Chart of Methodology

Source: Author's Construction

5. Results and Discussion

5.1. Unit Root Test

Figure 4 depicts that this study has used the Levin, Lin and Chu (2002) test of stationarity. Table 3 has summarized these results which find overwhelming evidence that all variables are stationary. Therefore, we have to reject the null hypothesis of unit root.

Table 3: Unite Root Test (Levin, Lin & Chu t^*) Null Hypothesis: Unit Root

Variables	Individual Effect		Individual Effect and Linear Trends	
	Statistics	Decision	Statistics	Decision
GDPPC	-4.1859*	I(1)	-4.2184*	I(0)
SFIBI	-3.2566*	I(0)	-5.5638*	I(0)
AIBI	-3.5214*	I(0)	-4.218*	I(0)
FDI	-5.8932*	I(0)	-7.9670*	I(0)
GFCF	-1.7048**	I(0)	-6.6801*	I(0)
LR	-2.3399*	I(0)	-4.6699*	I(0)
UNE	-16.6414*	I(0)	-95.8069*	I(0)
INF	-2.4464*	I(0)	-19.5126*	I(0)

*,** indicate the rejection of null hypothesis at 1% and 5% levels of significance

5.3. *Descriptive Statistics and Correlation Matrix*

Table 4 presents the detailed picture of growth in each variable for the period under analysis. For instance, the average value for GDP per capita growth is 1.15%, with a maximum value of 5.80%. The average growth of Shariah-Compliant financing variable is 14.82%, with a maximum value of 42.95%. Similarly, the average growth in assets of the Islamic banks is 18.32%, with a maximum of 53.29%. The statistical values of these indicators highlight that Shariah-Compliant financing and financial deepening should be considered as the long-run forcing factors of economic growth in these countries.

5.4. *Regression Results*

The estimation rules of panel data were followed for the purpose of estimating the regression model. The Hausman's test was evoked to select between the two models: Random Effects Model (REM) and Fixed Effects Model (FEM). For robustness, the robust least squares (RLS) and dynamic ordinary least squares (DOLS) estimators are also used in this study. Table 5 summarizes the results of these estimators.

The estimates of REM and RLS show that one percent increase in growth of Shariah-Compliant financing is causing 0.27 percent growth in GDP per capita. For DOLS, this value is 0.13 %. Moreover, these estimators also highlight that one percent increase in financial deepening is causing the GDP per capita to grow by 0.19, 0.18 and 0.15 percent in the long run, respectively. The empirical findings of this study confirm the conclusions of numerous studies (Furqani & Mulyany, 2009; Tajgardoon et al., 2013; Imam & Kpodar, 2015; Anass et al. 2017; Boukhatem & Moussa, 2018; Ledhem & Mekidiche, 2020) that growth in Islamic finances is essential for boosting the economic growth. Despite the relatively small size of Islamic finance as compared to GDP, the regression analysis confirms that Islamic banking industry stimulates the economic growth in the selected OIC member countries in the long run. Accumulation of fixed assets and inflow of capital in the form of technologies, managerial skills, and marketing capabilities also stimulates economic growth. Results related to human capital (literacy rate) indicate that education plays a vital role in the economic development of such economies. The coefficients of the

remaining two variables also signify the importance of macroeconomic stability (low inflation and higher employment) in the growth process of these economies.

Table 5: Islamic Finance, Financial Deepening and Economic Growth:
Regressions Results of Panel Estimators

Methods / Variables	Random-effects		Robust Least Squares		DOLS	
	Coefficient [Std Error]	P- value	Coefficient [Std Error]	p-value	Coefficient [Std Error]	P- value
Shariah-Compliant Financing of IBI (SFIBI)	0.2784 (0.0256)	0.0000	0.2608 (0.0567)	0.0000	0.1334 (0.0446)	0.0056
Assets of IBI (AIBI)	0.1925 (0.0450)	0.0000	0.1796 (0.0612)	0.0007	0.1543 (0.0126)	0.0027
Foreign Direct Investment (FDI)	0.4337 (0.1155)	0.0008	0.2541 (0.1056)	0.0203	0.6329 (0.3588)	0.0884
Gross Fixed Capital formation (GFCF)	0.3263 (0.0689)	0.0001	0.2904 (0.1525)	0.0570	0.5852 (0.1837)	0.0035
Literacy rate (LR)	0.2388 (0.0598)	0.0004	0.2543 (0.1324)	0.0550	0.1527 (0.0445)	0.0018
Unemployment (UNE)	-0.5484 (0.0646)	0.0000	-0.5238 (0.1430)	0.0003	-0.6444 (0.2026)	0.0035
Inflation (INF)	-0.6258 (0.0689)	0.0000	-0.5902 (0.1525)	0.0001	-0.5347 (0.2172)	0.0200
Goodness of Fit Test	R ² = 0.9278		R ² = 0.9152		R ² = 0.9323	
Normality Test – Jarque-Bera (p- value)	2.0026 (0.3674)		6.0075 (0.1496)		3.9231 (0.1406)	
Correlated Random Effect-Hausman Test	Chi-Sq. Statistic (P-value) = 107.9089 (0.0000)					
Kao Residual Cointegration Test	ADF-t-statistic (p-value) = -1.6825 (0.0462)					

6. Conclusion

The baseline theme of this article was to scrutinize the impact of Islamic finance and financial deepening on the economic growth of twelve OIC member countries. Shariah-Compliant financing and total assets of the Islamic banks were used as indicators of Islamic finance and financial

deepening, respectively. Growth rate of GDP per capita was used as an indicator of economic growth in the real sector of the economy. The impacts of these indicators were analyzed within the framework of augmented Solow growth model. The unavailability of data on these indicators constrained us to choose a sample size spanning from 2012-2019. The Hausman test preferred to deploy the random-effects model as a panel estimator. For robustness, the RLS and DLS estimators were also used in this study. The results of REM and RLS indicated that one percent increase in growth of Shariah-Compliant financing is causing 0.27 percent growth in GDP per capita. However, this value was 0.13 % for the DOLS model. Similarly, the results of REM, RLS and DOLS portrayed that one percent increase in total assets of the Islamic banks is associated with 0.19, 0.18 and 0.15 percent increase in growth of the economy, respectively. Furthermore, growth in stock of fixed assets, inflow of FDI and literacy rate were also found essential for boosting economic growth. In addition, these results also demonstrated that countries with sound macroeconomic stability will experience faster growth as compared to other nations.

This study suggests that policy makers should consider the role of Islamic finance and, therefore, should develop a policy framework for its growth, yet further. Possible channels for reconsideration are: improving the penetration rate of Islamic banking industry, its integration with non-Muslim communities, and the accessibility of its tools to other markets. As a system, Islamic banking has the potential to play its role in alleviation of extreme poverty and fostering shared prosperity worldwide. Therefore, the government should not consider it as a niche market disconnected from the mainstream policy; rather, they should treat it as an integral part of the financial system, so that the monetary decision may be properly transmitted to the real economy.

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