

ISLAMIC FINANCE DEVELOPMENT AND ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM TURKEY

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Abstract

This work is a study on Islamic finance development and economic growth nexus for Turkey. It employs the econometric methods of unit root, co-integration, and Granger causality in a VECM framework; and the results, which are robust to all measures of Islamic finance development, show a unidirectional short and long run causality from Islamic finance development to economic growth. Hence, it is recommended that policy makers increase their efforts in promoting Islamic finance in Turkey.

Keywords: Islamic finance development, Granger causality, Turkey

İSLAMİ FİNANSAL GELİŞME VE İKTİSADİ BÜYÜME: TÜRKİYE İÇİN UYGULAMALI BİR ÇALIŞMA

Özet

Bu çalışma Türkiye’de İslami finansal gelişmeyle iktisadi büyüme arasındaki bağı araştırmaktadır. Çalışmada, VECM çerçevesi içinde ekonometrik birim kök, eş-bütünleşme ve Granger nedensellik metodları kullanılmaktadır. Elde edilen sonuçlara göre kısa ve uzun dönemde İslami finansal gelişmeden iktisadi büyümeye doğru tek taraflı bir nedensellik vardır ve sonuçların hepsi İslami finansal gelişme ölçümlerinin hepsi için güçlüdür. Dolayısıyla, politika karar alıcıları Türkiye’de İslami finansal gelişimi daha fazla desteklemelidirler.

Anahtar Kelimeler: İslami finansal gelişme, Granger nedensellik, Türkiye

1. Introduction

Turkey is one of those countries that have recently made a significant stride in economic growth and development. In the last decade or so, the Turkish economy enjoyed a significant growth emanating from stable and prudent macroeconomic management, supported by a stable political regime which results in remarkable changes in the socio-economic conditions of the country. In the same period, the country’s niche Islamic finance sector has increase considerably. While the contribution of finance to development is well

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documented in both theoretical and empirical works, in developed and emerging economies like Turkey, the impact of Islamic finance development has not been studied widely.

Furthermore, the numbers of banks operating solely sharia compliance products and those conventional banks operating Islamic windows have both increased. It is against this back drop that, in this work, we seek to investigate the contribution of the Islamic finance sector to the overall economic development of Turkey, taking a near sample as a proxy.

In a separate development, the great recession of 2007-2010 has shown that countries that have a significant share of the Islamic finance in their financial sector were able to have resilience to shocks from the crisis and the impact of the recession was not hard felt in those countries. In fact, after the recent great recession, the world has come to realize the potential that Islamic finance has to offer, in terms of stability and growth promoting functions of a financial system.

Given the parallel development of significant growth and upsurge in the number and size of Islamic banks in Turkey, one is prompted to believe that the economic success of Turkey in the recent past can be attributed to, among others, the rise in Islamic finance in the country. However, such a claim or conjecture needs to be confronted with empirical evidence before such a statement can be given any credit.

At this juncture, it is noteworthy that there are existing studies that seek to explore the relationship between finance and growth. However, either those studies did not explore the differing impacts on the conventional and Islamic banks or that they only considered the conventional banking sector.

In this paper, we are interested in ascertaining the relationship between economic growth or measure of real economic activity and Islamic finance development indicators. We, in other words, want to know whether Islamic financing development has any causal relation with economic growth, for example, as a measure of real economic activity. Such a causal relationship can be unidirectional from Islamic finance development to economic growth or vice versa, bi-directional from either sides to the other, or no causal relationship. In addition, we are also interested in knowing such a relationship broken down to short and long run relationships. Is such a relationship significant or not?

This study seeks to show the contribution of the Islamic finance sector in Turkey, and hence the needed policy direction that will strengthen such a contribution. This is paramount especially when monetary policy experts are struggling to meet up policy challenges in the face of a dual financial system, where certain challenges of monetary policy transmission mechanism theoretically do not work with Islamic banks.

This study, on a broader perspective, will show what muscles Islamic finance has to offer in the fight against economic underdevelopment, taking a case study of Turkey. This study is restricted to Turkey from the period 2005M12 to 2015M11.

2. Literature Review

2.1. Theoretical Background

One of the first theoretical works in the field of finance-growth nexus is Schumpeter (1912), where his famous supply-leading hypothesis was proposed. He contends that financial institutions provide funding to entrepreneurs with high growth prospects; and since high prospects industries usually require huge investment, and the future cash flows will be higher compared to the current cash flows in such industries, they require huge external funding. This is where financial institutions play the needed role. By funding such industries, financial institutions start a process that multiplies production in the economy. In addition, in Rajan and Zingale (1998), industries with natural lag between investment opportunities and cash flow will have a great need for external financing and therefore will flourish in countries that have a deepened financial sector.

In King and Levine (1993) information acquisition of financial institutions is emphasized. In emerging and less developed economies, where information acquisition can be a problem, financial institutions can, through their price signaling mechanism and allocation of resources to special venture minimize this problem and lead to better investment decisions, hence promoting growth in those economies. Moreover, the model of De la Fuente and Marine (1998) show that entrepreneurs, in an urge to avoid risky project, tend to prefer low rewarding but less risky projects, which suggest that industries with high risky investments (and highly rewarding) will tend to be large in countries with well-developed financial system.

By devoting their resources to monitoring entrepreneurs, financial institutions contribute to ‘creating’ success stories and not just picking the winners. This is the essence of Blackburn and Hung (1998) model of the financial sector.

There is the demanding-following hypothesis that economic growth causes finance development, which is contrary to the supply-leading hypothesis. Prominent researchers like Robinson (1952) and Friedman and Schwartz (1963) show that causation runs from the financial development to economic growth.

The critique of Lucas, (1988) claims that the role of finance is over emphasized. This is considered to be the ‘independent hypothesis’, that growth is not affected by finance.

In addition, the theoretical notion of a feedback effect exists, where both finance and growth cause each other, and this is known in literature as the feedback hypothesis. In terms of causality, feedback hypothesis is shown by a bi-directional causality from finance to growth and from growth to finance, lending support to both the supply-leading and demand- following hypotheses. Moreover, the dynamics of finance-growth nexus along the different stages of development of a country is explained in a hypothesis put forward by

Patrick, H. (1966). According to this hypothesis, a country in its initial stages of development needs a developed financial sector to fund investment and facilitate trading in promoting growth; a case of supply-leading hypothesis. However, as the country develops the demand for variety of products and services- including financial services- increase, and so demand-following hypothesis becomes prevalent in the late stage.

Much of what is discussed above has to do with the conventional banking, where interest rate charges form the basis of business. While it is the convention in the literature to superimpose the same theoretical underpinning of the above theory on Islamic finance effect on growth, it is our views that, given the vast difference between Islamic financing and the conventional banking, the theoretical effects of Islamic financing on growth may not match one to one; after all, it is with the expectation of such differences that we seek to conduct this study.

In Kouten and Nedra, (2012), the potential of Islamic financial intermediation in promoting growth is explored through its effect in mitigating ex-post and ex-ante asymmetric information maladies that characterize financial intermediation. Accordingly, this role of Islamic participative intermediation in affecting growth works through the following effects.

- Reduction of informational and transaction costs and efficiency of saving-investment process:

In conventional finance, intermediation arise as a result of agency problems between entrepreneurs and savers, asymmetric information, and transaction costs. A conventional bank solves asymmetric information problems by signaling at lower cost, information production by taking advantage of economies of scale, guarantee credibility, better monitoring, and providing solutions to market imperfection through providing liquidity following shocks to consumers' consumption. In Islamic intermediation how is asymmetric information solved?

The profit and loss sharing (PLS) provides a stronger information signal than the short run financing. Islamic banks by participating in the business have access to more important information that would otherwise not be available. They can better collect information at a lower cost, due to integration of the business world. Since the reward of the bank and its depositors are attached through the PLS they do a more accurate evaluation than the normal credit scoring. In addition, unlike the standardized credit scoring strategy of conventional banks, PLS financing of Islamic banks require complex and case by case specific evaluations.

Monitoring cost is reduced in PLS financing from the fact that the bank participates in the company, and as a result they have control over the performance of firms than their counterpart conventional banks. In short, the close relationship that exists between them allows the banks to monitor, acquire information flow and share risks (McCauley and Zimmer, 1989). Moreover, in Musharaka, banks depend on the board of directors of the

customer, which allows for monitoring at a lower cost; however, in Mudarabah, where the bank takes a passive role, the cost of monitoring may be significant. In long term PLS financing, supervision cost is greatly reduced due to reputation gathered over time.

In summary, Islamic financing, especially Musharakah, solves the information asymmetric problem in financial intermediation than its counterpart conventional banking does, and hence leads to a more efficient way of mobilizing savings and saving rates, maximize resource allocation by eliminating the mismatched between surplus and deficient sectors of the economy, and increase the share of savings channeled to investment. It also improves the marginal social productivity of investments and directs investment towards the productive sectors. An increase in investment further increases Islamic banking, because investment is determined by real investment and not by credit multiplier, as in the conventional banking system.

- Risk management and the stimulation of innovation:

The problems associated with transaction costs and asymmetric information have been reduced, if not overcome by the great improvement in information technology, and hence banks are now concerned with how to reduced participation cost and improve risk management.

Islamic banks, by nature, are involved in risk sharing, which allows them to manage and redistribute risk to guarantee stability and minimize exposure to bankruptcy. They discourage excessive risk taking and also distribute risk between the depositor, the bank and the entrepreneur, unlike the conventional banks where risk is bore by the bank through inter-temporal risk smoothening, or the use of derivatives. Therefore, PLS financing stimulates an increase in new projects in the productive sector, help increase capital and boost technological innovation. When risk is collectively shared, it increases the rate of new and innovative firms and hence promotes business growth. PLS financing-through its better risk evaluation and choice of winning projects, development of loyalty in customers, and an efficient risk management- reduces risks and therefore promotes technological progress and economic growth.

2.2. Empirical Literature

Several empirical studies have explored finance-growth relation, but few works have been done in the area of Islamic finance development and growth. Tabash, and Dhankar (2014) analyzed Islamic finance and economic nexus for United Arab Emirates, employing data from 1990 to 2010, and found a positively significant causality from Islamic finance development to economic growth, supporting the Schumpeter supply-leading hypothesis. In their study, they also found a bi-directional causality between Islamic finance and foreign direct investment. Meanwhile, Oqool, et al (2014) studied the case of Jordan, using both a financing and a deposit model, utilizing data that spans 1980-2012, and found that Islamic banks financing has a significant positive impact on economic

growth in Jordan. They, however, show that the Islamic banks deposit does not cause growth, which they ascribed to the excess liquidity problem of the Islamic Banks.

In earlier studies, Furqani, and Mulyany (2009), using the empirical methods of co-integration and VECM for Malaysia during 1997:1 to 2005:4, found that in the short run only fixed investment granger causes Islamic finance, but in the long run a bi-directional relation exist between Islamic banks and fixed investment. In their study they did not find any evidence that support the demand-following hypothesis between Islamic finance and GDP growth.

In an unbalanced panel of 16 MENA countries, using GMM estimation of dynamic panels, Goaid, and Sassi (2010) found a significant positive relation between Islamic finance, measured by the amount of credit given to the private sector, and economic growth in the panel of countries. However, in some specifications, they found a negative relation between Islamic finance and growth in these countries.

In a study examining the effect of financial development on economic growth from both conventional and Islamic finance perspective for Turkey, Asutay and Ergec (2013) shows that both the conventional and Islamic finance has contributed to economic growth for Turkey between 2005 and 2012.

In a more recent panel data study by Imam and Kpodar (2015) of low and middle income countries, they found a significant evidence of Islamic finance spurring growth in these economies, even after controlling for various determinants, including financial depth. However, in another panel study of 19 countries between 2000 to 2013, Tunay (2016) found no direct causality from Islamic banks' financing to economic growth, but a unidirectional relation moving from Islamic banks' financing to gross fixed capital formation.

3. Methods and Procedures

3.1. The Model

In line with Furqani, and Mulyany (2009) and Oqool et al. (2014), we construct two models of Islamic finance development and economic growth for Turkey, where the FINC and DEPT are used to measure Finance development.

Financing Model

$$\begin{aligned} LNRGDP_t &= \alpha_0 + \alpha_1 LNFINC_t + \varepsilon_t \\ LNFINC_t &= \beta_0 + \beta_1 LNRGDP_t + \varepsilon_t \end{aligned} \tag{1}$$

Deposit Model

$$\begin{aligned} LNRGDP_t &= \delta_0 + \delta_1 LNDEPT_t + \varepsilon_t \\ LNDEPT_t &= \gamma_0 + \gamma_1 LNRGDP_t + \varepsilon_t \end{aligned} \quad (2)$$

Where LNRGDP is the natural log of real GDP, LNDEPT is the natural log of total deposits, and LNFINC is the natural log of banks' financing.

3.2. Unit Roots Analysis

To avoid a scenario of a spurious regression and help us choose the right model, we formally run a stationarity test on our variables using Augmented Dickey Fuller test (Dickey and Fuller, 1979). Based on the result of the unit root test are variables is described I (d) where d is the order of integration. The standard ADF test follows

$$\Delta LNRGDP_t = \omega_0 + \omega_1 LNRGDP_{t-1} + \theta t + \sum \omega_2 \Delta LNRGDP_{t-i} + \mu_t \quad (3)$$

Where the lagged difference term of the series, $\sum \omega_2 \Delta LNRGDP_{t-i}$, takes care of possible autocorrelation in the residuals; it is the addition over the Dickey-Fuller, which does not correct for autocorrelation in the residuals. The ω_0 and θt represent the deterministic and the trend in the data generating processes.

The number of augmented lags (p) is determined by minimizing the Schwartz Bayesian Information (SBC). Alternatively, the lag is determined by the starting at sufficiently large enough lags and dropping until the last lag is statistically significant. The Akaike Information Criterion and Schwartz Information Criterion are based on the equations

$$AIC(n) = \log \delta_\mu^2(n) + (2/T)n \quad \text{and} \quad SBC(n) = \log \delta_\mu^2(n) + (\log T/T)n \quad \text{respectively.}$$

Where n is the order of the AR process, T is the sample size and $\log \delta_\mu^2(n)$ is the error variance estimator. The elimination factors are $(2/T)n$ and $(\log T/T)n$ for AIC and SBC respectively.

The ADF is left-skewed and hence the hypothesis

$$H_0: \omega_1 = 0 \text{ (unit root)} \quad H_0: \omega_1 < 0 \text{ (stationary)}$$

Once a series is found to have a unit root in the level in its correct DGP, then it is difference 'd' times, and called an integrated series, I(d). In fact, Engle and Granger (1987) define a non-stationary time series to be integrated of order d if it achieves stationarity after being differentiated d. times. This notion is usually denoted by $X_t \sim I(d)$.

However, to establish the correct data generating process, the H_0 is constructed under three null hypotheses: with drift and deterministic trend as above, with only drift, or without drift and deterministic trend.

3.3. ARDL Co-integration Analysis

In recent times ARDL Bound testing methodology has become common and attracted the attention of researchers investigating long run relationship among variables, due to its ability to return both short run and long run multipliers, while the order of integration of the variable does not matter; that is either the variables are pure I (0) or I (1) or fractionally integrated. The ARDL specification of the unrestricted error correction model for the Islamic finance and economic growth relationship can be presented below.

Financing Model

$$\Delta LNRGDP_t = a_0 + a_1 LNRGDPT_{t-1} + a_2 LNFINC_{t-1} + \sum a_{3i} \Delta LNRGDP_{t-i} + \sum a_{4i} \Delta LNFINC_{t-i} + \mu_t \quad (4)$$

$$\Delta LNFINC_t = b_0 + b_1 LNFINC_{t-1} + b_2 LNRGDP_{t-1} + \sum b_{3i} \Delta LNFINC_{t-i} + \sum b_{4i} \Delta LNRGDP_{t-i} + \psi_t \dots\dots\dots$$

Deposit Model

$$\Delta LNRGDP_t = c_0 + c_1 LNRGDPT_{t-1} + c_2 LNDEPT_{t-1} + \sum c_{3i} \Delta LNRGDP_{t-i} + \sum c_{4i} \Delta LNDEPT_{t-i} + \omega_t \quad (5)$$

$$\Delta LNDEPT_t = d_0 + d_1 LNDEPT_{t-1} + d_2 LNRGDP_{t-1} + \sum d_{3i} \Delta LNDEPT_{t-i} + \sum d_{4i} \Delta LNRGDP_{t-i} + \varphi_t \dots$$

Consequently, we estimate the above equation by OLS estimation and test for the long run co-integration by conducting a joint F-test of significance of the coefficients of the lagged level variables. Specifically, the null hypothesis $H_0: a_1 = a_2 = 0$, $H_0: b_1 = b_2 = 0$, denote the F(LNRGDP/LNFINC) and F(LNFINC/LNRGDP) respectively and the null hypotheses $H_0: c_1 = c_2 = 0$, $H_0: d_1 = d_2 = 0$ are for the F(LNRGDP/LNDEPT) and F(LNDEPT/LNRGDP) respectively.

The computed F-statistics is compared to the critical lower and upper bound values produce in Pesaran et al (2001) are non-standard test and hence the lower bound and upper bound critical values are provided by Pesaran et al (2001), where Lower bound assumes all variables are I (0) and upper bound assumes all variables are I (1).

The decision rule is that if the F-statistics exceed the critical upper bound value, then the null hypothesis of no co-integration is rejected; if the F-statistics is below the critical lower value, then the null hypothesis of no co-integration is accepted; but if the F-statistics falls between the critical lower and upper values, then knowledge of the order of integration is required or else it's inconclusive (Pesaran et al, 2001).

3.4. VECM and Granger Causality Analysis

The granger causality concept was developed by Granger, wherein if two variables are co-integrated, and each individually integrated of order one, then either one variable cause the other or both causes each other, if the past values of one help predict the changes in current values of the other variable.

Assuming the presence of co-integration among the variables in the financing and deposit models, then VECM framework can be used to show granger causality between the variables, by regressing the lag deference of one variable and the error term on the lag difference of the other, vice versa.

A VECM representation of the two models can be presented below.

Financing Model

$$\begin{aligned}\Delta LNRGDP_t &= \gamma_0 + \sum \gamma_{1i} \Delta LNRGDP_{t-i} + \sum \gamma_{2i} \Delta LNFINC_{t-i} + \delta_1 ECT_{t-i} + \mu_t \\ \Delta LNFINC_t &= \partial_0 + \sum \partial_{1i} \Delta LNFINC_{t-i} + \sum \partial_{2i} \Delta LNRGDP_{t-i} + \delta_2 ECT_{t-i} + \mu_t\end{aligned}\quad (6)$$

Deposit Model

$$\begin{aligned}\Delta LNRGDP_t &= \varphi_0 + \sum \varphi_{1i} \Delta LNRGDP_{t-i} + \sum \varphi_{2i} \Delta LNDEPT_{t-i} + \delta_3 ECT_{t-i} + \mu_t \\ \Delta LNDEPT_t &= \theta_0 + \sum \theta_{1i} \Delta LNDEPT_{t-i} + \sum \theta_{2i} \Delta LNRGDP_{t-i} + \delta_3 ECT_{t-i} + \mu_t\end{aligned}\quad (7)$$

An indication of long run causality is when the error correction terms ($\delta_1, \delta_2, \delta_3, \text{ and } \delta_4$) are found to be negatively significant in each of the models. If the error correction term is negatively significant and between zero and one, then the system is stable in the long run and there is convergence. The significance of the individual coefficients indicates a short run causal effects and the direction of causality, which can be ascertained through the Wald test on the joint significance of the lagged variables. That is the statistical significance of the $\gamma_{2i}, \partial_{2i}$ indicates causality running from LNFINC to LRGDP and LNRGDP to LNFINCE respectively. Similarly, the statistical significance of φ_{2i} and θ_{2i} indicate causality in the deposit model.

4. Results of the Econometric Analysis

4.1. Data and Descriptive Statistics

This study relies on a secondary data set collected from BDDK website on Islamic banks credit to the private sector (FINC) and total Islamic banks' deposit (DEPT). Detailed description of each variable is given below.

Real GDP:

Islamic Finance, as we have mentioned above, is a new industry that started in Turkey in the recent past. Therefore, we are careful in choosing our sample to be able to capture the true Islamic finance effect. Taking the annual data would restrict us to a very small sample size; hence we resorted to using monthly data from 2005 December- 2015 November.

The monthly industrial production index-denoted IPI- for Turkey is used as a measure of real output for the period 2005 December to 2015 November. After taking its log we called it LNIP. All variables are seasonally adjusted using Census X-12.

Islamic Financial Development Variables:

We used three measured of Islamic financial development, namely: the deposit of the Islamic banks, the credit to households, and credit to the private sector, and denoted as DEPT, FINCHH, and FINCP respectively. Their nominal values were extracted from... and monthly CPI was used to turn them into real variables. After taking their logs, we called them LNDEPT, LNFINCHH, and LNFINCP respectively.

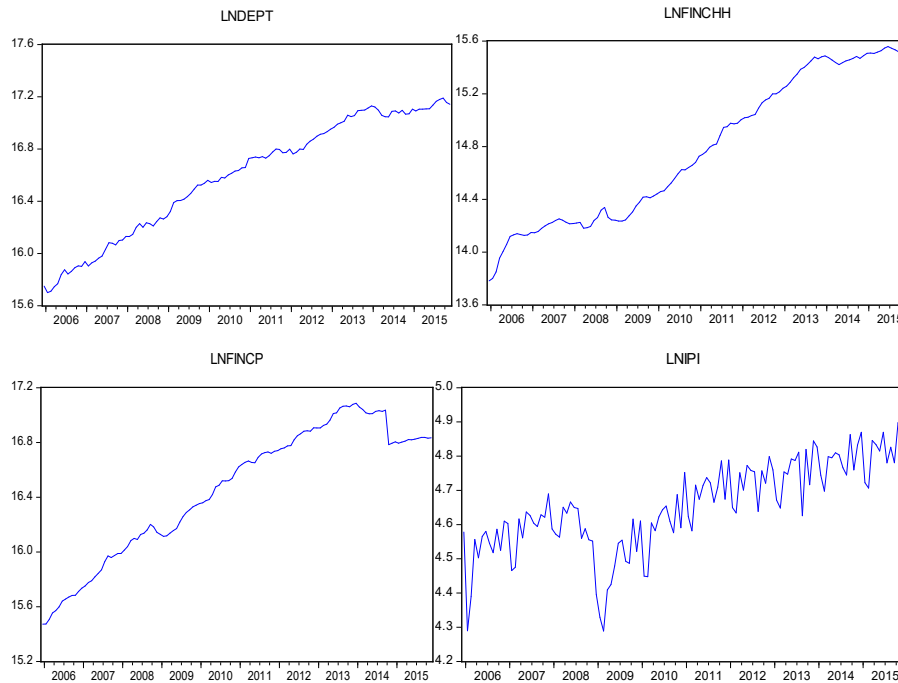
Data on real income, proxied by the industrial production index; real Islamic banks' credit to the private sector, and the households; and real deposit of Islamic banks for Turkey from 2005 December to 2015 November, constitute a time series of 120 observations. IPI and Real Debt are normal, with mean and median almost the same. As expected the credit to private sector is more than that to households alone, with a range of more than 4.7M and 21M lira for real FINCHH and real FINCP respectively.

Table1: Descriptive Statistics

	IPI	Real DEBT	Real FINCHH	Real FINCP
Mean	105.9188	17592215	3002407.	15524078
Median	104.4650	17774034	2430729.	16238596
Minimum	72.89000	6580507.	967015.1	5244158.
Maximum	133.9900	29188775	5711703.	26336345

A graphical inspection of the variables indicates that, like most macroeconomic variables, our variables show trend, which will have impact on the identification of the unit root process. While real deposit and credit to household consistently show robust growth under the period of consideration, the real credit to private sector fell sharply since 2014. Finally, the LNIPI looks to be comparatively more volatile.

Figure 1: Variable Trends



4.2. Stationarity Test

To avoid any possibility of a spurious regression, we present below the results of the unit root test of stationarity by making use of the Augmented Dickey Fuller Method. The stationarity tests of levels, as well as the first difference, of the series are shown. We make sure that no I (2) variables is included. As the tables indicate, we can safely refer to our series as I (1) variables, assuming that LNIPI follows no trend and intercept, as shown by the graphical analysis.

The unit root analysis show that our variables are integrated of order one, if we assume a trend in our variables as the visual inspection show, and no variable is integrated of order two. Hence we can safely make use of the bound testing method.

Table 2: Unit Root Table

Variable	Model	Test Stats (Level)	Test Stats (Diff)	ADF Critical Value 1%	ADF Critical Value 5%
IPI	None	1.254	-2.098*	-2.586	-1.943
	Intercept	-0.633	-3.233*	-3.493	-2.888
	Int. & Tr	-2.001	-3.560*	-4.046	-3.452
DEPT	None	5.5**	-8.505**	-2.584	-1.943
	Intercept	-2.205	-10.737**	-3.486	-2.886
	Int. & Tr	-0.66	-11.314**	-4.037	-3.448
FINCP	None	4.027**	-8.305**	-2.584	-1.943
	Intercept	-3.145*	-9.258**	3.486	2.886
	Int. & Tr	0.058	-10.076**	-4.037	-3.448
FINCHH	None	3.230*	-5.155**	-2.584	-1.943
	Intercept	-1.413	-6.301**	-3.486	-2.886
	Int. & Tr	-1.485	-6.411**	-4.0376	-3.448

4.3. Bound Testing and Causality

4.3.1. Deposit Model

Using Eviews 9 package, we allow an automatic selection for the optimal lags based on AIC, after feeding with maximum lags of 12 given that we have a monthly data. The table below shows the optimal lags selection for the ARDL models in each case.

Table3: Bound Test Result (Deposit Model)

Deposit Model				
Relationship	F-statistics	Lower Bound	Upper Bound	Selected Model
F(lndept/lnipi)	2.73	4.94	5.73	ARDL(1,1)
F(lnipi/lndept)	8.14	4.94	5.73	ARDL(2,3)

Accordingly, there is a co-integration when real income is taking as the dependent variable, given that the f-statistics is greater than the upper bound of 5.73.

According to granger representation theory, when two variables are co-integrated, there exist a causality between them, at least in one direction. Hence, in the framework of vector error correction (VECM) we find out the co-integration relationship between the variables. Both the short run and the long run causality results are presented below.

Table 4. Results of Granger Causality (Deposit Model)

Dependent Variable	$\Delta \ln ipi_t$	$\Delta \ln dept_t$	ECT_{t-1} (t-statistics)
$\Delta \ln ipi_t$	-	20.5220* (0.00)	-0.296* (-3.746)
$\Delta \ln dept_t$	2.21224(-0.139)	-	- 0.044 (-1.776)

In the short run causality results, based on a F-test, show causality running from Islamic financial development, as measured by LNDEPT, to real output at 5% level of significance. A probability value of 0.00 is too low. However, no short run causality runs from real output to Islamic financial development, given a probability value of 0.13, which is high.

In the same vein, the result for the long run is indicative of causality running from Islamic financial development to real output. The EC term has a t-statistics of -3.746 which is higher than -1.96 for 5%. This is a case in support of supply-leading hypothesis, that Islamic finance plays a significant role in the economy of Turkey.

The result also indicates that no long run causality runs from real output to Islamic finance development. An EC of -0.044 (-1.766) is not in support of causality at 5% level of significance. It is however, useful to note that we allow for some lenience to increase the significance level to 10%, this result also is indicative of causality from real output to Islamic financial development, measured by real deposits.

To motivate, compare and contrast our findings from the deposit model, we construct other measures of Islamic financial development from, what we called, the financing model. The real credit to household and to private sector (LNFINCHH and LNFINCP) from Islamic banks and real output relation is shown below.

4.3.2. Financing Model

In both cases we choose a lag of 2 as advice by SC and HQ information criteria.

Table 5: Result of Bound Test (Financing Model)

Relationship	F-statistics	Lower Bound	Upper Bound	Selected Optimal Model (AIC)
F(lnfinch/lnipi)	2.079	4.94	5.73	ARDL(2,4)
F(lnipi/lnfinchh)	9.57	4.94	5.73	ARDL(2,4)
F(lnfincp/lnipi)	5.1	4.94	5.73	ARDL (1,4)
F(lnipi/lnfincp)	6.26	4.94	5.73	ARDL (2,1)

Taking either LNFINCHH or LNFINCP as our chosen measure of Islamic finance, there is co-integration between financial development and output when output is taken as the dependent variable, but no co-integration is reported when we take either LNFINCHH or LNFINCP as the dependent variable.

Invoking the granger representation theorem, we investigated the direction of causality between our choice variables, in both the short run and the long run, in VECM framework. The results are identical to that found in the deposit model. The tables, showing the results for the short run and long run causalities, are shown below.

Table 6: Granger Causality Results (Financing Model)

Dependent Variable	$\Delta \ln ipi_t$	$\Delta \ln dept_t$	ECT_{t-1}
$\Delta \ln ipi_t$	-	8.333* (0.00)	-0.491* (-4.919)
$\Delta \ln finchh_t$	1.547 (0.217)	-	-0.045 (-1.495)

Dependent Variable	$\Delta \ln ipi_t$	$\Delta \ln incp_t$	ECT_{t-1}
$\Delta \ln ipi_t$	-	3.296* (0.046)	-0.292* (-3.577)
$\Delta \ln incp_t$	0.843 (0.436)	-	-0.049 (-1.389)

The table clearly shows that in the short run there is causality from Islamic finance development to economic growth, but not in the other direction. In the long run, the same direction of causality is preserved: a unidirectional causality runs from Islamic finance development to real output, at 5% level of significance.

Therefore, the results that we found are robust to all measures of financial development across time. That is to say, whether we take deposit or the financing model, our finding is still in support of the supply-leading hypothesis of (Schumpeter, 1912) that Islamic finance promotes growth in Turkey.

5. Conclusion and Recommendation

As shown in the section above, our findings show a unidirectional causality from Islamic finance to economic growth, in both short and long run. This is in line with (Tabash, M and Dhankar. R., 2014), (Oqool, M et al., 2014) and (Imam, P and Kpodar, K., 2015) all of whom found a positively significant unidirectional causality running from Islamic finance to economic growth. (Halicioglu. F, 2008) studied financial development and economic growth nexus for Turkey, without making any distinction between Islamic and conventional financial development, and found a long run bi-directional causality and no short run causality effects. Comparing to our finding, it shows that Islamic finance, by its nature of participatory approach to financing, has an almost immediate effect on

economic growth, and hence our finding of a short run causality, in addition to the long run effects.

Therefore, policy makers should put more efforts into promoting Islamic finance in Turkey. As our results show, channeling funds to both households and private enterprises will promote growth in Turkey. Authorities should encourage more Islamic banks and the opening of Islamic finance windows for the many conventional banks in existence. In addition, a more deregulation of the sector is highly recommended.

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