Analysis of Islamic Bank's Financing and Economic Growth: Case Study Iran and Indonesia

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The purpose of this paper is to examine the short-run and the long-run relationships between Islamic banking development and economic growth in the case of Iran and Indonesia, with this regard we use quarterly data (2000:1-2010:4), this paper utilizes the bound testing approach of cointegration and error correction models, developed within an autoregressive distributed lag (ARDL) framework. Also in this paper addresses some of the issues and challenges that Islamic banking has been facing in Iran. It also seeks to examine modes of Islamic financing and the commitment of commercial banks to implement the Islamic banking law. The results show a significant relationship in short-run and long-run periods between Islamic financial development and economic growth. The relationship appears to be bi-directional relationship. This paper uses empirical evidence to show the role of Islamic banks' financing towards economic performance of a country.

1. Introduction

The theory of Islamic banking is based on the concept that interest is strictly forbidden in Islam, and that Islamic teachings provide the required guidance on which to base the working of banks. The basic principle that has guided all theoretical work on Islamic banking is that although interest is forbidden in Islam, trade and profit is encouraged.

Islamic banking is a financial system whose key aim is to fulfill the teachings of the Holy Quran. Islamic law reflects the commands of God

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and this law regulates all the aspects of a Muslim's life and hence Islamic finance is directly involved with spiritual values and social justice (Gudarzi Farahani and Dastan, 2013).

The basic principle in Islamic law is that exploitative contracts or unfair contracts that involve risk or speculation are impermissible. Under Islamic banking, all partners involved in financial transactions share the risk and profit or loss of a venture and no one gets a predetermined return. This direct correlation between investment and profit is the key difference between Islamic and conventional banking which its main objective is maximizing shareholders' wealth (Dar and Presley, 2000).

Islamic banking has introduced itself as an emerging alternative to conventional banking system and has grown rapidly over the last two decades both in Muslim and non-Muslim countries. Islamic banks have recorded high growth rates in both size and number and have operated in over 60 countries worldwide and bankers predict that Islamic banking would control over 50% of savings in the Islamic countries within the next decade (Ahmad, 2004 and Muhamad. A and Azmi Omar. M, 2012).

Recent articles and theoretical papers have called on economies to consider Islamic economic theories as an alternative solution to the current capitalist system. There are also numerous good and well-organized papers respecting Islamic banking system which attempt to clarify the effects of Islamic banking on economic growth in comparison to the effects of conventional banking on it. However, most of empirical studies conducted in this field were not able to explain the overall effect of Islamic bank's financing on economy, due to the fact that they consider a single-country sample.

Islamic banking activities can be classified into two groups: In one group, their activities are without any competition with conventional banking based on interest rate, due to the domestic laws and regulations of some Islamic countries which do not allow any activities based on interest rate (ribah) for financial institutions, banks in those countries. In the second group, there is a high competition between these two banking systems which is because of this fact that they are operating in non-Muslim countries or Muslim countries which do not forbid interest rate-based banking system (Gudarzi Farahani and Dastan, 2013).

Out of the extensive research carried out in this field, there are no sufficient works conducted within the Islamic financial framework. The objective of this paper, therefore, is to narrow the gap in literature by examining the short-run and the long-run relationships between Islamic financial development and economic growth, particularly in these countries using the bound testing approach of cointegration and error correction models (ECMs), developed within an autoregressive distributed lag (ARDL) framework by Pesaran and Shin (1995), Pesaran et al. (1996) and Narayan (2004). However, most of studies in this field have applied the bound testing approach of cointegration, error correction models (ECMs), Auto Regressive Distributed lag (ARDL) and Vector Autoregressive Model (VAR).

This study is guided by the following research questions: What is the relationship between Islamic financial development and economic growth in these selected countries? Does Islamic financial development have significant effect on these countries' economic growth in the short-run and in the long-run?

This paper uses the selected Islamic countries' information includes Iran and Indonesia based on data availability and compatibility to test the validity of the theoretical findings. Accordingly, the following hypotheses are considered:

Hypothesis 1: There is a long-run relationship between Islamic financial development and economic growth.

Hypothesis 2: Islamic financial development leads to economic growth.

Hypothesis 3: Economic growth leads to Islamic financial development.

In this paper, we use Muhamad Abduh and Azmi Omar (2012) article "the relationship between Islamic financial development and economic growth for Asian countries".

In this paper the relationship between Islamic financing and economic growth is tested by using panel data of these selected Islamic countries over the period 2000:1 – 2010:4. This paper consists of four sections.

Section 1, discusses the introduction, in which the background and rationale of the study is outlined. Section 2, covers the review of literature, of the relationship between financial development and economic growth. Section 3, captures the background of Islamic banking in Iran and Indonesia. Section 4, covers the detail of the data and research methodology employed in this study reports the findings and discussion. The final section contains the conclusions.

2. Literature review

In recent years a number of both theoretical and empirical studies about the Islamic banking have been published. Most of these studies have been argued that Islamic bank's products must confirm to principles set by sharia board and this prevents the emergence of speculative demand for money and Islamic bank also use profit and loss sharing criteria. These advantages help the Islamic banks to cope with instability in the economy.

Muhamad Abduh, Mohd Azmi Omar (2012) examines the short-run and the long-run relationships between Islamic banking development and economic growth in Indonesia. For this purpose they use quarterly data (2003:1-2010:2), they utilizes the bound testing approach of cointegration and error correction models, developed within an autoregressive distributed lag (ARDL) framework. Their results show a significant relationship in short-run and long-run periods between Islamic financial development and economic growth. The relationship, however, is neither Schumpeter's supply-leading nor Robinson's demand-following. It appears to be bi-directional relationship.

Furqani and Mulyany (2009) examine the dynamic interaction between Islamic banking and economic growth in Malaysia by employing the cointegration test and vector error correction model. Their results show that in the short run, only fixed investment is the granger cause of Islamic banking for period 1997:1 – 2005:4. While in the long run, there is evidence of a bidirectional relationship between Islamic banking and fixed investment and also there is evidence supporting demand following hypothesis of GDP and Islamic banking, where increases in GDP causes Islamic banking to develop and not vice versa.

Dahduli (2009) investigates the effectiveness of Islamic banking and finance concepts and concludes that in addition to the traditional prohibitions, Islamic banks should be aware of the immoral defrauding and selfish sales behavior that took place in Western financial institutions, which only protects banks' interests and the bonuses paid to management. In addition and through discussing developed countries banking practices in the 19th century, it has been concluded that the Islamic PLS (profit and loss sharing) contracts would have helped accelerate economic growth by its force of directing funds into profitable industries that increases banks' cash flows and market confidence.

Mirakhor and Khan (1990) point out that reliance on profit sharing arrangements makes the Islamic system akin to an equity-based system, relatively straightforward theoretical models that have been developed for analyzing the working of the system. In these models, depositors are treated as shareholders (as in a mutual fund or investment trust, for example) and bank provides no guarantee on the rate of return or nominal value of shares. Symmetrically, banks themselves become partners with the borrowers and accordingly share in the returns obtained from the borrowed funds. They add that an interesting result emerging from such models is that the Islamic system may be better suited than an interest-based system to adjust to shocks that can lead to banking crises.

King and Levine (1993) for instance, studied this issue using data from 80 countries over the 1960-1989 periods. They constructed four indicators of the level of financial sector developments which is regressed with the real gross domestic product (GDP) per capita and its sources. First is "financial depth" which equals the ratio of liquid liabilities of the financial system to GDP. Second is the ratio of deposit money bank domestic assets to deposit money bank deposit assets plus central bank domestic assets to measure the relative importance of specific financial institutions. The third and fourth financial development indicators are designed to measure domestic asset distribution.

The significant relationship only appears in the high income countries. Some studies have taken a more microeconomic approach and some used stock markets as the proxy for financial development. For example, Fisman and Love (2003) revisited an earlier paper by Rajan and Zingales (1998) by re-examining their assumptions, and the robustness of their results to alternative theories and interpretations. The result is supporting the hypothesis that financial development helps industries with good growth opportunities. It also reinforces their hypothesis that the role of financial development is to reallocate resources to industries that have good growth opportunities and not to industries with "technological dependence" on external finance.

Another study by Beck and Levine (2004) investigates the impact of stock markets and banks on economic growth using a panel data set for the period 1976-1998. The results strongly reject the notion that overall financial development is unimportant or harmful for economic growth. Therefore, they argue that stock markets and banks positively influence economic growth.

With regard to the role of Islamic financial development in economic growth, Furqani and Mulyany (2009) and Majid and Kassim (2010) are among the limited articles in this area. However, using not-so-different time span of quarterly data, their findings are different in terms of the direction of the relationship. Furqani and Mulyany (2009), on the one hand, posit that the relationship between Islamic financial development and economic growth is following the view of "demand-following" which means that economic growth causes Islamic banking institutions to change and develop. On the other hand, findings of Majid and Kassim (2010) are in favor of the supply-leading view.

3. Iranian and Indonesian Islamic banking

As explained in the previous section under Islamic banking, the lender and borrower share the profits of enterprise (and associated risk) according to some previously agreed upon share. Thus, the actual size of the profit to the lender is determined only after completion of the projects. An increase in risk sharing, as entailed by Islamic banking, encouraged borrowers to adopt more risky projects. Naturally this made the loan portfolios of banks more risky. Hence, banks were persuaded to ration credit more strictly, and to divert a large proportion of their assets

away from long term investment loans to commercial and short-term ones.

The central feature of the Iranian monetary system in the 1980s was that the money and credit council administered the interest rates. The underlying purposes of such an administered structure of interest rates were the mobilization of savings and the provision of funds for productive activity to the preferred sectors at concessional rates of interest. Monetary policy was also influenced by the need to raise the domestic savings rate. If there is a larger proportion of savings in the form of financial assets, there is need to offer depositors a positive real rate of interest. The monetary authorities of Iran realized that low interest rates might not be able to generate savings. So they geared policy towards encouraging deposits with long maturities.

The International Monetary Fund (IMF) released a report which stated that Islamic banking is one of the fastest growing segments in the financial industry with a tracking of 10-15 percent growth over the past decade, and globally, Islamic banking assets are estimated to grow around 15 percent a year of $1 trillion by 2016.

In Indonesia, Islamic banking industry started 17 years ago, in 1992 with the establishment of the first Islamic bank in Jakarta, namely Bank Muamalat Indonesia.

It remained the only Islamic commercial banking (BUS) until the financial crisis 1997, which caused massive destruction to the Indonesian financial system (Bank Muamalat Indonesia, 2002). In 1999, as the impact of 1997-1998 financial and multi-dimensional crises in Indonesia, four big banks under the auspices of the government were merged and become PT. Bank Mandiri (BM). These four banks were PT. Bank Dagang Negara, PT. Bank Bumi Daya, PT. Bank Exim and PT. Bapindo. BM later on bought PT. Bank Susila Bakti (BSB) which has affected by financial crises as well with condition that BSB will operate again as an Islamic bank under name of PT. Bank Syariah Mandiri (BSM). Hence, on 1 November 1999, the number of Islamic bank grows to two BUS, one Islamic window and 78 Islamic rural banks (Muhamad. A and Azmi Omar. M, 2012).

To date, there are ten Islamic commercial banks (i.e. BSM, Bank Muamalat Indonesia, Bank Syariah Mega Indonesia, BRI Syariah, BUKOPIN Syariah and PANIN Syariah) with 1,113 branches and 23 Islamic windows of the conventional banks with 251 branches. The total number of Islamic rural banks also increased significantly from 105 in 2006 to 146 in July 2010. Currently, there are 1,640 branches of Islamic banks spreading in the country (Table I). This rapid development is the result from government strategies through The Blueprint of Islamic Banking Development in Indonesia, released by Islamic banking central bank (BI) in year 2002. The blueprint mentions phases in developing Islamic banking in Indonesia and its parameter of success like:

- Placing strong base for sustainable development;
- Strengthening industrial structure; and
- Complying with international standards for financial products and services.

Finally, after the Islamic Banking Act No. 21 Year 2008 concerning Islamic banking legal foundations was passed by the House of Representatives of Indonesia, many conventional banks spin-off their Islamic windows to full-fledged Islamic bank and conversion of rural banks to Islamic rural banks which base their operation within the Islamic tenets. On the other hand, demand from Muslim customers in Indonesia is also pushing the industry to fulfill their needs in terms of banking transaction under shariah principles. Both sides of government regulation and demand from customers have encouraged Islamic banking in Indonesia to grow faster.

The growth achieved, however, not only in terms of the number of banks and branches, With regard to economic growth, these countries are still experiencing a positive growth of 3.5 and 6 percent in 2008 and 2.3 and 4.5 percent in 2009. While in the first half of 2010 the growth is higher than previously estimated of 1.8 and 5.7 percent. The Iranian and Indonesian economy is expected to grow at 6 and 8 percent at the end of 2012. The extensive transformation in many aspects, including the rapid development of Islamic banking, has provided a more resilience foundation into the Indonesian economic development today. Focusing on the rapid development of Islamic banking in Indonesia, this paper is, therefore, aimed at providing an empirical evidence of the contribution

of Islamic banking towards Indonesian economy (Muhamad. A and Azmi Omar. M, 2012).

4. Data and research methodology

Data

In this paper, regressions are based on data concerning a group of 9 Islamic countries over the period 2000:1 – 2010:4. Data for real GDP growth (GDP), gross fixed capital formation (GFCF) and total Islamic bank's financing (FIN) for these Islamic countries namely Iran and Indonesia come from the World Bank Statistics and International Financial Statistics published by the International Monetary Fund.

Countries have been selected based on data availability. One of the main reasons for choosing these countries is similarity in their financial markets which the use of homogeneous data leads to more accurate coefficients and more consistent results.

GDP is a common statistic for representing the income level of a particular country within a certain time range. Study about finance-growth nexus always use GDP as the principal variable reflecting economic growth. We use gross fixed capital formation (GFCF) as a representation of investment in order to measure net new investment during an accounting period. It is to be noted that the financing variable applied in this model is a portion of total financing in the economy provided by Islamic banks.

After collecting all data required, the unit root test for all variables is carried out using Augmented Dickey-Fuller (ADF) and Phillips-Perron (P-P) (Table 1). Even though the ARDL framework does not involve pre-testing variables to be done, the unit root test could convince as to whether or not the ARDL model should be used. Table 1 shows the summary of unit root test which lead to the mixture of I(0) and I(1) of underlying regressors and therefore, the ARDL testing could be proceeded.

ADF Unit Root Test

Nelson and Plosser (1982) argue that almost all macroeconomic time series typically have a unit root. Thus, by taking first differences the null hypothesis of nonstationarity is rejected for most of the variables. Unit root tests are important in examining the stationarity of a time series because nonstationary regressors invalidates many standard empirical results and thus requires special treatment. Granger and Newbold (1974) have found by simulation that the F-statistic calculated from the regression involving the nonstationary time-series data does not follow the Standard distribution. This nonstandard distribution has a substantial rightward shift under the null hypothesis of no causality.

Thus the significance of the test is overstated and a spurious result is obtained. The presence of a stochastic trend is determined by testing the presence of unit roots in time series data. Non-stationarity or the presence of a unit root can be tested using the Dickey and Fuller (1981) tests.

The test is the t statistic on φ in the following regression:

$$\Delta Y_t = \beta_0 + \beta_1 . trend + \rho Y_{t-1} + \sum_{i=0}^{\infty} \varphi_i \Delta y_{t-i} + \varepsilon_t$$

Where Δ is the first-difference operator, ε_t is a stationary random error.

The results of the unit root tests for the series of bank's financing and GDP variables are shown in Table 1. The ADF test provides the formal test for unit roots in this study. The p-values corresponding to the ADF values calculated for the two series are larger than 0.05. This indicates that the series of all the variables are non-stationary at 5% level of significance and thus any causal inferences from the two series in levels are invalid.

Table 1. Results of unit root test

	ADF t-statistic		PP t-statistic	
	Trend and Intercept	First difference	Trend and Intercept	First difference
ln(FIN)	-3.97	-4.36	-3.74	-4.38
ln(GDP)	-2.51	-5.72	-2.59	-5.93
GFCF	-1.97	-4.27	-2.12	-4.89
Critical values (5%)	-3.63	-3.64	-3.57	-3.58

Note: The optimal lags for the ADF tests were selected based on optimising Akaike's information Criteria AIC, using a range of lags. We use the Eviews soft ware to estimate this value.
Source: IMF, 2012

The analysis of the first differenced variables shows that the ADF test statistics for all the variables are less than the critical values at 5% levels (Table 1). The results show that all the variables are stationary after differencing once, suggesting that all the variables are integrated of order I(1).

ARDL and ECM

The ARDL models are models formed by an autoregressive part plus a regression with distributed lags over a set of other variables. Put differently, an ARDL model regresses a variable over its own past plus the present and past values of a number of exogenous variables (Fabozzi et al., 2006). The ARDL method does not involve pre-testing variables, which is particularly problematic in the unit root-cointegration literatures where the power of the unit root tests is typically very low and there is a switch in the distribution function of the test statistics, therefore, obviating uncertainty (Narayan, 2004). In other words, the ARDL approach to testing for the existence of a relationship between variables in levels is applicable regardless the underlying regressors are purely I(0), purely I(1), or mixed.

Without having any prior information about the direction of the long-run relationship among the variables, the ARDL approach to cointegration

involves estimating the conditional error correction (EC) version of the ARDL and its model in this study is divided into three models:

$$\Delta lngdp_t = \alpha_1 + \sum_{i=1}^{m} \beta_i \Delta lngdp_{t-i} + \sum_{i=1}^{m} \gamma_i \Delta lnfin_{t-i} + \delta_1 lngdp_{t-i} + \delta_2 lnfin_{t-i} + \delta_3 gfcf_{t-i} + \varepsilon_t \qquad (1)$$

$$\Delta lnfin_t = \alpha_1 + \sum_{i=1}^{m} \vartheta_i \Delta lngdp_{t-i} + \sum_{i=1}^{m} \theta_i \Delta lnfin_{t-i} + \delta_1 lngdp_{t-i} + \delta_2 lnfin_{t-i} + \delta_3 gfcf_{t-i} + \varepsilon_t \qquad (2)$$

$$\Delta gfcf_t = \alpha_1 + \sum_{i=1}^{m} \psi_i \Delta gfcf_{t-i} + \sum_{i=1}^{m} \varphi_i \Delta lnfin_{t-i} + \delta_1 gfcf_{t-i} + \delta_2 lnfin_{t-i} + \delta_3 \ln gdp_{t-i} + \varepsilon_t \qquad (3)$$

where:

lngdp: natural logarithm of real gdp.

lnfin: natural logarithm of Islamic banks' total financing.

gfcf: gross fixed capital formation.

The F-statistic is the underlying statistic for testing the existence of the long-run relationship. When long-run relationship (cointegration) exists, F-statistic test indicates which variable should be normalized. This F-statistic is in a generalized Dickey-Fuller regression, which is used to test the significance of lagged levels of the variables in a conditional unrestricted equilibrium correction model (Pesaran et al., 2001).

Having found a long-run relationship (cointegration), equations (1)-(3) are estimated using the following ARDL (p, q) model:

$$lngdp_t = \alpha_1 + \sum_{i=1}^{m} \beta_1 lngdp_{t-i} + \sum_{i=0}^{n} \beta_2 lnfin_{t-i} + \omega_t \qquad (4)$$

$$lnfin_t = \alpha_1 + \sum_{i=0}^{m} \beta_1 lngdp_{t-i} + \sum_{i=1}^{n} \beta_2 lnfin_{t-i} + \omega_t \qquad (5)$$

$$gfcf_t = \alpha_1 + \sum_{i=1}^{m} \beta_1 gfcf_{t-i} + \sum_{i=0}^{m} \beta_2 lnfin_{t-i} + \omega_t \qquad (6)$$

The orders of the lags in the ARDL model are selected by the Akaike information criterion (AIC) and the Schwartz Bayesian criterion (SBC) before the selected model is estimated by ordinary least squares (OLS). After that, we reconfirm the lag by checking lag-length criteria and the

correlogram of residuals from unrestricted VAR using the selected lag. Lag length which minimizes AIC-SBC and showed by the lag-length criteria as well as insignificant residual's correlogram probability of unrestricted VAR is selected. Narayan (2004) argues that the estimates obtained from the ARDL approach to cointegration are unbiased and efficient given the fact that: it can be applied to studies that have a small sample, such as the present study; it estimates the long-run and short-run components of the model simultaneously, removing problems associated with omitted variables and autocorrelation; and the ARDL method can distinguish between dependent and independent variables. In the presence of cointegration for ARDL equations (1)-(3), short-run elasticity can also be derived by constructing an ECM of the following forms:

$$\Delta lngdp_t = \alpha_1 + \sum_{i=1}^{m} \beta_1 \Delta lngdp_{t-i} + \sum_{i=0}^{n} \beta_2 \Delta lnfin_{t-i} + \psi ECT(-1) + \Theta_t \qquad (7)$$

$$\Delta lnfin_t = \alpha_1 + \sum_{i=0}^{m} \beta_1 \Delta lngdp_{t-i} + \sum_{i=1}^{n} \beta_2 \Delta lnfin_{t-i} + \psi ECT(-1) + \Theta_t \qquad (8)$$

$$\Delta gfcf_t = \alpha_1 + \sum_{i=1}^{n} \beta_1 \Delta gfcf_{t-i} + \sum_{i=o}^{m} \beta_2 \Delta lnfin_{t-i} + \psi ECT \ (-1) + \Theta_t \qquad (9)$$

where:

Δ : the first difference of the operator.

β's : coefficients relating to the short-run dynamics of the model's convergence to equilibrium.

ψ : measures the speed of adjustment.

Error term with lagged parameter (ECT) is an adaptive parameter measuring the short-term dispersal from long-term equilibrium. In short-run, the variables may disperse from one to another which will cause system in equilibrium. Hence, the statistical significance of the coefficient associated with ECT provides us with evidence for an EC mechanism that drives the variables back to their long-term relationship.

Variance decomposition

Variance decomposition (VDC) serves as a tool for evaluating the dynamic interactions and strength of causal relations among variables in the system. The VDC indicates the percentages of a variable's forecast error variance attributable to its own innovations and innovations in other variables. Thus, from the VDC, we can measure the relative importance of Islamic financial development in accounting for fluctuation in growth and business activity variables.

Granger causality test

Engle and Granger (1981), note that if two time-series variables are not cointegrated there may be unidirectional or bidirectional Granger causality in the short-run. Short-run causality is determined by test on the joint significance of the lagged explanatory variables, using an F-test or Wald test. The traditional practice in testing the direction of causation between two variables has been to use the standard Granger causality test (i.e. pair wise Granger causality tests for bivariate time-series). As an alternative, the short-run Granger causality can be tested by the Wald test.

Under the Wald test, the maximum likelihood estimate of the parameters of interest is compared with the proposed value, with the assumption that the difference between the two will be approximately normal. Typically the square of the difference is compared to a chi-squared distribution. The Block Exogeneity Wald test in the VAR system provides chi-squared statistics of coefficients on the lagged endogenous variables, which are used to interpret the statistical significance of coefficients of the regressors. In this way, Wald test statistics can be used to find out the Granger causal effect on the dependent variable. In the VAR system, Granger causality is done to glimpse the short-run causality running from independent variables to a dependent variable, using asymptotic t-statistics that follow chi-squared distribution instead of F distribution. The hypothesis in this test is that the lagged endogenous variable does not Granger causes the dependent variable.
Before testing the long-run relationship between Islamic banks' financing and the proposed variables, we run the Granger causality test among those variables and the result is reported in Table 2. From this test, we found a relationship between Islamic banks' financing and

growth (GDP). However, as displayed in equations (1) and (2), we are still encouraged to run both direction of relationship between Islamic banks' financing and growth.

Table 2: Granger causality test (Indonesia)

	F-statistics [P-value]			t - statistics
Dependent variable	$LnGDP$	$LnFIN$	$GFCF$	ECM_{t-1}
$LnGDP$	-	0.675(0.236)	-	-0.22(0.021)
$LnFIN$	5.322(0.021)	-	2.314(0.082)	-0.16(0.031)
$GFCF$	-	1.012(0.112)	-	-

Table 3: Granger causality test (Iran)

	F-statistics [P-value]			t - statistics
Dependent variable	$LnGDP$	$LnFIN$	$GFCF$	ECM_{t-1}
$LnGDP$	-	0.524(0.352)	-	-0.25(0.035)
$LnFIN$	4.251(0.031)	-	2.519(0.131)	-0.15(0.042)
$GFCF$	-	0.922(0.135)	-	-

The empirical results reported in Table 2 show that there is a distinct short-run and long- run unidirectional causal flow from $LnFIN$ to economic growth.

The short-run causality from $LnFIN$ to economic growth is supported by the F-statistic in the economic growth equation, which is statistically significant. The long-run causal flow, on the other hand, is supported by the lagged error-correction term in the economic growth function, which is negative and statistically significant as expected. The results also show that economic growth is not Granger-causes Ln FIN. The long-run causality, on the other hand, is supported by the coefficient of the error-correction term, which is negative and statistically significant in the economic growth function as expected.

The next step is estimating the long-run relationship in equations (1)-(3). The combination of the smallest value of AIC-SBC, lag-length criteria

technique and observation towards insignificant correlogram of residuals from unrestricted VAR are used to determine the optimal number of lags to be included in the model. The lag length chosen is 1 for all equations.

The cointegration relationship between [GDP, FIN and GFCF] is examined using the ARDL bounds testing procedure. Two steps are used in this procedure. In the first step, the order of lags on the first differenced variables in equations (1) - (3) is obtained from the unrestricted models - using the Akaike Information Criterion (AIC) and the Schwartz- Bayesian Criterion (SBC). In the second step, we apply bounds F-test to equations (1) – (3) in order to establish whether there exists a long-run relationship between the variables under study. The results of the bounds test are reported in Table 4.

Table 4: Bounds F-test for Cointegration

Dependent variable	Function		F-test statistic			
$\Delta InGFCF$	CFC (GDP, FIN)		5.251^{***}			
$\Delta InGDP$	GDP(FIN, GFCF)		2.355			
$\Delta InFIN$	FIN(GDP, GFCF)		4.681^{***}			
Asymptotic Critical Values						
	1%		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Pesaran et al (2001), p. 300, Table CI(ii) Case II	4.24	5.21	3.89	3.94	2.75	3.28

Note: *** denotes statistical significance at the 1% level.

The results reported in Table 3 show that there is evidence of cointegration when GDP and FIN are taken as a dependent variable, but not when CFC is taken as a dependent variable. This is supported by the calculated F statistic, which is found to be statistically significant in GDP and FIN equations but not in the GFCF equation.

The overall F-statistic shows that the null hypothesis of no cointegration between Islamic banks' financing and the two variables tested is rejected in various level of significant and therefore, there is evidence of the long-run relationship between Islamic financial development and economic performance of Iran and Indonesia. However, we find evidence that economic growth also important for the development of

Islamic financial system. Therefore, the relationship between Islamic financial development and growth appears to be bi-directional in Iran and Indonesia.

Given the results from the cointegration tests, ECM based causality test is conducted for all equations and the ECM results are presented in Table 3. The ECM coefficients for all equations tested are significant and negatively correlated. This shows the evidence of causality in at least one direction. The overall ECM coefficients indicate low rate of convergence to equilibrium. The positive significance of Islamic financial depth coefficients in equations (1) and (3) support the view that Islamic financial development could positively affect the economic growth and business activity.

The result of VDC is displayed in Table 5 and 6. From Table 5, VDC substantiate the significant role played by Islamic financing depth in accounting for fluctuations in Iran economic growth and investment. After 10 years horizon, while the fraction of Islamic financing forecast error variance attributable to variations in growth is 37.96 percent, the fraction of income and investment forecast error variance attributable to variations in the Islamic financial deepening are 60.25 and 1.77 percent, respectively.

Table 5- Variance decomposition in Iran

Variance Decomposition of growth: Period	S.E.	growth FIN	INV	growth
1	0.005034	100.0000	0.000000	0.000000
2	0.008279	93.26622	0.042632	6.691148
3	0.011451	79.35250	0.114892	20.53261
4	0.014998	69.30703	0.367730	30.32524
5	0.018260	61.87366	0.753789	37.37255
6	0.021223	55.39407	1.125239	43.48069
7	0.024010	49.98583	1.383585	48.63059
8	0.026605	45.40000	1.563380	53.03662
9	0.029019	41.41817	1.694026	56.88780
10	0.031290	37.96274	1.778169	60.25909

From Table 6, VDC substantiate the significant role played by Islamic financing depth in accounting for fluctuations in Indonesia economic growth and investment. After 10 years horizon, while the fraction of Islamic financing forecast error variance attributable to variations in growth is 32.59 percent, the fraction of income and investment forecast error variance attributable to variations in the Islamic financial deepening are 56.60 and 10.80 percent, respectively.

Table 5- Variance decomposition in Indonesia

Variance Decomposition of growth: Period	S.E.	FIN	INV	growth
1	0.004943	100.0000	0.000000	0.000000
2	0.007942	95.13987	0.042005	4.818125
3	0.010488	82.08506	0.204025	17.71091
4	0.013215	70.63403	0.970971	28.39500
5	0.015722	59.45482	3.201557	37.34362
6	0.018116	50.93684	4.659504	44.40366
7	0.020410	45.01222	6.226080	48.76170
8	0.022607	39.97836	7.911583	52.11005
9	0.024700	35.95653	9.331504	54.71196
10	0.026747	32.59245	10.80059	56.60696

5. Conclusion

Many studies had been conducted to see the link and impact of financial development upon economic growth. In term of the role of financial deepening towards economic growth, studies had found that at least three direction appeared:

(1) finance drives growth;

(2) growth drives finance; and

(3) bi-directional.

However, despite the extensive studies done in direct relationship between financial deepening and economic growth within the conventional financing framework, studies conducted within the Islamic financial framework are limited. This paper finds evidence that in the long-run, Islamic financial development is positively and significantly correlated with economic growth and capital accumulation. In this regard, domestic financing provided by Islamic banking sector has been found to contribute to the growth of the Indonesian economy. In other words, Islamic banking has shown to be effective as financial intermediaries that facilitate the transmission of funds from surplus households to deficit households. However, unlike earlier studies, the relationship between Islamic financing and growth in Indonesia is bi-directional indicating the development in Islamic banking stimulates growth and at the same time, growth propels Islamic banking development in Iran and Indonesia.

Our results support that current as well as past changes in Islamic banks' financing have significant impact on the changes in income in these countries. It is clear for these countries in general that in short run Islamic banks' financing is an important ingredient for economic development. The results generally show that in the long run, Islamic bank's financing is positive and significantly correlated with economic growth and capital accumulation of these countries. In this regard, Islamic banking has effectively played its main role as financial intermediaries that facilitate the transmission of saving from surplus households to deficit households. Furthermore, results show the reliability and contribution of Islamic banking to the real economic sectors of these countries specifically economic growth and capital accumulation. These results reveal that improvement of the Islamic financial system in these countries may benefit economic development and it is important in the long run for economic welfare.

This interesting finding provides a number of implications. First, the Indonesian Government should continue to promote Islamic banking as it has shown to benefit the economy. This can be done by setting a target ratio of Islamic banking assets to total banking assets to be achieved by a certain year as was done in Malaysia. Currently the ratio is 2.8 percent and it should be set at a reasonably high percentage in order to make

Islamic banking more impactful to the economy. As a corollary to this, the government needs to encourage and promote the establishment of more Islamic commercial banks, Islamic windows, and Islamic rural banks whilst at the same time encourage existing Islamic banks to establish more branches. In addition, allowing foreign Islamic banks to operate in Iran and Indonesia can also help to foster more innovation in the domestic Islamic banking industry. Second, as the number of Islamic banks and Islamic financial institutions increases, there is also a need to have sufficient skill manpower to manage these institutions. There is a need to relook at the current regulations and guidelines in order to bring it at par with the development of Islamic banking worldwide. For example, the judiciary must have a dedicated unit to handle Islamic banking legal cases should it go to the court for adjudication. Finally, as the relationship is found to be bi-directional, Islamic banking will not be able to contribute fully to economic growth if the economy is not growing well, hence a positive economic growth will help spur Islamic banking growth further.

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