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Dynamic Relationship between Islamic Banking System and Real Economic Activity: Evidence from Pakistan

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Abstract. This study examines the rapid expansion and diffusion of Islamic banking and its relationship with real economic activity in Pakistan. Additionally, the study also highlights the functional role of Islamic banking for greater economic activity and growth in Pakistan. Two major balance sheet items of Islamic banks (Islamic deposits and Islamic financing and investment) were used as proxies for Islamic banking development. The Large Scale Manufacturing Index (LSMI) was used as a proxy for real economic activity. Quarterly data was obtained from statistical bulletins of the State Bank of Pakistan. Robust time series techniques such as the JJ Cointegration Test, Granger Causality Test, Impulse Response Functions, and Variance Decomposition Analysis were used for the data analysis. The findings of the study unveil a significant positive and dynamic long term bi-directional causal relationship between Islamic banking and real economic activity. Furthermore, the findings also reinforce that the State Bank of Pakistan should continue promoting Islamic banking as a parallel banking system to the conventional system as it exerts a substantial positive impact on real economic activity in Pakistan.

***Keywords*:** Islamic Banking, Islamic Deposits, Islamic Financing and Investments, LSMI Index, IRF, VDC, Economic Activity.

JEL Classification: G21, O14, O16, O40, P51.

KAUJIE Classification: J2, J42, L0.

1. Introduction

The principles of Islamic finance are as ancient as Islam although modern Islamic banking and finance can be traced back about 40-50 years ago. Since its beginnings, the evolution of Islamic banking and finance has been phenomenal. The industry has exponentially expanded around the globe. The development of the Islamic banking and finance industry is not merely confined to Muslim majority countries. Currently, Islamic financial institutions operate in around 75 countries across the globe. Islamic financial institutions are not only present in countries with majority Muslim populations but they have also emerged as rapidly growing niche markets in Europe and the United States of America. Total assets of the Islamic finance industry had reached USD 2.1 trillion at the end of 2014 and are expected to grow to over USD 4 trillion by 2020(1). Additionally, different sectors of the Islamic finance industry have achieved double digit growth rates around the globe(2). The adaptation of Islamic finance principles is not only limited to domestic Islamic banks in Muslim countries but large conventional banks have also started windows of Islamic banking. Islamic financial institutions include commercial banks, insurance companies, investment banks, asset management companies and leasing firms. Various products (namely, *ṣukūk*, *takāful*, *muḍārabah*, *mushārakah* and *ijārah*) have developed under Islamic finance principles and added to the portfolio of products available to customers in financial markets around the globe. At the end of 2014, Islamic banking counted for 81% of the total Islamic finance industry followed by *ṣukūk* (14%), Islamic funds (4%) and *takāful* (1%)(3). The Islamic finance industry has achieved remarkable growth in Saudi Arabia, Malaysia, United Arab Emirates, Turkey, Indonesia, Bahrain, Qatar, Pakistan and Bangladesh.

The origins of the link between financial development and economic growth can be traced back to the start of the 19th century (Schumpeter, 1934, p. 80). Earlier studies on the topic asserted the importance of financial intermediation for economic growth and manufacturing innovation (Gurley & Shaw, 1960). McKinnon (1973, p. 98) found a positive association between financial development and economic growth. Another notable cross-country study of Levine (1997, pp. 720-721) showed that financial development induced economic growth. He also highlighted the role of financial development as a strong indicator for economic growth, efficiency and investment. The literature on the underlying topic advocated that financial development is good for economic activity at least for lower middle or middle income developing economies (Levine, Loayza, & Beck, 2000, p. 63). A strong financial sector supports real economic activity through promoting productive efficiency and allocative efficiency in an economy. It also reinforces real economic activity by providing the necessary means for product innovation, manufacturing, quality assessment and delivery of real commodities and items. A stable financial sector assists higher investment, enhanced productivity of physical capital and a better standard of living and prosperity in an economy. The financial literature also emphasizes financial arrangements in an economy and discusses whether a financial system should be bank-based or market-based, however, the general conclusion is that what really matters for economic growth is the overall level of financial development (Levine, 2002, p. 423).

The financial crisis of 2007 resurrected the debate on financial stability, when major global markets were under severe distress due to the credit crunch and subsequent banking crisis. As a result, Islamic banking obtained the opportunity to be recognized as a possible alternative or complement to conventional banking. The Islamic banking system deals with standard risk and finance concerns according to the principles of Islamic Sharīʿah. Islamic economies were considered to perform unsatisfactorily after World War II, yet the perception is not entirely true. Most Muslim countries and other regions with large Muslim populations (except for oil-producing countries) can be categorized as having relatively low economic, social and political development. Economic growth rates of these Muslim economies are at par with other low income and lower middle income developing economies.

(1) Malaysia International Islamic Financial Center (MIFC) Report "2014 – A Landmark Year for Global Islamic Industry", www.mifc.com.
(2) Ibid.
(3) Ibid.

The exceptional growth in Islamic banking over the last decade has drawn considerable attention in the financial and economics literature. Many distinguished studies like Levine (2005, pp. 921-923) have found that there is a strong link between financial development and economic growth. Later studies also find a link between Islamic banking development and economic growth (Furqani & Mulyany, 2009, p. 70; Abduh & Azmi, 2012, pp. 44-45; Imam & Kpodar, 2013, pp. 112-137; Kassim, 2016, pp. 66-76).

2. Overview of the Islamic Banking Sector in Pakistan

Despite the fact that the constitution of Pakistan encourages Islamic modes of financing, the evolution of Islamic banking in the country has not been smooth. The significant emergence of Islamic banking in Pakistan started in 2001, when the State Bank of Pakistan (SBP) announced its first Islamic banking policy. The policy stated to promote Islamic banking as a parallel to conventional banking. Al-Meezan Investment Bank was given the first license for an Islamic bank in Pakistan. In the last decade, Islamic banking has evolved and emerged as a key player in the financial sector. The industry has exponentially increased its size in terms of assets, deposits, financing, investment, branches and customers. The total assets of Islamic banks have increased from PKR 13 billion in 2003 to PKR 1745 billion in June 2016(4). Meanwhile, total deposits have increased from PKR 8 billion (0.4% of total banking industry) to PKR 1461 billion (12.9% of the total banking industry). For the same period, financing and investment activities of Islamic banks has grown from PKR 10 billion to PKR 1337 billion and the total number of branches has increased from 17 to 2146. These figures reveal the impressive growth of the Islamic banking industry over the last decade.

Table 1 represents the total assets of the Islamic banking industry and the percentage (%) share of Islamic banking assets to total assets of the overall banking sector for the time period 2003-2014. Table 2 and Figures 1-3 report the annual growth rate of Islamic banking assets, gross domestic product and the mean value of Large Scale Manufacturing Index (LSMI) for the period 2003-2015.

(4) The statistics are drawn from different versions of State Bank of Pakistan's Quarterly Islamic Banking Bulletins.

Table (1) Progression of Islamic Banking Assets in Pakistan [2003-14]

Year	Total Assets of the Islamic banking industry (billion PKR)	% of the Total Assets of the Total Banking Sector
Dec.03	13	0.5
Dec.04	44	1.5
Dec.05	71	2.0
Dec.06	119	2.8
Dec.07	206	4.0
Dec.08	276	4.9
Dec.09	366	5.6
Dec.10	477	6.7
Dec.11	641	7.8
Dec.12	837	8.6
Dec.13	1014	9.6
Dec.14	1259	10.4
Dec.15	1610	11.4

Source: Different Versions of State Bank of Pakistan's Quarterly Islamic Banking Bulletins

Table (2) Performance of Islamic Banking Industry in Pakistan [2003-15]

Year	Annual Growth rate (%) of Islamic Banking assets	Annual GDP Growth rate (%)	Annual Average of Large Scale Manufacturing Index
2003-04	238.462	7.5	146.480
2004-05	61.364	9.0	173.000
2005-06	67.606	5.8	188.890
2006-07	73.109	5.5	205.370
2007-08	47.798	5.0	213.269
2008-09	33.191	0.4	197.265
2009-10	31.309	2.6	205.100
2010-11	36.253	3.6	206.203
2011-12	26.964	3.8	213.238
2012-13	27.004	3.7	217.642
2013-14	20.598	4.0	222.360
2014-15	37.281	4.2	226.159

Source: Different versions of Economic Survey of Pakistan and State Bank of Pakistan's Statistical Bulletins.

The statistics reflect the outstanding expansion and diffusion of the Islamic banking sector. Table 2 shows significant co-movement between Islamic banking growth and the manufacturing index. Additionally, the statistics also reveal that Islamic banking reports double digit growth rates even in years with overall low output growth in the economy. This suggests that Islamic banking could serve as a locomotive for economic growth in times of recession. The rapid growth and diffusion of Islamic banking in Pakistan prompted us to explore the key relationship between Islamic banking and real economic activity in the country.

Fig. 1. Annual Growth Rate (%) of Islamic Banking Assets in Pakistan [2003-15]

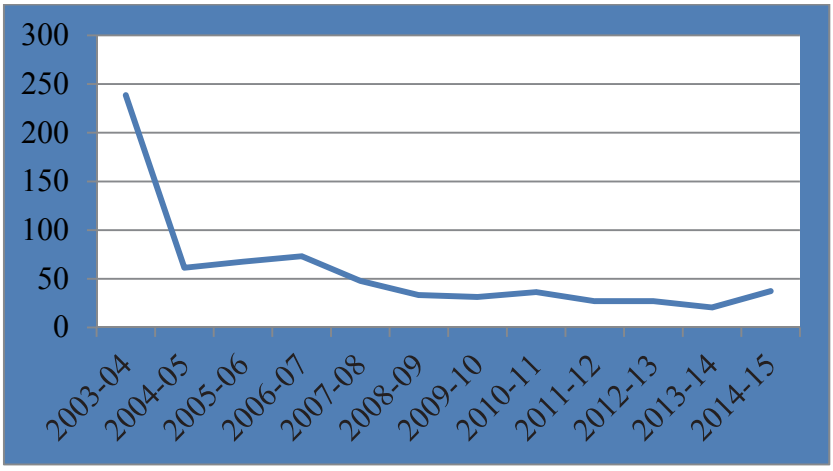


Fig. 2. Annual GDP Growth Rate (%) in Pakistan [2003-15]

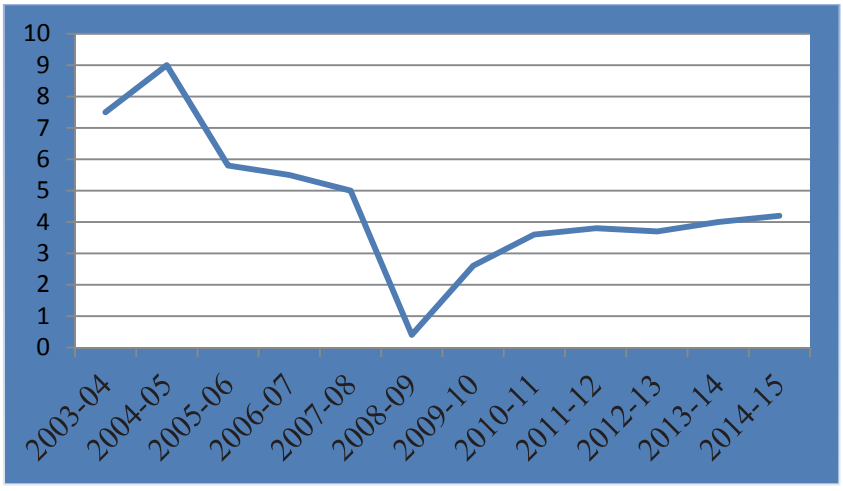
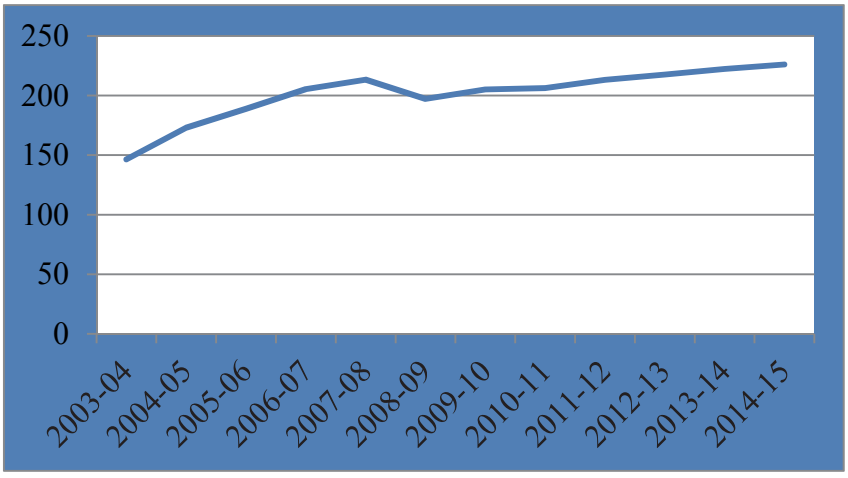


Fig. 3. Mean Large Scale Manufacturing Index in Pakistan [2003-15]



3. Objective of the study

This study is in-line with earlier literature on the nexus between economic growth and Islamic banking and is a pioneering study in this area for Pakistan. We specifically estimate the role played by the Islamic banking sector in reinforcing real economic activity in Pakistan by deploying different robust time series techniques (JJ-integration tests, Granger Causality tests, variance decomposition analysis and the study of impulse response functions). The study provides key insights about the relationship between economic growth, production and Islamic banking. It will also assist policy makers in policy formulation about Islamic banking and economic development in Pakistan.

4. Financial Development and Economic Growth

Economists sharply disagree about the link between financial development and economic growth. Meier and Seers (1984) in their famous collection of essays *Pioneers in Development* did not even discuss finance. Robinson (1979, p. 86) argued that finance does not cause economic growth and the financial sector merely adjusts to varying requirements of the real sector. Lucas (1988, p. 6) termed finance as an over accentuated determinant of economic growth. In contrast, Miller (1998, p. 14) advocated that the role of financial markets for economic growth is too obvious to ignore. Studies of Schumpeter (1934), Gurley and Shaw (1955), Goldsmith (1969) and McKinnon (1973) assert that the nexus between finance and economic growth cannot be ignored.

A plethora of research has been carried out to investigate the link between financial development and economic growth. Surveys of Levine (2005), Beck (2011) and Panizza (2014) comprehensively document an abundant literature on the underlying subject. As mentioned earlier, the link between finance and economic development was first documented at the start of the 19th century, yet empirical analysis on the nexus can be traced back to the 1960s. In his seminal study Goldsmith (1969, p. 390) argued that the effect of the financial structure on economic development is among the most essential problems of finance. His path-breaking cross country study of 35 countries showed a significant positive correlation between assets of financial intermediaries and economic growth, yet the empirical analysis did not examine causal relationships. Later on King and Levine (1993, pp. 734-735) showed that financial development significantly predicts economic growth after controlling for factors that jointly correlate with financial and economic development. The causal link between finance and economic growth was first established by Levine et al. (2000, p. 63). Based on cross-sectional data from 74 countries for the period 1960-1995, the study found that the exogenous component of financial intermediary development was positively associated with long term economic growth. Beck, Levine, and Loayza (2000, p. 296) use panel data of 77 countries and several Generalized Method of Moments (GMM) estimators to show that the nexus of financial depth and economic growth passes through productivity growth instead of factor accumulation. Another prominent study of Rajan and Zingales (1998, p. 584) inspected the link between finance and economic growth by looking at the performance of different sectors across countries. The results indicate that financial development has a significant supportive impact on the rate of economic growth. Additionally, they also assert that industrial sectors with relatively more need of external finance disproportionately grow in countries where financial sectors are relatively developed.

However, there is another stream of literature that challenges the causal relationship between financial development and economic growth. Demetriades and Hussein (1996, p. 406) deploy time series techniques to examine the relationship and conclude that little evidence exists to corroborate the view of finance as a leading stimulator of economic growth. However, the study also found considerable evidence of bi-directional causality and reverse causality across a few countries. Arestis and Demetriades (1997, p. 796) found that the relationship between financial development and economic growth may be influenced by institutional factors. These findings were further reinforced in Demetriades and Law (2006, p. 256) who found that financial development and economic growth are not positively associated in countries with poor institutional frameworks. Few studies also find differential effects of financial development on economic growth in developing and developed economies (De Gregorio & Guidotti, 1995, p. 445; Deidda & Fattouh, 2002, p. 344). Another line of

study documents the vanishing effect of causal relationships between financial development and economic growth (Rousseau & Wachtel, 2011, p. 286; Arcand, Berkes, & Panizza, 2015, p. 141). However, Laeven, Levine, and Michalopoulos (2015) show that financial innovation is a key driver of economic growth. The aforementioned study incorporates financial innovation into a traditional Schumpeterian growth model and finds that technological innovation and economic growth become static unless financial intermediaries innovate. On the basis of prior evidence, we can adequately assert that financial development and markets both substantially matter for economic growth.

5. Islamic Banking and Economic Growth

The recent global economic and financial crisis has highlighted the fragility of the conventional banking system and enhanced the attention devoted to Islamic banking by academics and policymakers. Theoretically, Islamic principles of finance differ substantially from the conventional finance. Islamic Sharīʿah compliant finance does not permit charging of interest (*ribā*) on payments as the banks are not allowed to offer a fixed rate of return on deposits. Further, banks are not permitted to charge interest on loans. In addition, excessive speculation (*maysir* and *gharar*) and financing of illicit activities are prohibited. The fundamental principle of Sharīʿah compliant financing is the idea of profit and loss and risk sharing. This indicates clear distinction in financing activities between Islamic and conventional banks. With given characteristics and adequate application, Islamic banking is presumed to be significantly associated with economic growth. Hasan and Dridi (2011, p. 190) found that Islamic banks performed better than conventional banks during the period of the global financial crisis. Beck, Demirgüç-Kunt, and Merrouche (2013, p. 445) found that Islamic banks were better capitalized, had higher asset quality and were less likely to disintermediate during the crisis period. Additionally, they also identify significant differences in orientation between Islamic banking and conventional banking models.

The first notable study regarding the link between Islamic banking development and economic growth was carried out in Malaysia. Furqani and Mulyany (2009, pp. 68-70) use co-integration tests and vector auto correction models to estimate the dynamic relationship between Islamic banking development and economic growth. Islamic financing was used as a proxy for Islamic banking development and Gross Domestic Product (GDP) and Gross Fixed Capital Formation (GFCF) as proxies for economic growth. They found that economic growth causes development of Islamic banking in Malaysia. In contrast, a similar and more recent study of Kassim (2016, p. 73) shows that development of Islamic banking causes economic growth. Abduh and Azmi (2012, pp. 44-45) identify a bi-directional causal relationship between Islamic banking and economic growth in Indonesia. Using an Autoregressive Distributive Lag Model, this study finds significant short and long-term associations between Islamic banking and economic growth. Similar results are also reported by Abduh and Chowdhury (2012, p. 112) for Bangladesh.

Goaied and Sassi (2010, p. 17) use GMM to examine the relationship between Islamic banking development and economic growth and find a significant relationship between the two. Yusof and Bahlous (2013, p. 167) find that Islamic banking corroborates economic growth in both the short and long-run in the GCC and select East Asian countries. Imam and Kpodar (2013, p. 132) also find a positive link between Islamic banking development and economic growth despite the modest size of Islamic banking sectors in a panel of 52 countries. Additio-nally, they argued that Islamic banks emerge as a complement rather than substitute to conventional banks. Lebdaoui and Wild (2016) examine the relationship in South Asian countries and also find a long-term association between Islamic finance and economic growth.

6. Research Methodology

6.1 Data

In order to estimate the underlying relationship between Islamic banking development and economic growth in Pakistan, two major balance sheet items of Islamic banks are used. Islamic Financing and Investment (IFI) and Islamic Deposits (ID) are used as proxies for Islamic banking development and the Large Scale Manufacturing Index (LSMI) is used as a proxy for real economic activity. Quarterly time series data of LSMI are obtained from the Statistical Bulletin of the State Bank of Pakistan. Quarterly time series data for ID and IFI are obtained from the

Quarterly Bulletins of Islamic banking from the State Bank of Pakistan. The period for the study is decided according to the availability of data.

6.2 Empirical Model

The literature on the link between financial development and economic growth exhibits diverse econometric methodologies deployed to approximate the true nature of the relationship. These methodologies include cross-sectional regression (King & Levine, 1993, p. 731; Levine & Zervos, 1998, p. 546; Rajan & Zingales, 1998, p. 574), Generalized Method of Moments (GMM) (Beck et al., 2000, p. 276), threshold regression models (Deidda & Fattouh, 2002, p. 340), endogenous growth models (Kang & Sawada, 2000, p. 430), translog production functions (Evans, Green, & Murinde, 2002, p. 125), co-integration tests, Granger causality tests (Al-Yousif, 2002, p. 140), vector auto regressions (Luintel & Khan, 1999, p. 387), Vector Error Correction Models (VECM), Impulse Response Functions (IRF) and Variance Decomposition Analysis (VDC) (Ansari, 2002, p. 82). The choice of the model employed to estimate the relationship is significantly dependent upon the attributes of available data. In this study, aggregate industry data is used to investigate this relationship. This study uses time series data to estimate a Vector Auto Regression (VAR) model to test the dynamic relationship between Islamic banking development and real economic activity in Pakistan. Following the recent trend and to avoid the difficulty of interpreting VAR coefficients, IRF and VDC analysis is used. Additionally, to test causality between the variables, we also employ bi-variate Granger causality tests.

6.2.1 Unit Root Test

The first inspection of the time series data is to check for stationarity. The rationale behind establishing stationarity is to check whether the variable under consideration has a tendency to return to long-run equilibrium after a shock or the time series follows a random walk. If the time series follows a random walk after the shock then the results of the regression are not valid and the resulting OLS parameters are inconsistent. In our study, we use the most widely adopted approach, namely Dickey and Fuller's (1981) unit root test commonly known as Augmented Dickey-Fuller (ADF) test. Due to a limited number of observations the test for structural changes was skipped.

6.2.2 JJ Cointegration Test

In order to estimate the long-term association between the variables in our model, we follow Johansen (1988) and Johansen and Juselius (1990). The JJ co-integration test presents two statistics for evaluating the number of co-integrating vectors. These two statistics include the trace statistic (Tr) and the maximum eigenvalue statistic (L-max). We estimate a p dimensional (3×1) matrix r to ascertain whether the eigenvalue of Π is significantly different to zero. The JJ co-integration test uses a maximum likelihood method to estimate the long term equilibrium between the variables. For the trace statistic (Tr) the maximum likelihood ratio statistic is calculated as follows

$$-2\ln Q = -T\sum_{i=r+1}^{p=3}\ln(1-\lambda_i) \quad \text{..... (1)}$$

The null hypothesis states that there are at least r number of co-integrating vectors, where the value of r is either 0 or 1 or 2. In every case, the null hypothesis is tested against the alternative hypothesis. The L-max statistic is calculated as follows:

$$-2\ln Q = -T\ln(1+\lambda_{r+1}) \quad \text{..... (2)}$$

The null hypothesis r is tested against the alternative hypothesis r + 1, where the null hypothesis states r = 0 and the alternative hypothesis states r = 1. Further, r = 1 is against the alternative r = 2 and so on.

6.2.2 VAR Configurations

To establish the dynamic long-term relationship between the variables under consideration, we propose the following empirical model and VAR specifications.

$$\text{LSMI} = f(\text{IFI, ID}) \quad \text{..... (3)}$$

$$Y_t = \sum_{i=1}^{k} X_t - Y_{t-i} + u_t \quad \text{..... (4)}$$

In equation 4, Y_t = (LSMI, IFI, ID) and u_t= (u_tLSMI, u_tIFI, u_tID). Where A_1-A_k is a k×k matrix of the coefficient and u_t is the vector of the error correction terms.

6.2.3 Granger Causality Test

In order to determine the causal link between Islamic banking development and real economic activity, we employ Granger causality tests in unrestricted VAR environment. Following Granger (1969) considering two series X_t and Y_t, the bivariate VAR model for Granger causality is given below:

$$\Delta X_t = \Phi_1 + \sum_{i=1}^{n1} \Phi_{11}(i)\Delta X_{t-i} + \sum_{j=1}^{m1} \Phi_{12}(j)\Delta Y_{t-j} + u_{Xt} \quad \ldots\ldots (5)$$

$$\Delta Y_t = \Phi_2 + \sum_{i=1}^{n1} \Phi_{21}(i)\Delta X_{t-i} + \sum_{j=1}^{m1} \Phi_{22}(j)\Delta Y_{t-j} + u_{Yt} \quad \ldots\ldots (6)$$

In equation 5 and 6, u_{Xt} and u_{Yt} are random stationary processes which capture information missing in lagged values of X_t and Y_t.

6.2.4 Impulse Response Functions

Impulse Response Function analysis detects the effects of shocks in other endogenous variables in the VAR model on a particular variable. In other words, IRF analysis traces over time how each variable in the VAR model responds to shocks in other endogenous variables in the model.

6.2.5 Variance Decomposition Analysis

VDC analysis is used to forecast the proportion of innovation in a time series due to its own earlier shocks and shocks in other variables in the model. VDC dissects the variance of forecast errors followed by a shock in a variable. This enables one to predict which variables strongly impact each other. This study uses VDC to breakdown the impact of individual components of Islamic banking on real economic activity.

7. Results and Discussion

7.1 Unit Root Test Results

The ADF test is used to establish stationarity of the variables. The results of the ADF test show that none of the time series levels were stationary (Appendix: Tables A1 – A3). ID and IFI were stationary at first difference and LSMI was stationary at second difference. The reported results are based on a constant model which allows drift in data.

Table (3) Unit Root Test Results

	First Difference		Second Difference	
	Trace Statistic	**Critical Value 1 % Significance Level**	**Trace Statistic**	**Critical Value 1 % Significance Level**
ID	-8.9107	-3.6998	-	-
IFI	-3.4736	-3.6891	-	-
LSMI	-	-	-6.9590	-3.7529

7.2 Cointegration Results

To determine the long term equilibrium between the variables in our model, the multivariate JJ co-integration test is used. The optimal vector autoregressive order for our co-integrating model is estimated through standard indicators such as the, Akaike Information Criterion (AIC), Final Prediction Error (FPE), Schwarz Information Criterion (SIC) and the Hannan-Quinn (HQ) information criterion. The results indicate that the optimal lag length for our co-integrating model was 3 (Appendix: Table A4). The results of the co-integration model reveal that there is long-term equilibrium between real economic activity (LSMI) and Islamic banking development (IFI and ID). Table 4 shows the summary of the results for different co-integrating models.

Table (4) Number of Co-integrating Relations by Model

Data Trend	**None**	**None**	**Linear**	**Linear**	**Quadratic**
Test Type	No Intercept No Trend	Intercept No Trend	Intercept No Trend	Intercept Trend	Intercept Trend
Trace Statistic	1	1	1	2	1
Max-Eigen Value	1	1	1	1	0

Critical values based on MacKinnon, Haug, & Michelis (1999).

* Selected (0.05 level*) Number of Co-integrating Relations by Model.

* Lags interval: 1 to 3.

7.3 Causality Results

In order to establish short-run causality between Islamic banking development and real economic activity we utilize a bivariate Granger Causality test. The null hypothesis (H_0) of the VAR Granger Causality Wald Test is that the independent variable does not Granger cause the dependent variable. The results obtained from this section are depicted in Table 5.

Table (5) Granger Causality Test Results for LSMI, ID and IFI

Independent variables	Alternative hypothesis (H_1)	Prob.
ID	ID Granger causes LSMI	0.0063*
IFI	IFI Granger causes LSMI	0.3828
ID and IFI	ID and IFI Granger cause LSMI	0.0000*
LSMI	LSMI Granger causes ID	0.0092*
IFI	IFI Granger causes ID	0.0290*
ID	ID Granger cause IFI	0.0000*
LSMI	LSMI Granger causes IFI	0.0629

* Significant at 5% level.

The results of the Granger causality test confirm the causal relationship between Islamic banking development and real economic activity in Pakistan. These results also suggest that Islamic banking development is also linked to the growth of the manufacturing sector. The results suggest that the nature of the relationship between Islamic banking development and manufacturing activity is bi-directional. These findings are likely explained by the fact that the financial sector in Pakistan has a strong relationship with large manufacturing conglomerates. In most of these cases, the relationship between the financial sector and business conglomerates resembles vertical integration. Additionally, the causality results also reveal a bi-directional causal relationship between Islamic deposits and Islamic financing investment.

7.4 IRF Results

IRF results depict that a one standard deviation shock to Islamic Deposits (ID) causes an increase in LSMI (real economic activity). Similarly, a one standard deviation shock to LSMI causes a positive shock in ID. Additionally, the results also reveal that ID presents a positive response to a shock in IFI which also illustrates the nexus of IFI to ID to LSMI. Moreover, IFI depicts a delayed positive response to a one standard deviation shock in LSMI which means that Islamic banking is primarily reactive to manufacturing activity in Pakistan. All IRF results are depicted in Figures 4-12.

Accumulated Response to Cholesky One S.D. Innovations±2 S.E.

Fig 4. Impulse Respose of IFI to IFI

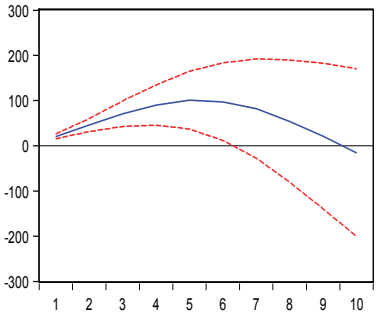


Fig 5. Impulse Response of IFI to ID

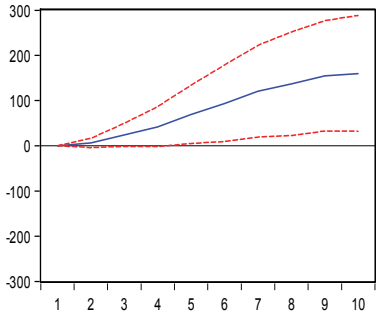


Fig 6. Impulse Response of IFI to LSMI

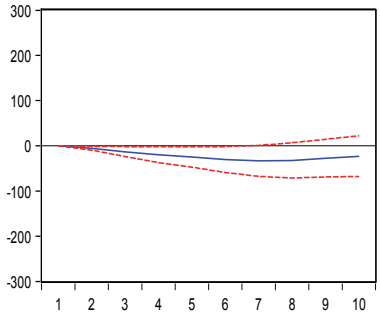


Fig 7. Impulse Response of ID to IFI

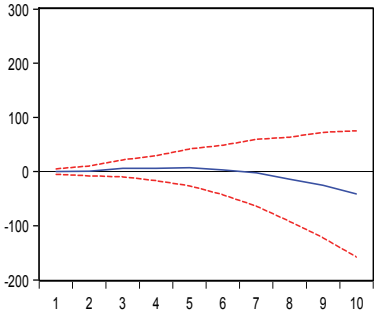


Fig 8. Impulse Response of ID to ID

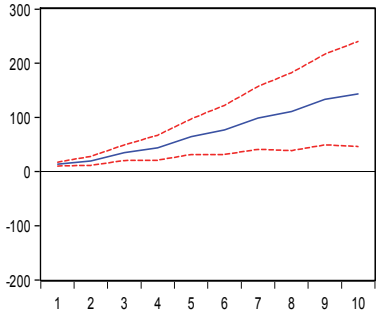


Fig 9. Impulse Response of ID to LSMI

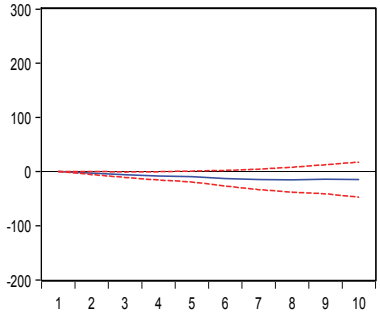


Fig 10. Impulse Response of LSMI to IFI

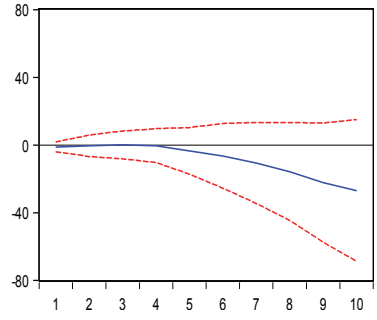


Fig 11. Impulse Response of LSMI to ID

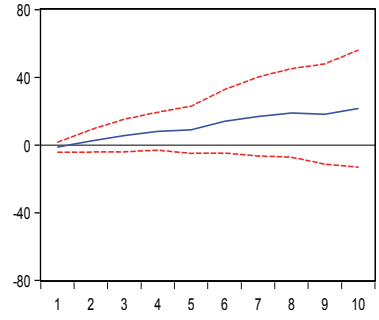
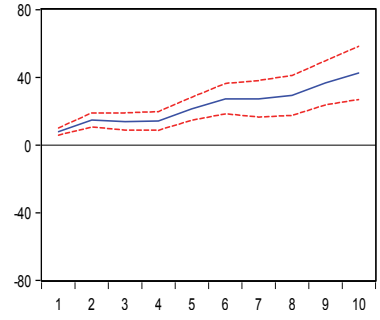


Fig 12. Impulse Response of LSMI to LSMI



7.5 VDC Results

Results of the VDC analysis (Table 6) also support the previous evidence. The results show that in the short-run ID and IFI only explain a 4% change in LSMI. The results are in-line with expectations because a smaller share of Islamic banking in the overall total banking industry in Pakistan does not enable Islamic banking to assert a significant short-term impact on real economic activity and growth. On the contrary, in the long-run ID explains a 16% change in LSMI and IFI explains a 26% change in LSMI. This implies that Islamic banking development explains around a 42% change in real economic activity which (again) emphasizes the key relationship between Islamic banking and manufacturing activity from a policy-making perspective. Furthermore, the results also depict the significant dependence of Islamic financing on Islamic deposits.

Table (6) VDC of LSMI, ID and IFI

VDC of LSMI			
Period	**LSMI**	**ID**	**IFI**
1	95.41636	2.081564	2.502079
2	86.97406	1.397363	11.62857
3	80.41288	1.508868	18.07825
4	76.40786	1.636229	21.95591
5	78.56665	5.727260	15.70609
6	71.48404	7.481164	21.03479
7	65.37056	12.77301	21.85643
8	60.10128	18.94074	20.95798
9	59.28276	24.46629	16.25096
10	58.16602	25.64458	16.18941
VDC of IFI			
1	0.000000	100.0000	0.000000
2	2.769035	93.91469	3.316273
3	4.231665	79.07679	16.69154
4	4.631464	71.38712	23.98142
5	4.214044	57.56169	38.22427
6	4.360811	49.63074	46.00845
7	3.748420	44.98849	51.26309
8	3.144821	49.85393	47.00125
9	2.850631	54.80974	42.33963
10	2.636605	61.06182	36.30158
VDC of ID			
1	0.000000	0.010991	99.98901
2	4.087541	0.415457	95.49700
3	3.934115	4.935384	91.13050
4	4.172283	4.190286	91.63743
5	2.540759	2.626237	94.83300
6	3.159803	4.044944	92.79525
7	2.438013	4.214407	93.34758
8	2.109956	11.13116	86.75888
9	1.664241	12.91536	85.42040
10	1.479036	20.11966	78.40130

* Cholesky Ordering: LSMI, IFI, ID.

8. Conclusion

8.1 Findings

In this study, we investigate the long-term dynamic relationship between Islamic banking development and real economic activity by deploying a variety of time series tests. The results obtained from the analysis show a bi-directional causal relationship between Islamic banking development and real economic activity in Pakistan. The bi-directional relationship implies that the development of the Islamic banking industry reinforces real economic activity. On the other hand, augmenting real economic activity also promotes development of Islamic banking in Pakistan. The share of Islamic banking assets is relatively small in the overall financial industry, yet despite this fact, growth of the sector is positively associated with manufacturing activity and economic growth.

8.2 Policy Recommendations

Based on the empirical evidence presented in this study, we can corroborate the view that Islamic financial intermediation leads to higher levels of manufacturing activity and growth in Pakistan. The State Bank of Pakistan (SBP) should continue promoting Islamic banking as a parallel system to con-

ventional banking to spur economic activity in the economy. The development of the Islamic banking industry could stimulate a more efficient and stable financial system in the country. Although Islamic banking in Pakistan has come a long way over recent decades the SBP should continue to provide support for the establishment of new Islamic commercial banks. The prevailing situation obligates SBP to review the current regulations and contractual guidelines to ensure that Islamic banking in Pakistan is aligned with the essential objectives of the Islamic economic system.

Currently, Islamic banking accounts for around 15% of total banking sector assets in Pakistan. In order to increase the overall size of the industry, Islamic banks need to expand their operations to more rural and under privileged areas. As of June 2016, the region-wise branch breakup of Islamic banks shows that only 10% of the branches of Islamic banks operate in less developed regions(5). Furthermore, Islamic banks in Pakistan are extensively involved in Sharīʿah compliant modes of financing(6) rather than Sharīʿah based modes(7). Even Sharīʿah based modes of *muḍārabah* and *mushārakah* are widely used on the liability side. Yet, the true potential of these instruments resides in entrepreneurial development and as investment tools. Financing to SMEs is only 2% of the credit portfolio of Islamic banks in Pakistan, whereas the SME sector is considered the nursery for innovation and growth. Our findings also show that Islamic financing and investment have been reactive to manufacturing activity. In order to compete with strong conventional counterparts, Islamic banks have to be more innovative with their product engineering. Many of the contemporary products of Islamic banks in Pakistan are structured as such that they resemble conventional banking products. This depicts a weak contractual framework prevailing in the sector and draws attention towards various agency problems. Hence, the essential focus of Islamic banking products should be to focus more on profit and loss sharing principles of Sharīʿah.

8.3 Future Research

This study highlights the functional role and policy implications of Islamic banking for economic activity and growth in Pakistan. We recommend a study to examine the impact of Islamic banking development on various manufacturing sectors in Pakistan. A study of this nature will assist in obtaining useful insights about the relationship between Islamic banking development and different types of manufacturing activity. Particularly, we also suggest a cross-country analysis of the relationship between Islamic banking development and real economic activity. Earlier studies have explored the relationship between Islamic banking development and economic growth, yet there is an absence of cross-country analysis focusing on the relationship between Islamic banking and manufacturing activity.

(5) Different versions of State Bank of Pakistan's Quarterly Bulletin on Islamic Banking.

(6) A Sharīʿah compliant product is one that satisfies all the compliance criteria. The product may not be necessarily Sharīʿah based but it does not violate any Sharīʿah ruling. *Sukūk* is an example of Sharīʿah compliant product.

(7) Sharīʿah based products and services are those which were practiced at the time of the Prophet Muḥammad (peace be upon him). The examples of Sharīʿah based modes include *muḍārabah* and *mushārakah*.

References

Abduh, M., & **Azmi, O. M.** (2012), Islamic banking and economic growth: the Indonesian experience, *International Journal of Islamic and Middle Eastern Finance and Management*, *5*(1), pp. 35-47.

Abduh, M., & **Chowdhury, N.T.** (2012), Does Islamic banking matter for economic growth in Bangladesh, *Journal of Islamic Economics, Banking and Finance*, *8*(3), pp. 104-113.

Ansari, M. I. (2002), Impact of financial development, money, and public spending on Malaysian national income: an econometric study, *Journal of Asian Economics*, *13*(1), pp. 72-93.

Arcand, J. L., Berkes, E., & **Panizza, U.** (2015), Too much finance?, *Journal of Economic Growth*, *20*(2), pp. 105-148.

Arestis, P., & **Demetriades, P.** (1997), Financial development and economic growth: assessing the evidence, *The Economic Journal*, *107*(442), pp. 783-799.

Beck, T., Levine, R., & **Loayza, N.** (2000), Finance and the Sources of Growth, *Journal of Financial Economics*, *58*(1), pp. 261-300.

Beck, T. (2011), *The role of finance in economic development: Benefits, risks, and politics* (CentER Discussion Paper No. 2011-041), Retrieved from Tilburg University, CentER for Economic Research, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1974471

Beck, T., Demirgüç-Kunt, A., & **Merrouche, O.** (2013), Islamic vs. conventional banking: Business model, efficiency and stability, *Journal of Banking and Finance*, *37*(2), pp. 433-447.

De Gregorio, J., & **Guidotti, P. E.** (1995), Financial development and economic growth, *World development*, *23*(3), pp. 433-448.

Deidda, L., & **Fattouh, B.** (2002), Non-linearity between finance and growth, *Economics Letters*, *74*(3), pp. 339-345.

Demetriades, P. O., & **Hussein, K. A.** (1996), Does financial development cause economic growth? Time-series evidence from 16 countries, *Journal of development Economics*, *51*(2), pp. 387-411.

Demetriades, P., & **Law, S. H.** (2006), Finance, institutions and economic development, *International Journal of Finance and Economics*, *11*(3), pp. 245-260.

Dickey, D., & **Fuller, W.** (1981), Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root, *Econometrica, 49*(4), pp. 1057-1072.

Evans, D. A., Green, C. J., & **Murinde, V.** (2002), Human capital and financial development in economic growth: New evidence using the translog production function, *International Journal of Finance and Economics*, *7*(2), pp. 123-140.

Furqani, H., & **Mulyany, R.** (2009), Islamic banking and economic growth: Empirical evidence from Malaysia, *Journal of Economic Cooperation and Development*, *30*(2), pp. 59-74.

Goaied, M., & **Sassi, S.** (2010), *Financial development and economic growth in the MENA region: What about Islamic banking development* (IHEC Working Paper), Carthage: Institut des Hautes Etudes Commerciales, Retrieved from http://www.iefpedia.com/

Goldsmith, R. W. (1969), *Financial Structure and Development*, New Haven: Yale University Press.

Granger, C. W. (1969), Investigating causal relations by econometric models and cross-spectral methods, *Econometrica*, *37*(3), pp. 424-438.

Gurley, J. G., & **Shaw, E. S.** (1955), Financial aspects of economic development, *The American Economic Review*, *45*(4), pp. 515-538.

Gurley, J. G., & **Shaw, E. S.** (1960), *Money in a Theory of Finance*, Washington D.C: Brookings Institution Press.

Hasan, M., & **Dridi, J.** (2011), The effects of the global crisis on Islamic and conventional banks: A comparative study, *Journal of International Commerce, Economics and Policy*, *2*(2), pp. 163-200.

Imam, P., & **Kpodar, K.** (2013), Islamic banking: how has it expanded?, *Emerging Markets Finance and Trade*, *49*(6), pp. 112-137.

Johansen, S. (1988), Statistical analysis of cointegration vectors, *Journal of economic dynamics and control*, *12*(2), pp. 231-254.

Johansen, S., & **Juselius, K.** (1990), Maximum likelihood estimation and inference on cointegration – with applications to the demand for money, *Oxford Bulletin of Economics and Statistics*, *52*(2), pp. 169-210.

Kang, S. J., & **Sawada, Y.** (2000), Financial repression and external openness in an endogenous growth model, *Journal of International Trade and Economic Development*, *9*(4), pp. 427-443.

Kassim, S. (2016), Islamic finance and economic growth: The Malaysian experience, *Global Finance Journal*, *30*, pp. 66-76.

King, R. G., & Levine, R. (1993a), Finance and growth: Schumpeter might be right, *The Quarterly Journal of Economics*, *108*(3), pp. 717-737.

Laeven, L., Levine, R., & Michalopoulos, S. (2015), Financial innovation and endogenous growth, *Journal of Financial Intermediation*, *24*(1), pp. 1-24.

Lebdaoui, H., & Wild, J. (2016), Islamic banking presence and economic growth in Southeast Asia, *International Journal of Islamic and Middle Eastern Finance and Management*, *9*(4), pp. 551-569.

Levine, R. (1997), Financial development and economic growth: views and agenda, *Journal of Economic Literature*, *35*(2), pp. 688-726.

Levine, R. (2002), Bank-based or market-based financial systems: which is better?, *Journal of Financial Intermediation*, *11*(4), pp. 398-428.

Levine, R. (2005), Finance and Growth: Theory and Evidence, in Aghion, P., and Durlauf, S. N. (Eds.), *Handbook of Economic Growth* (pp. 865-934), Amsterdam: Elsevier.

Levine, R., & Zervos, S. (1998), Stock markets, banks, and economic growth, *American Economic Review*, *88*(3), pp. 537-558.

Levine, R. Loayza, N., & Beck, T. (2000), Financial intermediation and growth: Causality and causes, *Journal of Monetary Economics*, *46*(1), pp. 31-77.

Lucas, R. E. (1988), On the mechanics of economic development, *Journal of Monetary Economics*, *22*(1), pp. 3-42.

Luintel, K. B., & Khan, M. (1999), A quantitative reassessment of the finance-growth nexus: evidence from a multivariate VAR, *Journal of Development Economics*, *60*(2), pp. 381-405.

MacKinnon, J. G. (1996), Numerical distribution functions for unit root and cointegration tests, *Journal of Applied Econometrics, 11*(6), pp. 601-618.

MacKinnon, J., Haug, A., & Michelis, L. (1999), Numerical Distribution Functions of Likelihood Ratio Tests for Cointegration, *Journal of Applied Econometrics*, *14*(5), pp. 563-577.

Meier, G. M., & Seers, D. (1984), *Pioneers in Development*, Vol. I, New York: Oxford University Press.

McKinnon, R. I. (1973), *Money and Capital in Economic Development*, Washington: Brookings Institution Press.

Miller, M. H. (1998), Financial markets and economic growth, *Journal of Applied Corporate Finance*, *11*(3), pp. 8-15.

Panizza, U. (2014), Financial development and economic growth: Known knowns, known unknowns, and unknown unknowns, *Revue d'économie du développement*, *22*(1), pp. 35-65.

Rajan, R. G., & Zingales, L. (1998), Financial dependence and growth, *American Economic Review*, *88*(3), pp. 559-586.

Robinson, J. (1979), *The Generalization of the General Theory and other Essays*, London: Palgrave MacMillan

Rousseau, P. L., & Wachtel, P. (2011), What is happening to the impact of financial deepening on economic growth?, *Economic inquiry*, *49*(1), pp. 276-288.

Schumpeter, J. A. (1934), *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*, New Jersey, NJ: Transaction publishers.

al-Yousif, Y. K. (2002), Financial development and economic growth: another look at the evidence from developing countries, *Review of Financial Economics*, *11*(2), pp. 131-150.

Yusof, R. M., & Bahlous, M. (2013), Islamic banking and economic growth in GCC and East Asia countries: A panel cointegration analysis, *Journal of Islamic Accounting and Business Research*, *4*(2), pp. 151-172.

Appendix

Table A1: ADF test of LSMI

			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-6.959020	0.0000
Test critical values:	1% level		-3.752946	
	5 % level		-2.998064	
	10 % level		-2.638752	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LSMI,3)				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LSMI(-1),2)	-8.733218	1.254949	-6.959020	0.0000
D(LSMI(-1),3)	6.583330	1.169082	5.631199	0.0000
D(LSMI(-2),3)	5.151007	1.014822	5.075776	0.0001
D(LSMI(-3),3)	3.636545	0.809020	4.495000	0.0004
D(LSMI(-4),3)	2.506850	0.541081	4.633042	0.0003
D(LSMI(-5),3)	1.399217	0.312282	4.480624	0.0004
D(LSMI(-6),3)	0.625783	0.142326	4.396843	0.0005
C	1.474656	1.361298	1.083272	0.2958
R-squared	0.981876	Mean dependent var	0.044783	-
Adjusted R-squared	0.973418	S.D. dependent var	39.77344	-
S.E. of regression	6.484674	Akaike info criterion	6.844968	-
Sum squared resid	630.7649	Schwarz criterion	7.239923	-
Log likelihood	-70.71713	Hannan-Quinn criterion	6.944298	-
F-statistic	116.0890	Durbin-Watson stat	2.452297	-
Prob(F-statistic)	0.000000	-	-	-

Table A2: ADF test of IFI

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.473620	0.0166
Test critical values:	1% level	-3.689194	
	5 % level	-2.971853	
	10 % level	-2.625121	
*MacKinnon (1996) one-sided p-values.			
Augmented Dickey-Fuller Test Equation			
Dependent Variable: D(IFI,2)			
Method: Least Squares			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LSMI(-1))	-0.965071	0.277829	-3.473620	0.0020
D(LSMI(-1),2)	0.149926	0.259469	0.577819	0.5688
D(LSMI(-2),2)	0.488946	0.193465	2.527312	0.0185
C	21.60049	7.685705	2.810477	0.0097
R-squared	0.597160	Mean dependent var	1.714286	-
Adjusted R-squared	0.546805	S.D. dependent var	39.54262	-
S.E. of regression	26.62000	Akaike info criterion	9.532767	-
Sum squared resid	17006.99	Schwarz criterion	9.723082	-
Log likelihood	-129.4587	Hannan-Quinn criterion	9.590948	-
F-statistic	11.85899	Durbin-Watson stat	1.748231	-
Prob(F-statistic)	0.000058	-	-	

Table A3: ADF test of ID

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.910718	0.0000
Test critical values:	1% level	-3.699871	
	5 % level	-2.976263	
	10 % level	-2.627420	
*MacKinnon (1996) one-sided p-values.			
Augmented Dickey-Fuller Test Equation			
Dependent Variable: D(ID,2)			
Method: Least Squares			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LSMI(-1))	-3.848132	0.431854	-8.910718	0.0000
D(LSMI(-1),2)	2.192521	0.348114	6.298287	0.0000
D(LSMI(-2),2)	1.339313	0.170499	7.855253	0.0000
C	5.186700	1.949076	2.661107	0.0140
R-squared	0.992071	Mean dependent var	5.629630	-
Adjusted R-squared	0.991037	S.D. dependent var	106.2306	-
S.E. of regression	10.05728	Akaike info criterion	7.590424	-
Sum squared resid	2326.423	Schwarz criterion	7.782399	-
Log likelihood	-98.47072	Hannan-Quinn criterion	7.647508	-
F-statistic	959.2528	Durbin-Watson stat	1.585323	-
Prob(F-statistic)	0.000000	-	-	

Table A4: VAR Lag Order Selection Criteria
Endogenous variables: LSMI ID IFI
Exogenous variables: C

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-469.5423	NA	2.86e+10	32.58912	32.73057	32.63342
1	-384.4819	146.6558	1.51e+08	27.34358	27.90936	27.52078
2	-347.7133	55.78689	22840067	25.42850	26.41862	25.73859
3	-328.2040	25.56391*	11739814*	24.70373*	26.11817*	25.14671*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

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العلاقة الديناميكية بين النظام المصرفي الإسلامي والنشاط الاقتصادي الحقيقي: التجربة الباكستانية

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المستخلص. تتناول هذه الورقة التوسّع السريع للخدمات المصرفية الإسلامية وانتشارها وعلاقتها بالنشاط الاقتصادي الحقيقي في باكستان. كما تسلِّط الضوء على الدور الوظيفي للمصرفية الإسلامية في زيادة النشاط الاقتصادي والنمو في باكستان. وتمّ استخدام بيانين رئيسيين في الميزانية العمومية للمصارف الإسلامية كمؤشرين لنمو الصناعة، وهما: الودائع الإسلامية والتمويل والاستثمار الإسلامي. كما تمّ استخدم مؤشر التصنيع على النطاق الكبير كمؤشر للنشاط الاقتصادي الحقيقي. وجُمِّعت بيانات الدراسة من خلال النشرات الفصلية الإحصائية التي يصدرها البنك المركزي الباكستاني. ولتحليل البيانات تم استخدام تقنيات السلاسل الزمنيّة مثل اختبار التجميع المشترك، واختبار غرانجر للسببية، ودالات استجابة النبضات، وتحليل تفكيك التباين. وكشفت نتائج الدراسة عن وجود علاقة سببية إيجابية وديناميكية على المدى الطويل وثنائية الاتجاه بين المصرفية الإسلامية والنشاط الاقتصادي الحقيقي. كما تؤكد ضرورة استمرار البنك المركزي الباكستاني في تعزيز المصرفية الإسلامية كنظام مصرفي مواز للنظام التقليدي بالنظر إلى أثره الإيجابي الكبير على النشاط الاقتصادي الحقيقي في البلاد.

الكلمات الرئيسية: المصرفية الإسلامية، الودائع الإسلامية، التمويل والاستثمار الإسلامي، المؤشرات، النشاط الاقتصادي الحقيقي.