

## MONETARY POLICY TRANSMISSION IN PAKISTAN: ROLE OF ISLAMIC BANKING IN ENHANCING POLICY OBJECTIVES AND SUPPORTING GROWTH

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### Abstract

*This study investigates the role of Islamic banking in enhancing policy objectives and supporting growth in Pakistan. This research aims to explain how the real economy of Pakistan has been influenced by the Islamic financial system, particularly in channelizing monetary policy tools. The secondary data within the period of 2007 – 2020 is used to answer the research question. Industrial Production Index has taken as a dependent variable, while Islamic Financing, Islamic Deposits, and Overnight Repo as taken as independent variables. Following the prior research co-integration test, impulse response functions and variance decomposition analysis have been used, by using EViews 10. The study has found a positive impact of Islamic banking on economic output and there is a significant positive impact of monetary policy decisions on economic output and there is an insignificant impact of financial crisis and COVID 19 in long run. It has mainly 03 implications are: Impact on real economy, Role in promoting financial stability, and different monetary policy instruments. The proposed model may offer some insights to policy makers if it is examined empirically.*

**Keywords:** Monetary Transmission Mechanics, Industrial Production Index, Islamic Financing, Islamic Deposits, Overnight Repo rate, ARDL Model.

## 1. INTRODUCTION

### 1.1 Background

The monetary transmission mechanism is the mechanism through which policy will affect the short-term interest rate and long-term interest rate which ultimately impact the economy of the country through real variables like Output, investments, and employment. Hence, the short-term and long-term interest rates affect the economy of the country. The influence of Monetary transmission channels on macroeconomic variables (Inflation, Investment, and economic growth) helps in identifying the relationship between the real economy and monetary policy so which means the monetary policy has a direct impact on the economy of the country (Mahmood Pradhan; Ravi Balakrishnan, 2011). If the monetary policy decisions are stronger that means, there is a strong relationship among monetary policy instruments like the performance of macroeconomics through the transmission of different channels and policy rates. Monetary Policy impacts economic activities through different special channels, money supply, interest rate, exchange rate, bank credit, expectation, and asset price are some of the monetary transmission channels. A lot of work has been done recently in monetary transmission channels like unconventional monetary policy, the effect of the financial crisis, and capital inflow in developing economies (Borio & Zhu, 2012; Jain-Chandra & Unsal, 2014; Kohlscheen & Miyajima, 2015; Mishkin, 1996)

When the Islamic finance concept has emerged in 2000 worldwide, mostly, every bank started to work on both modes (Conventional & Islamic) for its expansion and at that time, the monetary transmission mechanism had been challenged by the countries that had established Islamic banks already. Therefore, in those countries, many of the steps have been taken to conduct the studies on the effectiveness of monetary transmission mechanism because dual monetary transmission mechanism was available, and a large number of studies find out that there should have been

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given a preference to the monetary transmission through Islamic banking channel (Akhatova et al., 2016; Ergeç & Arslan, 2013; Majid & Hasin, 2014; Zaheer & Ongena, 2010). Islamic banks are free of interest rates and their principles are Shria complaint based so they are asset-backed, and they share profit and loss both that's why they are different from conventional banks. The Islamic banks do all the transactions based on Islamic principles, so their financing prices of assets are also too close to the real economy. Islamic banking sector plays a huge role in making limits on influencing the ability of monetary policy because here interest rate is not the main dependent variable, and the core principle of Islamic banks is to share the profit and loss. Therefore, they can mitigate the interest rate effect (Hamza & Saadaoui, 2018). Central banks of the country stabilize the economy by influencing through different channels in economic activities. The major control in bank loans is covered by open market operations, central banks and reduce the liquidity, so the banks will be restricted in providing new loans in the economy and there will be a shortage of loans and that will result in less production and investments and lower output in the economy (Sukmana & Kassim, 2010).

Monetary policy can impact the real economy of the country through different channels like credit, interest rate, exchange rate, and asset pricing channels. But generally, the importance of different channels depends on monetary policy transmission depends on structural characteristics. Such as those countries whose economies are open focus on external trade and that will play a vital role in their economy so the exchange rate in this kind of economies is the main factor in playing a significant role in the monetary transmission process. But if the country is dependent on bank credit, then in those economies, credit channels play a significant role in the monetary transmission process. In a nutshell, it is concluded that there is a significant role of Islamic banking in the monetary transmission process because there are several economic implications of channelizing monetary policy through the Islamic banking sector. The Bank lending channel is also playing a vital role in the monetary transmission process because it is a predictive variable and it spread the policy shock that ultimately impacts the real economy through the money channel. If the banking sector is very important in monetary policy transmission then it is really important to test the reliability & stability of the banking sector because of its economic consequences and among them, the health of the banking sector is the main factor so it must be good to achieve economic stability (Sukmana & Kassim, 2010).

Further, Policymakers consider the cyclic changes to achieve economic stability. Hence Industrial production index plays a vital role in explaining the aggregate fluctuations so economists consider it a leading macroeconomic indicator (Banerjee, 2005). But in Pakistan the monthly data of IPI is not available so the researchers use alternative variable Large Scale Manufacturing (LSM) but (Ejaz & Iqbal, 2019) found limitations to using the LSM as a proxy because LSM is made up of private sector industry and in Pakistan, the public sector contributes more in industry. Hence the paper used the IPI as a proxy which provides additional information which LSM misses out on.

Therefore, by seeing this gap, this paper attempts to fill it by taking a new proxy IPI in the replacement of LSMI for economic policy analysis because (Ejaz & Iqbal, 2019) found it inefficient to estimate the economic policy of Pakistan and there is limitation in literature of finding impact of Financial crisis period 2008 and COVID 19 effect into the study Hence, the results presented by this research can be considered more reliable.

Hence, this paper will analyze the impact of the banking sector on the monetary transmission process in the Pakistani context through ARDL & VECM models by taking IPI as a proxy of economic policy analysis. So, the contribution of the paper will be to fill the gap of LSMI proxy by replacing IPI and dummy variables for evaluating better impact overall and especially during Financial Crisis 2008 and COVID 19 and for desirable outcome the observation is also increased to come up with the desired outcome.

## **1.2 Problem Statement**

The monetary transmission mechanism is the mechanism that influences the economic condition of the countries through different factors which channelize the monetary policy and impact on the economy. Therefore, it is important to study the interest rate and other factors through monetary policy is channelized and Islamic banks play an important role in eradicating the interest rate factor from the monetary transmission mechanism. Previous studies adopted LSMI as a proxy of economic policy analysis which is insignificant in finding the impact of Islamic banking & monetary transmission. Therefore, this study aims to find “the role of Islamic banking in the monetary transmission mechanism of Pakistan” through different advanced models by taking IPI as a proxy of economic policy analysis.

## **1.3 Research Questions**

- Does monetary policy decision have a significant impact on economic output?
- Does Islamic banking performance have a significant impact on the monetary transmission mechanism by using IPI as a proxy?

#### 1.4 Research Objectives

This study aims to fulfill the following objectives:

- To determine the impact of monetary policy decisions on economic output
- To examine the role of Islamic banking on the monetary transmission mechanism through IPI as a proxy

## 2. LITERATURE REVIEW

This section contains a detailed section of the role of the Islamic Banking sector in the Monetary Transmission Process and that begins from Islamic Banking in Pakistan & its role in the monetary transmission and ends at the monetary transmission mechanism channels.

### 2.1 Islamic Banking in Pakistan

#### 2.1.1 Islamic Banking

Islamic banking is the financial intermediaries that earn from profit & loss sharing. All the participants of Islamic banking fully share the profit & loss. Hence, Islamic banks are not like commercial banks which earn profit from interest-based income. Islamic banks finance their assets through deposits collected from shareholders who do not have any guarantee of earning profit. Islamic banking only deals with those transactions that have not Riba, Gharar, and Gambling. They use asset-backed fixed returns like Ijarah, Mudarabah, and Murabaha which helps enhance the economy of the country. Hence, Islamic banks are most conservative in lending perspective which plays a crucial role in monetary transmission. (Cowen & Kroszner, 1990)

#### 2.1.2 Development of Islamic Banking in Pakistan

Islamic banking in Pakistan was established in 2002 due to the high demand for Islamic financial products and soon this sector grows in Pakistan but still found some issues like government Islamic securities were not offered at that time because the government of Pakistan offers financial products which were not based on Sharia Compliant especially Karachi interbank offer rate (KIBOR). KIBOR is the key rate at which short-term securities were determined at that time and fulfill the need for financing and Islamic banking strengthens the lending channel through Islamic financial products and ultimately influences the monetary policy of the country. (Beck et al., 2013) we can see the development of the Pakistani Islamic banking sector from the below table 2.1.

*Table 2.1 Financial Soundness of Islamic Banking in Pakistan from 2013-21*

Particular	2013	2021
Number of Banks	858.00	1,765.00
Number of ATMs	-	1,841.00
Number of employees	10,819.00	21,823.00
Total assets	638,753.27	2,699,385.59
Liquid assets	282,585.12	729,001.53
Total funding/liabilities and equities	638,753.27	2,699,385.59
Total revenues	50,683.42	93,638.64
Total financing	214,434.19	1,159,215.84
Total regulatory capital	42,423.20	177,741.70
Equity	41,445.20	144,087.60
Gross income	24,632.62	116,189.43

Source: State Bank of Pakistan

#### 2.1.3 Bank lending channel in Pakistan

Lending is the key component to check the strength of the Banking sector of any country, and bank lending channel is determined from different components like market concentration of bank, bank's capitalization, size of the bank, and the liquidity of banks assets. The banks which are operating in Pakistan but the ownership is outside the country also play a vital role in affecting the monetary policy of the country particularly on loan supply and publicly guaranteed state-owned banks are also affected by domestic monetary policy. (Ehrmann et al., 2003) Therefore, all the banks are either foreign or state. Therefore, the Islamic banking system plays a crucial role in the monetary transmission mechanism. So, our hypothesis of the study is:

**H1:** Islamic banking has a significant role in the monetary transmission mechanism.

### 2.1.4 Importance of banks within the financial system

Islamic banks play an expanding and central role in the development of the financial and economic system of Pakistan. During the 1990s deregulation and privatization made interest rate liberalization which was the cause of high development in the banking sector. Global development of economies made favorable conditions for the Pakistani banking sector to grow and this sector started to increase the proportion in gross domestic product (GDP) growth especially after 2002 and declined during 2007 due to the restrictive policy of 2007. (Muhammad Aqib Ali, 2014)

## 2.2 Monetary Transmission Mechanism

The monetary policy is transmitted through different channels into the real economy of the country. Previously, researchers concluded at two orthodox views of monetary transmission mechanism named credit/lending view and money view. The lending view is explained in detail by (Ballo & Bentley, 2011). They explained that restrictive monetary policy causes lower reserves in banks and lower interest rate reduces reserves in the country which is caused by lower deposits and lower lending funds. Besides, the money view is that view in which federal banks inject the money into the economy which causes more liquidity and lowers interest rates which impact spending so the demand of the economy increases and economic output enhances. (Boukhatem & Djelassi, 2022)

Prior literature investigated that there is a significant impact of monetary policy on banks' loan demand or loan supply. (Adrian & Shin, 2009; Altavilla et al., 2018; Morris & Sellon, 1995; Taketa & Udell, 2007) Many empirical kinds of research have been conducted on lending view by taking aggregated data of industry and investigating the impact of monetary policy through the lending channel. One of the best studies to investigate the impact of monetary policy through credit channels by (Blirder, 1990). This study had applied the V.A.R model in the USA context and used the consumer price index, unemployment rate, federal fund rate, and other bank-specific variables. This study concluded that restricting monetary policy hurts the economy of the country. Many other studies have been conducted on this methodology. (Adam, 2001; Bernanke & Gertler, 1995; Garretsen & Swank, 1998; Pogorelec, 2006; Suzuki, 2001)

Another empirical approach has been taken as research from different scholars to find the role of restrictive monetary policy in the money supply. All these studies concluded that the role of monetary policy depends on the ability of the bank to supply loans. (Kashyap Jeremy C Stein et al., 1994) investigated that there is the role of a bank's assets size in implementing the monetary policy and explained that there are large banks that are not as much affected by restricted monetary policy as the smaller banks affected and smaller banks affected. due to a shortage of money and reserves, banks' loans supply level declines and it affects the balance sheet of the bank. Therefore, monetary policy decisions highly affect the banks' performance. (Kashyap & Stein, 1997) found from an empirical study that the banks that have less liquidity are at higher risk of the shock of changes in monetary policy as compared to those who have high liquidity. According to (Personal & Archive, 2008), there is a significant impact of monetary policy decisions on the real economy in the context of India & Pakistan. He further explained that restrictive policy affects lending of banks which ultimately affects the economy of the country.

The monetary transmission mechanism is one of the most important topics to understand how effective monetary policy can be set and affect the economy of the country. There are many channels through the monetary policy that can be set and implemented. Hence, it is a tough task for central banks to adopt a particular channel to make the economy stable. (Rashid et al., 2020)

### 2.2.1 Channels of Monetary Transmission Mechanism

The core motive of the monetary policy is to make such policies to overcome the worst situations of the economy and achieve economic stability and growth. Hence, it is also really important for price makers to understand the monetary transmission mechanism to make prices stabilize to achieve the objective of the monetary policy. According to theoretical review, there are many channels through which monetary policy can be transmitted but this study explained 04 basic channels through which financial intermediaries help in implementing monetary transmission mechanisms. (Jan et al., 2021)

#### 2.2.1.1 Bank Lending Channel

Bank lending channel is also vital source of monetary policy transmission in which financial intermediaries especially Islamic banks play a key role in the transmission of monetary policy. According to the literature, there are two assumptions. First, there is no sustainability between retail bank deposits and other funding sources. Second, there must be the influence of monetary policy on bank loans. (Mishkin, 1996) By taking the above assumptions, this channel also influences other economic variables as shown below:

$$M2 \downarrow \Rightarrow D \downarrow \Rightarrow BL \downarrow \Rightarrow I \downarrow \Rightarrow Y \downarrow$$

When the restrictive policy is implemented, it will decline deposits which reduce bank loans which will fall bank reserves so banks will provide fewer loans to their clients, and investments decrease which ultimately decrease the spending and economic output.

### 2.2.1.2 Interest Rate Channel

This is one of the oldest channels and this is the mainstream economics model based on the Keynesian IS/LM model (Mishkin, 1996) which is also known as the money view. This channel can influence different economic variables as shown below:

$$M2 \downarrow \Rightarrow i \uparrow, I \downarrow \Rightarrow Y \downarrow$$

When the money supply is reduced it boost the real interest rate which will increase borrowing cost and ultimately investors start to reduce spending and that will cause lower demand and output will decline.

### 2.2.1.3 Asset Price Channel

Two different theories must focus to use asset price channels for monetary transmission mechanisms. They are Tobin's q theory & wealth effect theory. Both are almost similar, but q theory affects investment decisions and wealth effect theory affects consumption decisions otherwise both are similar.

Tobin's q theory of investment decisions affect variables through equity valuations and the scientists explain q as: "Market value of firm divided by replacement cost of capital". (Mishkin, 1996) So, the channel influence other economic variables as shown below:

$$M2 \downarrow \Rightarrow P_e \downarrow \Rightarrow q \downarrow \Rightarrow I \downarrow \Rightarrow Y \downarrow$$

Due to contractive monetary policy, money supply declines so households have less money to spend so they sell their assets/securities to reach their normal spending level which will decline the demand of securities so prices will reduce which will reduce q value of firm and businesses declines their investments and ultimately impact on economic output.

Contrary, In the wealth effect, this channel is based on the life cycle hypothesis model which means consumers find out from lifetime resources. Hence, wealth maximization will make more consumption permanent. As shown below:

$$M2 \downarrow \Rightarrow P_e \downarrow \Rightarrow W \downarrow \Rightarrow C \downarrow \Rightarrow Y \downarrow$$

As the central bank contract, the money supply, affects stock value and declines it which declines the wealth, and households must reduce consumptions due to less income, the demand declines and ultimately, the output will fall.

### 2.2.1.4 Exchange rate Channel

International trade is important for economic development and the exchange rate is the main component to facilitate international trade. If the country uses a flexible regime then the interest rate fluctuation is absorbed by the exchange rate (Mishkin, 1996) so it also affects other economic variables. As shown below:

$$M2 \downarrow \Rightarrow i \uparrow \Rightarrow I \downarrow \Rightarrow Y \downarrow$$

When state bank applies contractionary monetary policy then real interest rate increases due to shortage of money supply and interest rate (Domestic) increases relatively from a real interest, hence, foreign investors attract towards the country and increase their spending and exchange rate moves upward due to flow of currency which causes the prices of products higher and aggregate yield declines.

Many kinds of research (CARBONARI, 2014; Harvard, 2012; Janjua et al., 2014; Shabbir, 2012) have been conducted in past and explained some of the aspects of the impact of monetary transmission on the economy of Pakistan. Islamic banking operates under a different framework than conventional banking, which includes the prohibition of interest-based transactions (riba) and the requirement to adhere to Shariah principles. As such, the monetary transmission channels in Islamic banking are distinct from those in conventional banking.

Profit and Loss Sharing (PLS) channels: Islamic banking operates on the principle of risk-sharing, where the bank and the customer share profits and losses. In this channel, the bank provides financing to the customer for a project, and the profits or losses are shared between them. This channel helps to distribute credit risk in the economy and encourage entrepreneurship.

Asset-Based channels: This channel involves the use of assets as collateral for financing. The bank provides financing to the customer against an asset, such as real estate or equipment, and the customer pays back the loan with a profit margin. The bank also shares in any potential losses from the investment.

**Liquidity Management channels:** This channel involves the use of the Islamic interbank market for managing liquidity. Islamic banks may use various instruments, such as mudaraba certificates, to manage liquidity and meet reserve requirements.

**Investment Risk Sharing channels:** This channel involves the bank providing financing to an investment project, and the bank and the customer share the profits or losses from the investment. This channel encourages investment and helps to distribute investment risk in the economy.

**Islamic Capital Market channels:** Islamic capital markets provide an alternative source of financing for businesses and governments. This channel involves the issuance of Islamic bonds (sukuk) and the use of Islamic equity funds (mutual funds or exchange-traded funds) to mobilize funds. The paper attempt to explain the role of monetary transmission channels in Islamic banking especially in promote risk-sharing, encourage entrepreneurship and investment, and support the development of the Islamic financial system.

Hence, we can conclude that the past studies are limited and the effectiveness of a bank lending channel is conclusive (Aysan et al., 2018; Majid & Hasin, 2014; Sukmana & Kassim, 2010; Yungucu & Saiti, 2016). Therefore, this paper aims to find the role of Islamic banking in enhancing policy objectives and supporting growth in Pakistan. Specially provide evidence from the Islamic banking sector of Pakistan. So, the hypothesis of the study is:

**H2:** Monetary policy decisions have a significant impact on economic output.

### **3. METHODOLOGY**

#### **3.1 Data and Empirical framework**

This study has investigated the importance of Islamic banks in monetary transmission mechanism with the help of the main variables of the real economy, monetary policy, and the variables which channelize the monetary policy by taking some base papers like (Garretsen & Swank, 1998), (Suzuki, 2001), (Ballo & Bentley, 2011). Hence the conceptual framework has been created from the above literature:

$$IPI = f(IF, ID, ONIGHT)$$

The above equation shows different variables where IPI is used as a proxy for economic output which represents the Industrial production index, ID & IF is used as proxies of Islamic banks performance which are two main items of balance sheet represent Islamic deposit, and Islamic financing, ONIGHT is used as a monetary policy indicator which represents an overnight interest rate of the monetary policy and it is the base rate at which interbank lending and borrowing have done. ONIGHT variable is the only variable that is used in a real form otherwise all other variables have been transformed into logarithm form. Data frequency is different in different variables as IPI data is monthly basis and others' frequency is quarterly basis. Hence, the data is aligned quarterly, and the data sample has been taken from 2005 to 2020 and there are two crises in between financial crisis 2008 & COVID-19. Hence, to tackle this issue, the dummy variables will be used for both crises for the period of Jan 2017- Sept 2008 & Dec 2019-September 2020. All the data are sourced from the State bank of Pakistan especially from Islamic banking bulletin-SBP, and Monetary policy statements-SBP.

#### **3.2 Empirical Framework**

There are different pre-tests assumptions to meet whenever the data involve in time series. Hence, to determine unit root assumptions and degree of integration among variables are used before applying advanced techniques to reach the output. This study has met all assumptions through different steps from cointegration test and unit root, variance decomposition analysis to impulse response functions. All the tests are defined below in each section.

##### **3.2.1 Cointegration test**

The cointegration test is used to evaluate the degree of sensitivity of one variable over the change of other variables. Hence, it is the correlation between similar variables at different times so it is for long-run relationships and there is a chance of non-stationary variables but when the residual of the model will be stationary then there will be co-movement and the model of regression is really useful. (Johansen, 1988) There are many techniques to test cointegration but two are useful. JJ (Johansen & Juselius) test and EG (Engle-Granger) test. This study adopts the JJ test to evaluate cointegration due to higher priority and strong outcomes. (MW & Enders, 1995) VAR lag length is selected to use advanced models like ARDL and VAR models.

##### **3.2.2 Unit Root test**

This test is used to check the stationarity of the data which is the key technique for time series data. The data must be stationary and give significant results like the significant impact of the independent variable on the dependent variable. If the data is non-stationary, then the result will be spurious or false. So, to check integration, this study adopts four types of unit root tests such as Phillip-Peron, Augmented Dickey-Fuller, Kwiatkowski-Philips-Schmidt-Shin (KPSS), and Dickey-Fuller GLS test.

### 3.2.3 VDC & IRF

IRF test is the measurement of output in a dynamic system due to impulse or shock in time on the expected future value of the variables. This technique is really important because it gives the direction of shock at a particular time on an interesting variable and also quantifies the strength and its variation which is caused by shock on that variable. (Eggert & Haufler, 1999) This study aims to find the shock on ONIGHT interest rates due to IPI, ID, and IF.

VDC is an old statistical technique which shows that how much each error variance is explained by each variable due to shock on an interesting variable. This is an old technique, which is used for the analysis of the explanation of changes in variables due to similar variables at different periods. Currently, factor analysis is the most common technique to solve autocorrelation issues and quantify the error variance explained by the variables. This technique is also vital to remove the autocorrelation issue which is one of the worst conditions in the time series context.

## 4. DATA ANALYSIS

This section contains the analysis part of the study which starts from the investigation of descriptive statistics and normality through selecting descriptive analysis & histogram. Further, for stationarity of data, the unit root test has been applied followed by the ZA test. The paper used EViews 10 software for applying econometrics tests. Moreover, Assumptions for linear function are also checked and relevant measures have been taken for their remedies.

### 4.1 Econometric Tests and Techniques

#### 4.1.1 Descriptive Analysis

At the initial level, Descriptive and histogram of all variables have been investigated and found that Series IPIG has JB- Test p-value <0.05 so the variable is not normally distributed and the Skewness of the variable is -1.567121 which is in between the benchmark range -3 to +3 so skewness is not bad but Kurtosis benchmark is 0 so IPIG Kurtosis value is 5.624251 which is greater than zero means the data is kurtotic and Islamic deposits growth is highly volatile against all other variables of the study. Similarly, IDG, IFG, and ONIGHT also has been tested and found that only ONIGHT series is normally distributed so ID and IF should have been transformed into Log form but they still did not accomplish the objectives after a transformation so we are taking the variables in original form for further proceedings in the model and we will proceed with non-normality models.

Table 4.1: Descriptive Analysis

Descriptive Analysis	IDG	IFG	IPIG	ONIGHT
Mean	0.349027	0.030502	0.019888	0.101711
Median	0.045029	0.036385	0.038834	0.099167
Maximum	19.18115	1.038627	0.11014	0.15
Minimum	-1	-1	-0.240617	0.0625
Std. Dev.	2.575144	0.268887	0.071552	0.027165
Skewness	7.166139	-0.996527	-1.567121	0.005547
Kurtosis	52.95269	11.89537	5.624251	1.762214
Jarque-Bera	6301.6	193.8998	38.99037	3.575218
Probability	0	0	0	0.16736
Sum	19.54552	1.708124	1.113745	5.695831
Sum Sq. Dev.	3.65E+02	3.98E+00	0.281583	0.040587
Observations	56	56	56	56

According to Descriptive Analysis table 1, the statistical model now will be:

$$\text{IPIG} = \beta_0 + \beta_1 \text{IFG} + \beta_2 \text{IDG} + \beta_3 \text{ONIGHT} + \varepsilon$$

#### 4.1.2 Correlations

Primarily, the correlation of regressors has been investigated to test the multicollinearity issue. As shown in table 4.2:

Table 4.2: Correlation Analysis

Correlations	IPIG	IDG	IFG	ONIGHT
IPIG	1	0.10123	0.1132	-0.4077
IDG	0.10123	1	0.12108	-0.0362
IFG	0.1132	0.12108	1	0.00317
ONIGHT	-0.4077	-0.0362	0.00317	1

The results concluded that the two variables are slightly correlated with each other. So, diagnosis tests have been applied to the model to check the multicollinearity. Initially, Variance Inflation Factor has been applied which gave the results. As shown in table 4.3:

Table 4.3: Principal Component Analysis

Variance Inflation Factor	Coefficient	Uncentered	Cantered
Variable	Variance	VIF	VIF
IDG	1.23E-05	1.035268	1.01626
IFG	1.13E-03	1.028235	1.014937
ONIGHT	0.113222	16.70161	1.093477
C	0.001197	15.95426	NA

VIF, Auxiliary Regression, and Principal Component Analysis have been applied for the diagnosis of the high autocorrelation and as shown in the VIF table, the Centered VIF values are less than 15. Hence, it suggested that there is no strong evidence of Multicollinearity between Islamic Deposits & Islamic Financing variables and concluded that both are the functions of Islamic banking and both are interrelated that's why to show high correlation.

#### 4.1.3 Unit Root Test – ADF

The Unit Root test has been applied to the variables to test the stationarity of the data. As shown in table 4.4:

Table 4.4: Unit Root Test Output

Variables (P-Value)	Level	1 <sup>st</sup> Difference	2 <sup>nd</sup> Difference
IPIG	0.1231	0	0
IDG	0.0000	0.0000	0
IFG	0.0000	0.0000	0
ONIGHT	0.1443	0.0198	0

As you can see from the above table, two variables are not stationary at the level because their p- value is greater than 0.05 and become stationary at 1<sup>st</sup> difference. Hence, both variables have been transformed into 1<sup>st</sup> difference for further proceedings. As the model is time series data model so there is the issue of structural breaks in the models due to any sudden change, so Zivot and Andrews Test is applied to check the structural breaks in data. As shown in table 4.5:

Table 4.5: Zivot &amp; Andrews Test Output

ZA Test (5% Critical Value)	Level			1st Difference		
	T-Statistic	Time Break	P-Value	T-Statistic	Time Break	P-Value
IPIG	-4.93	2018Q4	0.001773	-4.93	2009Q4	0.038342
IDG	-4.93	2019Q3	0.428361	-	-	-
IFG	-4.93	2009Q3	0.000186	-	-	-
ONIGHT	-4.93	2018Q3	0.000366	-5.08	2018Q3	0.020718



Table 4.5 shows that there are structural breaks in data especially in IDG because the p-value of variables is greater than 5% at the level. So, Robust heteroscedasticity has been applied on data to run ARDL and further statistical techniques to minimize that effect.

**4.1.4 Autocorrelation**

The autocorrelation is one of the serious issues in time series data so to check the autocorrelation, graphically put the residual against t and Durbin Watson also verified the autocorrelation by showing 1.952552 value which means there is no autocorrelation issue in the data because the value is around 2.

**4.1.6 Regression Analysis**

As the variables are mixed like some stationary at the level and some at 1<sup>st</sup> difference so we are applying ARDL Model

**4.1.6.1 VAR Model**

The model is applied for finding the optimum test and lag values of regressors to apply the ARDL model. The VAR suggested the AIC technique at 8 lag values by showing the lowest possible value at this point. As shown in table 4.6 & 4.7:

*Table 4.6: VAR Model Output*

Determinant resid covariance (dof adj.)	9.90E-11
Determinant resid covariance	1.95E-11
Log-likelihood	339.3172
Akaike information criterion	-10.63989
Schwarz criterion	-8.064122
Number of coefficients	68

*Table 4.7: Log Selection Criteria*

Lag	LogL	LR	FPE	AIC	SC	HQ
0	247.9763	NA	3.64E-10	-10.38197	-10.22451	-10.32272
1	282.8085	62.25327	1.64E-10	-11.18334	-10.39604*	-10.88707
2	302.5411	31.90799	1.42E-10	-11.34217	-9.925038	-10.8089
3	326.2955	34.36812	1.06E-10	-11.67215	-9.625177	-10.90186
4	353.0281	34.12675*	7.28e-11*	-12.12886	-9.452046	-11.12155
5	369.824	18.58267	8.05E-11	-12.16272	-8.856076	-10.91841
6	390.5827	19.43371	8.16E-11	-12.36522	-8.428738	-10.8839
7	400.1293	7.312251	1.51E-10	-12.09061	-7.524285	-10.37227
8	441.6723	24.74904	8.62E-11	-13.17754*	-7.981385	-11.22219*

Hence, if we increase lag to 10 than we can find as per AIC and other techniques Lag 10 will be suggested As shown if figure 1 below but optimum lag values are 8 because as we increase lag value in the ARDL we must have sufficient sample. So, with this data lag 8 is suggested.

**4.1.6.2 ARDL Model**

The ARDL Model output expresses the overall output of the Autoregressive Distributed Lag #Model and the R-square value is 95% means model regressors are explaining 95% of the variation of the dependent variable. So, it will give quality output in both the short-run and long-run. As shown in table 4.8:

Table 4.8: ARDL Model Output

R-squared	0.950148
Adjusted R-squared	0.770681
S.E. of regression	0.030672
Sum squared resid	0.009408
Log likelihood	133.4441
F-statistic	5.294272
Prob(F-statistic)	0.003972

#### 4.1.6.2.1 Cointegration test: Bounds F-test

Priorly, it was mentioned that Bounds F-test will be used in the study so the results of the cointegration are provided in the table which shows that F-statistics for the model is 5.73 which is a higher value than the value of the critical bound (5.07 at 5% significance level). So, there is strong long-run relationship exists among the investigated variables of the model. Hence, we are concluding that Islamic banking performance has an equilibrium relationship with the economy of Pakistan in the long-run relationship. As shown in table 4.9:

Table 4.9: Bound Test for Cointegration

F-Statistic Value	Critical bounds (k=3)	
Level of significance (%)	I (0)	I (1)
10	3.47	4.45
5	4.01	5.07
1	5.17	6.38

#### 4.1.6.2.2 Error Correction Model

Cointegration equation variable has negative coefficient with a significant impact which demonstrated that there is short-run relationship exist in the variables to determine the economic output. Individually, Islamic Deposits growth and Islamic Financing growth found insignificant impact on the economy of the country in the short run because the p-value is less than 5%.

Table 4.10: ECM Regression Model: ARDL (8, 8, 8, 8)

Regressors	Coefficients	t-statistic	P value
D(DIPIG(-1))	1.840325	3.6365	0.0046
D(IDG)	-0.106808	-1.081613	0.3048
D(IFG)	-0.027091	-0.651523	0.5294
D(DONIGHT)	5.418838	6.835184	0
C	0.034522	1.920335	0.0838
CointEq(-1)*	-3.035087	-5.458861	0.0003

#### 4.1.6.2.3 Data analysis of impact of Financial Crisis & COVID 19

To check the impact, Dummy variables has been added because there is a chance of different trend during these periods. Therefore, it is really important to check there impact overall. After adding dummy variables in Eviews for finding the impact of both crises like financial crisis 2008 and COVID-19. The study found no long-run impact but both crises impact in the short run in the economy of the country. As shown in table 4.11:

Table 4.11: ECM Regression Model: ARDL (1, 6, 5, 4, 6)

Regressors	Coefficients	t-statistic	P value
D(IDG)	-0.207264	-2.904769	0.008
D(IFG)	-0.020292	-0.556567	0.5832
D(DONIGHT)	4.320201	6.764446	0
D(Financial_Crisis)	2.792174	10.88475	0
CointEq(-1)*	-1.391684	-11.08173	0

Table 4.12: ECM Regression Model: ARDL(2, 0, 4, 3, 3)

Regressors	Coefficients	t-statistic	P value
D(IFG)	0.078391	4.765882	0
D(DONIGHT)	0.339225	0.429964	0.6699
D(COVID)	-0.110234	-3.257091	0.0025
CointEq(-1)*	-1.46964	-10.8482	0

The above output in table 4.12 shows that Pakistan has higher growth during the normal period by 2.79 times than during the financial crisis period in the short run. Another table shows that there is the negative impact of covid-19 on Pakistan growth by 0.11 times so we can conclude that there is the impact of both crisis on Pakistan economy and the factors which contribute in the economy of the country but from results, we can also compare that covid has a higher negative impact on Pakistani economy than financial crisis and the main reason was that Pakistan has not derivative market and they deal with mostly Islamic mode of financing. Hence, they suffer lesser in that crisis, and as covid was a global crisis so it affects all countries' economies.

## 5. CONCLUSION AND RECOMMENDATION

Islamic banking plays a crucial role in monetary transmission process by facilitating economic growth, promoting financial inclusions, and channeling funds to productive sectors of the economy. Moreover, Islamic banking operates on the principles of Sharia which prohibit the interest-based transactions and promote investment on social economical projects which ultimately benefit the community and economy overall. In terms of monetary policy, Islamic banking can help in the implementation of monetary policy by providing an alternative source of financing to the economy. For example, if the central bank reduces interest rates, conventional banks may not be able to pass on the full benefit to their customers due to various reasons, but Islamic banks can use other mechanisms like profit-sharing, leasing, and installment sales to provide cheaper financing to their clients. Hence, Islamic banking plays a crucial role in the development of the economy of Pakistan, so this paper attempts to analyze the role of Islamic banking especially Islamic deposits & Islamic financing role in channelizing the monetary transmission mechanism of Pakistan. Theoretically, we can say that both above factors are related to interest rates and ultimately affect the economy of the country and In Pakistan, the dual banking system is available conventional and Islamic so for analyzing that Is Islamic banking impact similar way as conventional banks do on monetary policy by extracting interest rate factor which plays the central role in the monetary transmission mechanism. Therefore, this study plays a significant and detailed role in the Islamic perspective of the banking system. The output explained that there is a positive impact of Islamic banking in contributing monetary transmission mechanism and the economy suffered during financial crisis 2008 and COVID-19. Comparatively, COVID-19 was found more severe than the financial crisis 2008 and the paper found derivative investments behind the huge losses of the financial crisis. As Pakistan has not established a derivative market so they suffered lesser than other countries and COVID was a global disease, so it affected higher. Hence, we can say that Islamic banking plays an important role in contributing economic output of the country. Hence, policymakers, and government authorities should have to focus on both these factors too because they affect positively the monetary transmission mechanisms and ultimately the real economy of the country.

During this study, the paper also found that there is a lack of study in the perspective of commercial risk of banking sector of Pakistan. Secondly, Islamic deposit is also working as a financing tool for the Islamic banking development in Pakistan. So, both can be taken into consideration for future researchers from the perspective of Pakistan.

Some of the implications of the role of Islamic banking in monetary transmission are discussed below:

### 5.1 Different monetary policy instruments

Islamic banking operates on the principles of Shariah law, which prohibits charging or paying interest (riba). Therefore, Islamic banks cannot use traditional monetary policy instruments such as interest rates. Instead, they use profit and loss sharing (PLS) instruments, which allow for risk-sharing between the bank and its customers. This means that changes in monetary policy will have different effects on Islamic banks compared to conventional banks.

### 5.2 Impact on the real economy

Islamic banks focus on financing productive economic activities that comply with Shariah principles, such as trade, manufacturing, and services. This means that changes in monetary policy will affect the real economy differently through the financing and investment activities of Islamic banks.

### 5.3 Role in promoting financial stability.

Islamic banking promotes financial stability by avoiding risky financial instruments and focusing on asset-based financing. This can reduce the risk of financial crises and contagion in the financial sector.

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