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## Comparison of risk taking behavior of banks and islamic banks in response to monetary policy & macro-prudential policy shifts

Naveed Aslam

*Master of Science in Islamic Banking & Finance*

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**COMPARISON OF RISK TAKING BEHAVIOR OF  
BANKS AND ISLAMIC BANKS IN RESPONSE TO  
MONETARY POLICY & MACRO-PRUDENTIAL  
POLICY SHIFTS**

This Project is submitted to the Department of Finance as partial fulfilment of Master of  
Science Degree in Islamic Banking and Finance

by

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Institute of Business Administration (IBA), Karachi

Fall Semester 2021

Institute of Business Administration (IBA), Karachi, Pakistan

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## **Acknowledgement**

I thank Dr. Ashraf Khan, Assistant Professor at the Institute of Business Administration (IBA), Karachi, for his invaluable guidance. I am also indebted to Dr. Irum Saba for her zealous patronage of MS Islamic Banking and Finance programme.

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## **Abstract**

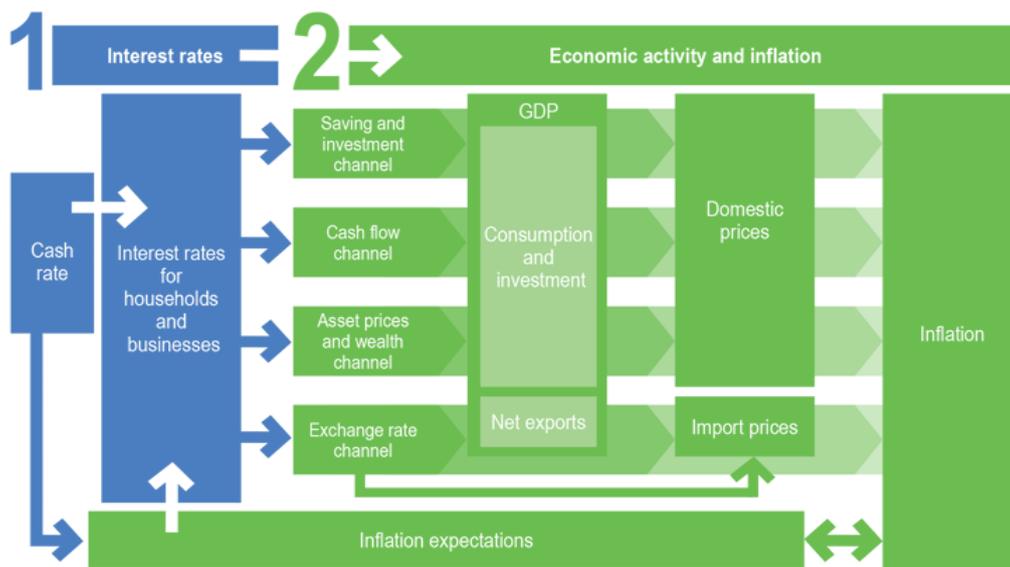
In the aftermath of global financial crisis of 2008, the central banks developed and deployed Macro-Prudential Policy (MPP) tools for protecting the financial system. MPP ensured the financial stability by influencing the risk taking behavior of financial institutions. Later, researchers raised questions over the impact of MPP on transmission mechanism of Monetary Policy (MP) which targeted inflation/employment. The literature on this issue transpired that MPP may impact the monetary policy transmission in a positive or negative way by controlling the risk taking channel. In this paper, the influence of monetary policy variables over the risk-taking behavior of overall banking industry and Islamic Banking Institutions (IBI) was examined in the presence of macro-prudential policy variables. The period of study was 2012-2020 when the monetary policy rates hit the lowest rates of 6.25% and then surged to peak in 2019 to 13.5%. Results transpired that expansionary monetary policy did not trigger the risk taking behavior but rather had a positive relationship with risk taking variable of loans to deposits both in overall banking industry and IBIs. This signifies a strong macro-prudential policy influence over risk taking in Pakistan. Though, the risk taking of IBIs was relatively higher, however, the credit risk management was better in IBIs as portrayed by lower non-performing financing rate.

**Keywords:** Islamic Banking; Risk Taking; Monetary Policy Transmission; Panel Regression

# Chapter 1

## Introduction

Monetary policy is based around the rate charged by the central bank to loan money to the commercial banks. This rate has a direct impact on the lending rate charged by the commercial banks to their customers. Hence, the level of borrowing of bank clients is directly based on the rates charged. When the rates are low, they want to borrow and when the rates are high, the borrowing is lower. The main purpose of the monetary policy is to ensure that there is a sustainable level of inflation which does not strip the purchasing power of the public and it provides maximum employment by giving incentive to the producers. Thereby, the country can move towards a GDP increase in the long run<sup>1</sup>. The transmission of monetary policy is based on how the monetary policy rate defines the resultant economic shift and its impact on inflation<sup>2</sup>. The main channels of transmission of the monetary policy include the i) saving and investment channel, ii) bank rates channel, iii) asset prices channel and iv) exchange rates channel. The description of the monetary policy channel by Reserve Bank of Australia is given below:



**Figure 1: monetary policy channel by Reserve Bank of Australia**

<sup>1</sup><https://www.banrep.gov.co/en/node/22746#:~:text=The%20primary%20objective%20of%20monetary,the%20population%27s%20quality%20of%20life.>

<sup>2</sup><https://www.rba.gov.au/education/resources/explainers/the-transmission-of-monetary-policy.html#:~:text=The%20transmission%20of%20monetary%20policy%20describes%20how%20changes%20made%20by,the%20impact%20on%20the%20economy>

The effectiveness of monetary policy is determined by how the credit channel of banks is able to respond to shifts in monetary policy. This is determined by studying the risk taking behavior of the bank towards changes in monetary policy (Paligorova & Santos, 2012).

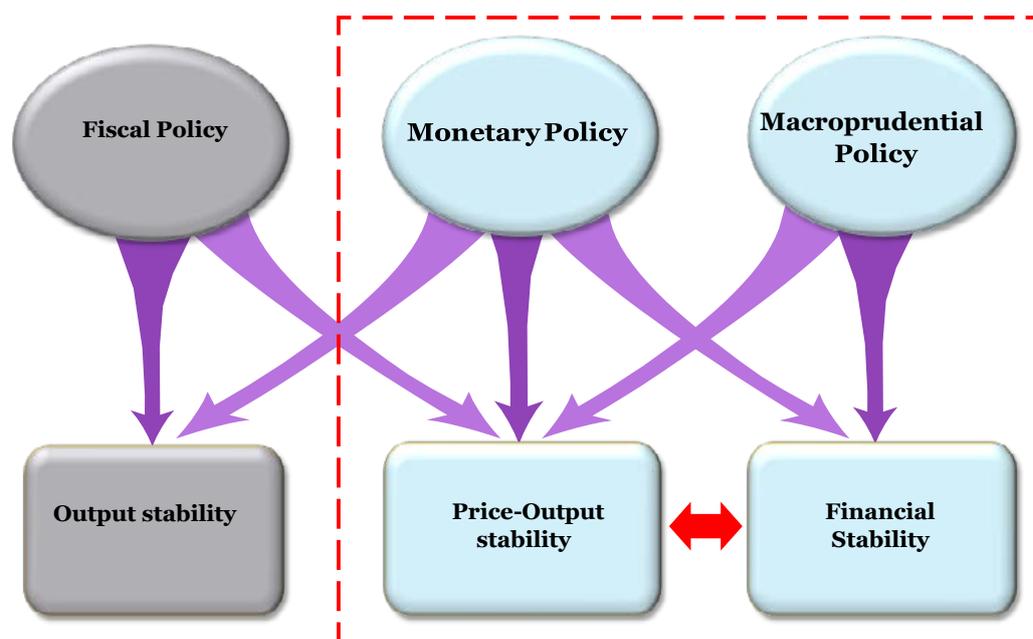
The Global Financial Crisis showed that monetary policy was not able to contain the seeds of economic turmoil and the question arose that whether price stability can ensure economic stability. IMF highlighted that GFC proved that price stability cannot ensure macroeconomic stability. In many jurisdictions, financial turmoil occurred during phases of low inflation. Hence, economic stability cannot happen without financial stability (Maddaloni & Luis Peydró, 2013). It was identified that there are side-effects of monetary policy and its impact on the financial stability can have an overall bearing over the economic stability (Nier & Kang, 2017). The below table explained this relationship.

**Table 1: side-effects of monetary policy and its impact on the financial stability**

<b>Source of financial instability</b>	<b>Monetary Policy Channel</b>	<b>Relationship with MP</b>	<b>Tools to contain side effects</b>
Risky behaviour of financial institutions	Risk-taking	Increases with lax MP and vice versa	Capital buffers, leverage ratio Net stable funding ratio, capital buffers

After the Global Financial Crisis (GFC), central banks and banking regulators have focused on the tools on the right hand side of the above table for achieving the financial stability. These tools have been broadly named as Macro-prudential policy which is used to control the side-effects of Monetary Policy, i.e., its impact over the risk taking of FIs. However, the side-effects of MPP include its impact on the monetary policy.

Its may be noted that there is a wide difference in the goals of these two policies. Monetary policy focuses on price stability and it may neglect economic stability. The goal of MPP is to ensure the stability of the financial system. This policy operates by placing the countercyclical buffers which protect the financial system from the adverse impact of economic downturns. (Maximillian, 2018). The interaction between Fiscal, Monetary and Macro-prudential policy is depicted by Nier & Kang (2017) by the below diagram:



**Figure 2: Interactions among policies and objectives**

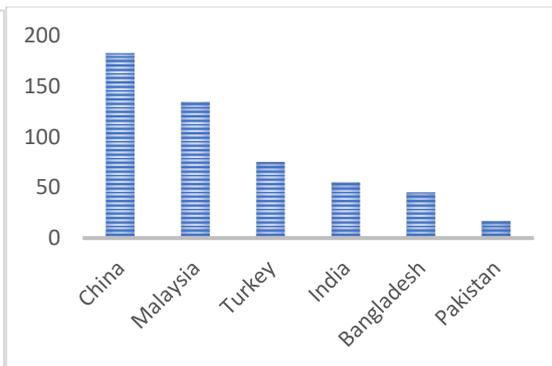
It has been observed that MPP is devised independently from the monetary policy. In case of Pakistan, the monetary policy is decided by the Monetary Policy Committee (MPC) which is a broad based committee comprising of economists, central bankers and Government officials (fiscal side representation). However, the macro-prudential policy resides solely with the State Bank of Pakistan. It was identified that these policies may compliment or nullify the effect of one-another. For instance, a central bank may pursue and loose monetary policy whereas the same may not result in credit off-take due to restrictions placed by regulators on leverage of banks. Other researchers pointed out that these policies must work in harmony to enhance the impact of eachother.

### **1.1 Risk taking in Pakistan under Monetary Policy and Macro-prudential Policy Variables**

Pakistan has one of the lowest Credit (Pvt. Sector) to GDP ratios in the world which is only 17.12%. This ratio has declined from 27.84% in 2007. The annual report of SBP (2015) addressed a special section to explain low Credit to GDP rate of Pakistan (State Bank of Pakistan, 2015). The main reasons cited in the report include crowding out effect, structural issues and financial deepening. An indication of where we stand viz-a-viz regional players is given by the below graph which suggests that we are at the bottom. Further, this graph also signifies the role of credit in economic growth. (Source: World Bank)

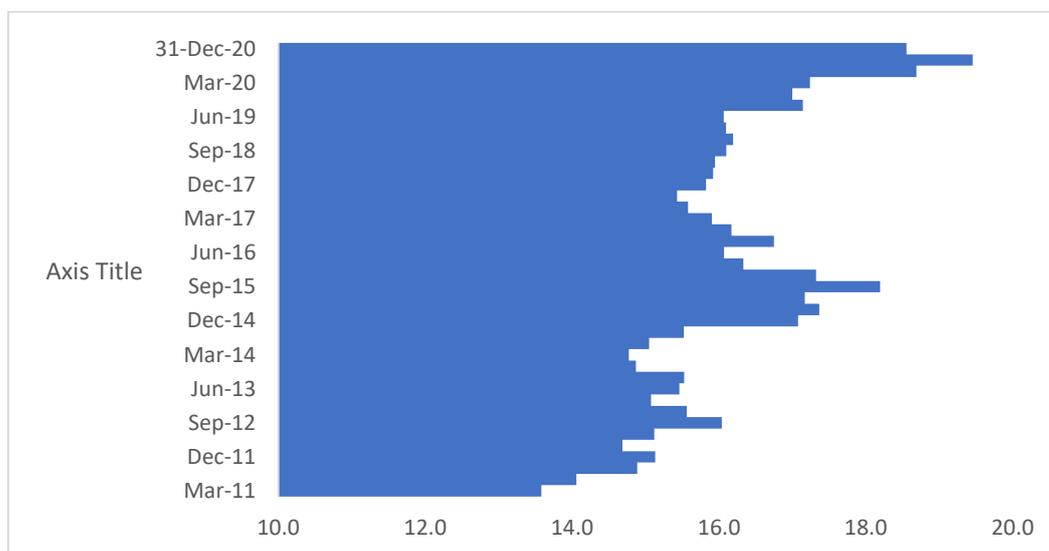


**Figure 3: Credit (Pvt.) to GDP-Pakistan**



**Figure 4: Credit (Pvt.) to GDP**

Literature transpired that introduction of capital adequacy ratio has resulted in decline in risk taking behavior. It was revealed that CAR ratio, overtime has been strengthened as a result of Basel implementation. This has contributed negatively to extension of credits to private sector which attracts higher risk charge and reduces the CAR (Khalid & Nadeem, 2017). The growth of CAR from 13% in 2011 to around 19% in 2020 depicts that Macro-Prudential policy has tightened (Source: SBP).



**Figure 5: CAR**

In case of Pakistan, the monetary policy rates from 2013 onwards witnessed an all-time low policy rate of 6.25% in 2016. This trend continued till mid of 2017, however, the credit take-off could not be witnessed contrary to expectations and economic theory. Further, as the interest rates started to increase thereafter, the loan to deposits of banking sector increased whereas this was supposed to have a negative impact over the ADR of the banking sector. No study in Pakistan has tried to probe this disruptions in credit/risk taking channel in presence of

macro-prudential policy. Further, there is a need to further establish whether the risk taking behavior of Islamic Banks reacts to monetary policy and macro prudential variables in the same way as the overall banking industry. It would be interesting to probe this fact as Islamic Banks deal in real assets rather than in document based financing only. Hence, their sensitivity to monetary policy channel viz-a-viz the banking industry would be interesting to note. This paper attempts to compare the risk-taking in banks and IBIs in Pakistan in a period with marked variations in discount rate & a stringent macro-prudential policy stance.

## Chapter 2

### Literature Review

As per the popular literature, low interest rates stimulate the risk taking channel which actually result in higher credit extensions. As low interest rates reduces the debt repayments, this results in lower default rates amid higher loan demand. This creates incentives to take higher risk (Nier & Kang, 2017). It was noted that credit lending criteria are laxed when interest rates are lowered (Dell'Ariccia, Laeven, & Suarez, 2017). This risk taking materializes into losses when the period of low interest rate is followed by higher interest rates or recession (Bonfim & Soares, 2018). Resultantly, after the GFC, Macro-prudential policy (MPP) tools were deployed to dampen the risk taking triggered by MP, to avoid credit crisis leading to financial/economic instability.

#### 2.1 Interaction of Monetary Policy & Macro-Prudential Policy

The financial stability can be achieved only if monetary policy can complement the macroprudential policy. The perplexing situation is that the macro-prudential tools may limit the risk taking of the financial institutions which may negative affect the MP transmission. Resultantly, the financial system may appear to be inelastic to deltas in discount rate or monetary policy rate. Maddaloni & Luis-Peydró (2013) pointed out that the two policies have acted in opposite directions in many jurisdictions. Resultantly, they may act to nullify the impact of each other.

Literature review revealed that the effective use of Macro prudential tools can reduce the use of more aggressive tools of monetary policy (Kannan, Pau, & Alasdair, 2009). It was highlighted that these two policies must be laid down with consultation with each-other. Further, it was emphasized that MPP should be deployed to achieve goals of Monetary Policy (N'Diaye, 2009). It was also confirmed that MPP may be used to pursue MP goals. Conversely, one of the researches pointed out that trade-off exists regarding the practice and outcome of these two policies (Vlček & Roger, 2011).

Researchers endeavoured to explore the nature of relation between MP and MPP as to whether they have complimentary or negative in various scenario. Peydro et al, (2013) found out that a relationship exists between these two policies. It was pointed out that MP affects financial stability. Hence, it can be conferred that these two policies must keep the goals of each other in perspective. It was concluded that welfare gains can be achieved if these two collaborate with eachother.

One research revealed that these two policies did not in practice did not interact (Maximillian, 2018). This position was somewhat similar to that in Pakistan where the tools for each policy were deployed without material coordination.

Suh (2012) pointed out that MP affected the preferences of the bank borrowers whereas macro-prudential policy influenced the lending preferences of the lenders. Paligorova & Santos (2012) probed the risk-taking in banks by analysing the changes in credit extension viz-a-viz monetary policy.

Paydro (2013) pointed out that these two policies must collaborate with each other to avert future crisis. He also concluded that a loose monetary policy stance was balanced by a strict capital adequacy policy. Overall, there is evident division over the impact of one policy over the other from the available literature review.

Jaime Caruana General Manager, Bank for International Settlements brought up this issue in a high level conference on “The Emerging Framework for Financial Regulation and Monetary Policy (2010)” jointly organized by BIS and IMF. She pointed out that MP should not be trusted to fix the imbalances related to credits and financial system. Further, Fiscal policy must also work in coordination.

## **2.2 Monetary Policy in case of Islamic Banks**

As the pricing of Islamic Banking Financing products is also based on discount rate. Hence, the transmission is conducted as in case of conventional banks. Research by IMF has concluded that monetary policy transmission can happen through the credit channel of Islamic Banking (Khatat , 2016). However, the question remains as to whether the efficiency of monetary policy transmission is the same as that of conventional banks. Zaheer et al, (2013) stated that the response of Islamic Banks to monetary policy shocks not as efficient as that of small-sized conventional banks. Hence, monetary policy transmission may dampen as the size of IBIs increase in the economy and becomes significant.

## **2.3 Research Design/Methodology in previous research**

Bonfim & Soares (2018) used panel regression to enquire about the monetary policy transmission and discount rate by analysing the banks’ risk-taking behavior. Sarkar & Sensarma (2019) employed panel data regression methodology, to assess the risk taking behavior of banks. The author took Gross Non-Performing Loans to Gross Loans as proxy for Credit Risk, liquid assets to total assets) was used as proxy of liquidity risk, market risk was measured in in terms of interbank borrowings/total borrowings and asset risk was measured as Provision against Advances to total assets. Monetary policy call rate was used to define

Monetary Policy in the analysis. Similarly, Dell'Ariccia et al, (2017), used panel Regression Model to test the Bank Risk. The dependent variable risk taking was measured in terms of obligor risk rating of borrowers whereas the independent variables included federal funds rate, Capital to assets ratio which was inverse of leverage ratio, loan variables such as loan size and loan maturity. Chen (2019) used the variable of non-performing loans to measure the risk taking. The other variables in his analysis included Return on Assets of bank, monetary policy rate, GDP and size of banks. Nier & Kang (2017) used panel data regression wherein credit growth was analysed as a dependent variable against Capital Adequacy Ratio (CAR), reserve requirement and Loan to Value requirement.

## Chapter 3

### Methodology & Data

Based on the methodology used by Nier & Kang (2017) and Sarkar & Sensarma (2019), I have used panel regression to assess the effectiveness of the risk taking channel. The data consisted of published data from the State Bank of Pakistan related to key statistics of the banking industry and Monetary Statistics data. The data related to GDP was the published data of Pakistan Bureau of Statistics. The data frequency was quarterly and the data period was from September 2012 till December 2020 .

In this research, we probe the risk taking behavior by keeping ‘Advances/Financing to Deposits’ of both Islamic Banking Industry and overall banking industry in Pakistan as dependent variable. We have used the variable of ‘Advances/Financing to Deposits’ instead of ‘advances/financing’ to measure credit extension due to two reasons, a) it neutralized the impact of increase in broad money/monetary aggregates, b) it allows us to study risk taking in relation to available disposable funds with the bank and c) the banking regulators around the world use this variable to keep the credit growth in check. This also helped to avoid multi-collinearity. Further, we will try to establish the relationship between the monetary policy rate and the dependent variable. Many other variables such as Customer Price Index and exchange rate were tested and later omitted as their inclusion resulted in multi-collinearity. Besides discount rate, the other variables were selected based on the previous researches already discussed which include:

- Capital Adequacy Ratio represents the capital buffers available against the risk weighted assets as prescribed by Basel Standards and enforced by State Bank of Pakistan.
- GDP represent the real economy contribution in explaining the credit growth.
- Lending rate broadly represents the discount rate plus the spread. Hence, this variable would serve to highlight the change in banking spread.
- Reserve requirements have a direct bearing over the credit extension as the overall credit multiplier function is measured in terms of multiple of reserve requirement. Further, as per SBP, this function is not widely used as a monetary policy tool.
- Return over equity (ROE): is used as a proxy to represent the profitability of the firms and the status of the firms.

- Non-performing Loans/Financing to Total Loans: this represents the level of risk of loans/financing which has been recognized. This is a historical figure which described the quality of credit at a given time.
- Liquid Asset to Total Asset: represents the available liquidity to the firms which may play a factor in the extension of credit.

The details of variables is given at appendix A.

## Chapter 4

### Analysis & Results

#### 4.1 Overall Banking Industry

The panel data regression in case of overall banking industry gives the following equation for defining the dependent variable of ‘Advances to Deposits’:

$$ADVANCES\_DEPOSITS = \alpha + \beta_1 * CAR + \beta_2 * DISCOUNT\_RATE + \beta_3 * LOG(GDP) + \beta_4 * LENDING\_RATE + \beta_5 * NPL\_Rate + \beta_6 * ROE\_AFTER\_TAX$$

The results of panel data regression are produced below:

**Table 2: Panel Data Regression - Overall Banking Industry**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Discount Rate	0.5721	0.2718	2.1047	0.0451
LOG_GDP	42.3893	14.1271	3.0006	0.0059
Lending Rate	-0.5649	0.4853	-1.1639	0.2550
ROE after tax	-0.2424	0.1379	-1.7581	0.0905
CAR	0.1177	0.3074	0.3829	0.7049
Provision Coverage	-0.2690	0.1306	-2.0604	0.0495
Liquid Assets Ratio	-0.5976	0.1411	-4.2349	0.0003

There is positive significant relationship between the risk taking and discount rate. This implies that the reduction in discount rate has not resulted in increase of risk taking but the opposite happened. Hence, the leverage or advances to deposits also declined. Further, there is also significant relationship of dependent variable with the GDP, hence, the credit extension has rather been associated with the growth rate of the economy. The strong and significant relationship of risk taking with the liquid asset ratio also signifies the impact of MPP over the risk taking. Furthermore, the augmented role of MPP in defining risk taking is also amplified in its strong relationship with provision coverage ratio (PCR). There is also a strong but not significant relationship between risk taking and ROE of the banks.

#### 4.2 Islamic Banking Industry

The panel data regression in case of Islamic Banking Industry gives the following equation for defining the dependent variable of ‘Financing to Deposits’:

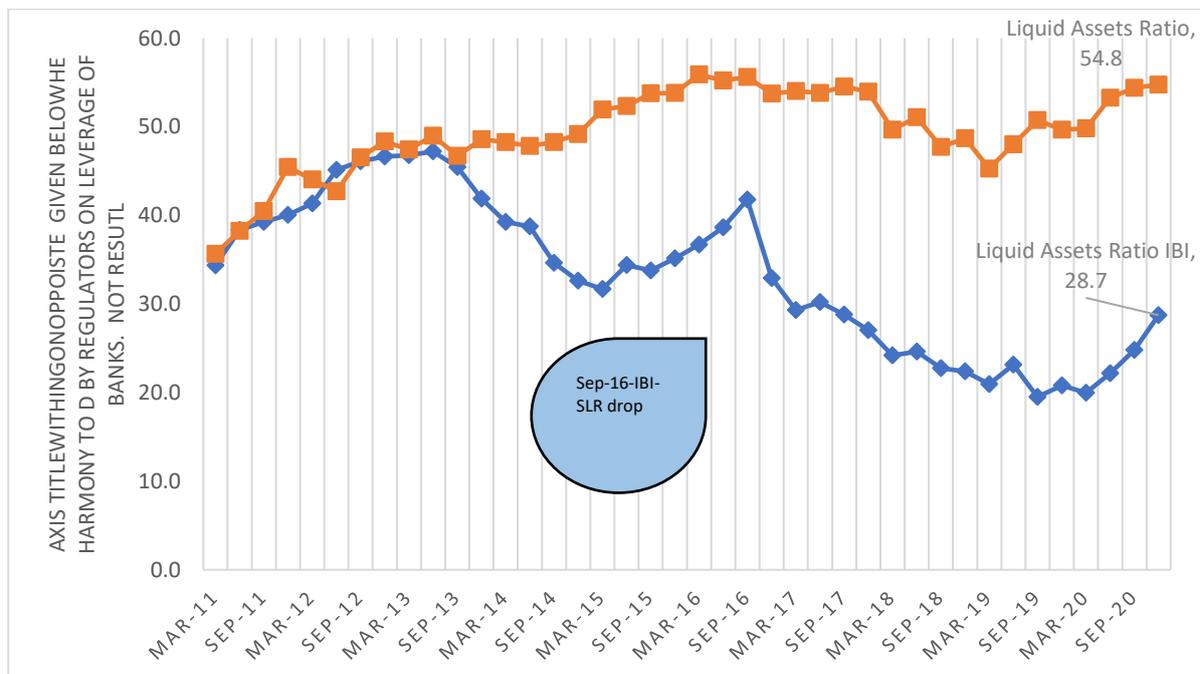
$$FINANCING\_DEPOSITS = \alpha + \beta_1 * Discount\_rate + \beta_2 * Lending\_rate + \beta_3 * LOG\_GDP + \beta_4 * ROE\_AFTER\_TAX + \beta_5 * CAR + \beta_6 * NPL\_RATIO + \beta_7 * SLR + \beta_8 * LIQUID\_RATIO$$

The results of panel data regression are produced below:

**Table 3: Panel Data Regression - Islamic Banking Industry**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Discount Rate	1.623467	0.640317	2.535411	0.0176
Lending Rate	-1.883835	1.081565	-1.741767	0.0934
Liquid Assets Ratio	-0.301318	0.243105	-1.239459	0.2262
LOG_GDP	93.70432	46.75007	2.004368	0.0556
ROE after tax	-0.073971	0.281969	-0.262336	0.7951
SLR	-208.7700	48.20446	-4.330927	0.0002
CAR	0.266247	0.577453	0.461070	0.6486

The above panel regression results transpire that there is a positive significant relationship between risk taking and discount rate similar to overall banking industry however, it is slightly stronger relationship. Similarly, there is a strong relationship of risk taking in IBIs with the GDP as was found in case of banking industry. There is very strong negative relationship with the SLR requirement. The reduced SLR requirement for IBIs was a result of central bank action in 2016 which has resulted in excess risk taking on behalf of IBIs. The reason for reduction in SLR requirement by SBP was due to lack of investment avenues for the IBIs. Hence, there is a less strong negative relationship with liquid assets as compared to overall banking industry.



**Figure 6: Liquid Assets Ratio**

Furthermore, there is a strong negative relationship with the overall lending rate which mainly depicts that the risk taking increased when the lending rates reduced.

### 4.3 Consolidated Synopsis of Results

It is evident that there is a significant positive relationship between the risk taking of IBIs and banking industry with the discount rate. This is contrary to the literature where the lax monetary policy results in excessive risk taking. Hence, this is evidence of disruptions in monetary policy transmission. It can be deduced that MPP acted in opposite direction to MP with counter cyclical methodology. IBIs have a relatively stronger relationship with the discount rate than the banking industry which implies that monetary policy transmission impediments in Islamic Banking are relatively higher than banking industry. The following graph depicts this scenario.

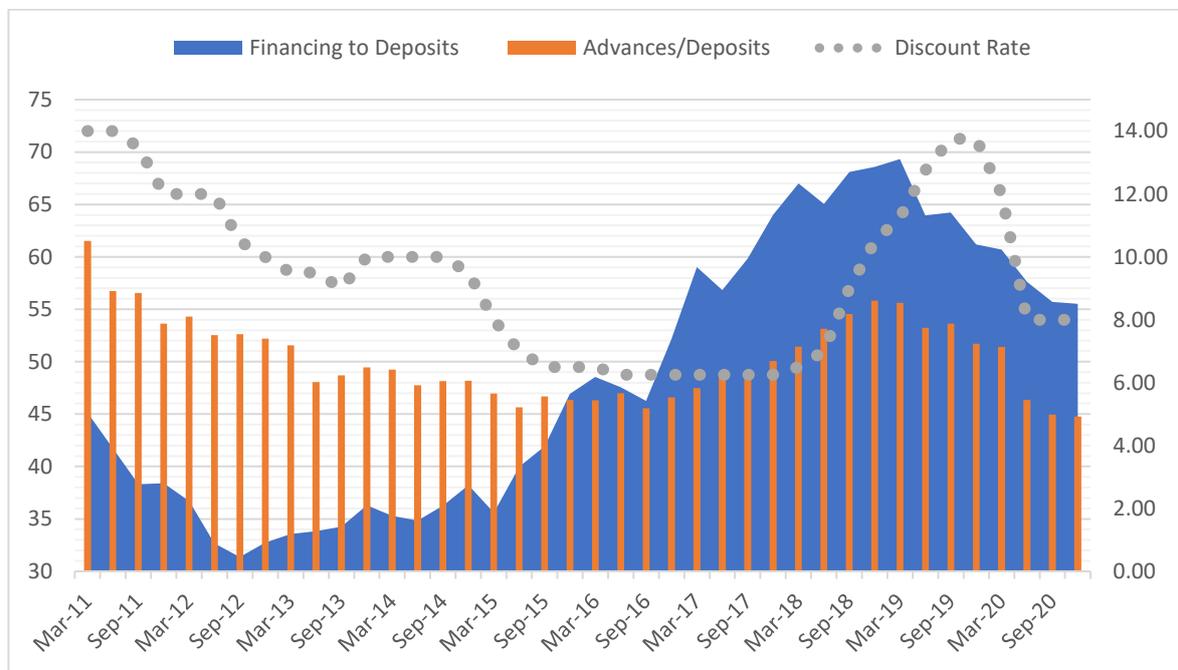
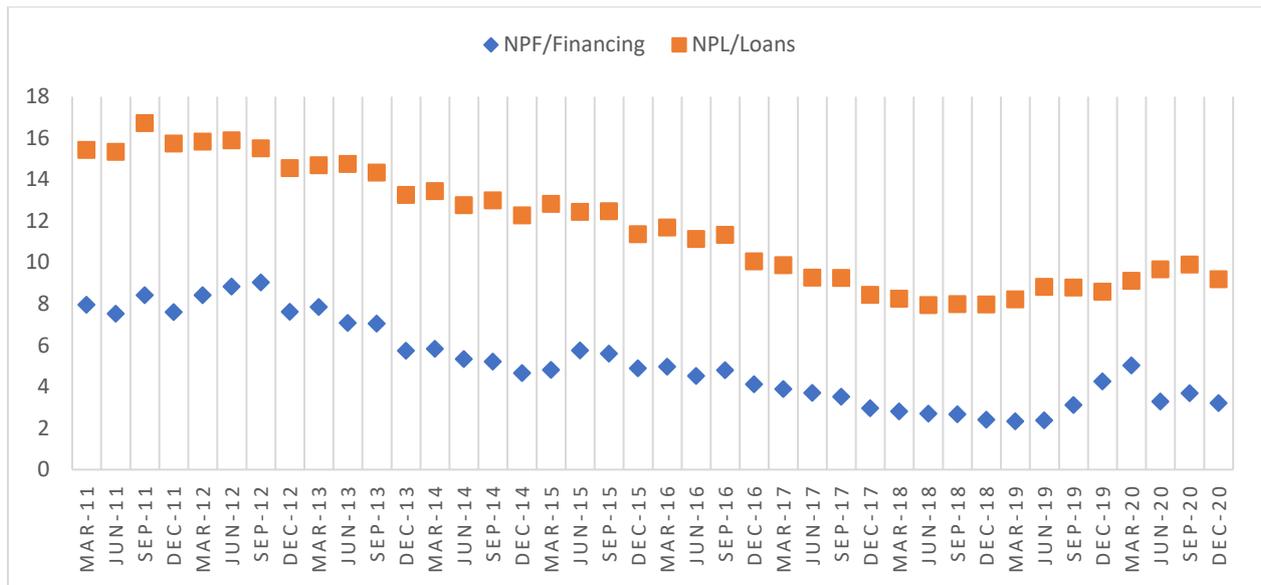


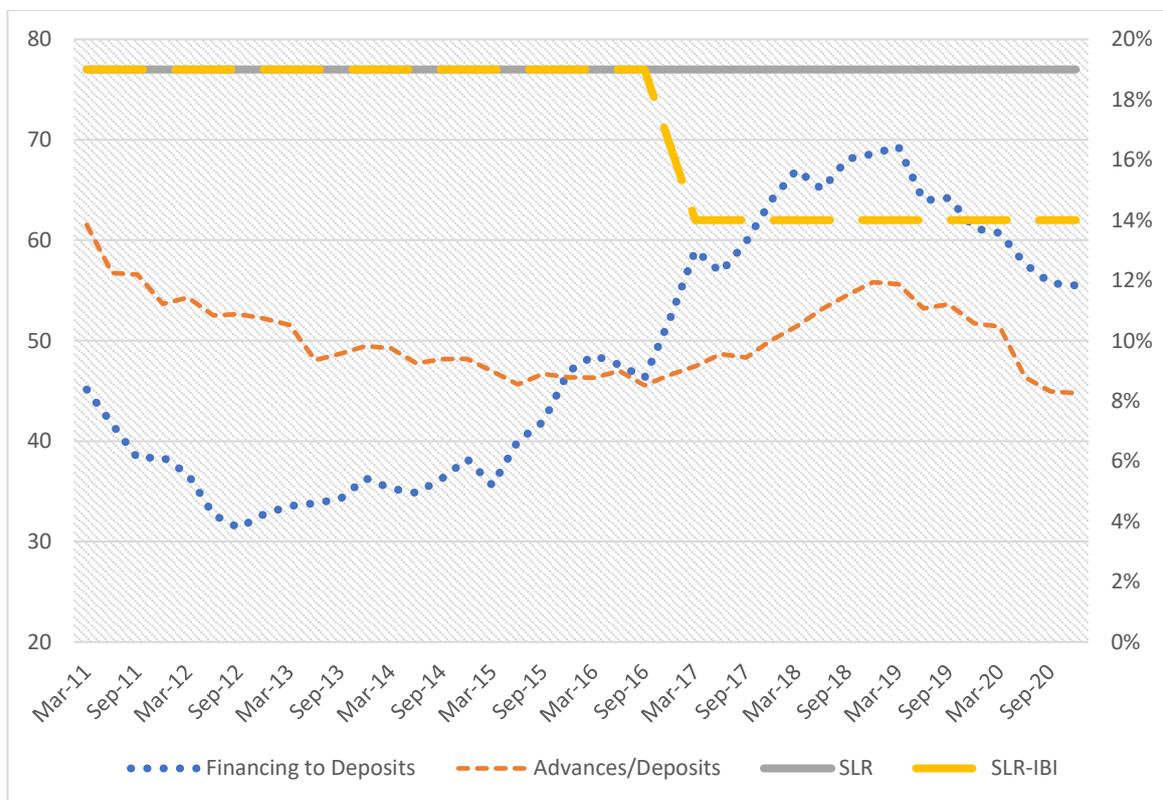
Figure 7: Discount Rate & Credit Take-Off

On an overall basis, the risk taking in IBIs is greater than risk taking of banking sector as depicted by the respective loan/financing to deposits rate. However, it may also be noted that risk taking in IBIs has still resulted in lower non-performing financing as compared to banking industry which have even reduced overtime. This behavior is highlighted by the below graph.



**Figure 8: Non-performing Financing/loans trend**

The banking industry also showed significant relationship with the liquid assets ratio whereas the relationship was not that significant in Islamic Bank. This was mainly due to reduced liquidity requirement upon reduction in SLR as explained above. Hence, IBIs showed a strong relationship with the SLR as depicted in the below graph. It may be noted that his tool is not often used as a monetary policy tool in Pakistan.



**Figure 9: Impact of SLR on IBI**

## 4.4 Conclusion

The role of macro-prudential policy in shaping the risk taking behaviour remains a fact today. It was introduced to strengthen the financial system by introducing counter-cyclical buffers. However, the results of this paper transpired that the monetary policy was not able to achieve its desired objectives as the risk taking was not triggered in presence of stringent macro-prudential policy. Hence, it is recommended that both policies must work in a collaborative way for welfare gains. Further, it was noted that Islamic Banking is able to play its role of financial intermediation in a better way as compared to banking industry. This feat was achieved while fulfilling the requirements of the macro-prudential policy such as CAR. While the Islamic finance is based on the existence of real assets under every transaction which guarantees better risk management. In this paper, the results also indicated that the risk management in Islamic Banks is better than the commercial banks while exhibiting higher risk taking behaviour.

The main findings of this research paper are summarized below:

- Contrary to literature, there is a significant positive relationship between the risk taking of IBIs and banking industry with the discount rate.
- Risk taking in IBIs exceed the risk taking of banking industry.
- Despite, higher risk taking in IBIs, NPFs in IBIs were still considerably less in IBIs and on declining trend. This signifies that credit risk measurement and management was better in IBIs than in banking industry.
- Lax MP did not result in increase in risk taking which may signify that both MP and MPP did not complement each other.
- The stringent MPP stance can also be gauged from the fact that CAR has improved overtime, NPLs have reduced and liquid to assets ratio has also improved in the banking industry at-large.
- SLR as a monetary tool has not been effectively used to achieving monetary policy outputs. This tool was effectively used in case of IBIs which increased the risk taking and in IBIs.
- Credit to GDP has not taken off in Pakistan as compared to other regional countries which have shown strong economic performance.

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## Appendix A

This main variables are given below:

Type	Variable	Estimation
<b>Dependent Variable</b>	Advances to Deposits	Net Advances/Total Deposits
	Discount Rate	Monetary Policy Rate used by Central Bank as Lender of Last Resort
	Lending Rate	Weighted Average Lending Rate of Advances
<b>Independent variables</b>	Capital Adequacy Ratio	Total Eligible Capital/Total Risk Weighted Assets
	SLR (Statutory Reserve Requirement)	Total Cash and investments in eligible Govt. Securities/Total Eligible Deposits
	Return over equity (ROE)	Total Income After Tax/Equity
	Liquid Assets Ratio	Liquid Assets to Total Assets
	Non-Performing Loans to Gross Loans(NPL)	(Non-performing loan/Gross Loans)
<b>Macroeconomic Variables</b>	GDP	Nominal GDP