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# Islamic Banking and Financial Development

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**Abstract:** Abstract With the growing number of Islamic banks worldwide, much ink has been spilled on heated debate about its merits and ability to improve the financial sector. In order to buttress the subject matter of this debate, this paper investigate the link between Islamic banking assets share and the financial development. Using five different proxies of financial development from 22 countries for the period between 2000 and 2013, this research employs the generalized method of moments to cope with the endogeneity problem, and concludes that the share of Islamic banking is positively associated with the banking sector activity as measured by private credit. The competition of banking sector intensifies in countries with higher Islamic bank shares resulting in smaller net interest margin, whereas the structure of the financial sector does not change. A financial sector index composite regression showed that in general, financial development is positively linked to the Islamic banking presence. These findings provide empirical evidence that Islamic banking presence benefits financial development in Muslim countries.

**Keywords:** Islamic finance, Islamic banking presence, financial development, GMM, PCA

## 1 Introduction

Islamic banking (IB) is developing at an impressive pace and, for almost 5 decades since its inception, this industry accounts for more than 300 institutions worldwide operating in over 60 countries and keeps exploring new markets to tap new niches and post high growth rates. Numbers show that assets of IB – also called Sharia-compliant banking or participation banking – grew at 17.6% annually between 2009 and 2015 outpacing their conventional counterpart, and are still set to increase at a compound annual growth rate of 9.8% between 2016

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and 2020. Today, sharia-compliant finance has grown into a global industry with assets of roughly \$2trillion, mostly made of assets in Islamic banks or conventional banking's Islamic windows, *Sukuk* (the IB bonds), sharia-compliant investment funds and *takaful* (IB insurance).<sup>1</sup>

Islamic banks operate according to Sharia teaching and therefore, attract devout Muslims who abjure the financial system in the absence of IB for religious reasons. Consequently, IB can increase the size of the financial systems with increasing deposits, credits and intensified competition inside the financial system, these factors altogether, accordingly, contribute to the development of the financial system. Recently, Muslim and non-Muslim countries have started to permit IB's operation, moreover, conventional banks can also offer IB windows as part of their operations.

The presence of this new banking system received contradictory opinions, ranging from those who confirm its ability to foster the financial development to those who are skeptical. In his seminal work, Bagehot (1873) asserts that banks must carefully assess borrowers' creditworthiness and risk in order for the bank to properly conduct the financial intermediation and foster the economic growth, which is also one of the pillars of Islamic banks requiring the risk sharing between depositor and borrower, thereby minimizing the moral hazard. As a result, funds will be channeled toward more profitable, innovative and prudent projects (Siddiqi 1999). The literature of IB has been dominated by extensive works discussing the theoretical aspects of the IB model and explaining the zero interest rate tenet, profit and loss sharing principal and the prohibition of engaging in highly risky or *unethical* investments and emphasizing the objective of the IB to establish more justice and promote fair play in the financial market (see Hassan 1999; Siddiqi 1999; ElGamal 2000; Hanif 2010 for more details.). Mohieldin et al. (2012) argued that the Islamic financing presence improves the financial inclusion, and thus enlarges the financial deepening. The positive impact of IB is also expected to occur because of risk sharing and the compulsory tax on income – called *zakat* – principals, the first gives an alternative to *riba-based* financing and provide devoted Muslims with an alternative financing and the latter enables a fair distribution of wealth.<sup>2</sup>

This paper aims to assess the impact of IB presence on the financial development of the hosting countries. The research adds to the banking literature since by employing different measures of the financial sector development

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<sup>1</sup> according to World Islamic Banking Competitiveness Report 2014–2015 Ernest & Young report.

<sup>2</sup> *Riba* or Interest based financing is prohibited according to *Sharia*: “God deprives interest of all blessing but blesses charity” 276, and “O believers fear Allah and give up what is still due to you from interest (usury), if you are true believers.” 278, Al Baqarah chapter (2) of Qur'an.

instead of using only the standard financial depth indicator. Given the magnitude of aspects circumscribing the concept of the financial development and for the reasons cited above, this paper makes use of different aspects of the financial development, and therefore, numerous proxies for the financial development are used to capture the banking sector's structure, activity, efficiency and financial deepening. The paper uses data from 20 countries for which complete data about the whole financial sector are available in BvD BankScope dataset and central banks for the period from 2000 to 2013.

Hanif (2012) contrasted Islamic and conventional banking performance in Pakistan using 27 banks and concluded that conventional banks led in terms of liquidity and profitability, whereas, Islamic banks showed better risk management and higher levels of solvency. Beck et al. (2013) argued that Sharia-compliant banks are less efficient in cost management but have better capitalization and higher asset quality. Interestingly, they found that Islamic banks are more crisis-resilient and therefore, show less rate of disintermediation during crises. Along with the work of Hasan and Dridi (2011), this corroborate the findings of Khan and Mirakhor (1990) who defended the ability of Islamic banks to adjust to shocks that can lead to financial crisis. Abduh et al. (2011) concluded that both 1997/1998 and 2007/2008 financial crises showed the Islamic bank to be more resilient and performed better in keeping deposits inflow even during the crises time. Abedifar et al. (2014) assessed the impact of coexistence of the two banking models in 22 countries. Their results show that the presence of Islamic banks hastens the economic growth, improves the financial system and leads to lower credit risk but high cost inefficiency; Lebdaoui and Wild (2016) concluded that the time frame is relevant when assessing the relationship between economic growth and participation banking presence and argued that IB presence fuel economic growth in the long-run but not in the short run. Gheeraert (2014) found that the development of IB contributes significantly to the increase of private credits and bank deposits and therefore the financial development for the period 2000–2005, his study excluded the 2008 financial crisis period though. He argued that Islamic banks can be a good complement to the traditional banking rather than a substitute. Based on a sample of 70 countries for the same period, Gheeraert and Weill (2015) confirmed these conclusions using a stochastic frontier approach where they bring evidence of the positive impact of IB on macroeconomic efficiency. Moreover, they suggested that a nonlinear relationship exists between efficiency and Islamic banks credits by depositors.

Farahani and Dastan (2013) based their cointegration and Granger-causality analysis on quarterly data from nine countries and concluded that IB financing is positively correlated with economic growth and capital accumulation in the

countries under investigation. Other studies could not find empirical evidence of the effectiveness of Islamic banks. Based on data from 18 banking systems, Cihák (2010) found diverging and size-sensitive results; they concluded that large commercial banks are financially stronger than large Islamic banks, whereas small Islamic banks tend to be financially stronger than small conventional banks. They also suggested that the impact of Islamic banks' market share banks is not significant.

Beck et al. (2000) mentioned about the difference in IB regulation across countries and questioned the compliance of some financial institutions to Sharia regulation; he argued that these banks barely relabeled *Islamic* their products without any changes in the content. Aggarwal and Yousef (2000) concluded that Islamic financing is knee to short-term rather than long-run financing. They further studied the instruments given by Islamic banks and found that they adjust to become debt like as a rational response to their environment and they put forth conditions for Islamic financing to enhance the social welfare. Chong and Liu (2009) argued that in practice, Islamic banks are not different than the traditional banks and suggested that the fast growth of Islamic banks is not due to the principals of Sharia-compliant banks but rather to Islamic resurgence worldwide. However, in a descriptive study, Mohieldin et al. (2012) elaborated how products offered by Islamic finance can deal with the financial inclusion issue, and reduce income gap through instruments like *zakat* (the Islamic tax on wealth), *qard hasan* (zero interest benevolent loan for good cause), *sadaqat* (charity) or *waqf* (religious endowment).

This paper aims to empirically assess the impact of IB presence on the development of the financial system. We posit that the presence of Islamic financing may induce higher level of bankarization,<sup>3</sup> drain more deposits and lead to more financing activity in the financial system; on another hand, the competition is expected to intensify and consequently predict a better financial development. Our research enriches this analysis by estimating a principal component analysis (PCA) based composite that captures the overall banking sector development. This paper is organized as follows. Section 2 describes the empirical specification of the methodology and data, results are presented in Section 3 and Section 4 concludes this research paper.

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<sup>3</sup> Bancarization or bankarization is defined as the access to and use of banking services in particular and (Anastasi et al. 2006).

## 2 Empirical Specification

### 2.1 Methodology

We use a panel data regression to cover as much data as possible over the span of 14 years from 2000 to 2013. A dynamic analysis seems more appropriate to allow the dynamic adjustments of the financial sector's development over time. One way to make the model dynamic is to add the lag of the explained variable as dependent variable in the regression. However, this may cause having the autocorrelation and endogeneity issues, which is dealt with using of the generalized method of moments (GMM) (see Arellano and Bond 1991; Arellano and Bover 1995; Blundell and Bond 1998, for more elaborated discussions about the GMM). In our regression equation, the dependent variable captures the level of domestic financial development, whereas the independent variable is the share of Islamic banks assets in total assets with a conditioning set of control variables. The basic model is written as

$$FD_{it} = \alpha + FD_{it-1} + \beta IB_{it} + \gamma CV_{it} + T_t + F_i + \varepsilon_{it} \quad (1)$$

where  $i$  and  $t$  are country and time subscripts,  $FD_{it}$  is the financial development proxy,  $IB_{it}$  is the share of IB assets,  $CV_{it}$  is a vector of control variables and  $T_t$  and  $F_i$  are time-specific effect and country-specific unobserved effects proxies respectively,  $\varepsilon_{it}$  is the error term. The lagged values of the dependent variable  $FD_{it-1}$  are introduced to cope with the endogeneity problem and are source of the equation's dynamic feature. The regression takes into consideration some macroeconomic variables expected to influence the financial development: real GDP growth, government spending, real interest rate, inflation, financial openness, legal origin and institutional quality; these variables are used to control, more explicitly, for financial development coming from the macro-environment as well as the financial sector itself. The financial development is assessed qualitatively and quantitatively. The quantitative dimension of the financial development is captured by the size, the structure and the activity of the financial sector, whereas the net interest margin capture the improvement in the quality of the financial sector.

### 2.2 Data

The share of Islamic banks' assets is calculated as the share of IB sector assets to total assets of the banking sector. The logic followed here is the same as the one

used in the case of the foreign banks presence widely represented in the literature as the share of foreign banks' assets in banking sector's total assets. For the financial development, different proxies are used: The main reason that drives customers to choose the products of Sharia-based banking is the religious convictions, actually, the prohibition of *riba* or trading in money in the financial operations impede Muslims from dealing with conventional banks. The presence of the Islamic banks, especially in Muslim countries, would expand the deposits in the financial system, and, thereby the total assets. This is the ultimate result of the increase of bankarization rate of the total population. Beck et al. (1999) proposed many measures to gauge the domestic financial development of a given country.

Focus is made on the following metrics: **Liquid liabilities** (LL) used to capture the size and activity; it equals the liquid liabilities of the financial system M2 to GDP (see Goldsmith 1969; Levine and Zerves, 1998 for instance). Larger financial depth implies that more funds and resources are available for banks, and therefore, more chances for the financial system to develop. The second proxy **private credits** (CP) is used as a measure of the financial sector's activity and is calculated as private credit by deposit money banks and other financial institutions to GDP. If banks give more credits to the private sector, the financial activity gets enhanced and hence more developed (Levine et al. 2000). As for the **commercial to central bank** (CC) proxy, it is utilized to seize the structure of financial intermediaries; the ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets is used as financial development measure. Mavrotas and Son (2006) consider the relevance of this indicator since the importance of the central banks is sensitive to the income level across countries: The higher the income level, the lower the importance of the central bank in the financial sector. All variables were deflated to remove the impact of inflation.

Using these proxies for the financial development, a new **composite index** (FD) is estimated (following Demetriades and Hussein 1995; Bandiera et al. 2000; Mavrotas and Son 2006) which is to capture different aspects of the financial sector: structure, size and activity. This index is constructed using the first principal component with a linear combination of the financial deepening variables that have maximum variance among all linear combinations and select weights of each component to calculate this index. In this case,  $FD_{1p}$  is defined through coefficients  $e_{11}, e_{12}, e_{13}, \dots, e_{1p}$  in such a way that the variance is maximized, subject to the constraint that the sum of squared coefficients is equal to one.

Using the first PCA,  $FD$  index is computed as follow:

$$FD_{1p} = e_{1p}LL + e_{2p}CC + e_{3p}CP \quad (2)$$

$$\begin{aligned} \text{where we maximize} \quad & \sigma^2(FD_{1p}) = \sum_{k=1}^p \sum_{l=1}^p e_{1k} e_{1l} \sigma_{kl} = e'_1 \Sigma e_1 \\ \text{Subject to} \quad & e'_1 e_1 = \sum_{j=1}^p e_{1j}^2 = 1 \end{aligned}$$

We summarize the variables used in the different regressions as explanatory, explained or conditioning sets in Table 1.

The data set covers 20 countries: Bahrain, Bangladesh, Brunei Darussalam, Egypt, Indonesia, Iran, Iraq, Jordan, Lebanon, Malaysia, Pakistan, Philippines, Qatar, Singapore, Sudan, Syria, Singapore, United Arab Emirates, Palestinian territory and Yemen: countries where the IB asset share is more than 2% as of the end of 2013.<sup>4</sup> Variables included in this paper along with data sources are presented in Table 1, Table 2 presents the correlation matrix. The real interest rate was dropped from our analysis since it shows high correlation with inflation.

### 3 Empirical Results

Both *system* and *two-step* models of GMM are used throughout the following regressions. Each table presents results of the regression for a given proxy of the financial development on the IB share along with a set of the conditioning variables. We start with the first principal component based estimated composite, this index serves as a proxy for the global financial sector's development level and it encompasses the financial market structure (PC), the financial intermediary development (LL) and the size of the financial market (CC).

As reported in Table 3, the financial-development index improves with the increase of the quality of the intermediation of the financial system 0.7084, the increase of the financial sector's size 0.5811 and in a lower proportion, the increase in the financial sector's activity 0.4006. Therefore, the FD stands for financial-development index featured by high-financial deepening and higher intermediation quality.

Empirically, the model that explains the composite index estimated by the principal component analysis method yields positive results as presented in Table 4. For the estimated models with system-GMM and two-step GMM, the statistical significance in the majority of the estimated models may help to

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<sup>4</sup> The share of Islamic banking assets provided by Islamic Financial Service industry stability report (2013), "Islamic financial service board". Other countries with more than 2% Islamic banking share where removed since data of the whole banking sector were not available.

**Table 1:** Financial development Islamic banking diffusion: Variables and sources.

Variables		Definition	Data source
<b>Dependent variables</b>			
Financial deepening	LL	M2 to GDP	International financial statistics
Private credits	PC	Credits to private sector to GDP	International financial statistics
Commercial to central	CC	Commercial bank assets to commercial and central bank assets	International financial statistics
Financial development index	FDI	PCA based financial development index	Authors' calculations
<b>Independent variables</b>			
Islamic banking share	IBS	Share of Islamic banking sector assets to total assets	Autors' calculations based on Bank scope Database and central banks of respectivescountries
<b>Control variables</b>			
Financial openness	KO	Capital openness KaOpen	Index proposed by Chinn and Ito (2008)
Real GDP growth	GDP <sub>g</sub>	Control for the wealth effect (La Porta et al. 1998)	Bloomberg
Inflation <sup>a</sup>	INF	Average variation in the consumer price index, Boyd et al. (1996)	International financial statistics
Trade openness	TRADE	Total export and import to GDP	The World bank
Human capital	HUM	High school enrollment	World bank and UNESCO database
Government size	GOV	Government expenditure to GDP	
Institutional quality	RULELAW	Kauffmann index	World governance index (WGI) Kaufmann et al. (2010)
Legal origin	LO	Dummy variable for legal origin	La Porta et al. (1998)

Note: <sup>a</sup>Variables included as  $\log(1 + \text{variable})$ .

derive some empirical findings. In other words, after controlling for macroeconomic variables, the coefficient of the share of IB is positively linked to the financial development and therefore, higher Islamic bank's share in total assets hastens the financial development. In models where the statistical significance appears, the financial openness is positively associated with the financial



**Table 2:** Correlation matrix.

	IBS	GDP	KO	INF	GOV	TRADE	FDI	HUM	NIM	PC	LL	CC
IBS	1											
GDP <sub>g</sub>	0.15	1										
KO	0.04	-0.14	1									
INF	-0.10	-0.22	0.09	1								
GOV	0.03	0.41	-0.21	-0.16	1							
TRADE	0.12	0.74	-0.07	-0.29	0.26	1						
FDI	0.14	0.41	0.21	0.00	0.33	0.43	1					
HUM	0.06	0.75	-0.15	-0.23	0.43	0.71	0.25	1				
NIM	-0.07	-0.60	-0.01	0.14	-0.05	-0.68	-0.33	-0.53	1			
PC	-0.18	-0.01	-0.05	0.05	-0.37	-0.04	-0.22	0.13	-0.01	1		
LL	0.20	0.48	0.03	-0.33	0.11	0.54	0.40	0.54	-0.48	-0.16	1	
CC	0.02	0.22	0.00	-0.09	0.07	0.32	-0.02	0.25	-0.15	-0.03	0.23	1

KO, Financial openness; GDP<sub>g</sub>, real GDP growth; INF, inflation; Trade, trade openness; FDI, financial development index; HUM, human capital; GOV, government size; LL, financial deepening; NIM, net interest margin; CC, commercial to central bank; PC, private credits; IBS, Islamic banking share.

**Table 3:** Estimation of principal component analysis based financial development composite proportions.

Variable	Liquid liabilities	Commercial to central	Private credits
First component	0.5811	0.7084	0.4006
Second component	-0.5699	0.0028	0.8217
Third component	0.5810	-0.7058	0.4054

development. Inflation is found to be negatively associated with the financial development proxy, which is just in the same veins as Boyd et al.'s (2001) findings. The probability of Hansen (1995) specification test is high enough to fail to reject the null in all models, thus models in Table 4 are well specified and the null of instruments' over-identification is rejected.

Table 5 reports the results of regression of total liquid liabilities on the share of IB share. The aim of this regression is to check for the power of Islamic banks to attract the *hoarded* funds especially in areas where Muslim population's portion is high. The results in Table 5 lack of statistical significance but only Model 6 of the system-GMM estimation shows a statistically significant and positive association between financial development and IB share. An increase of inflation reduces the liquid liabilities level in the financial market, and the

Table 4: Islamic banking share and financial development composite's regression results.

	System-GMM												Two-step GMM	
	1	2	3	4	5	6	7	8	9	10	11	12		
	<b>Independent variable: financial development composite (FD)</b>													
L × FD	0.86*** (0.07)	0.79*** (0.10)	0.73*** (0.13)	0.68*** (0.16)	0.74*** (0.14)	0.62*** (0.21)	0.87*** (0.10)	0.84*** (0.12)	0.75*** (0.05)	0.94*** (0.29)	0.66*** (0.08)	0.56*** (0.17)		
IB share	0.34* (0.19)	0.28* (0.16)	0.14 (0.39)	0.08 (0.42)	0.12 (0.42)	-0.23 (0.84)	0.47** (0.19)	0.15 (0.19)	0.40*** (0.13)	-0.01 (0.48)	0.57*** (0.21)	0.64*** (0.20)		
KO		0.02 (0.05)	0.22** (0.09)	0.31** (0.14)	0.22** (0.10)	0.13 (0.36)		-0.01 (0.05)	0.47*** (0.10)	0.10 (0.26)	0.34*** (0.13)	0.68*** (0.23)		
GDPg			0.14 (0.31)	0.17 (0.29)	0.13 (0.34)	0.14 (0.43)			0.21 (0.13)	-0.20 (0.31)	0.05 (0.15)	0.24 (0.18)		
INF			-3.93** (1.70)	-5.06** (2.34)	-4.08* (2.08)	-6.04* (3.37)			-5.26*** (0.70)	-0.36 (1.91)	-4.82*** (0.78)	-6.28*** (1.08)		
Trade			0.41 (1.16)	0.76 (1.25)	0.38 (1.04)	1.86 (2.63)			-0.25 (0.52)	0.40 (0.65)	0.47 (0.94)	0.54 (1.05)		
FDI			-0.03 (0.19)	-0.06 (0.22)	-0.06 (0.22)	-0.16 (0.29)			-0.06 (0.09)	0.29 (0.28)	0.01 (0.12)	-0.22 (0.20)		
HUM			-2.97 (2.67)	-2.91 (3.06)	-3.31 (3.11)	-2.55 (3.63)			-2.99*** (0.91)	-2.61 (2.77)	-3.70*** (1.11)	-4.74 (3.56)		
GOV			-1.04 (0.79)	-1.25 (0.85)	-0.89 (0.75)	-1.34 (1.08)			-0.81** (0.33)	0.64 (0.89)	-1.38** (0.58)	-2.30* (1.26)		
				-20.61 (19.4)		-49.80 (63.1)			-2.94 (15.1)					

PS				0.04 (0.31)										0.24* (0.14)	0.08 (0.29)
LO							0.27 (0.60)								
Constant	-0.17 (0.11)	-0.13 (0.13)	-1.64 (3.34)	-2.22 (3.22)	-1.06 (4.48)	-2.28 (4.46)	-0.19 (0.14)	-0.02 (0.17)	-2.13 (1.59)	5.52 (4.55)	-1.08 (1.44)	-5.34 (3.53)	0.56		
Hansen	0.64	0.61	0.25	0.39	0.50	0.66	0.49	0.61	0.41	0.68	0.52	0.21			
AR(1)	0.04	0.04	0.07	0.17	0.10	0.29	0.03	0.06	0.06	0.05	0.02	0.21			
AR(2)	0.11	0.74	0.55	0.42	0.45	0.58	0.11	0.74	0.10	0.93	0.23	0.32			

Note: Numbers given in parenthesis are standard deviations of the estimated coefficients. For *t*-statistic \*, \*\* and \*\*\* denote significance at 10 %, 5 % and 1 %, respectively. The null hypothesis of Hansen test is that the instruments are not correlated with the residuals, Hansen test reports the probability of Hansen statistic, hypothesis of the second order correlation test is that the errors in the first-difference regression exhibits no second-order serial correlation. FD, financial development; IB, Islamic banking; KO, financial openness; GDP<sub>g</sub>, real GDP growth; INF, inflation; Trade, trade openness; HUM, human capital; GOV, government size; LO, legal origin; AR(1) and AR(2) are the *p*-values for first and second order autocorrelated disturbances in the first differences equations.

Table 5: Islamic banking share and liquid liabilities regression results.

	System-GMM						Two-step GMM					
	1	2	3	4	5	6	7	8	9	10	11	12
L × LL	1.01*** (0.08)	1.01*** (0.12)	0.93*** (0.09)	0.96*** (0.06)	0.91*** (0.09)	0.90*** (0.12)	0.95*** (0.08)	1.00*** (0.16)	0.70*** (0.07)	0.84*** (0.09)	0.91*** (0.07)	0.76*** (0.13)
IB share	-0.11 (0.11)	-0.08 (0.14)	-0.07 (0.10)	0.04 (0.04)	-0.03 (0.13)	0.11** (0.05)	-0.07 (0.05)	-0.05 (0.12)	-0.03 (0.04)	-0.01 (0.04)	-0.05 (0.09)	0.11 (0.10)
KO		0.00 (0.05)	0.02 (0.05)	0.05 (0.03)	0.01 (0.05)	0.04 (0.06)		-0.00 (0.05)	0.06** (0.03)	-0.01 (0.03)	0.07** (0.03)	-0.06 (0.06)
RGDPpc			-0.06 (0.05)	0.02 (0.03)	-0.04 (0.06)	0.06 (0.06)			-0.22** (0.09)	0.01 (0.03)	-0.10 (0.11)	0.16 (0.17)
INF			-1.01*** (0.16)	-0.79*** (0.14)	-1.03*** (0.16)	-0.75*** (0.20)			-0.88*** (0.10)	-0.90*** (0.08)	-0.74*** (0.09)	-0.98*** (0.11)
TRADE			0.06 (0.10)	-0.05 (0.08)	0.06 (0.08)	-0.16* (0.09)			0.15 (0.12)	-0.00 (0.04)	-0.11 (0.09)	-0.05 (0.11)
FDI			0.03 (0.04)	0.02 (0.02)	0.03 (0.03)	0.04 (0.05)			0.03* (0.02)	0.01 (0.01)	0.05 (0.03)	0.04** (0.02)
HUM			0.07 (0.42)	0.02 (0.44)	0.17 (0.44)	0.57 (0.93)			2.34*** (0.99)	0.18 (0.28)	1.55 (1.09)	-0.78 (1.35)
GOV			0.06 (0.04)	-0.12 (0.07)	0.04 (0.05)	-0.27*** (0.07)			-0.13* (0.07)	-0.09 (0.06)	-0.16** (0.08)	-0.15* (0.08)

RULELAW		-4.75 (5.49)	-6.66 (8.27)		-0.11** (0.04)	-3.34 (6.28)
LO			(0.04)			(0.04)
			-0.09 (0.06)			-0.17 (0.12)
Constant		1.11* (0.62)	-0.19 (0.52)	0.96 (0.59)	0.23 (0.33)	0.02 (0.60)
					1.69** (0.70)	0.44** (0.22)
Hansen test		0.50 (0.32)	0.02 (0.32)	0.34 (0.34)	1.00 (0.32)	1.00 (0.32)
AR(1)		0.01 (0.17)	0.03 (0.03)	0.10 (0.10)	0.06 (0.06)	0.20 (0.20)
AR(2)		0.56 (0.56)	0.50 (0.50)	0.50 (0.50)	0.34 (0.34)	0.58 (0.58)
					0.28 (0.28)	0.28 (0.28)

Note: Numbers given in parenthesis are standard deviations of the estimated coefficients. For *t*-statistic \*, \*\* and \*\*\* denote significance at 10 %, 5 % and 1 %, respectively. The null hypothesis of Hansen test is the instruments that are not correlated with the residuals, Hansen test reports the probability of Hansen statistic, hypothesis of the second order correlation test is that the errors in the first-difference regression exhibits no second-order serial correlation. LL, liquid liabilities; FDI, financial development index; KO, financial openness; IB, Islamic banking; INF, inflation; HUM, human capital; LO, legal origin; Trade, trade openness; GOV, government size; RGDPpc, Real GDP per capita; RULELAW, rule of law index; AR(1) and AR(2) are the *p*-values for first and second order autocorrelated disturbances in the first differences equations.

government spending increase leads to deterioration of the available liquid assets. The size of the financial openness is positively correlated with the activity of the financial market, thus opening up the financial sector to foreign funds boosts the financial activity. Economic and statistical inference might be done using both system and difference-GMM estimators when regressing credits to private to IB share along with the conditioning set as presented in Table 6. The regressions with consistent and significant coefficients show a positive impact of Islamic banking share (IBS) on the financial sector. The trade openness does not seem to be relevant and is negatively signed but not statistically significant. Results of the net interest margin models are reported in Table 8 and show a negative and statistically coefficients coefficients. Therefore, increasing the share of Islamic banks in countries under investigation leads to higher competition in the banking sector and therefore lower interest and interest margins. The selected models are statically significant and show both Hansen over-identification specification and AR(2) probabilities significant at 10%. commercial to central bank regression results are reported in Table 7. Unfortunately, no statistical significance is found in coefficients of Islamic banks share and the other controlling variables' signs confirm results found in the previous models; one way to explain this finding is that given that the share of Sharia-based banking is still very low, and consequently, the insignificant presence of Sharia based banking is far away from being capable of switching the structure of the whole financial sector.

These results suggest that IB costumers are depositors rather than creditors since the Sharia-compliant banks presence influences the size of the financial sector and improves the competition inside the financial market but does not significantly affect the financial structure and the financial activity in general.

Our empirical results provide support for the view that opening the financial system to the IB entry does provide an alternative way of banking that improves access to financial services, ameliorate banking sector competition and further deepens the financial sector. The significant control variables have the expected signs; financial openness coefficient is positively and strongly significant, the more a country is open financially, the more funds are expected to flow in and the large is the financial market, this finding confirm the findings of Bayraktar and Wang (2008). Trade openness does not follow the same logic, and is rather negatively linked to the liquid assets. As for inflation, inflationary periods adversely affect the financial development and thus expected to deteriorate the liquid assets' availability. As we previously mentioned, higher inflation rates decrease the available liquid liabilities and hence dampens the financial development in general. This finding is just in line with Kim and Lin (2010) and therefore rejects the hypothesis of the positive effect presumed by English

Table 6: Islamic banking share and private credits regression results.

	System-GMM						Two-step GMM					
	1	2	3	4	5	6	7	8	9	10	11	12
L x PC	0.36** (0.14)	0.54*** (0.15)	0.92*** (0.25)	0.70*** (0.10)	0.93*** (0.29)	0.94*** (0.31)	0.80*** (0.19)	0.79*** (0.16)	-0.54*** (0.15)	0.28*** (0.08)	-0.56*** (0.20)	-0.62*** (0.20)
IB share	0.59* (0.33)	0.67* (0.33)	0.34 (0.92)	0.38 (0.22)	0.34 (1.13)	0.40 (1.10)	0.37 (0.26)	0.23 (0.27)	0.47 (0.34)	0.59 (0.43)	1.37** (0.62)	0.00 (0.54)
KO			-0.42 (0.35)	-0.09 (0.11)	-0.42 (0.45)	-0.43 (0.37)		0.04 (0.15)	0.40 (0.35)	-0.03 (0.13)	0.76 (0.57)	0.97** (0.40)
GDP <sub>g</sub>			-0.01 (0.12)	0.06 (0.08)	-0.01 (0.14)	0.07 (0.25)			-0.02 (0.20)	0.01 (0.10)	-0.11 (0.16)	-0.19 (0.43)
Inflation			-1.44 (2.51)	-0.45 (0.97)	-1.59 (3.71)	-1.93 (3.36)			-1.37 (1.90)	-1.06 (0.83)	-6.17* (3.18)	-3.55 (3.12)
TRADE			0.49 (1.04)	0.04 (0.38)	0.50 (1.10)	0.57 (1.27)			-0.66 (0.91)	-0.03 (0.46)	-0.68 (0.46)	0.90 (2.08)
FDI			0.18 (0.28)	0.07 (0.15)	0.18 (0.26)	0.20 (0.28)			-0.05 (0.24)	-0.05 (0.11)	-0.11 (0.21)	-0.40 (0.36)
HUM			0.61 (3.57)	2.83* (1.36)	0.59 (4.10)	0.61 (3.88)			2.53 (2.78)	0.62 (0.77)	5.45*** (1.76)	-3.60 (9.09)

(continued)

Table 6: (continued)

	System-GMM											Two-step GMM	
	1	2	3	4	5	6	7	8	9	10	11	12	
GOV		0.09 (0.43)	-0.61** (0.25)	0.11 (0.36)	0.06 (0.55)				-1.69*** (0.49)	-1.17*** (0.32)	-2.39** (1.03)	-1.64 (1.03)	
RULELAW			-29.89 (36.8)		-15.96 (50.2)					19.72 (20.2)		-2.06 (1.61)	
LO					-0.20 (0.49)							-0.59 (0.94)	
Constant	2.57*** (0.76)	1.72** (0.81)	1.13 (2.33)	-1.52 (1.52)	1.19 (2.30)	0.93 (3.00)	0.69 (0.93)	0.82 (0.80)	1.58 (2.28)	-0.06 (1.11)	-1.83 (2.15)	5.81 (7.13)	
Hansen test	1.00	0.98	0.52	0.99	0.48	0.56	0.42	0.34	0.97	1.00	0.72	0.55	
AR(1)	0.02	0.03	0.15	0.29	0.35	0.34	0.12	0.04	0.83	0.37	0.59	0.46	
AR(2)	0.18	0.18	0.58	0.35	0.58	0.80	0.81	0.23	0.39	0.31	0.69	0.36	

Note: Numbers given in parenthesis are standard deviations of the estimated coefficients. For *t*-statistic \*, \*\* and \*\*\* denote significance at 10 %, 5 % and 1 %, respectively. The null hypothesis of Hansen test is that the instruments are not correlated with the residuals, Hansen test reports the probability of Hansen statistic, hypothesis of the second order correlation test is that the errors in the first-difference regression exhibits no second-order serial correlation. PC, Private credits; KO, financial openness; IB, Islamic banking; GDP<sub>o</sub>, real GDP growth; TRADE, trade openness; FDI, financial development index; HUM, human capital; GOV, government size; LO, legal origin; RULELAW, rule of law index; AR(1) and AR(2) are the *p*-values for first and second order autocorrelated disturbances in the first differences equations.



Table 7: Islamic banking share and commercial to central regression results.

	System-GMM												Two-step GMM		
	1	2	3	4	5	6	7	8	9	10	11	12	Independent variable: CC		
IBS	0.78*** (0.12)	0.52*** (0.17)	0.67*** (0.08)	0.56*** (0.13)	0.53*** (0.13)	0.52*** (0.13)	0.62 (0.40)	0.55*** (0.12)	0.84*** (0.04)	0.60*** (0.16)	0.59*** (0.19)	0.53*** (0.10)	0.59*** (0.19)	0.60*** (0.16)	0.53*** (0.10)
KO	0.13 (0.13)	-0.04 (0.14)	0.12 (0.11)	-0.06 (0.18)	0.02 (0.07)	-0.05 (0.18)	-0.12 (0.40)	-0.03 (0.18)	0.02 (0.03)	0.09 (0.11)	0.07 (0.22)	-0.01 (0.11)	0.07 (0.22)	0.09 (0.11)	-0.01 (0.11)
RGDPpc		0.04 (0.03)	0.05 (0.07)	0.08 (0.07)	0.12 (0.08)	0.04 (0.07)		0.03 (0.04)	0.04 (0.03)	0.01 (0.12)	0.14 (0.11)	0.07* (0.04)	0.14 (0.11)	0.01 (0.12)	0.04 (0.04)
INF		0.00 (0.05)	0.00 (0.07)	0.07 (0.07)	0.05 (0.07)	0.01 (0.08)		0.01 (0.08)	-0.05 (0.03)	0.06 (0.11)	0.06 (0.13)	0.04 (0.06)	0.06 (0.13)	0.06 (0.11)	0.04 (0.06)
TRADE		-0.14 (0.17)	-0.14 (0.17)	-0.82 (0.48)	-0.94* (0.51)	-0.77 (0.51)		-0.77 (0.51)	-0.26*** (0.13)	0.10 (0.73)	-1.20* (0.59)	-1.09** (0.46)	-1.20* (0.59)	0.10 (0.73)	-1.09** (0.46)
FDI		0.08 (0.09)	0.23 (0.14)	0.02 (0.14)	0.19 (0.12)	0.24 (0.16)		0.24 (0.16)	0.07 (0.10)	0.25* (0.13)	0.18 (0.21)	0.20* (0.11)	0.18 (0.21)	0.25* (0.13)	0.20* (0.11)
HUM		0.02 (0.03)	0.02 (0.02)	0.02 (0.02)	0.01 (0.03)	0.02 (0.03)		0.02 (0.03)	0.04*** (0.01)	-0.08 (0.06)	0.03 (0.03)	0.03 (0.02)	0.03 (0.03)	-0.08 (0.06)	0.03 (0.02)
GOV		-0.37 (0.37)	-0.37 (0.46)	-0.66 (0.46)	-0.60 (0.36)	-0.11 (0.63)		-0.11 (0.63)	-0.22 (0.17)	-1.28** (0.47)	-0.48 (0.48)	0.00 (0.32)	-0.48 (0.48)	-1.28** (0.47)	0.00 (0.32)
		-0.20 (0.12)	-0.48*** (0.16)	-0.48*** (0.15)	-0.48*** (0.15)	-0.52** (0.19)		-0.48*** (0.15)	-0.06 (0.07)	0.02 (0.21)	-0.54** (0.23)	-0.63*** (0.15)	-0.54** (0.23)	0.02 (0.21)	-0.63*** (0.15)

(continued)

Table 7: (continued)

	System-GMM						Two-step GMM					
	1	2	3	4	5	6	7	8	9	10	11	12
RULELAW			-7.86 (9.33)		-5.82 (8.71)					3.06		-10.10 (6.80)
LO					0.11 (0.09)					(10.95)		0.12** (0.05)
Constant	0.90 (0.55)	2.10** (0.80)	1.21** (0.56)	0.94 (1.04)	0.97 (0.86)	1.10 (0.99)	1.74 (1.90)	1.99*** (0.58)	1.25*** (0.25)	1.74 (1.67)	0.49 (1.66)	0.57 (0.83)
Hansen test	123	117	116	117			0.67	0.55	0.82	0.67	0.35	0.20
AR(1)	0.55	0.55	0.98	0.23	0.42	0.20	0.89	0.26	0.19	0.30	0.19	0.14
AR(2)	0.05	0.04	0.26	0.11	0.09	0.13	0.98	0.31	0.32	0.30	0.44	0.37

Note: Numbers given in parenthesis are standard deviations of the estimated coefficients. For  $t$ -statistic \*, \*\* and \*\*\* denote significance at 10 %, 5 % and 1 %, respectively. The null hypothesis of Hansen test is that the instruments are not correlated with the residuals, Hansen test reports the probability of Hansen statistic, hypothesis of the second order correlation test is that the errors in the first-difference regression exhibits no second-order serial correlation. CC, Commercial to central; IBS, Islamic banking share; KO, financial openness; INF, inflation; TRADE, trade openness; FDI, financial development index; HUM, human capital; GOV, government size; LO, legal origin; RULELAW, rule of law index; RGDPpc, Real GDP per capita; AR(1) and AR(2) are the  $p$ -values for first and second order autocorrelated disturbances in the first differences equations.

Table 8: Islamic banking share and net interest margin regression results.

	System-GMM						Two-step GMM					
	1	2	3	4	5	6	7	8	9	10	11	12
L × NIM	0.82*** (0.12)	0.55*** (0.17)	0.27 (0.30)	0.49** (0.20)	0.42* (0.20)	0.48** (0.20)	0.74*** (0.16)	0.83*** (0.17)	0.40* (0.22)	0.58*** (0.11)	0.47*** (0.08)	0.55*** (0.12)
IBS	-1.41** (0.56)	-2.79*** (0.97)	-0.87 (1.01)	-2.49 (1.65)	-2.60** (1.17)	-2.55 (1.60)	-1.49* (0.74)	-1.27 (1.02)	-2.97*** (0.86)	-1.15 (0.74)	-2.03*** (0.45)	-1.09 (0.73)
KO		-0.24 (0.31)	0.69 (0.76)	0.38 (0.97)	-0.04 (0.90)	0.31 (0.95)		-0.01 (0.27)	-0.59 (0.54)	0.06 (0.40)	-0.62 (0.43)	0.10 (0.47)
RGDPpc			-1.12 (1.71)	-0.61 (1.53)	-0.95 (1.04)	-0.50 (1.64)			0.09 (0.39)	-1.75 (1.26)	-1.46** (0.62)	-1.38 (1.32)
INF			2.38 (4.53)	-1.72 (3.29)	1.10 (3.83)	-0.99 (3.51)			-2.45 (1.45)	-0.56 (2.57)	1.81 (1.78)	-1.19 (2.48)
TRADE			2.64 (1.55)	0.61 (2.13)	1.21 (2.05)	0.46 (2.18)			2.41*** (0.65)	2.99** (1.35)	2.78** (1.18)	2.84** (1.35)
FDI			-0.47 (0.50)	-0.28 (0.24)	-0.26 (0.22)	-0.37 (0.33)			-0.75*** (0.13)	-0.12 (0.10)	-0.31*** (0.09)	-0.26 (0.15)
HUM			-7.28 (9.91)	-4.44 (9.36)	-4.26 (7.28)	-4.79 (9.72)			-4.40 (3.67)	1.86 (7.39)	-1.38 (5.22)	-0.89 (7.65)

(continued)

Table 8: (continued)

	System-GMM												Two-step GMM		
	1	2	3	4	5	6	7	8	9	10	11	12	Independent variable: NIM		
GOV			4.48 (3.34)	2.77 (2.35)	2.04 (2.06)	2.88 (2.30)			1.34 (1.20)	2.49** (1.02)	0.74 (0.85)	2.62** (1.23)			
RULELAW			28.93 (79.4)			40.16 (74.9)				51.30 (52.9)		46.51 (56.2)			
LO						-0.41 (0.92)						-0.59 (0.45)			
Constant	1.44** (0.69)	3.52*** (1.03)	24.18 (21.1)	15.52 (13.9)	18.07 (11.6)	15.13 (14.5)	1.70 (1.02)	1.31 (1.21)	6.29 (6.03)	20.85*** (8.80)	17.98*** (4.25)	19.71* (9.52)			
Hansen test	0.64	0.54	0.83	0.33	0.60	0.39	0.55	0.52	0.39	0.33	0.60	0.39			
AR(1)	0.30	0.55	0.49	0.55	0.55	0.70	0.91	0.36	0.51	0.94	0.52	0.88			
AR(2)	0.64	0.65	0.65	0.86	0.51	0.78	0.65	0.71	0.79	0.55	0.96	0.78			

Note: Numbers given in parenthesis are standard deviations of the estimated coefficients. For  $t$ -statistic \*, \*\* and \*\*\* denote significance at 10%, 5% and 1%, respectively. The null hypothesis of Hansen test is that the instruments are not correlated with the residuals, Hansen test reports the probability of Hansen statistic, hypothesis of the second order correlation test is that the errors in the first-difference regression exhibits no second-order serial correlation. NIM, Net interest margin; IBS, Islamic banking share; KO, financial openness; INF, Inflation; TRADE, trade openness; FDI, financial development index; HUM, human capital; GOV, government size; LO, legal origin; RULELAW, rule of law index; RGDPpc, Real GDP per capita; AR(1) and AR(2) are the  $p$ -values for first and second order autocorrelated disturbances in the first differences equations.

(1996). The crowding out effect takes place in our models since the government's spending is negatively correlated to the financial development; furthermore, we join the no-relationship postulate between economic growth and financial development advanced by Lucas (1988). When legal origin proxy is added to the regression's right side, results show statistically insignificant coefficients, implying the non-relevance of the legal origin to the financial development; this result held through different models specifications and therefore we cannot confirm La Porta et al.'s (1998) legal-origin hypothesis.

## 4 Conclusion

The IB industry gained more popularity in both Muslim and non-Muslim countries in recent decades. Academics controversies arose with the dispersion of IB in respect of their ability to stimulate financial development. Proponents of IB bring forward the argument that banks are able to mobilize; otherwise, unprofitable hoarded funds owned by Muslim segments of the population, critics, on the other hand, argue that there is no real contribution of IB to financial development. To our knowledge, this is the first empirical study to explore the impact of Islamic bank on the financial development using multiple dimensions of financial development. We investigate the link between IB and financial development while coping with the endogeneity problem caused by the dynamic feature of lagged-dependent-variable models and unobserved country-specific effects. The scope of our research covers 20 countries where IB along with conventional banks operate during the period 2000–2013.

The results indicate that, when significant, the qualitative financial development proxies receive a positive impulse from the presence of IB share in both, system- and two-step GMM models and enhance financial deepening and the banking sector's activity by stimulating private credits, which confirms our expectation that Islamic banks can tap funds previously excluded from the financial market because of religious motives. These non-bancarized potential customers constitute a niche to be exploited by IB institutions. The increase of the share of sharia-compliant banking sector induces more people to join the banking sector, increases deposits of the banking system in general, and the financing activities in particular; the improvement of financial development may also suggest the existence of a complementarity between Islamic and conventional banking.

However, no significant relationship is evident in the case of financial sector's structure as proxied by assets of central to commercial banking. The

share of IB assets in the financial sector is yet too small to make structural change and a threshold effect may be present implying that statistically significant effects arise only when IB's share reaches a certain level. Future research may shed light on the determination of this threshold. Further, the results show that significance improves when the PCA financial development composite is used as financial development proxy and a positive relationship is hence observed, i. e. IB presence stimulates financial development in our sample. The qualitative component of the financial development – expressed as net interest margin – improves with IB presence and thereby results on a better technical quality of the financial services as well. Meanwhile, the results also provide an insight at the behavior of macroeconomic and bank-specific variables: Inflation, for instance, negatively influences financial development, while financial openness improves financial development.

Our results should encourage policymakers who may be reluctant to open up the financial sector to Islamic banks, to rethink and change their conservative attitudes, especially in countries with significant share of Muslim population. The results further confirm the role of IB in stimulating the financial development, and policy makers are encouraged to allow the operation of Islamic banks and go one step forward by allocating more resources and efforts to the establishment of a regulatory framework that encompasses and enhances IB institution's well functioning.

## References

- Abduh, M., M. A. Omar, and J. Duasa. 2011. "The Impact of Crisis and Macroeconomic Variables Towards Islamic Banking Deposits." *American Journal of Applied Sciences* 8 (12):1413–18.
- Abedifar, P., I. Hasan, and A. Tarazi. 2014. "Finance-Growth Nexus and Dual Banking System: Relative Importance of Islamic Banks." Working Papers hal-01065676, HAL.
- Aggarwal, R. K., and T. Yousef. 2000. "Islamic Banks and Investment Financing." *Journal of Money, Credit and Banking* 32 (1):93–120.
- Anastasi, A., E. Blanco, P. Elosegui, and M. Sangiácomo. 2006. Bancarization and determinants of availability of banking services in Argentina.
- Arellano, M., and S. Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies* 58 (2):277–97.
- Arellano, M., and O. Bover. 1995. "Another Look at the Instrumental Variable Estimation of Error-Components Models." *Journal of Econometrics* 68 (1):29–51.
- Bagehot, W. 1873. *Lombard Street: A Description of the Money Market*. London: Henry S. Kind and Co.

- Bandiera, O., G. Caprio, P. Honohan, and F. Schiantarelli. 2000. "Does Financial Reform Raise or Reduce Saving?." *The Review of Economics and Statistics* 82 (2):239–63.
- Bayraktar, N., and Y. Wang. 2008. "Banking Sector Openness and Economic Growth." *Margin: The Journal of Applied Economic Research* 2 (2):145–75.
- Beck, T., A. Demirgüç-Kunt, and R. Levine. 2000. "Financial Intermediation and Growth: Causality and Causes." *Journal of Monetary Economics* 16 (1):31–77.
- Beck, T., A. Demirgüç-Kunt, and O. Merrouche. 2013. "Islamic Vs. Conventional Banking: Business Model, Efficiency and Stability." *Journal of Banking & Finance* 37 (2):433–47.
- Beck, T., R. Levine, and N. Loayza. 1999. Finance and the Sources of Growth.
- Blundell, R., and S. Bond. 1998. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics* 87 (1):115–43.
- Boyd, J. H., R. Levine, and B. D. Smith. 1996. Inflation and Financial Market Performance.
- Boyd, J. H., R. Levine, and B. D. Smith. 2001. "The Impact of Inflation on Financial Sector Performance." *Journal of Monetary Economics* 47 (2):221–48.
- Chinn, M. D., and H. Ito. 2008. "A New Measure of Financial Openness." *Journal of Comparative Policy Analysis* 10 (3):309–22.
- Chong, B. S., and M. -H. Liu. 2009. "Islamic Banking: Interest-Free or Interest-Based?" *Pacific Basin Finance Journal* 17:125–44.
- Cihák, M. and Hesse, H. (2010). "Islamic Banks and Financial Stability: An Empirical Analysis." *Journal of Financial Services Research* 38 (2–3):95–113.
- Demetriades, P. O., and A. K. Hussein. 1995. "Does Financial Development Cause Economic Growth? Time-Series Evidence from 16 Countries." Technical report, Department of Economics, Keele University.
- ElGamal, M. A. 2000. *A Basic Guide to Contemporary Islamic Banking and Finance*, 2000 ed. Houston: The Rice University.
- English, W. B. 1996. Inflation and financial sector size.
- Farahani, Y. G., and M. Dastan. 2013. "Analysis of Islamic Banks; Financing and Economic Growth: A Panel Cointegration Approach." *International Journal of Islamic and Middle Eastern Finance and Management* 6 (2):156–72.
- Gheeraert, L. 2014. "Does Islamic Finance Spur Banking Sector Development?." *Journal of Economic Behavior and Organization* 103 (Suppl):S4–S20.
- Gheeraert, L., and L. Weill. 2015. "Does Islamic Banking Development Favor Macroeconomic Efficiency? Evidence on the Islamic Finance-Growth Nexus." *Economic Modelling* 47:32–9.
- Goldsmith, R. W. 1969. *Financial Structure and Development*, New Haven ed. Yale: Yale University Press.
- Hanif, M. 2010. "Differences and Similarities in Islamic and Conventional Banking." *International Journal of Business and Social Sciences* 2 (2):166–75.
- Hanif, M. 2012. "Comparative Performance Study of Conventional and Islamic Banking in Pakistan." *International Research Journal of Finance and Economics* 83 (83):62–72.
- Hansen, B. E. 1995. "Time Series Analysis." *Econometric Theory* 11 (03):625–30.
- Hasan, M., and J. Dridi. 2011. "The Effects of the Global Crisis on Islamic and Conventional Banks: A Comparative Study." *Journal of International Commerce, Economics and Policy* 02 (02):163–200.
- Hassan, M. K. 1999. "Islamic Banking in Theory and Practice: The Experience of Bangladesh." *Managerial Finance* 25 (5):60–113.

- Kaufmann, D., A. Kraay, and M. Mastruzzi. 2010. The Worldwide Governance Indicators: Methodology and Analytical Issues.
- Khan, M. S., and A. Mirakhor. 1990. "Islamic Banking: Experiences in the Islamic Republic of Iran and in Pakistan." *Economic Development and Cultural Change* 38 (2):353–75.
- Kim, D. -H., and S. -C. Lin. 2010. "Dynamic Relationship Between Inflation and Financial Development." *Macroeconomic Dynamics* 14 (03):343–64.
- La Porta, R., F. Lopez-de Silanes, A. Shleifer, and R. W. Vishny. 1998. "Law and Finance." *Journal of Political Economy* 106:1113–55.
- Lebdaoui, H., and J. Wild. 2016. "Islamic Banking Presence and Economic Growth in Southeast Asia." *International Journal of Islamic and Middle Eastern Finance and Management* 9 (3):1–27.
- Levine and Zerves. 1998. "The Legal Environment, Banks, and Long Run Economic Growth." *Journal of Money, Credit, and Banking* 30 (4):596–613.
- Levine, R., N. Loayza, and T. Beck. 2000. "Financial Intermediation and Growth: Causality and Causes." *Journal of Monetary Economics* 46 (1):31–77.
- Lucas, R. E. 1988. "On the Mechanics of Economic Development." *Journal Monetary Economics* July (22–21):3–42.
- Mavrotas, G., and S. -I. Son. 2006. "Financial Sector Development and Growth: Re-Examining the Nexus'." *Transparency, Governance and Markets* 26 (217):221–45.
- Mohieldin, M., Z. Iqbal, A. Rostom, and X. Fu. 2012. The Role of Islamic Finance in Enhancing Financial Inclusion in Organization of Islamic Cooperation (OIC) Countries.
- Siddiqi, M. N. 1999. "Islamic Finance and Beyond: Premises and Promises of Islamic Economics." *Proceedings of the Third Harvard University Forum on Islamic Finance*, 49–53. Cambridge, MA: Center for Middle Eastern Studies, Harvard University.