
Research

THE IMPACT OF LOAN SIZE AND GLOBAL FINANCIAL CRISIS ON INTEREST RATE SPREADS IN PAKISTAN'S COMMERCIAL BANKING SECTOR

Saadia Irshad¹ and Shahbaz Ahmad²

Abstract

This study investigates the effect of loan size and global financial crisis on interest rate spreads (IRS) in Pakistan's banking sector. This study employs unbalanced panel data set of 22 commercial banks in Pakistan for the period 2005-2014. By using fixed effect regression model, it is found that loan size is negatively affected by the IRS which indicates that as loan size increases, IRS is reduced. In the same vein, bank size has a negative but insignificant effect on IRS. Liquidity and credit risks are negatively influenced by banking spreads, whereas operating cost has a positive effect on IRS. Return on assets (ROA) has no effect on IRS. Finally, recent global financial crisis is also positively influenced by banking spreads which indicates that the financial system of Pakistan is globally integrated.

Keywords: Interest rate spread, commercial banks, loan size, global financial crisis

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1- The Women University, Multan, Pakistan

2- Air University, Islamabad, Pakistan

Introduction

The Banking sector plays a significant and vital role in a country's economy. If the banking system of a country is effective, efficient and well-disciplined, it results in rapid growth in various sectors of the economy. In other words, financial sector development and economic development are interrelated. Banks act as financial intermediaries which collect funds from those who have spare amount of money and lend it to those who require these funds for different investment purposes. According to Financial Stability review (SBP, 2006) Financial Intermediation is defined as "channeling funds mobilized from the surplus sector of the economy (savers), towards the deficit sector (investors). According to the Dr. Ishrat Hussain (2006), financial intermediaries perform five basic functions that affect the real economy (1) mobilizing savings from domestic households and corporates, (2) pooling and managing risk, (3) acquiring and disseminating information about investment opportunities, (4) monitoring borrowers and exerting corporate control, and (5) facilitating the exchange of goods and services. Like other developing countries, banking channel is a channel most heavily relied upon, due to the absence of well-developed debt and equity markets. . Due to this significance of banking channel policy makers and researchers always pay great attention to the efficiency of financial intermediaries. IRS and net interest margin (NIM) are used as proxy variables for determining the intermediary's efficiency of commercial banks. . IRS is the difference between weighted average lending rate (WALR) and weighted average deposits rate (WADR) (Mahmood ul Hassan B. K., 2010). Both interest rate spread and net interest margin reflect the profit maximizing ability of the banking sector (Bandaranayake, 2014).

When IRS is high, people feel reluctant to borrow funds from banks for investment purposes because it increases their cost of borrowing. High IRS is considered impediment to the expansion and development of financial intermediation, as it discourages potential savers with low return on their savings and limits financing for

potential borrowers, thereby reducing feasible investment and therefore potential growth of the economy (Barajas, 1999). Jayaraman and Sharma (2003) highlighted the reasons of high banking spread. They attributed it to inadequate competition, diseconomies of scale due to small sized market, high transportation costs of funding perceived market risks, high fixed and operating costs and risk profile of the banks. High IRS is also considered an indicator of the poor performance of the banking system and indicates inadequate banking regulations (Ayesha, 2010). Low interest rate spread is an indicator of managerial efficiency. When IRS is small, people are more likely to borrow because it is easy to repay. In this way, new projects will be started that create employment opportunities. So, low IRS leads to investment as well as employment opportunities that result in higher national income or economic growth (Thordsen, 1999).

Pakistan is a perfect candidate to study issues regarding high IRS because its banking system is attributed to high spreads and substantial profitability. According to the Financial Stability Review (FSR) of SBP (2006), “extraordinary interest rate spreads in Pakistan **are indication of lack of competition among banks**”¹ Competition among banks also indicates that banks are operating like “an organized cartel and are involved in fixation of spreads and interest rates on different products in consultation with each other and there is no competition among them, which is leading to anti-competitive behavior”². This situation compelled the State Bank of Pakistan to initiate a base lending rate of 5% in May 2008. To encourage savings, SBP increases the base lending rate from 5% to 6.3% in December 2012.

¹ Addressing a conference on the issue of “ Fixed income market developments in developing market economies” on Dec 18,2006, cited from an article <http://www.opfblog.com/3353/the-sbp-and-the-banking-cartel-dr-farrukh-saleem/>.

² Cited from an article at <http://www.opfblog.com/3353/the-sbp-and-the-banking-cartel-dr-farrukhsaleem/>

The basic objective of this study is to determine the financial intermediaries' efficiency. We employed unbalanced panel data set of 22 commercial banks³ from 2005 to 2014. There are different firm level, industry level and macroeconomic factors that determine the intermediary efficiency. In this study, we employed bank specific factors that are used as control variables which are bank size, return on asset, credit risk, liquidity risk, operating costs. Loan size is used as explanatory variable and recent global financial crisis is used as dummy variable. Loan size is one of the factors that affect the IRS. There are so many studies on the subject of IRS in Pakistan but there is no one study that address the issue of loan size impact on interest rate spread.

This study is intended to analyze the effect of loan size on IRS of the banking sector in Pakistan. The theoretical relationship between interest rate and loan supply could be found in available literature on monetary policy and bank lending under the direct credit channel of credit view. The direct channel of credit view asserts that SBP sells government securities to the public in exchange for cheques drawn on private bank in Pakistan, the reserve account of the bank is actually being debited by the State Bank of Pakistan. If the reserve falls below the SBP legal minimum reserve requirements, the banking system as a whole must reduce its holding of deposits. According to the basic accounting equation, assets must always equal to liability plus equity. Therefore, when deposits are reduced, the supply of the bank loan must also reduce. This will increase the loan rates which mean the cost of borrowing will be higher. Thus, it will contract the spending in the economy. Calcagnini et al. (2012a) investigated the relationship between interest rates, loans and guarantees. They concluded that loan size was negatively influenced by the banking spread. Calcagnini et al. (2012b) analyzed the financial crisis effect on interest rate spread and guarantees and revealed that interest rate spread is negatively influenced by the loan size.

³ 22 commercial banks which include 4 public banks, 5 foreign banks and 13 domestic private banks.

The second dimension of the study is to analyze the effect of the recent global financial crisis 2007/08 on IRS. Global financial crisis 2007/08 is used as dummy variable. Subprime mortgages, rating agencies, regulators, securitization and globalization are the key factors that play their role in originating and spreading this crisis. This crisis was started from the U.S. and then spread worldwide due to financial contagion. As a result of this financial crisis, various banks were collapsed. This study has examined the relationship between global financial crisis and IRS in Pakistan's commercial banking sector.

During 1990s, Pakistan initiated the financial sector reforms with the name of liberalization. There are four main objectives of liberalization in the banking sector. These objectives include introducing stiff competition within the financial intermediaries (banks), adopting an indirect market based system, strengthening their governance and supervision system and instilling credit management for improved resource allocation (Ayesha, 2010). Under these reforms, nationalized banks were started to be transformed into private entities. In this way, a directed system of credit and administered interest rates system was shifted towards market based system of credit and interest rate. As a result of these reforms, the total number of banks increased from 20 in 1992 to 45 in 2014. The ownership structure of banks was changed and foreign banks were also allowed to start their operations in Pakistan. These reforms were intended to enhance competition in the banking sector. Because of the competition, banks normally have to reduce their profit margins and thus IRS is reduced. So the main objective of these reforms was to enhance the efficiency of financial intermediaries. To what extent these financial reforms, in the name of liberalization, succeeded in meeting their objective is a big question mark which this study is aimed to answer.

Research objectives

To sum up, the following are the questions which are to be answered by this research:

- What is the relationship between interest rate spread and loan sizes of commercial banks in Pakistan?

- To what extent does bank-specific variable affect the interest rate spreads?

- Does global financial crisis has any effect on the interest rate spread in Pakistan?

Literature review

In the context of Pakistan, there are few studies which have examined the determinants of interest rate spread.

Khawaja and Din (2007) analyzed the determinants of IRS in Pakistan. The study used panel data set of 29 commercial banks for the period 1998 - 2005. They employed firm-level variables (administrative costs, liquidity ratio, non-performing loans, and market share), industry-level variables (banks concentration and interest-insensitivity of deposit) and macroeconomic variables (GDP growth, inflation and bank discount rate). The results revealed that deposits inelasticity is a major determinant of IRS.

Ayesha and Mirza (2010) examined the determinants of IRS in Pakistan's commercial banking sector during 2004-2009. They used an extensive set of bank specific variables including the bank size, operational efficiency, liquidity, risk absorption capacity, bank concentration, interest rate volatility, GDP growth and M2/GDP. They report that there is a positive relationship between the bank size and IRS. It also found out that return on assets has positive and significant effect on IRS, deposit market share is statistically significant but had negative effect on IRS. The overhead costs were highly significant

for both interest rate spread and net interest margin. The results revealed that intermediary efficiency is affected by bank size, asset quality, GDP growth rate and operational efficiency.

Siddiqui (2012) investigated the determinants of IRS in the banking sector of Pakistan. The study employed panel data of 22 commercial banks from 2000 to 2008. The study was based only on bank-specific factors including market share, liquidity risk, administrative cost as a percentage of total assets, non-performing loans as a percentage of net advances, net mark-up as a percentage of total income and return on assets (ROA) after payment of tax as a percentage of average assets. The study estimated panel data framework in three categories such as random effect model, fixed effect model and common constant model. It is found out that administrative costs, non-performing loans and return on assets are significantly affecting the interest rate spread in all regression models .

Shahzad (2012) explored the determinants of IRS in the banking sector of Pakistan. This study employ bank specific factors which includes market size, operating costs, non-markup revenue; industry specific factors which includes Herfindhal index (HHI); and macroeconomic factors which include corruption, domestic borrowing, fiscal deficit, exchange rate, inflation, money supply and government expenditure. The study found that domestic borrowing, GDP and market size have a positive but significant effect on interest rate spreads. Budget deficit, inflation, money supply and exchange rate have a negative but significant effect on interest rate spreads. This study concludes that technology was a prominent factor at bank level.

The State Bank of Pakistan (SBP, 2006) examined the financial intermediary's efficiency in Pakistan, using interest spreads and net interest margin for the period 1997 to 2006. It employs the bank specific, industry specific and macroeconomic factors include non-interest income, administrative costs, provision of non-performing loans, foreign ownership, bank concentration, real GDP growth rate and

inflation and interest rate volatility. This review concluded that all these variables are significant in explaining the interest rate spreads and foreign ownership or administrative are the variables that explain a large proportion of interest rate spreads

Since there are no previous studies which have handled the subject of the loan size and the effect of financial crisis on interest rate spread in a single model, therefore, this study has targeted to fill this research gap.

Research Methodology

Given the objectives of this study, the suitable design is causal predictive research design. According to Cooper & Schindler (2014) a causal predictive study is an attempt to anticipate an effect on one variable by manipulating another variable while holding all other variables as constant. The study use unbalanced data set from the period 2005 to 2014. The study employs a variety of firm-level variables to examine the efficiency of commercial banks in Pakistan. The study is conducted on 22 commercial banks⁴ (see appendix 1 for the list) operating in Pakistan as on 1st July 2015 (SBP, 2015). Secondary data was used in this study, which is collected from the annual reports of the commercial banks.

Model

To examine the relationship among interest rate and loan size, we developed the following model

$$\text{Interest Rate Spread} = \alpha + \beta_1 \text{ Loan Size} + \beta_2 \text{ Bank Size} + \beta_3 \text{ Credit Risk} + \beta_4 \text{ Operating Costs} + \beta_5 \text{ Liquidity Risk} + \beta_6 \text{ ROA} + \beta_7 \text{ Financial Crisis} + \epsilon$$

The dependent variable is the interest rate spread. The independent variable is the loan size while other variables are control variables. The relationship between interest rate spreads was

⁴Islamic banks in Pakistan are excluded because there is no concept of interest in Islamic banks. Specialized banks (such as Zarai Tarqiaati Bank, Industrial development Bank etc) were not the part of this study because those banks are established for specific purposes e.g to promote a particular industry.

controlled for the effects of firm characteristics as well as other bank specific factors.

Dependent Variables

Interest rate spreads (IRS) and net interest margins are used as proxy variables of intermediary efficiency. Both are financial indicators that gauge the intermediary efficiency of the banking sector. IRS is the difference between weighted average deposits rate (WADR) and weighted average lending rate (WALR). These proxy variables of intermediary efficiency are measured as:

$$Spread = \tau_{it} = \frac{r_{it}}{EA_{it} - EquityINV_{it}} - \frac{c_{it}}{IntLiab_{it}}$$

Where r is interest revenue, c is interest expense, EA is total earning assets (sum of lending to financial institution, gross advances excluding non-performing loans and gross investment excluding equity investment). IntLiab includes all interest-bearing liabilities (sum of remunerative deposits and borrowings), and the subscript it represents bank i and time t.

Independent Variables:

The study employed a variety of bank-specific variables that might possibly explain the dynamics of interest rate spreads of banking sector in Pakistan. These variables include bank size, return on assets, non-performing loans to gross advances ratio, liquidity risk, operating cost and loan size. Financial crisis is used as a dummy variable.

Model:

To examine the relationship among above-explained variables, we developed following model

$$\text{Interest Rate Spread} = \alpha + \beta_1 \text{ Loan Size} + \beta_2 \text{ Bank Size} + \beta_3 \text{ Credit Risk} + \beta_4 \text{ Operating Costs} + \beta_5 \text{ Liquidity Risk} + \beta_6 \text{ROA} + \beta_7 \text{ Financial Crisis} + \varepsilon$$

The dependent variable is interest rate spread. The independent variable is loan size while other variables are control variables. The relationship between interest rate spreads was controlled for the effects of firm characteristics as well as other bank specific factors.

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Table 1:

Measurement of Variables and Expected Signs

Variables	Measure	Expected Signs
Interest rate spread	The difference between weighted average lending and weighted average deposits rate.	
Loan size	Amount of loans given in a year.	-
Bank size	Log of total assets.	+
Credit risk	Ratio of non-performing loans (NPLs) to gross advances.	-
Operating costs	Log of operating expenses.	-
Liquidity risk	Ratio of liquid assets to total assets.	+
Return on assets	Net income divided by average total assets.	+
Financial crisis	Dummy variable. 0 for before and 1 for after effects of financial crisis on interest rate spreads.	-

Hypothesis:

H₀₁: There is no causal relationship between loan size and Interest rate spread.

H₁₁: There is a causal relationship between loan size and Interest rate spread.

H₀₂: Global Financial crisis has an effect on the interest rate spread.

H₂: Global Financial crisis has an effect on the interest rate spread.

Data Analysis, Results and Discussion

The results of this study are exhibited in terms of the descriptive analysis, correlation analysis and regression analysis.

Descriptive Statistics:

Table 2 exhibits bank-wise descriptive statistics for the period 2005 to 2014. On average, Habib Bank Limited has highest IRS at 5.3%, followed by Muslim Commercial Bank (MCB) with a mean IRS of 5.2%. Similarly, both Citi Bank and Standard Chartered Bank have 5.1% spread. During sample period, Bank of Punjab has lowest spread of 0.9% due to its poor asset quality and also has high credit risk of 31.5%. Bank of Punjab has a mean ROA of -2.1% that indicates massive overhead cost. Despite large bank size, National Bank of Pakistan has average spread of 4.3% and also has the largest loan portfolio of Rs. 4.72 billion. It is also noted that Bank of Punjab has high impaired lending to gross advance ratio (credit risk) due to bad governance and corruption scams which resulted in lowest spreads and lowest return on assets of -0.21%. Bank Al-Falah has lowest credit risk of 5.65%, indicating the management efficiency and recovery of loans on time. Duetche A.G bank has highest liquidity risk of 73.1% which implies that bank should consider investing funds in short-term assets or otherwise, it might be required to borrow emergency funds at high costs in future. First woman bank has a good average spread of 4.00% due to low credit risk. Due to low credit risk, FWBL keeps a

small provision of non-performing loans which ultimately improves bank profitability.

Table 2.

Average Statistics of Top 5 Banks vs. Remaining Banks

		Spread (%)	Bank Size	Liquidity Risk (%)	Loan Size (mln)	NPL to Gross Advance (%)	Operating Cost	ROA
Top 5 Banks	Mean	4.47	11.84	35.30	349000	9.85	10.23	2.15
	Median	4.45	11.85	33.00	317000	9.74	10.24	2.00
	Min	1.70	11.40	19.40	144000	4.10	9.72	0.40
	Max	6.70	12.27	58.00	661000	16.60	10.64	4.00
	SD	1.34	2.08	10.08	130000	3.30	24.20	0.79
Remaining Banks	Mean	2.58	11.06	40.00	77800	13.10	9.47	0.55
	Median	2.20	11.13	37.00	65900	10.00	9.51	0.75
	Min	0.00	10.00	16.60	1690	0.20	6.00	-8.00
	Max	7.70	11.87	80.30	291000	5.20	10.32	8.40
	SD	1.52	4.44	13.57	62700	11.11	5.00	2.12

We also compared the descriptive statistics of the top five banks with the remaining banks in our sample set. Large banks are decided on the basis of their total assets. Table 2 indicates that larger banks have high interest rate spreads and margin due to operational efficiency, which is depicted by high ROA and also by better assets quality. It is also noted that large sized banks have better and well diversified portfolio. On the other hand, medium and small sized banks have their exposure concentrated in the public sector. It is also reported that medium and small sized banks have higher liquidity because they invests in low risk and liquid assets, which results in lower ROA as compared to top five banks. It is interesting to note that larger banks have relatively lower non-markup income and medium or small sized banks have higher non-markup income indicating the former's tendency to attain overall profitability with interest-based sources

Table 3 compares the average statistics on the basis of ownership classification. Banks are classified into three major categories: foreign banks, domestic private sector banks and public sector banks. Islamic sector banks and special category banks are not the part of the analysis because their nature of operations is different from the former three categories. This table reports some interesting facts about the performance and operational efficiency of these three categories of banks. It is noted that foreign sector banks perform well as compared to public sector and private sector banks because foreign banks are more cautious in loaning. Foreign sector banks has the highest average IRS of 4.36%, followed by the public and private sector banks with spread of 2.82% and 2.80% respectively.

Table 3:
Bank Average Statistics, 2005-2014 (Ownership Classification)

Bank	Spread (%)	Bank Size	Liquidity Risk (%)	Loan Size (mln)	NPL to Gross Advance (%)	Operating Cost	ROA
Foreign Bank	4.36	10.93	52.00	53400	10.00	9.52	1.27
Private Sector Banks	2.80	11.35	35.70	158000	11.10	9.73	0.93
Public Sector Banks	2.83	11.15	38.66	175000	19.00	9.50	0.70

It is also noted that the public sector banks reveal the lowest asset quality, which largely emanates from politically motivated loans by these banks. Public sectors banks have the highest impaired lending to gross advance ratio (19%) which indicates the poor asset quality. The public sector banks have the lowest ROA due to the highest overhead costs while private sector banks have highest ROA ratio due to technological advancement and management efficiency.

Correlation analysis

The correlations between bank specific factors are shown in Table 4. It is noted that loan size and liquidity risk are negatively correlated at

0.05 level of significance. Bank size and loan size are positively correlated at the 0.05 level. Operating cost and bank size are positively correlated at the 0.01 level of significance. Operating cost and loan size are also correlated and the correlation is significant at 0.05 level. Return on assets and spread rate are positively correlated and such correlation is significant at 0.05 level of significance. It means that better management of loan portfolio increase the spread rate. Return on assets and loan size are positively correlated and the correlation is significant at 0.05 level. It means that large size loan portfolio is a great source of income. When banks lends more loans to their customer and earn interest on such loan then bank profitability automatically increases. The correlation among rest of the variables is low. It is also noted that financial crisis has very low correlation with any other variables.

Table 4:

Correlation Matrix of Bank-Specific Variables

Variable	Spread	Bank Size	Liquidity Risk (%)	Loan Size (mln)	NPLs to Gross Advances (%)	Operating Cost	ROA (%)
Spread	1						
Bank Size	0.27491	1					
Liquidity Risk	0.216233	-0.65621*	1				
Loan Size	0.225369	0.659655*	-0.45482	1			
NPLs to Gross Adv	-0.3409	-0.03969	-0.31331	0.176851	1		
Operating Costs	0.45818	0.954017**	-0.54479	0.672221*	-0.13427	1	
ROA (%)	0.629199*	0.373677	0.171626	0.061117*	-0.47206	0.429897	1
Financial Crisis	0.047123	-0.23727	0.219287	0.001616	0.286942	-0.18818	-0.07599

Regression analysis

Regression is a statistical technique that is used to determine the relationship between variables. Before starting the regression analysis we must decide the regression model type. In panel data analysis, we estimate two different models: fixed effect and random effect model. In panel data, it is difficult for researchers to select the suitable model. So, estimation of regression depends on some assumptions of model. On the basis of such assumptions, it is decided that which model is appropriate for analysis. In this study, we estimated

both models and then apply the Husman test on random effect model. On the basis of Husman test, we are enabled to decide that which model (fixed or random effect model) is appropriate for this study. Difference in coefficients is not systematic is a null hypothesis of Husman test. If this null hypothesis is rejected and its p-value is less than 0.05, then we use fixed effect model. It means that correlation exists between individual entity and error term and $E(X_{it}, e_{it})$ is not equal to zero. On the other side, if $E(X_{it}, e_{it}) = 0$ then error component model is preferable.

Applying Husman test on random effect model implies that if p-value is greater than Chi-Square at 5% level of significance, then we reject the null hypothesis (no systematic difference in coefficients in both model) and rejection of null hypothesis means using fixed effect model. Table 9 exhibits that null hypothesis of $E(X_{it}, e_{it})$ is not equal to zero. It means that correlation is present between individual entity and error term and we reject the null hypothesis because p-value is 0% which is less than 5% level of significance. So, Husman Test suggests the fixed effect model. In fixed effect model, each entity has a common slope but different intercept.

Table 5:
Results of Husman Test

Pool: P1					
Test cross-section random effect					
Test Summary		Chi-Sq. Statistics	Chi-Sq. d.f.	Prob.	
Cross-section random		80.259734	7	0.0000	
Cross-section random effects test comparisons:					
Variable		Fixed	Random	Var(Diff.)	Prob.
Bank Size	BS_?	-0.011482	-0.013443	0.000017	0.6349
Financial Crisis	FC_?	0.005353	-0.000889	0.000001	0.0000
Liquidity Risk	LR_?	-0.031465	-0.030299	0.000020	0.7961
Loan Size	LS_?	-0.000000	-0.000000	0.000000	0.0000
Non-performing loan	NPL_?	-0.021476	-0.020452	0.000018	0.8115
Operating Cost	OC_?	0.008781	0.013288	0.000001	0.0000
Return on Asset	ROA_?	0.055729	0.119105	0.000082	0.0000

Interpretation of Regression Results:

We estimate regression with fixed effect model for measure of intermediary efficiency i.e. IRS on various bank specific variables using our panel of 22 commercial banks for the period 2005-2014. The results for regression are summarized in Table 7. The results show a negative relationship between bank size and IRS with insignificant coefficient for log of total assets. It implies that it is not necessary that large size banks reveal higher level of intermediary efficiency. Foreign banks are small in size but they reveal higher level of intermediary efficiency. Foreign banks do not have substantial assets and wide branch network but they show high intermediary efficiency. Table 5 reports that loan size had a negative effect on IRS ($\beta = -9.66E-14$, $p = 0.0000$) and this effect is significant at 5% level of significance. In a liberalized financial system, it is noted that financial institutions are more interested to lend large corporations and blue chips companies who have banking history and audited financial accounts to ensure reduced transaction costs and prudent credit allocation. The results show that credit risk (NPLs to Gross advances ratio) had significantly negative effect on IRS ($\beta = -0.0214$, $p = 0.0400$). It means that when nonperforming loan decreases, banks' specific provisioning against NPLs is reduced which results in increased profitability i.e. higher intermediary efficiency. The liquidity risk had a very significant negative effect ($\beta = -0.0314$, $p = 0.0002$). The coefficient on the measure for operational efficiency shows some interesting results. ROA had a positive effect ($\beta = 0.0557$, $p = 0.1694$) and the effect was insignificant at 5% level. The positive relationship has profound policy implications. Banks with high return on assets have the leverage and are in better position to reduce the IRS and enhance the intermediary efficiency. It is showed that operating cost had a positive effect ($\beta = 0.0087$, $p = 0.0067$) which was significant at 5% level of significance. Finally, the result shows that global financial crisis had a positive effect on IRS and this effect was also significant because Pakistan's economy totally depends on international financial institutions such as IMF, world Bank etc. Due to high integration with international financial institutions, the global scenarios affect the economy. The

recent global financial crisis triggered by the banking sector's excessive risk taking which become worse with simultaneous erosion of bank's capacity to absorb various risks. Table 9 also shows the adjusted R-square, F- Statistics and Durbin Watson test. Adjusted R-square is equal to 0.753. It means that this model is able to explain 75.3% of the variation in IRS due to loan size and financial Crisis. F-statistics (22.54, $p = 0.0000$) reveals that model is a good fit.

Conclusion

This study represents the first attempt to analyze the effect of the loan size and the effect of global financial crisis on interest rate spreads in Pakistan's banking sector. Interest rate spread is used as proxy variable for measuring intermediary efficiency. Interest rate spread is used as dependent variable which is measured as the difference between weighted average lending rate and weighted average borrowing rate. Loan size is used as an independent variable which is measured as the amount of loans given in a period. We also employed a variety of firm level variables including bank size, return on asset, operating cost, credit risk, liquidity risk which are used as control variables. In this study, on the basis of Hausman test, we used fixed effect regression model to explain the relationship between loan size and interest rate spread. This study concludes that loan size had negative but significant effect on the intermediary efficiency. It means that as the loan size increases, interest rate spreads of banks decreases and vice versa. In liberalized economies, it is noted that financial institutions especially banking sector give preference to lend the large corporations and blue chip companies who have banking history and audited accounts to ensure the lower transaction cost and prudent credit allocation in future.

This study also found that financial crisis had a positive effect on IRS. The recent global financial crisis compelled financial institutions to take excessive risk. Since financial system of Pakistan is globally integrated, therefore, crisis also affected the financial system of Pakistan due to financial contagion. The previous studies reported that financial crisis have badly affected the less developed countries

(LDCs) and financial liberalization enhances the vulnerability of financial system to financial crisis. Moreover, countries having regulatory weaknesses also affected seriously by this crisis (Brownbridge, 2000). Financial system of Pakistan fulfills all the above mentioned conditions, so it makes sense if our study found the positive effect of financial crisis on IRS.

The results also reveal that the bank size had a negative but insignificant effect on the intermediary efficiency. It means that bank size has almost no effect on IRS. Table 4 exhibits a comparison among the three categories of bank. The results show that foreign banks have high interest rate spreads as compared to the public sector bank and foreign banks which indicate that it is not necessary that banks having high financial standing (total assets) and network size also exhibit high efficiency. If banks have poor regulatory framework along with less trained staff and low technological advancement then its efficiency is automatically lowered.

The results show that non-performing loans (NPLs) to gross advance ratio (credit risk) is negatively related with IRS. It means that high provision of NPLs can reduce the intermediary efficiency. Provision of non-performing loans is recorded as expense of banks. So, when the provision of NPLs increases, it reduces the profitability of bank. Impaired lending to gross advance ratio is a measure of asset quality. Loan portfolios are the asset of banks. So, well managed loan portfolios enhance their profitability and ultimately efficiency.

This study also found that return on assets is positively influenced to the IRS. Return on assets is a measure of operational efficiency. Smoothing operations and skilled staff can enhance the profitability and also efficiency. Higher return on assets can lead high intermediary efficiency because interest sensitive assets are performed well. This study reveals that operating expense is also positively influenced by the IRS but this cost has no effects on interest rate spreads. Banks incur costs for screening the risk profile of loan applicant (borrowers) and also for monitoring the projects for which the loans are advanced.

Finally, the study shows that liquidity risk had a negative effect and this effect is also significant. It means that when liquidity risk increases, it reduces the IRS. High liquidity risk indicates that bank obtained the emergency funds at higher interest rate which results in reduced profitability and efficiency.

Policy Implication

The findings of this study are significant for the practitioners as well as policymakers. Banks could use the findings derived from this study to better understand the impact of the loan size on the interest rate. Due to globalization, financial systems in the world are well integrated and this integration increases the competition in the banking sector. So, banks could have a better focus on challenges and means to respond them in the light of the outcome of this study. Policy makers and financial regulators can also be benefited from this study as they will be able to gain insights regarding the influence of borrowing and lending rates on efficiency of banking sector. Thus, it would help them in formulating such policies and guidelines which can enhance banking efficiency in order to attain financial stability and economic growth in the long run.

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Appendix 1: LIST OF COMMERCIAL BANKS IN PAKISTAN

1. Allied Bank Limited.
2. Askari Bank Limited.
3. Al-Habib Bank Limited.
4. Bank Alflah Limited.
5. Barcalay PLC Bank Limited.
6. Bank of Khaber.
7. Bank of Punjab
8. Citi Bank Limited.
9. Deutsche A.G Bank Limited.
10. Faysal Bank Limited.
11. First Woman Bank Limited.
12. Habib Bank Limited.
13. Habib Metropolitan
14. JS Bank Limited
15. KASB Bank Limited.
16. Muslim Commercial Bank Limited.
17. National Bank of Pakistan.
18. NIB Bank Limited.
19. Soneri Bank Limited
20. Standard Chartered Bank.
21. Summit Bank Limited
22. United Bank Limited