An Evaluation of Credit Risk Management and its Impact on the Financial Performance: Evidence from the Banking Sector of Pakistan

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ABSTRACT

The purpose of the study is to examine the impact of credit risk on the financial performance of the banking sector and make a comparison among different banks in Pakistan. The study used panel regression as an underlying mechanism to determine the link between credit risk indicators and profitability determinants. The data of 23 banks for a period of 2006-2019 have collected from the annual report of the State Bank of Pakistan (SBP). The study mainly relies on the private vs. pubic and Islamic vs. conventional banking sector, the data were analyzed by using E-views software The results found that the independent variable capital adequacy has an insignificant impact on the financial performance of the baking sector. The other indicators of credit risk like the non-performing loan ratio, loan loss provision ratio, and leverage ratio have a significant relationship with the financial performance of banks in Pakistan. The study findings aim to contribute its part positively and it will surely help the bank managers, and investors to identify the risk and enhance the performance by paying more attention towards it and to generate improved policies to govern their institutions by mitigating the risk.

1. INTRODUCTION

Since the financial crisis of 2007-08, the bank's performance related to profitability has been increased (Akram & Rahman, 2018). In this competitive environment, where the default rate is increasing and the debt of consumers is exceeding, the effective management of credit risk can make a way towards success (Altman, 2002). The banks operating in Pakistan are experiencing major losses of credit due to inefficient management of credit risks. The credit risk arises when the return on the provision of a loan, and the expected outcome on investment is different from the true value (Cornford, 2004). It also arises due to inefficient capacity of

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banks, fluctuated interest rates, poor practical implementation, low liquidity, clement lending, underwriting of giving loans, absence of modern tools and techniques for assessment of activities of credit, and more interferences. Over the last decade, the financial institution's structure has become more complex as the financial markets are growing; the banks are involved in more transactions. Consequently, the risk-bearing side gets obscured and risk exposure parts within the institution. The banking sector has experienced different hurdles and challenges due to non-performing loans, interest rate fluctuations, and economic instability. (Akram & ur Rahman, 2018). The banks faced many risks such as fluctuation of the exchange rate and currency risk, operational risk, and interest rate fluctuations (Shafiq & Nasr, 2010). The main failure arises in banks when there is poor implementation of policies and lack of management skills. The State Bank of Pakistan (SBP) being the regulatory body rules out the procedures of banks according to the Ordinance of Pakistan 1962. According to Ferhi (2018) the Basel Accords are placed to take on effective credit risk management to evaluate the capital adequacy. Various studies have been conducted in Pakistan on evaluation of the link between credit risk management and profitability of the banking sector in Pakistan, but they do not find a clear connection between these variables. Some studies lacked in time horizon and others took a limited amount of data that does not provide a clear connection of the relationship among the variables under consideration. Also, sufficient studies are not available which compare the effects of credit risks on profitability between Islamic banks and conventional banks so on the comparison between public banks and private banks in Pakistan.

The main objective of the research is to determine the association of credit risk management with the performance of banks. We are also interested to get the following dimensions:

    i. Does credit risk management of Islamic banks is higher than the credit risk management of the conventional banks.

    ii. A comparison between credit risk management in public banks and private banks along with their efficiencies.

This paper provides a piece of guidelines to the banking sector to improve its strategies of risk related to credit on a long-term basis. It will find out the level of profitability in the absence of credit risk management. The study will examine the connection between different indicators of credit risk and their impact on financial performance measures such as ROI and ROE. It focuses on each strategy separately to realize its significance. The findings of this research aim to

contribute positively and it will surely help the bank managers and investors to identify the risks. The banks can assess the risk by identifying the quality of credit and exposure of credit as the focus is to manage credit risk and adopt a portfolio system (Gadzo et al., 2019).

The function of the bank is to manage the credit efficiently and provide financial services to mitigate the risk and contribute to economic growth and prosperity. According to one of the researches conducted by Kaplan and Stein (1993), the lending party fails to get the desired amount of profit or interest which is set mutually on agreed terms in a contract. When the level of debt increases, it also increases the level of bankruptcy. The banking sector should have the documented frameworks to identify and analyze the risk through modern tools and find the optimal ways to control it (Yurdakul, 2014). The main factors related to the profitability of banks include the size of the firm, fluctuations in market structure, type of stock market, and other external determinants related to the economy and industry.

2.   LITERATURE REVIEW

Modern portfolio theory was presented by Harry Markowitz in the 1950s, and then further elaborated by Sharpe, Linter, and Tobin respectively. The assets are holding in a proper combination could minimize the chance of risk. The level of risk changes with time in comparison to the cost of capital (Leland, 1994). Credit risk arises when an amount of debt is not received, or it can be considered as a chance of a loss to a firm (Campbell, 2007). In banking sectors, low for the counterparty, poor management, inadequate management of the portfolio, and unresponsive to economic changes are the factors that induce the problem of credit risk (Kargi, 2011). The foremost indicator of credit risk is the financial performance of the banks (Kithinji, 2010). In addition, competitive surrounding (Bulbul et al., 2019), adoption of tools (Bassey et al., 2014; Bulbul et al., 2019) irrelevant and immoral decisions, non-performing loan ratio (Ekinci & Poyraz, 2019; Bassey et al., 2014; Kargi, 2011; Kolapo et al., 2012), profitability (Boudriga et al., 2009), possessing of loan (Bassey et al., 2014), optimal capital structure (Shahid et al., 2019), financial status and its performance (Kithinji, 2010). Financial institutions should hold a certain amount of cash to maintained daily operations that are founded on the ratio of variable capital adequacy. Empirically it is analyzed by Rehman et al., (2019). On the other hand, the leverage ratio is an independent variable that measures the risk of the firm (Shahid et al., 2019). The loan loss provision ratio is used for the credit risk measurement in a financial organization (Dietrich & Wanzenried, 2011).

2.1   Empirical Literature Review

	Author and Year	Variables		Results
		Independent	**Dependent**	
1	Karami et al., 2020	Corporate financial performance, stock market, foreign exchange, commodity exchange, investment	Risk Management	Significant relationship of independent variables with risk management
2	Ekinci & Poyraz, 2019	Credit risk, Capitalization, Asset Quality, Bank Size, The ratio of concentration, GDP, CPI, Crisis	ROE, ROI	A weak association between the variables.
3	Antwi, 2019	CAR, Cost Income ratio, Bank Size, Debt Equity ratio	ROE, ROI	Positive relationship CAR, Cost Income Ratio Negativize relationship, Bank Size positive and significant relationship, Asset Growth positive relationship
4	Ferhi, 2018	NPL, CAR	ROE	Significant relationship of NPL and CAR with ROE
5	Hosna et al., 2009	NPL, LLPR, CAR, Bank Size	ROA, ROE	Direct relationship with dependent variables except for Bank Size. NPLR, CAR is showing a positive and significant relationship with ROE
6	Zou & Li, 2014	The ratio of total income to assets, the growth rate of GDP, Loan loss reserves, loan loss provisions	ROA, NIM	The banks that are Islamic show less risk related to the credit as compared to their conventional counterparts in Asia
7	Onaolapo, 2012	NPLR, LLPR, CAR	ROA, ROE, NIM	NPLR has a strong and negative link with performance, LLPR and CAR has a positive and significant link
8	Abbas et al., 2014	NPLR, LLPR, ratio of total loan to total deposit ratio	ROA, ROE	NPLR, LLPR, ratio of total loan to total deposit ratio does not positively affect the variables that determined the performance like ROA and ROE. The ratio of total loan to deposit is strongly related.
9	Sayani et al., 2017	CAR, Asset Quality (AQ), Earnings Ability, and Liquidity Ratio (LR).	Return on Equity (ROE),	A direct link exists between ROE and AQ, ROE and EA, and indirect relations are noticed among the ratio of ROE and CAR and lastly the ROE and LR.
10	Afriyie & Akotey, 2012	NPLR, CAR	ROE, ROA	An important direct positive association between the ratio of NPLR and distinct profitability indicator, CAR shows indirect but positive relations with independent variables.

3.   METHODOLOGY

3.1   Data

The objective of the study is to examine and compare the credit risk management, at overall banking sector, across public and private banks, and across commercial and private banks. To achieve this objective this study collected the data of 23 banks of Pakistan that includes all private, public, Islamic, and conventional banks for the period 2006-2019 from the official published reports and through the State Bank of Pakistan.

Table 1. Descriptive Statistics

	Non-Performing Loan Ratio – NPLR	Capital Adequacy Ratio - CAR	Leverage Ratio – LR	Loan Loss Provision Ratio - LLPR	Return on Equity - ROE	Return on Investment – ROI
Mean	0.126	0.168	42.427	0.083	0.012	0.012
Median	0.088	0.145	12.662	0.091	0.0976	0.020
Maximum	2.285	0.654	941.318	2.047	2.347	0.212
Minimum	0.0001	-0.080	-51.013	-5.068	-14.742	-0.494
Std. Dev.	0.173	0.101	141.739	0.451	0.887	0.07
Skewness	7.253	2.293	4.837	-8.751	-14.474	-3.083
Kurtosis	80.773	9.662	25.370	108.289	239.283	239.283
JB Statistics	3978.55***	877.99***	7970.52***	52846.5***	760295.1***	158.460***
Sum	40.767	54.306	13661.50	26.943	3.897	4.060
Sum Sq. Dev.	9.647	3.326	644887.	65.340	252.899	1.776
Observations	322	322	322	322	322	322

Note: *, **, *** represents the significance level at 1%, 5% and 10%, respectively.

Table 1 represents the descriptive statistics of all variables. The important thing to be noted here is that the data is not normal, as the JB statistics is rejected at 10% (the null hypothesis of JB statistics is Normal Distribution), the reason behind this non-normality is heterogeneity in the panel data set. Subsequently, it also represents that the all variables are either negatively or positively skewed and Leptokurtic. It can be concluded from the descriptive statistics that pooled panel regression will not give suitable estimates.

The correlation among the variables determines the existence of linear relationship in variables. Table 2 represents the correlation among variables which implies that there is a weak correlation. Capital Adequacy ratio, and non-performing loan ratio are negatively corelated

with the return on investment. Similarly, return on equity is negatively correlated with the non-performing loan ratio. It can also be inferred that there is a low chance of multicollinearity.

Table 2. Correlation

	Capital Adequacy ratio	Loan Loss Provision Ratio	Leverage ratio	Non-Performing Loan Ratio	Return on Equity	Return on Investment
Capital Adequacy ratio	1.000					
Loan Loss Provision Ratio	0.082	1.000				
Leverage ratio	0.021	0.036	1.000			
Non-Performing Loan Ratio	0.043	0.268	-0.054	1.000		
Return on Equity	0.105	0.075	0.073	-0.132	1.000	
Return on Investment	-0.194	0.002	0.179	-0.280	0.306	1.000

Source: Author's own compilation

3.2 Model

This study collected the data of 23 banks for the period of 14 years, and it follow the properties of the panel data. Therefore, we used first generation panel regression analysis to analyze the objective of the study.

$$Profitability = f\ (Credit\ Risk)$$

where the proxies of the profitability are Return on Investment and Return on Equity. On the other hand, the profitability of the bank is also dependent on many other things including the non-performing loans ratio, capital adequacy ratio, leverage ratio, and loan loss provision ratio.

$$RoI_{it} = \alpha_0 + \alpha_1 CAR_{it} + \alpha_2 LLPR_{it} + \alpha_3 LR_{it} + \alpha_4 NPLR_{it} + error$$

$$RoE_{it} = \alpha_0 + \alpha_1 CAR_{it} + \alpha_2 LLPR_{it} + \alpha_3 LR_{it} + \alpha_4 NPLR_{it} + error$$

where, α_0 is an intercept of the regression analysis and is interpreted as an average level of RoI_{it} and RoE_{it} of all banks if all other variables are missing. $\alpha_1, \alpha_2, \alpha_3\ and\ \alpha_4$ are the estimated slope parameters which can be interpreted as if one percent change in independent variable leads to an increase in the dependent variable by the value of estimated parameters. First-generation panel regression models are based on Pool Effect, Fixed Effect, and Random Effect. This study estimated all three models because exact specifications dose not known and are presented below in Table 3.

4.3 Regression Analysis

A number of studies show that the panel regression model is suitable to test the relationship between credit risk management and profitability of different banking sectors (Kurawa &

Garba, 2014). The main hypothesis of this study is to evaluate the impact of credit risk management on firms' performance. The empirical results are presented in table 3 above.

Table 3. Estimated Regression Models

	Overall Regression Analysis						Islamic Vs. Conventional Banks		Private Vs. Public Banks	
	ROE			ROI			ROE		ROI	
	Pooled Effect	Fixed Effect	Random Effect	Pooled OLS	Fixed Effect	Random Effect	Fixed Effect	Random Effect	Fixed Effect	Random Effect
Constant	0.13***	0.09***	0.10***	0.03***	0.03***	0.03***	0.14***	0.11***	0.13***	0.10***
Capital Adequacy Ratio	-0.22***	-0.03	-0.08*	0.001	0.001	0.001	-0.21***	-0.08	-0.23***	-0.08*
Loan Loss Provision Ratio	0.20***	0.17***	0.18***	0.001***	0.001	0.001	0.20***	0.18***	0.19***	0.18***
Leverage Ratio	0.001***	0.001***	0.001***	-0.04***	-0.03***	-0.03***	0.001***	0.001***	0.001***	0.001***
Nonperforming Loan Ratio	-0.26***	-0.19***	-0.20***	-0.01	-0.01	-0.01	-0.27***	-0.21***	-0.3***	-0.21***
DUM_ROE	1.06***	1.05***	1.05***				1.06***	1.05***	1.06***	1.05***
DUM_ROI				1.19***	1.16***	1.17***				
Islamic vs. Conventional							-0.04**	-0.04		
Public vs. Private									0.03**	0.02
MODEL STATISTICS										
R^2	0.99	0.99	0.99	0.82	0.87	0.83	0.99	0.99	0.99	0.99
Adj R^2	0.99	0.99	0.99	0.82	0.86	0.82	0.99	0.99	0.99	0.99
S.E of regression	0.11	0.08	0.09	0.03	0.03	0.03	0.11	0.09	0.11	0.09
Log Likelihood	269.74	359.14		654.97	707.65		272.29		271.94	
F Statistics	4465***	1348***	6179***	285***	72***	301***	3769***	5140***	3760***	5155***
Durbin Watson Statistics	0.85	1.38		1.16	1.55	1.46	0.87	1.23	0.87	1234254
Hausman Test			22.56			4.71		23.23	--	21.87
JB Test	3.14	95.6***	0.83	19.58	76.5***	18.39***	5.9	2.14	1.42	3.88

*, **, *** represents significance level at 1%, 5% and 10% respectively

Our results are consistent with the descriptive statistics i.e. the choice of pooled regression is not suitable for the current data set. Subsequently, the study used Hausman test to choose a statistical model between fixed and random effect model. Empirically, it is found that the null

hypothesis is rejected, hence it implies that fixed effect model is better as compared to the random effect model. Fixed effect model in case of over regression implies that there is negative relationship between credit risk management and non-performing loans, and positive relationship with loan loss provision ratio and leverage ratio. All parameters are significant, except credit risk management. Hence, it implies that the performance of the bank depends upon loan loss provision ratio, non-performing loans and leverage ratio, but not on credit risk management. This is true for both the measure of performance of the banks, either it is ROE or ROI. Nevertheless, this study also aims to analyze the performance of the banks across Islamic and Conventional banks. Empirically, it is found that all the estimated parameters are statistically significant including the dummy variables which implies that there is a significant difference between Islamic and Conventional Banks in terms of performance. Furthermore, the performance of the Islamic bank is lesser than the conventional banks (D = 1 if Islamic Banks). Similarly, on the comparison of Private and Public Banks, the performance of the private banks is much better than the conventional banks. In overall regression, the capital adequacy ratio was found insignificant, however, it becomes significant while the comparison between Islamic and Conventional Banks, and Private and Public Banks. The reason behind is that in overall regression there as heterogeneity which superseded the significance of the estimated parameters. The economic significance of the study elaborated the results stated in the table 3. The results support the tradeoff theory that the risk of a firm changes with the passage of time which creates a significant impact on returns which is also called the cost of capital. The risk of default is directly proportional to the return, whereas, it has not determined the optimal level of loan in a portfolio that is essential for the increment in return and minimizing the level of risk. These scenarios can also be stated by different other credit risk theories.

5. CONCLUSIONS

Based on our empirical analysis, it is concluded that the credit risk management is significantly connected with the performance of banks. Also, the Islamic banks have a higher level of credit

risk as compared to conventional banks. Not only this, private banks have a lower level of credit risk as compared to public banks. The overall picture implies that the performance of the banks is related to the credit risk management. However, it varies across specializations of banks and their performance. As private banks are working more efficiently, the level of credit risk is lower which shows a better performance.

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