Determinants of the Interest Rate Spread in Commercial Banks of Pakistan

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Abstract

This study is about the determinants of the Interest Rate Spread (IRS) in commercial banks of Pakistan. A higher IRS is of concern for the business community as it borrows at a higher rate, which affects its relative competitive position in the market. Relative to other institutions, banks are more sensitive to the fluctuations in the IRS. The data for this study was collected from published annual reports of ten commercial banks from 2010 to 2017. Using the random effect model, the result shows that Non-Performing Loans (NPL), inflation rate and exchange rate have a positive impact on the IRS. Inflation has a significant positive impact on the IRS, while the NPL ratio and exchange rate have an insignificant positive impact on it. On the other hand, the demand deposits to total deposits ratio, capital adequacy ratio, and GDP growth rate have a negative impact on the IRS. The demand deposit ratio and capital adequacy ratio have a significant negative impact on the IRS, while GDP growth has an insignificant negative impact on IRS.

Keywords: Bank spread, Non-performing loans ratio, Capital adequacy ratio, Economic factors

Introduction

Development is the key to a nation's success. It, along with growth, plays an important role in the improvement of living standards. Much of the literature states that growth has a significant effect on the economy. For the achievement of economic goals, growth is compulsory. In the 1950s and '80s, a lot of the growing countries understood the target growth standard for the economy, but the standard of living did not change as there were poverty, illiteracy and a dearth of health facilities. The effect of these factors is higher on economic development (Maudos & Guevara, 2004). In the case when the growth rate is high, the government offers different facilities and the education level goes up (Al-Shawawreh, 2014). Likewise, banks play a vital role in the development of the economy. Economic development is possible only if there exist well-developed financial systems and financial institutions (Rajaraman & Vesishtha, 2002). The performance of financial institutions indicates the direction of economic growth. The inefficiency of financial institutions influences the development, structure, and growth of the particular economy, and affects the global economy as well (Farhan *et al.,* 2012). A developed

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financial system theoretically has a low IRS. A higher IRS shows incompetence, which is linked with lower financial efficiency (Ahmadian & Kyanvnd, 2015). Throughout the previous decade, there was an increasing trend in the IRS. A higher IRS is of concern for the business community as it borrows at a higher rate, which affects its relative competitive position in the market. Relative to other institutions, banks are more sensitive to the fluctuations in the IRS. Stability in IRS is important for stable investments and attracting new customers (Raharjo *et al.*, 2014). The objective of this study is to assess the determinants of the commercial banks' IRS in Pakistan. The banking sector of Pakistan is growing rapidly. Various factors like inflation, GDP growth rate, exchange rate, deposit ratio, and capital adequacy ratio also fluctuate in the volatile economic situation of Pakistan. This study is an attempt to assess the various determinants of the IRS in the commercial banking sector of Pakistan. The results of this study are intended to make contributions to various stakeholders. First, commercial banks in Pakistan require this information for setting justified lending rates to attract more customers and to make access to finance easy in the market. Second, the results of the study are also useful for the government in making policies to regulate the growing banking sector to help decrease the ever-increasing banking spread. Third, this study is intended to extend the body of knowledge about the determinants of the IRS for the banking sector in Pakistan.

Literature Review

If the system of financial institutions is functioning well and implements efficiently the financial intermediaries' functions, it will lead to the achievement of economic growth for the country (Levine, 1997). Since the last couple of years, the banking sector of Pakistan has received more importance, and has a huge potential for development and growth, and therefore, the capability to boost the economy. The banking sector has shown considerable growth and development in terms of profitability, indicating a high performing banking sector. After a huge growth in 2008, Pakistan's banking sector is facing various pressures and hurdles like the liquidity pressure in the market and the problem of solvency, which has the most considerable effect on the banking sector's performance and the system of financial institutions.

NPL and Bank Spread

In commercial banks, loans usually make the bulk of their total assets. This activity of commercial banks exposes them to the default risk from borrowers. NPL or lower asset quality is the cause of banking crises and a matter of concern for regulators. According to Ngetich and Wanjau (2011), a higher IRS is an important determinant of NPL. They further recommend that banks should assess the customers and charge interest accordingly because a higher interest rate leads to higher NPL. The study of Khawaja and Din (2007) examined various determinants of the IRS in the commercial banking sector

in Pakistan. Their study used deposit inelasticity, concentration, liquidity, market share, administrative costs, macroeconomic variables, and asset quality. This study concluded that inelastic deposit supply is the only determinant of the IRS for commercial banks in Pakistan. Bofandi and Ropele (2011) assessed the determinants of NPL for the banking sector in Italy and concluded that among other factors, the higher interest rate charged by banks affected the NPL ratio. The same results were found by Louzis *et al.* (2011) for the commercial banking sector of Greece.

H_1: There is a positive relationship between the NPL and the IRS

Capital Adequacy Ratio and Bank Spread

Demirguc-Kunt and Huizinga (1999) studied the bank spread determinants for 80 countries. The macroeconomic and bank-specific determinants were taken into consideration. Their study concluded that higher bank capitalization led to higher bank spreads. Cihak (2004) made an analysis of the IRS for the banks in Croatia. Total assets, deposit rate, NPL, market share and capital adequacy ratios were taken as the various determinants of the IRS. The capital adequacy ratio and NPL were found to be important determinants of the IRS for banks in Croatia. Claeys and Vennet (2003) studied the IRS for banks in Western and Eastern European countries. According to their study, bank risk, institutional reforms, capital adequacy ratio and operating efficiency led to a higher bank spread in both groups of countries.

H_2: There is a positive relationship between capital adequacy ratio and the IRS

Market Power and Bank Spread

According to Norris and Floerkemeier (2007), banks with higher deposits relative to total market deposits have greater market power, which leads to higher profits and higher IRS. The study of Abbogge *et al.* (2008) studied the responsiveness of certain macroeconomic and bank-specific factors to bank spread. They concluded that bank concentration or market power, staff cost and inflation directly affected the bank spread for banks in Ghana. The study of Khawaja and Din (2007) concluded that market share of interest rate-based deposits determined the IRS in Pakistan. Martinez, Peria, and Mody (2004) examined the effect of market power and foreign participation on bank spread in four Latin American countries. They suggest that market power is an important determinant of the interest spread in these countries.

H_3: There is a positive relationship between market power and the IRS

GDP Growth and Bank Spread

The effects of a business cycle are measured by the GDP growth rate in every economy. The repayment capacity and creditworthiness of banks' customers are affected by variations in the business cycle. Banks usually impose higher lending rates to compensate against the losses arising from changes in business cycles. According to

Beck and Hess (2009) and Afzal (2011), commercial banks usually charge a lower bank spread when there is an acceleration in the growth of the economy, and a higher bank spread when there is low growth in the economy. Afzal and Mirza (2010) asserted that there is no connection between GDP growth and the IRS in Pakistan. Athanasoglou *et al.* (2005) also confirmed a positive relationship between the bank spread and economic growth rate.

H_4: There is a positive relationship between GDP growth rate and the IRS

Exchange Rate Volatility and Bank Spread

Exchange rate volatility is an important determinant of macroeconomic stability. The risk encountered by commercial banks is affected by it. Banks usually increase their spread to compensate against macroeconomic instability or volatility in exchange rates. Therefore, bank spread is directly related to the exchange rate volatility (Folawewo & Tennant, 2008). Nampewo (2013) studied various determinants of the IRS for banks in Uganda. The study used cointegration analysis and the Granger Causality technique and concluded that the exchange rate volatility and interest rate volatility positively affected bank spread.

H_5: There is a positive relationship between exchange rate volatility and the IRS

Inflation and Bank Spread

Inflation as an economic indicator shows changes in the annual consumer price index and the cost of doing business. Inflation enhances the solvency risk of a bank as it decreases the value of cash flows and negatively affects bank reserves (Chirwa & Mlachila, 2002). Khawaja and Din (2007) asserted that the inflation rate in Pakistan does not explain the IRS. According to Moudos and Solis (2009), commercial banks increase bank spread with the increase in the inflation rate, as a higher inflation rate decreases the payment ability of debtors, ultimately increasing the NPL ratio. Banks, therefore, adopt a higher bank spread with the increase in the inflation rate.

H_6: There is a positive relationship between inflation and the IRS

Research Methodology

Data Collection

This research study is based on the data collected from the commercial banks of Pakistan. There are thirty-five banks incorporated in Pakistan. These include public sector commercial banks, private sector commercial banks, specialized banks, and foreign banks. Data for this study is collected from ten commercial banks which are selected randomly from the total population, using their published annual reports from 2010 to 2017. A list of these sample banks is given below.

Table 1: *List of Banks*

S.No	Bank Name	S.No	Bank Name
1	First Women Bank Limited	6	Bank Al-Falah Ltd.
2	National Bank of Pakistan	7	Bank Al-Habib Limited
3	The Bank of Khyber	8	Faysal Bank Ltd.
4	Allied Bank Ltd.	9	Habib Bank Limited
5	Askari Bank Limited	10	Habib Metropolitan Bank

Statistical Model

The following statistical model is applied to investigate the determinants of the IRS in Pakistan.

$$IRS_{it} = \alpha_0 + \beta_1 NPL + \beta_2 CA + \beta_3 GDP + \beta_4 EXR + \beta_4 INF + \beta_4 SDD + \varepsilon_i$$

Variables Definition

Table 2: *Variables Definition*

Variables	Abbreviation	Measurement
Interest rate spread	IRS	It is calculated as (Interest income – Interest expense) /Total assets Moujeri and Younus (2009).
Non-performing loans	NPL	Ratio of non-performing loans to total loans Georgievska, L, *et al*. (2011).
Capital adequacy ratio	CA	Ratio of capital to total assets Georgievska, L, *et al*. (2011).
GDP growth rate	GDPG	The total increase of GDP growth rate Garr and Kyereboah-Coleman (2013).
Exchange rate	EXR	Ratio of average of USD price to Pak rupee Nazarian, R. Hasheminejad, AA. (2009).
Inflation rate	INF	Inflation is the consumer price index growth rate (Beck and Hesse (2006).
Demand deposits ratio	SDD	Ratio of the average of demand deposit and interest free deposit to total deposits (Norris & Floerkemeier, 2007).

Data Analysis

The result is derived from ten banks' data for ten years, shown in Table 3 below. It shows that the mean for Inflation is -2.434 and the standard deviation is .667 for the ten periods. This result shows the instability in the inflation variables (the mean of inflation is instable in the banking sector). The highest value of Inflation is 1.332 and the lowest value goes down to -3.681; the standard deviation is 66.7811%. The skewness value for inflation is +1.14. As per the current result, the data is skewed to the positive side. The range for this test is between-1.9 to +1.9. The result shows that the mean for IRS is -.035 and the standard deviation is 1.056. The highest value of the IRS is 3.621 and the lowest value goes down to -2.891; the standard deviation is 1. The skewness value for IRS is +.470; the results show that the data is skewed to the positive side.

The result demonstrates that the mean for the NPL ratio is -1.413 and the standard deviation is 2.358. In the result, the highest value of the NPL ratio is 3.411 and the lowest value is -5.914; the standard deviation is 2.358. The skewness value for the NPL ratio is +.770; the data results show a positive skewed side result. The results show that the mean for Capital Adequacy is .088 and the standard deviation is .079. The highest value of CA is .593, and the lowest value is .044. The skewness value is for CA is +4.742. The data results show a positive skewed side result.

Results show that the mean for the Exchange Rate is 85.137 and the standard deviation for is 19.050. The highest value of the EXR is .593 and the lowest value is 59.395. The skewness value for EXR is -.283. The data result shows a negative skewed side result. The mean for SDD is -2.318 and the standard deviation is 1.005. The highest value of the SDD is .123, and the least is -5.916. The skewness value is for SDD is -.685, and the data result is negatively skewed. The mean for GDP Growth shows the value of 3.862 and the standard deviation as1.389. In the result, the highest value of the GDPG is 5.541, and the lowest value is .363. The skewness value is 1.186, and the data results show a positive skewed side result.

Table 3: *Descriptive Statistics*

Variable	Mean	Std. Dev	Min	Max	Skewness
Inflation	-2.434	.667	-3.681	1.325	1.141
Interest rate spread	-.035	1.056	-2.881	3.623	.471
Non-performing loans ratio	-1.412	2.358	-5.912	3.41	.773
Capital adequacy ratio	.088	.079	.043	.592	4.742
Exchange rate	85.137	19.050	59.391	.591	-.283
Demand deposit ratio	-2.318	1.005	-5.913	.123	-.685
GDP growth rate	3.862	1.389	.362	5.542	-1.186

Correlation Analysis

Correlation analysis is employed in this study to evaluate the relationship between the variables, with results reported in Table 4. The value between IRS and NPL ratio is .258 - a weak relationship exists between the NPL with IRS, but the relation is positive. It means that NPL is positively correlated with the IRS. The relationship between the SDD and IRS is negative; the stated value is -.484. It means it will negatively affect the dependent variables by -.484. CA has a negative relation with the IRS by -.406. EXR has a positive weak correlation with the IRS; the correlated value is .137. GDP Growth has a negative correlation with IRS; the calculated value is -.068. INF has a positive correlation with the IRS; the value is .144, showing a weak relation with the IRS. So, from the results, it is concluded that three variables have a positive weak correlation with the IRS, and three variables have a negative correlation with the IRS.

However, it is proved that a relationship exists between the dependent and independent variables.

Table 4: *Correlation Analysis*

	IRS	NPL	SDD	CA	EXR	GDPG	INF
Interest rate spread	1						
Non-performing loans ratio	.258	1					
Demand deposit ratio	-.484	-.249	1				
Capital adequacy ratio	-.406	.382	.373	1			
Exchange rate	.137	.009	-.147	-.227	1		
GDP growth rate	-.068	-.127	.016	-.013	.290	1	
Inflation	.144	.131	-.098	.141	-.417	-.616	1

Test Result for Autocorrelation

Table 5: *Test Result for Autocorrelation*

Wooldridge Test for Autocorrelation
H_0: No first order Autocorrelation
F(9) = 63.132Prob> F = .0412

The Wooldridge test of autocorrelation shows that there is no autocorrelation as the p-value is .043.

Heteroscedasticity Statistics

Table 6: *Heteroscedasticity Statistics*

Breush-pagan/Cook-Weisberg Test for Heteroscedasticity
Ho: Constant variance
Chi2(1) = 32.223Prob> chi2= .075

The Breush-Pagan test for heteroscedasticity shows that there is no heteroscedasticity in the data as the p-value is .0752.

Pooled Regression Model

Table 7: *Pooled Regression Analysis*

	Coeff.	Std. Err.	T	P-value
Non-performing loans ratio	.021	.008	2.612	.010
Demand deposit ratio	-.982	.019	-50.724	.000
Capital adequacy ratio	-1.114	.259	-4.291	.000
Inflation	.078	.032	2.424	.017
Exchange rate	.011	.035	0.382	.705
GDP growth rate	-.014	.014	-.98 6	.331

Dependent variable = Interest rate spread

Table 7 shows the pooled regression analysis for the impact of various dependent variables on the IRS. It shows that NPL and inflation rate have a significant positive

impact on the IRS, while the exchange rate has an insignificant positive impact on the IRS. On the other hand, demand deposits to total deposits ratio and capital adequacy ratio have a significant negative impact on the IRS, GDP growth rate has an insignificant negative impact on the IRS.

Fixed Effect Model

Table 8: *Fixed Effect Model*

	Coeff.	Std. Err.	T	P-value
Non-performing loans ratio	.0316	.011	2.833	.006
Demand deposit ratio	-1.024	.019	-52.926	.000
Capital adequacy ratio	-.885	.281	-3.151	.002
Inflation	.062	.028	2.177	.033
Exchange rate	$8.98e^{-06}$	.007	.014	.991
GDP growth rate	-.015	.012	-1.178	.246

Dependent variable = Interest rate spread

Table 8 shows the fixed effect model analysis for the impact of various dependent variables on the IRS. It shows that NPL and inflation rate have a significant positive impact on the IRS, while the exchange rate has an insignificant positive impact on IRS. On the other hand, demand deposits to total deposits ratio and capital adequacy ratio have a significant negative impact on the IRS, while GDP growth rate has an insignificant negative impact on the IRS.

Random-Effect Model

Table 9: *Random-Effect Model*

	Coef.	Std. Err.	Z	P-value
Non-performing loans ratio	.024	.009	.312	1.842
Demand deposit ratio	-1.009	.018	-53.504	.000
Capital adequacy ratio	-1.004	.263	-3.811	.000
Inflation	.066	.029	2.296	.022
Exchange rate	.001	.081	.132	.900
GDP growth rate	-.015	.013	-1.228	.223
R-Square	37.754%			
Wald Chi	39.736			
	(.000)			

Dependent variable = Interest rate spread

Table 9 shows the random-effect model analysis for the impact of various dependent variables on the IRS. It shows that inflation rate has a positive impact on the IRS, while NPL and exchange rate have an insignificant positive impact on the IRS. On the other hand, demand deposits to total deposits ratio and capital adequacy ratio have a

significant negative impact on the IRS, while GDP growth rate has an insignificant negative impact on the IRS.

Breuch-Pagan LM Test

Table 10: *Breuch-Pagan LM Test*

Dependent Variable	X^2- Value	P-value
Internet Financial Reporting	26.714	.001

Table 10 shows the test result of the Breuch-Pagan LM test. This test decides the selection of either the pooled OLS model or the fixed effect or random-effect model. The null hypothesis for this test is that intercepts and slopes are similar across firms. The significant p-value of chi-square statistics shows that the null hypothesis of similar intercepts and slopes are rejected. Therefore, the fixed effect or random-effect models are better estimates in comparison to the pooled OLS model.

Hausman Test

Table 11: *Test Result of Hausman Test*

Test Summary	Chi-Sq Statistic	Prob.
Cross-section random	51.654	0.0

The result of the Hausman test shows that the random effect model is selected, as the p-value is significant at 5%.

Discussion of Results

The term economic growth and economic development are not indistinguishable. For development, growth is essential, but not sufficient. The increase in per capita income or the increase in the production of a country is considered as economic growth. Financial institutions, like commercial banks, play an important role in performing the intermediaries' functions. The activities of the banking business are to receive the surplus funds from individuals and groups through current accounts, fixed accounts, and profit and loss account deposits, or, if required, borrowing from other banks or institutions. These funds are then used for granting loans along with providing advances and other credit facilities to the public and organizations, and investment in different securities for the generation of return. This progression includes the collaboration of various actions and institutions and is probably linked with economic growth.

The role of financial institutions in the economy is very important. Banks face failures all over the world. Due to these unexpected events, regulatory authorities come into action and many banks and other financial institutions are closed down. As a result, different sectors of the economy are negatively influenced. The second cause of banks' failure or inefficiency is the reduced credit flow to the economy and the different sectors therein, affecting the efficiency and productivity of firms and units of the economy. Several practical investigators have exposed that NPL is the major cause of bank failures.

Economic development and the development of financial sectors are interrelated. No economy in the world can develop, grow or improve the standard of living of its people without the presence of an efficient banking system. If the inefficiency of the financial market in general, and banking institutions, in particular, continues for an extended period, the stock of NPL will increase with an increasing rate if new loans are serviced. It increases because it consists of the principal amount along with the markup rate. Continuously increasing the amount of NPL will create different threats to the banking sector. NPL is not just the problem of Pakistan; other countries are also facing such problems. In recent years, the growth and turn around in Pakistan's banking sector has been remarkable and for the first time has been classified as the region's best performing sector. Commercial banks are important indicators in economic development and growth and also in the development of a country's economy. For the stability of the banking system, there is a need for a stable macroeconomic environment, which enhances the effectiveness and real growth of deposits and investment decisions. The role of the State Bank of Pakistan cannot be denied as it is performing important activities for the development and growth of the economy by providing guidelines and principles to financial institutions to facilitate the investors and assembling the economic resources for the country's development. A key indicator of the banking sector's effectiveness is the IRS. The main margin among deposit-lending rates, the IRS in an economy has significant implications for the development and expansion of the economy, as many authors propose a critical link between the effectiveness of bank intermediation and financial growth. The difference among advance and deposit rates, identified as the IRS, is a significant factor in the effectiveness of the financial strength of a nation. A greater IRS pieces as an impairment to the growth of financial intermediation, required for the development and expansion of an economy.

GDP growth has an insignificant negative impact on the IRS in Pakistan. Large economies with higher growth rates bring economies of scale and competition among credit suppliers in financial markets, consequently, lowering the interest rates charged by the financial institutions. It happens when the private sector has a higher level of access to financial products at a lower cost (Rebei, 2014). But this situation is not prevailing in the financial markets of Pakistan. NPL have an insignificant positive impact on the IRS in the case of commercial banks of Pakistan. The same results were suggested by Wanjua (2011), and Bofandi and Ropele (2011). These studies recommended that banks should assess customers and charge interest accordingly as a higher interest rate leads to a higher NPL ratio. The exchange rate has also positive insignificant impact on the IRS in commercial banks of Pakistan. Folawewo and Tennat (2008), and Nampewo (2013) also confirmed an insignificant impact of the exchange rate on the IRS as banks usually

increase their spread to compensate against macroeconomic instability or volatility in exchange rates. The capital adequacy ratio has a significant negative impact on the IRS. Banks with a higher capital adequacy ratio usually invest more in low risk with lower return assets. This tendency ultimately ensures lower interest rates for spread in commercial banks. The same results were also suggested by Cihak (2004), and Claeys and Vennnet (2003). Market power or market share has a significant negative impact on IRS as the market for deposits is highly competitive and commercial banks usually compete on the basis of interest rate to attract more deposits for them. The studies of Norris and Floerkemeier (2007), and Abbogge et al. (2008) also confirmed the same results. Inflation has a positive significant impact on the IRS in commercial banks of Pakistan. The same results were also suggested by Chirwa and Mlachila (2002), and Moudos and Solis (2009).

Conclusion

This study is about the determinants of the IRS in the commercial banks of Pakistan. The data for this study were collected from the published annual reports of ten commercial banks, from 2010 to 2017. The result shows that NPL, inflation rate and exchange rate have a positive impact on the IRS. Inflation has a significant positive impact on the IRS, while the NPL and exchange rate have an insignificant positive impact on IRS. On the other hand, demand deposits to total deposits ratio, capital adequacy ratio, and GDP growth rate have a negative impact on the IRS. Market power and capital adequacy ratio have a significant negative impact on the IRS, while GDP growth rate has an insignificant negative impact on IRS. It shows that the market power and capital adequacy ratio as a bank's internal factors are important determinants of the bank spread in Pakistan. Commercial banks should therefore further strengthen their capital base and enhance their demand deposits to remain competitive. In the context of this study, the inflation rate as an economic indicator is an important factor in determining the IRS in Pakistan. Policymakers, therefore, should control the inflation rate to strengthen the banking sector in Pakistan. Further studies should be carried out by including variables like management quality, staff cost, loan growth rate and the deposit rate.

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