

Nexus between Islamic Banking Profit Rate and Conventional Banking Interest Rate; Evidence from Pakistan's Dual Banking System.

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Abstract

The fast pace of Islamic banking growth has also attracted a few controversies. Critiques of Islamic Banking argue that the Islamic Banks are replicating and getting influenced by conventional interest rate banking. The very purpose of this paper is to investigate the nexus between the Profit rate of Islamic Banks and the interest rate of conventional banks on Deposits and lending in Pakistan. It also investigates the impact of State Bank's Policy rate on Islamic Banking Profit rate and Conventional Banking Interest rate. To investigate the nexus between Islamic and conventional banking rates of return and the impact of State Bank's Policy rate on both the said rates, this study has applied regression, Johansen Cointegration, autoregressive distributed lag (ARDL), Vector Error Correction Model (VECM), and Granger Causality econometric techniques. The study covers bi-annual time series weighted average data for 15 years from 2003 to 2018. The findings of regression, Johansen Cointegration, ARDL, and VECM Models confirmed the existence of cointegration between the profit rate of Islamic Banks and interest rates of conventional banks. Granger causality test traced the causality between the two rates of return running from Islamic to conventional banking rates thus confirming that Islamic banks are not pegging their rates in response to change in interest rates. State Bank's Policy rate found granger cause for Conventional bank's rate of return but not for Islamic Banking Profit rates. In light of the findings of the study, Islamic Banks can develop an alternate independent benchmark rate to disengage its pricing mechanism with interest rate. Policymakers can develop separate monetary policy rates to regulate the Islamic Banking rates of return. The study has also practical implications insight for policymakers and regulators who want to influence both the banking rates in a dual system through one policy rate. The study advanced the finding of previous studies to loan side nexus of rates of return between Islamic & conventional banking. The impact of SBP monetary policy is also documented for the first time in Pakistan as a comparative analysis on Islamic & conventional Bank's rates of return.

Keywords: Nexus, Interest Rate, Profit rate, SBP Policy discount rate, co-integration.

Introduction

As per the IMF study report on Islamic Banking-2017, Islamic Banking, so far, has made its presence in 60 countries around the globe and has also become systematically vital in 14 jurisdictions. Islamic Banking volume in the international banking industry has crossed USD 2.00 Trillion (Shabsigh, et al. 2017). The Islamic Republic of Pakistan is the 6th country of the world in term of the population having a population exceeding 212 Million which consist mostly on Muslims (98%) (Hakim & Mahmood, 2001). Being a Muslim country, inspiration towards Islamic banking is natural. As per the Islamic Banking bulletin of State Bank of Pakistan Dec-18, Share of Islamic Banking Assets has touched to 13.5 percent and Share of Deposit has crossed 15.5 percent in overall Deposit of the Banking Industry. Islamic Banking Assets as of Dec 31, 2018, has reached Rs. 2.658 trillion after registering YOY growth of around 17 percent. Islamic Banking Deposit for the like period has touched Rs. 2.20 trillion while registering a YOY growth rate of 16.9 percent. Islamic Banking Assets are now 13.5 percent and Deposits are 15.5 percent of total Banking Industry volume (SBP, 2018).

The fast pace of Islamic banking growth has also attracted a few controversies (Sukmana & Ibrahim, 2017). Critiques of Islamic Banking argue that the present Islamic Banking Practices are not in line with the essence of Sharia'h objectives (Majeed & Zainab, 2017). The Critiques of Islamic banking argue that the profit rate of Islamic Banks is linked and influenced by the interest rate of conventional banks, so it is fair to say that both

are just two sides of the same coin (Samad & Chowdhury, 2017). Further, one of the most distinguishing features of Islamic Banking is its Profit & Loss sharing partnership Contract but in practicality, it is observed that this PLS base mode contract counts only a very nominal portion of Islamic Banking Assets in the industry as the major portion is based on debt-based instruments. However, among all, the most damaging criticism is that Islamic banking benchmarking its products against conventional banking interest rates (Sukmana and Ibrahim, 2017). Some studies conducted on "linkage between the Interest rate and Profit rate on deposits" but reported mixed results.

Few studies (Adewuyi & Naim, 2016; Widigdo, et al. 2016; Samad & Chowdhury, 2017) confirmed that linkage exists between Interest-based conventional banks and profit rates of Islamic Banks. On the other hand, studies like (Kabir et al.2012) proved that Islamic banking is Sharia'h compliant and Islamic Banks do not adjust their profit rate in response to any change in conventional bank's interest rate (Ertürk & Yüksel, 2013). The referred mixed findings against and in favor of Islamic banking practices further strengthen that the debate about the Islamicity of Islamic banks is still a non-fading issue and needs to investigate further (Ibrahim, 2015). Though previous studies have compared and investigated the deposit side linkages between interest rates and profit rates of Islamic banks in different countries, however, this study is to be the first attempt to investigate both Deposits and financing side nexus between Islamic and conventional banking. The study also uses three different models regression and **Vector Error Correction Model (VECM)** for Deposits & **autoregressive distributed lag (ARDL)** for financing side nexus to have robustness in test results.

This study empirically investigates that whether a causal link exists or not between the conventional bank's interest rate and Islamic bank's profit rate on deposits and loans in Pakistan. The study also advances the previous studies through loan side linkage investigation of Islamic & conventional banks. More specifically, the study aims to investigate and answer the following three main research questions:

- (i) What is the nature of causality between the Profit rate of Islamic Banks and the interest rate of conventional banks on Deposits in Pakistan?
- (ii) What is the nature of causality between Profit rates of Islamic Banks and interest rates of conventional Banking on lending in Pakistan?
- (iii) How does the SBP Policy discount rate influence the Islamic and conventional Banking profits rates on Deposits and lending?

The findings of research study confirmed the existence of cointegration between the profit rate of Islamic Banks and interest rates of conventional banks. Granger causality test traced the causality between the two rates of return running from Islamic to conventional banking rates thus confirming that Islamic banks are not pegging their rates in response to change in interest rates. State Bank's Policy rate found granger cause for Conventional bank's rate of return but not for Islamic Banking Profit rates.

The rest of the paper consist on literature review as immediate after followed by Research methodology, model specification, empirical finding and discussion and last part of the paper is conclusion while taking into account the research limitation, policy implication and future direction for researchers. The study advanced the theoretical contribution towards nexus between Islamic and conventional banking profit rates while covering the methodological gap with advancement of dual impact analysis Deposit as well as advances.

Literature Review

The interest rate in conventional banking is considered a lifeblood element for the financial system. On the other hand, an Islamic bank is built upon the main prohibition of interest rate in their activities and based upon PLS mode for deposit and financing (Samad & Chowdhury, 2017). (Ibrahim & Ismail ,2015) mentioned that the structure of IFI is based on the Holy Quran and Sunnah where the essence is to achieve the objective of Maqasid al-Shariah. Although IFIs are different from conventional banks in terms of operations and philosophy

however, they also bear various similarities with the conventional bank in terms of the nature of governance. Islamic banking is defined as "the banking which is shari'ah compliant. The primary sources of shari'ah are the Quran (the Holy Book of Allah) & Sunnah (the traditions and practices of the Islamic prophet) of the Holy Prophet (PBUH). The secondary sources include Ijmah (the consensus or agreement of Islamic scholars on a point of Islamic law), Qiyas (the process of deductive analogy), and ijihad (physical or mental effort, expended in a particular activity).

(Paksoy & Abaross,2015) emphasized that elimination of interest is not the only requirement for Islamic Banking but it should practice and establish a mechanism that supports complete social justice without any exploitation. (Chowdhury et al.2018) concluded that risk-sharing products of Islamic banking are positively correlated with economic growth due to their engagement in real economic activities. (Ayub ,2007) in his book defined Islamic Banking as banking free from all kinds of Riba/interest. Islam prohibits all sort of Riba/Interest; however, at the same time, it encourages entitlement to profit with the concept of risk and responsibility. Islamic Banking is based on the theory of PLS and it operates through agency theory (Ismail, 2011). Agency theory while taking profit sharing as variable analyze the PLS distribution in a various contract of Islamic Banking (Mirakhor & Zaidi, 2007). Conventional banking is based on interest rate theory. Agency theory of causality is helpful to understand the cause & effect of one variable (Islamic Banking) on the other(conventional Banking) (Shogren, et al. 2017).

Central Bank's Policy Rate (monetary Policy rate) Impact on Islamic and conventional Banking rates of return

To analyze the role of Islamic banks in Indonesia and Malaysia, ten years of monthly data has been investigated through the VAR model and study results revealed that Islamic banks though playing a vital role in economic growth transformation yet the role to transmit monetary policy impact is yet modest (Audah & Kasri, 2020). A similar study in the context of Pakistan's banking industry conducted while using the monthly data ranging from 2006 to 2016. The study confirmed that monetary policy rates equally influence the Islamic and conventional banking systems (Naz, 2020). (Rashid, et.al.2019) investigated the impact of monetary policy shock on conventional and Islamic bank's credit channels and found that the impact on Islamic banks is weaker as compared with conventional banks (Rashid,et al. 2019). (Zulhibri,2018) investigated the impact of conventional monetary policy towards Islamic Banks and found that the Islamic Bank's financing behavior to monetary policy shocks is the same as of conventional banks.

However, in the case of a partnership (musharakah) based financing, (Adela,2018) confirmed that the rate of return on Musharakah is based on real economic activities thus can be used as an alternative to the interest rate for influencing various economic activities and monetary policy. (Korkut & Ozgur,2017) discussed that due to financial shocks, the financial sector is considered the most sensitive segment of an economy. Therefore, an alternate financial system by way of the Islamic financial system is inevitable which is considered more resilient. Since both, the system has different dynamics and structure so the policy rate needs to influence both the system differently for desired monetary results. To investigate this aspect in Malaysia (Nazib & Masih ,2017) found that monetary policy shock still has the same impact on Islamic banking deposits as on conventional banking deposits.

(Ito,2013) examined the co-movement of Islamic rate of Return, Kuala Lumpur interbank offer rate, and interest rate of conventional banks and found that Islamic Banking rate of return propels the conventional banking interest rate for the mentioned maturities. Unlike previous studies, this study results revealed that Islamic banking rates of return granger cause the conventional bank's rates of return. Since the study has been conducted in the context of Bangladesh only so this influence of Islamic Banking towards conventional banking might be specific to this market having its own dynamics including share of Islamic Banking and impact of religiosity of customers towards Islamic banking. (Hakan & Gulumser,2011) confirmed that any change in the central bank's

monetary policy interest rate not only does influence the deposit and lending rate of conventional banks but it equally does influence the Islamic bank's rate of return.

This is mainly because Islamic banks are heavily inclined towards debt-based instruments instead of the PLS mode of financing and investments. (Makiyan,2003) further highlighted that apart from the rate of return, many other factors can affect the lending behavior of banks. The statistically developed model was used to examine the causal relationship between lending behavior and Inflation, rate of return, and government intervention. Results revealed that government policy is stronger in influencing the lending behavior of banks than that of economic factors. Given above literature review, the study develops the following hypothesis:

H-1: Central Bank's Policy Rate doesn't granger cause the Islamic bank's Deposits & Lending rates of return.

Relationship between Interest rate of conventional Banks and Profit rates of Islamic Banks

As conceptually claimed that Islamic Banking products are interest-free but if this is true then any change in an interest rate should not affect the profit rate of Islamic Banking products. To investigate the relationship between the Interest rate of conventional Banks and Profit rates of Islamic Banks various studies have been conducted in various countries and found mixed results. In countries like Indonesia, Malaysia, Bangladesh, and Pakistan where Islamic banking operates in conjunction with the conventional banks, a substantial relationship exists between the two (Shogre, et al. 2017),(Imam & Kpodar,2010) in IMF working paper emphasized that Non-Muslims and less devout Muslims while putting their deposits with any banking institutions only consider the rate of return and the opportunity cost of placing funds with Islamic OR conventional financial institutions. (Bacha,2014) mentioned that an increase in the interest rate in conventional banks makes it compulsory for the Islamic banks and vice versa to reciprocate this increase for their depositors to avoid liquidity crunch.

(Haron & Azmi,2008) discussed that taking into considering the substitution effect an Increase in return on deposit products of one banking system can attract the customers from other systems (Khan, et al. 2008). Samad and (Chowdhury,2017) documented that the Islamic banks' rate of return has a very significant impact on the rate of interest of conventional banking institutions. A relative study conducted by (Akhtar et al.2017) revealed that a boost in the rate of interest causing an increase in deposit volume of the conventional banking industry and a decline in Islamic Banking Deposits. Another study to explore the linkage between Islamic banking benchmark rate and conventional banking benchmark rate has been conducted by(nechi & smaui ,2019) which confirmed that Islamic banking benchmark rate is not independent of that of conventional benchmark rate(Nechi & Smaoui 2019).

The said findings were further endorsed in a study of (Affandi,2019) where it revealed that shock of conventional banking rate has a higher impact on Islamic banking deposit rates(Affandi, 2019). Ashraf & Al-wreiket in their research study confirmed that Islamic and conventional bank's rates of return bear a nexus because of economic linkage where both the banking system operates under the same environment (Ashraf, Al-Wreiket, et al. 2020), (Khalidin & Masbar,2017) explored the causality of interest rate towards the financing portfolio in Islamic Banks and found that Islamic Banking financing in Indonesia is not free from interest influence. Further, interest also indirectly influences the operation of Islamic banking and Murabaha financing is get influenced by interest rate. (Adewuyi& Naim,2016) also confirmed the previous results of causality between Islamic Bank's Return & rate of interest of conventional Bank's against deposits in all the three countries.

(Cevik & Charap,2015) concluded that the rate of return on Islamic banking deposits very closely follows the direction and behavior set by conventional bank's interest rates. They further mentioned that another important question can be investigated to answer; whether lending side behavior of Islamic Bank's Credit pricing differs from conventional bank's lending practices? (Seho & Masih,2015) discussed that risk Sharing Financing (RSF)

is a prominent feature of Islamic banking but in practice, its share in overall financing of Islamic banking is not that encouraging as Islamic banks are more interested in debt-based instruments to compete with their conventional counterparts. (Gulzar & Masih,2015) also confirmed that Islamic banking profit rates are still linked with a conventional banking interest rate on deposits. Now the question arises if the same nexus also exists on the lending side of Islamic and conventional banks? (Ciorana,2014) in his research study traced out a significant causal link between the rate of inflation and the interest rate of monetary policy.

The same linkage of interest rate with inflation was also traced in Pakistan by (Ayub , et al.2014) for the period from 1973-2010. (Anuar et al.2012) also confirmed that movement in interest rate cause to adjust the Islamic Banking profit rate on deposits thus strengthening the viewpoint that in theory and practice of Islamic banking there exists a significant gap. This influence of interest rate also confirmed by (Adebola et al, 2011) in their research study. (Kaleem & Isa ,2003) also confirmed that Islamic Bank's before adjusting their return on TDRs always consider conventional Bank's interest rates. Since Islamic Banks are following sharia ruling having unique structure so it may not necessarily get influences by the same macro-economic factors which influence directly the conventional banking system (Abdullah et al, 2011).on the other hand, (Sekreter et al,2012) concluded that parallelism exists between the Islamic and conventional banks' deposit rates.

However, similarities between profit rates on deposits don't mean Islamic banks are simply distributing the interest to their clients like the way conventional banks are doing. Monthly average time deposit rates for the period 2000 to 2017 have been analyzed to investigate the link between real interest rate, time deposit rates, and inflation and risk premium rates. Findings revealed no prominent influence has been detected of real interest rates with time deposit rates of Islamic and conventional banks (Lee, et al. 2020). Al-Harbi also confirmed in his research study that interest rate is not one of the determinants of rates of return in Islamic banking (Al-Harbi 2020),(Hasan & Dridi ,2010) also concluded that Islamic Banks got affected differently from Conventional banks. Islamic banks proved more risk resilient but lower in profitability. To investigate this aspect in turkey under a dual banking system research study carried out by (Erturka & Yuksela,2013).

The granger causality test results confirmed no causality between the two deposit rates hence does not endorse rather contradicts the results of many previous studies conducted in Malaysia, Turkey & Bangladesh. The finding can be interpreted that the Islamic Bank does not adjust its deposit rate pegged to conventional bank's interest rate. (Kabir et al.2012) investigated the dissimilarities between Islamic and Conventional Bank's Profit & Lending rates in Bangladesh and found that the highest profit rate is charged to borrowers by foreign Banks and significant difference observed in the rate of Islamic Banks, Local Conventional Banks & state-owned Bank. The literature shows that overall mixed findings have been documented in various countries in favor and against the nexus of Islamic banking profit rates with interest rates. It strengthens the argument that the debate is still going on and yet need further empirical studies to conclude. Literature also has a gap as financing side nexus between interest rate and Islamic bank financing rates yet not investigated. Given above, we hypothesis that:

H-2: There is no causal link exists between the Profit rate of Islamic Banks and the interest rate of conventional banks on Deposits in Pakistan.

H-3: There is no Causal Link that exists between the Profit rate of Islamic Banks and the interest rate of conventional banks on Loans in Pakistan.

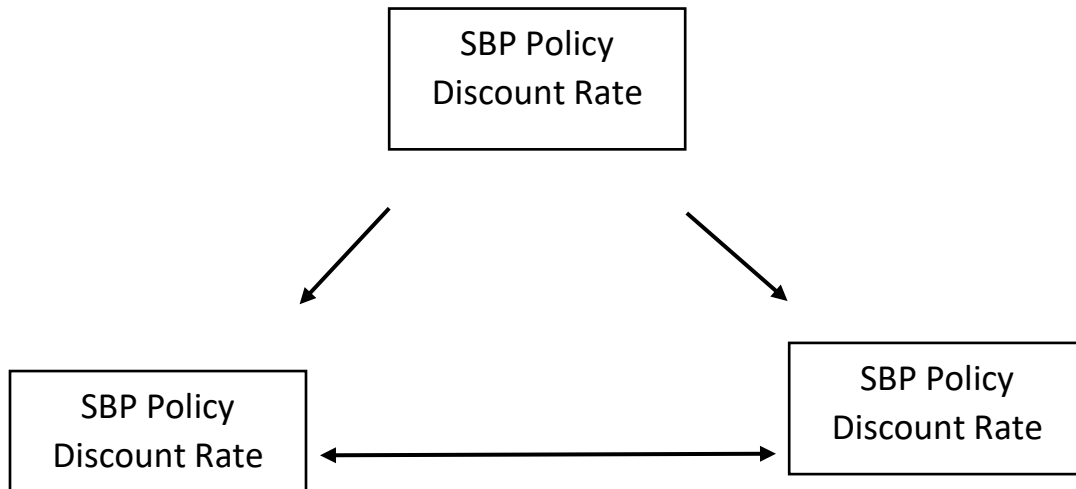
H-4: Conventional Bank's interest rate on deposits granger cause Islamic Bank's profit rate on deposits and loans.

Data and Research Methodology Framework

The study has used secondary data for a period of 15 years from 2003 to 2018. Time series data consist of Islamic Bank's Profit rate (IBPR_D), Conventional bank's Interest rate on Deposits (CBIR_D), and Islamic Banking Profit rate against lending (IBPR_L), Conventional banking Interest rate against lending (CBIR_L) and SBP Discount rate (SBP_DR). The Profit rate on deposits and lending products of Islamic Banking is a dependent variable, Interest rate on Deposits and Lending products of conventional banks are key explanatory and independent variables while SBP Discount rate included as control variables. Semi-annual weighted average data for all said variables have been extracted from the State Bank of Pakistan's website. Historical average data of Islamic & Conventional segment consists of all the respective conventional and Islamic Private Banks which were operational in Pakistan during the respective period. At present, thirty-five SBP-scheduled banks are operating in Pakistan with a total network of 13,693 branches.

It includes five full-fledged Islamic Banks, Five Foreign Banks, Four Specialized Banks, and twenty-one Local Private Banks. The study uses all private sector scheduled banks from the conventional side and all private sector Islamic Banks as a sample for our study. All the banks selected are commercial banks. Since Islamic Banks are from the private sector, therefore, for better comparison conventional banks also selected from the private sector as public sector banks have different market dynamics. In term of numbers, conventional Banking sample consists of 20 Banks and Islamic banking consist of 21 Banks which includes full-fledge Five Islamic Banks and rest 16 Islamic Banking Divisions of Conventional Banks.

Conceptual Frame work for the Study



Model Specification

A) Vector autoregressive model (VAR) for Causality between CBIR_D and IBPR_D

(Astrrious & Stephen,2007) mentioned that when the distinction in terms of an endogenous and exogenous variable is not very clear, VAR is the appropriate econometric technique to apply. In the present study, the direction of causality between the variable: CBIR_D and IBPR_D are also not clear so VAR is the most suitable model as its results are also much better than various other models. VECM has applied to check the causality between IBPR_D & CBIR_D. As an overall empirical methodology, the study includes various econometric techniques including but not limited to co-integration test, Test for a causal link, impulse response function, and variance decomposition. VECM diagnostic tests including normality and Model stability tests are also part of research methodology. Few previous studies where VAR as an econometric model was used to check the

causality for the same nature of variables are; (Cevik & Charap,2015),(Gulzar & Masih,2015), and Abdullah et al(2011). In this study, IBPR_D is the dependent variable, CBIR_D and SBP_DR are independent/explanatory variables. The econometric equation is given below:

$$1) IBPR_D = \alpha + \beta_1(CBIR_D) + \beta_2(SBP_DR) + \varepsilon_i$$

Where α is constant, β_1 and β_2 are coefficients and ε_i is error term of the model

FOR VECM Model, econometric equation is formulated as below:

$$2) \Delta IBPR_D_t = \beta_0 + \sum_{i=1}^n \beta_1 \Delta IBPR_D_{t-i} + \sum_{i=0}^n \beta_2 \Delta CBIR_D_{t-i} + \sum_{i=0}^n \beta_3 \Delta SBP_DR_{t-i} + \lambda ECt_{t-5} + \varepsilon_t$$

Where IBPR_D represents Islamic Banking profit rate on Deposits, CBIR_D is Conventional Banking Interest rate on deposits and SBP_DR is the state bank of Pakistan's Policy discount rate. Δ is reflecting the first difference, λ represents short-run coefficient, ECt_{t-5} is the error correction term, ε_t represent white noise. (This equation is amended version of original equation used by (Vazakidis & Adamopoulos,2011).

B) Auto-Regressive Distributive Lag (ARDL) for Causality between CBIR_L and IBPR_L

Auto-Regressive Distributive Lag (ARDL) has used as econometric model because of its flexibility and variables are not stationary at same level with respect of lending. The variable CBIR_L is stationary at level whereas the other variable IBPR_L & SBP_DR found stationary at 1st difference hence VAR is not appropriate for such scenarios. Therefore, Auto-Regressive Distributive Lag (ARDL) method otherwise called bound testing approach has been proposed by (Pesaran et al.2001). ARDL Methodology includes ARDL Bound Test, ARDL Co-integration, ARDL long run and short run estimates. (Adewuyi & Naim,2016) used ARDL as econometric model to check the co-integration between Islamic & conventional bank's rate of return. ARDL is comprises on two main stages : At first stage, it examines the long run co-integration between the variable through F statistics, If F statistics calculated value is above the upper bound critical values it suggest existence of long run co-integration in variable. Second stage is about estimation of both long run and how speedy it covers the distance towards long run equilibrium each period. At this stage actually coefficient of long run relationship are estimated and estimates for error correction model also obtained. The study also implies the granger causality test pair wise for involved variables. The diagnostic test including normality and Model stability test are also part of research methodology. In this case IBPR_L is the dependent variable whereas CBIR_L and SBP_DR are independent variable. The econometric equation for the model is given below.

$$3) IBPR_L = \alpha + \beta_1(CBIR_L) + \beta_2(SBP_DR) + \varepsilon_i$$

Where α is constant, β_1 and β_2 are coefficients and ε_i is error term of the model

For Model specification following econometric equation is used

$$4) \Delta IBPR_L_t = \beta_0 + \sum_{i=1}^n \beta_1 \Delta IBPR_L_{t-i} + \sum_{i=0}^n \beta_2 \Delta CBIR_L_{t-i} + \sum_{i=0}^n \beta_3 \Delta SBP_DR_{t-i} + a_1 IBPR_L_{t-1} + a_2 CBIR_L_{t-1} + a_3 SBP_DR_{t-1} + \mu_t$$

Where IBPR_L represents Islamic Banking profit rate on lending, CBIR_L is Conventional Banking Interest rate for Lending and SBP_DR is state bank of Pakistan's Policy discount rate. β_0 , β_1 , β_2 , β_3 , and a_1 a_2 a_3 ; are Parameters. Δ denotes first difference while μ_t is the error term.

4. EMPERICAL RESULTS AND DISCUSSION

Table-01 Descriptive Statistics

	CBIR_L	IBPR_L	CBIR_D	IBPR_D	SBP_DR
Mean:	10.34900	10.83867	4.082667	3.931333	9.649000
Max:	14.54000	15.11000	6.710000	6.150000	14.50000
Min:	5.690000	5.230000	1.180000	2.320000	5.750000
S.D:	2.713668	2.984312	1.619757	1.194521	2.683922
Skew.:	-0.159256	-0.277351	-0.164353	0.128682	0.084240
Kurt:	1.803440	1.929322	1.882125	1.519520	1.940801
Jarque-Bera:	1.916505	1.817558	1.697116	2.822573	1.437862
P Value :	0.383562	0.403016	0.428032	0.243829	0.487273

Table-1 shows a summary of descriptive statistics of all the variables. The CBIR_L consist on 30 observations and it ranges from 5.69% to 14.54% with mean average of 10.34% having standard deviation 2.71%, which means data is not much volatile. The comparative variable to CBIR_L is IBPR_L, the key statistics confirms almost same behavior during the period under study. IBPR_L ranges from 5.23% to 15.11% with mean average 10.83% and SD 2.98%. IBPR-L has reached a bit higher to CBIR_L, Mean average also shows the IBPR_L average remains higher to CBIR_L.

Similarly, when we look at Deposit side of both segment i.e Islamic Banking & conventional Banking both Variable: CBIR-D and IBPR-D bear same trend and direction. CBIR-D ranges from 1.18% to 6.71%, average mean is 4.08% and SD is 1.61 for lower than average mean. The comparative variable IBPR-D ranges from 2.32% to 6.15%, average mean here is 3.93% which is lower than CBIR-D. It means Islamic Banking Profit rate mean average is less than Conventional Banking Interest rate on Deposit, however, trend wise there is positive link in both. Jarque-Bera test statistic and respective P value shows that data is normally distributed.

Causality between CBIR_D and IBPR_D: In order to check the exact nature and extent of association between Conventional Banking interest rate on deposits (CBIR_D) and Islamic banking profit rate on deposits (IBPR_D) this study uses VECM as econometric tool.

Unit root test

To check the stationary the most reliable test: Augmented Dickey-Fuller (ADF) Test applied on time series and results are tabulated under table-1. The test result failed to reject null hypothesis of non-stationary for all the time series at level, however, null hypothesis are rejected at 1st difference mean series are stationary at 1st difference.

Table-02: Unit Root Test (Augmented Ducky-Fuller (ADF) Result: At Level					
Test	Test statistics	1%	5%	Decision	
CBIR_D	-2.313307 (0.1749)	-3.689194	-2.971853	Not stationary	
IBPR_D	-1.313988 (0.6088)	-3.689194	-2.971853	Not stationary	
SBP_DR	-0.794960 (0.8056)	-3.679322	-2.967767	Not stationary	
At 1st Difference					
CBIR_D	-3.337984 (0.0225)	-3.689194	-2.971853	Stationary	
IBPR_D	-3.775200 (0.0081)	-3.689194	-2.971853	Stationary	
SBP_DR	-4.190306 (0.0030)	-3.689194	-2.971853	Stationary	

*Null Hypo: Data is not stationary.

Since the time series data consist on time series from 2003 to 2018 which includes the financial crises of 2007-2008. Keeping in view, the study added structural break to check robustness of results and applied (Zivot &Andrew,1992) test as it is considered an advanced analysis over standard ADF when time series bears one structural break (Narayan,2005). As tabulated below time series are stationery at level for all the three variables and results are given below:

Table-03: Unit Root Test (Zivot and Andrews (1992) Result: At Level					
Test	Test statistics	1%	5%	Decision	Break point
CBIR_D	-7.679245 (7.69E-06)	-5.57	-5.08	Stationary	11.00
IBPR_D	-4.837675 (0.008305)	-5.57	-5.08	Stationary	10.00
SBP_DR	-4.281344 (0.025951)	-5.57	-5.08	Stationary	10.00

Null Hypothesis: time series has a unit root with a structural break in both the intercept and trend

Johansen Cointegration

To investigate existence of co-integration between study variables, study applies Johansen (1991 and 1995) tests. As results shown under table-2, Trace and Max-eigenvalue test indicates 2 cointegrating eqn (s) at the 0.05 level. The existence of cointegration is in line with findings of previous studies of (Cevik & Charap, 2015); (Adewuyi & Naim,2016), and (Takayasu Ito,2013).

Table-04: Unrestricted Cointegration Rank Test (Trace)

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No Of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.988872	124.8424	29.79707	0.0000
At most 1 *	0.489035	16.88370	15.49471	0.0307
At most 2	0.031526	0.768798	3.841466	0.3806
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.988872	107.9587	21.13162	0.0001
At most 1 *	0.489035	16.11490	14.26460	0.0252
At most 2	0.031526	0.768798	3.841466	0.3806
Trace and Max-eigenvalue test indicate 2 cointegrating eqn(s) at the 0.05 level. * reflects rejection of the hypothesis at the 0.05 level				

The existence of co-integration is an indication of a causal link between variables. So, to find out the causality and its direction study uses a pair-wise Granger causality test formulated by Granger (1969). Test results as appearing in table-3, confirm that IBPR granger cause CBIR-D and causality is unidirectional here running from IBPR_D to CBIR_D. SBP_DR granger cause IBPR_D & CBIR_D both. Based on the test, the results study concludes and rejects our null hypothesis H-1: Central Bank's Policy Rate doesn't granger cause the Islamic bank's Deposits. The finding has theoretical foundations as both the banking system have been following and getting influence from SBP-policy discount rate. Both the banking segment fix the price of deposit products while benchmarking the SBP policy rate so the influence and causality from the SBP policy discount rate are very obvious. Direction of causality in present study confirmed uni-directional causality

running from Islamic to Conventional rate of return which is in agreement to previous study conducted by (Samad & Chowdhury,2017)-Bangladesh

Table-05: Direction of Causality

Null Hypothesis: Direction of Causality	F-Statistic	Prob.	Decision
CBIR_D doesn't granger cause IBPR_D	0.66659	0.4217	Not Reject
IBPR_D doesn't granger cause CBIR_D	13.9726	0.0009	Reject
SBP_DR doesn't granger cause IBPR_D	4.41515	0.0455	Reject
IBPR_D doesn't granger cause SBP_DR	0.11573	0.7364	Not Reject
SBP_DR doesn't granger cause CBIR_D	7.80079	0.0097	Reject
CBIR_D doesn't granger cause SBP_DR	1.30084	0.2645	Not Reject

Table-06: Vector Error Correction Estimates

Cointegrating Eq:	CointEq1		
IBPR_D(-1)	1.000000		
CBIR_D(-1)	0.095781		
	(0.02383)		
	[4.01975]		
SBP_DR(-1)	0.338888		
	(0.01171)		
	[28.9378]		
C	0.381265		
Error Correction:	D(IBPR_D)	D(CBIR_D)	D(SBP_DR)
CointEq1	-2.392172	-0.366407	-1.894643
	(0.55085)	(0.77459)	(1.57438)
	[-4.34270]	[-0.47303]	[-1.20342]

Results in Table-06 shows that both the independent variables "t statistics" is above 1.96 which shows its significance, so we conclude that there is a significant and positive long-run association between the variable, meaning that both the independent variable (CIR_D & SBP_DR) have a long-run relationship with the dependent variable: IBPR_D. Further, CointEq1 is negative which is good as it shows the speed of adjustment towards equilibrium Standard errors in () & t-statistics in [].

Since monthly or quarterly data for the study, variables were not available, so the Johansen Cointegration test applied on 30 observations which may result is misleading results due to the low number of observations, to counter check for the result robustness the study also applied regression analysis on the 1st difference of variables where all variables are stationary ay same level.

The results are tabulated under table 4-A. The reported R Square 0.2878 indicates that the model explains a 28.78% variation in Islamic banking profit rate (deposits). The coefficient value of (CBIR_D) is 0.4463, t value is 3.303 and p-value is 0.0027 it indicates that CBIR has a significant positive association with IBPR.

Statistically, it can be interpreted that a one percent increase in CBIR_D brings a 0.44% increase in IBPR_D at a 01 percent significant level, other things keep constant. DW- state value is 1.8916 indicates no serial correlation issue. So the regression analysis justified that the cointegration results are correct and no spurious because a low number of observations have been used for cointegration analysis.

Table-07: Method: Least Square

	Dependent variable= D(IBPR_D)			
	Coefficient	Std. Error	t-statistics	Prob. value
C	-0.0068	0.0712	-0.0958	0.9243
D(CBIR_D)	0.4463	0.1351	3.3034	0.0027
R-square	0.2878			
Adj. R-square	0.2614			
F-statistic	10.9125			
Prob (F-statistic)	0.0026			
Durbin-Watson stat	1.8916			

Causality between Conventional Banking interest rate (CBIR_L) and Islamic Banking profit rate on Deposits (IBPR_L)

Unit root test. To check the stationary the most reliable test: Augmented Dickey-Fuller (ADF) Test applied on time series. The test result shows that our variable: CBIR_L is stationary at level, however, the remaining two variables are found stationary at 1st difference. Since the variables have mixed order of integration and no variable found stationary at 1st difference so ARDL can be applied (Adewuyi and Naim,2016); (Akhtar et al. 2017)

Table-08: Unit Root Test (Augmented Ducky-Fuller)

At Level				
Test	Test statistics	1%	5%	Decision
CBIR_L	-3.704272 (0.0115)	-3.769597	-3.004861	Stationery
IBPR_L	-1.712420 (0.4147)	-3.679322	-2.967767	Not stationary
SBP_DR	-0.794960 (0.8056)	-3.679322	-2.967767	Not stationary
At t 1st Difference				
IBPR_L	-3.343666 (0.0223)	-3.689194	-2.971853	Stationary
SBP_DR	-4.190306 (0.0030)	-3.689194	-2.971853	Stationary

Table-09: ARDL Bond Test

F-Bounds Test: Null Hypothesis: No levels relationship				
Test Statistic	Value	Significance.	Lower bound	Upper Bound
F-statistic	30.18901	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

ARDL Bond Test

ARDL Bound test is important to decide about the long run (Cointegration) between variables which is also a prerequisite for the ARDL model.

The result of the Bound test results in table-6 is evident that the F statistics value is 30.18 and it is above the upper bound critical value at a 1% confidence level. So, we reject the null hypothesis and accept the alternate hypothesis: there is a long-run relationship between the study variables.

Table-10: Causality (granger) Tests Test Result

Null Hypothesis:	F-Statistic	Prob.
CBIR_L does not Granger Cause IBPR_L	1.56565	0.2220
IBPR_L does not Granger Cause CBIR_L	18.3387	0.0002
SBP_DR does not Granger Cause IBPR_L	3.04276	0.0929
IBPR_L does not Granger Cause SBP_DR	0.24501	0.6248
SBP_DR does not Granger Cause CBIR_L	4.92768	0.0354
CBIR_L does not Granger Cause SBP_DR	0.00329	0.9547

Causality Tests: Pairwise

The existence of co-integration in variables is an indication that variable may have a causal link among them. So, to check out the causality and its direction study uses the pair-wise Granger causality test developed by (Granger,1969).

As per lag selection criteria, optimal lag -1as identified by AIC and SC criterion granger causality test run, and the result are tabulated in table-7. Test results show that IBPR_L granger causes CBIR_L but CBIR_L does not granger cause IBPR_L. SBP_DR granger cause CBIR_L but does not granger cause IBPR_L. Finding rejects the null hypothesis H-4.

Table-11: ARDL Long Run Coefficient

Case 2: Restricted Constant and No Trend (Levels Equation)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CBIR_L	1.029397	0.057992	17.75070	0.0000
SBP_DR	0.046155	0.057813	0.798351	0.4325
C	-0.243766	0.220963	-1.103201	0.2809

$$EC = IBPR_L - (1.0294*CBIR_L + 0.0462*SBP_DR - 0.2438)$$

ARDL Long Run Coefficients

Since ARDL bound test has proved that the data series bears long-run co-integration, so the long-run relationship coefficients are now needed to estimate. In the below table, estimates for long-run relationship have been estimated while taking lag as per the Akiak Information Criteria (AIC) criteria automatic selected as ARDL (1,0,1) The estimated long-run coefficients shows that there is long-run significant co-integration in CBIR & the dependent variable: IBPR_L. Test results CBIR_L with coefficient value: 1.0293 are very significant as the P-value is 0.00. It means CBIR_L & IBPR_L are co-integrated and a 1% increase in CBIR_L will cause a 1.029% increase in IBPR_L. This is because Islamic Banks also offering the same competitive rates to remain in the competition as the conventional banks are offering, co-integration results are in line with theoretical norms. SBP_DR coefficient is not significantly co-integrated with IBPR_L as P value is above 0.05. This is because Islamic finance operation is not merely lending but are structured on Islamic Trading & Partnership contracts based on the PLS system.

Conclusion

The study examined the nexus between Conventional Banking interest rates and Islamic banking profit rates on deposits & Loans. For this purpose, the study applied regression, the Johansen Co-integration test, ARDL-Bond Test, Causality test, and VECM as econometric models. The Johansen Co-integration and regression tests results confirmed the existence of co-integration between the Islamic & Conventional banking Deposits rates, ARDL Bond test also confirmed the same linkage on lending side rates of return. The finding of co-integration further extended via the granger causality test introduced by (Granger,1969). The granger causality test confirmed the causality between Conventional Bank's interest rates and the Islamic bank's profit rates on deposits and loans running from Islamic Bank's profit rates towards Conventional bank's interest rate.

The results are helpful to conclude that Islamic banks do not adjust their profit rate on deposits while taking any influence from conventional banking interest rates. VECM & ARDL-Long run test results are in agreement to conclude the significant long-run relationship between the Islamic bank's profit rate and Conventional Bank's interest rate on deposits and loans. State Bank of Pakistan's policy discount rate has found as granger cause for both Islamic & Conventional profit rates on deposits but it doesn't granger cause the lending rate of Islamic Banks because of the special structure of Islamic financing contracts like Salam, Istisna, Musharkah. This is also theoretically understandable as both the banking system have been following and getting influence from the SBP-policy discount rate. Both the banking segment fix the price of deposit products while benchmarking the SBP policy rate, so the influence and causality from the SBP policy discount rate are very obvious.

The study results regarding the existence of co-integration are in line with previous studies of, (Cevik & Charap ,2015); (Adewuyi & Naim,2016); and (Takayasu Ito,2013). The direction of causality in the present study found uni-directional running from Islamic to Conventional rate of return which is in agreement with previous studies conducted by (Samad & Chowdhury,2017) and (Khalidin & Masbar ,2017). It is worth mentioning here that the current study confirms co-integration and long-run relationship between Islamic & Conventional rates but the direction of causality is running from Islamic to Conventional which is endorsing the viewpoint of sharia scholars in Pakistan who claim that Islamic Banks are not pegging their rates of return in response to conventional banking interest-based returns.

Policy implication and Recommendations

The empirical findings of the study have several important policy implications for the state bank of Pakistan, Pakistan Banking Association, Commercial Banks, academicians, and research scholars. SBP policy rate does not influence the Islamic bank's rate of return on lending. So, SBP as regulator and policymaker needs to cater to this aspect while developing a separate monetary policy rate measure for Islamic banking keeping in view the special nature of Islamic Banking without any compromise on the essence of Islamic Banking which is a shariah-compliant PLS base system. Further, Islamic Banking being PLS oriented system needs to develop its

own pricing mechanism rather than follow the KIBOR: Karachi Interbank offer rate. Using conventional banking benchmark is creating doubts in the minds of Islamic banking customers. Musharakah PLS rates can be used as a benchmark by Islamic Banking Institutions. It will further help Islamic banking to clear doubts about the islamicity of Islamic banking (Adela,2018).

Depositors and borrowers of Islamic Banking are more concerned about the islamicity of Islamic banking. Profit rate competitiveness is one of the factors but a separate benchmark in Islamic banking would be very helpful to clear the doubts in minds of depositors and borrowers. The research has used available bi-annual data for the study variables because of the data availability issue. However, it is strongly believed that research could generate more robust results if it would have been available in a monthly time series. Researchers are encouraged to use monthly data subject to availability in the future to conduct more sophisticated research in this regard. Future research can also be focused on some quantifiable measures to investigate the shariah compliance in Islamic Banking as so far only qualitative research has been conducted in this regard.

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Annexure-A Data Table

Year	Bi-Annual Weighted Average Lending Rates %		Bi-Annual Weighted Average Deposit Rate %		Weighted Average-bi annual Rate
	IRLCB	PRLIB	IRDCB	PRDIB	SBP DR
Jun-05	7.06	8.38	1.46	2.32	8.25
Dec-05	9.09	9.99	2.23	2.70	9.00
Jun-06	9.91	11.46	2.79	2.92	9.00
Dec-06	10.59	11.00	3.39	3.47	9.50
Jun-07	11.28	11.88	3.85	3.58	9.50
Dec-07	11.28	11.48	4.11	3.94	10.00
Jun-08	11.42	12.53	4.22	5.03	12.00
Dec-08	13.65	15.04	6.05	6.15	13.00
Jun-09	14.54	15.11	6.71	5.49	14.50
Dec-09	13.82	14.47	6.26	5.32	12.83
Jun-10	13.51	14.10	5.96	5.20	12.50
Dec-10	13.47	14.20	5.82	5.04	13.50
Jun-11	13.69	14.60	5.90	5.46	14.00
Dec-11	13.78	14.02	5.88	5.28	12.50
Jun-12	13.13	13.90	5.70	5.21	12.00
Dec-12	12.46	12.60	5.60	4.80	10.83
Jun-13	11.28	11.70	5.11	4.60	9.50
Dec-13	10.89	11.10	4.72	4.80	9.50
Jun-14	10.90	12.00	4.81	4.40	10.00
Dec-14	10.65	11.50	4.91	4.40	9.83
Jun-15	9.77	10.00	4.25	3.70	9.83
Dec-15	8.51	8.50	3.52	3.10	6.16
Jun-16	8.15	8.20	3.30	2.70	5.91
Dec-16	7.56	7.30	2.99	2.60	5.75
Jun-17	7.32	7.80	2.80	2.50	5.75
Dec-17	7.40	7.40	2.78	2.70	5.75
Jun-18	7.72	8.00	2.80	2.60	6.08