

The Impact Of Regulatory Capital On Risk Taking By Pakistani Banks: An Empirical Study

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Abstract

Objective - The objective of this study is to examine the relationship between capital regulation and risk-taking by the banks of Pakistan.

Design - This study was conducted on all the commercial banks of Pakistan and data were collected from the year 2005 to 2016.

Findings - This study concluded the significant positive relationship between regulatory capital and risk-taking by banks in Pakistan. The findings of this study play a key role in the implementation of capital regulations in the banks of developing countries.

Policy Implications - In the light of this study, the regulators must revise their implementation process of the Basel Accord capital regulations in the banks of developing countries. The prime intention of regulators are only on to maintain the minimum capital ratios but must be conscious of other important elements of capital regulation implications.

Originality - This study is one of the first attempts that investigated the crucial role of regulatory capital towards risk-taking in the Pakistani context.

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Introduction

The role of financial institutions in the development of the economy is increasing continuously that force the regulatory authorities to put extra attention on the soundness of financial institutions. The WorldBank (2017) showed an increasing level of World Bank's contribution to the betterment of the economy of the world. As mentioned in the mission statement of World Bank, their major focus should be on achieving two goals, first one is to eliminate the extreme poverty by the end of 2030 and second one is to boost shared prosperity. World Bank is eliminating extreme poverty by reducing the ratio of people who are living almost on less than \$1.90 a day and also boosting the shared prosperity by raising (almost 40 percent) income growth in every country. For the achievement of these goals, World Bank will conduct strong collaboration with its partners in both public and private sectors, also collaborating with country government and civil societies and also engaging stakeholders and beneficiaries to ensure that almost every person in the country has an opportunity to fulfill his or her potential.

Increasing financial assistance of the World Bank towards developing countries is playing a vital role in the improvement of the economy of the country. WorldBank (2017) highlighted that reliable, modern and affordable energy power is essential for every country to achieve their development needs, but this facility is not available in every country. The World Bank provides the solution to this problem in the shape of a low-carbon option for energy. They provide finance for these projects such as over \$1 billion lends to Indian's solar projects and also provides finance for smart grids to Vietnam, Ukraine, and Turkey. "A Water-Secure World for All" is also the vision of the World Bank, for this purpose, bank supports financing in terms of mobilizing private capital towards safe water for all. Consequently, more than 1.2 million people of Bangladesh get access to improved water sources (WorldBank, 2017). Similarly, digital technologies are also becoming a vital driver of investment, economic growth, and job creation. So, it is essential for traditional industries to adopt digital technologies for improving productivity. World Bank provides support to the countries and their citizen by providing expanding affordable internet access to 4 billion people that they build their digital skills to participate in the digital economy. Furthermore, the bank also supports the developing countries in many ways such as provides financial assistance for the improvement of the transport sector, for private sector infrastructure, for boosting agriculture to create jobs and for Strengthening protection for natural resources. This financial and non-financial support of the World Bank for developing countries highlighted its importance towards the economy of the world and also create the needs of safeguard of this economical important institution of the world.

Banking Sector of Pakistan: An Overview

Banking industry of Pakistan is regulated by the State Bank of Pakistan (SBP) which was established in June 1948. This industry constitutes around 31 banks, out of which 22 local private banks, four are foreign banks and five are under public control. Majority of the banking industry is concentrated by six banks (National Bank Limited (NBL), Habib Bank Limited (HBL), Allied Bank Limited (ABL), United Bank Limited (UBL), MCB Bank Limited, and Bank Alfalah Limited) that our largest competitors in the country and hold large stake of assets of Pakistani banks. Moreover, these banks make up round about 53 percent of advances and 57 percent deposits in the economy collectively (H. M. Alam, Raza, & Akram, 2011). Furthermore, Basel II international standards must also comply with all the banks operating in the country. Due to limited access to technology, religious factor, and unbanked rural population, there is a huge difference in population (195 million) and their accounts (43 million) in the banks but due to the advent of Islamic banking, high-speed mobile internet and increased awareness of banking increased the potential for growth of banking in the country (H. M. Alam et al., 2011). Consequently, the performance and growth of the banking industry have been good in the past decade. According to the SBP (2017), total assets of the banks increased from PKR 6,516 billion to PKR 15,134 billion, deposits increased to PKR 11,092 billion from PKR 4,786 billion, lending



rose from 3,240 billion to PKR 5,025 billion from 2009 to 2016. SBP (2016) shows continuous improvement in Macro-economic conditions of the country during the financial year 2016. Declining in inflation up to 2.9 percent, growing GDP by 4.7 percent, stability of exchange rate is the evidence of economic improvement in the country. Moreover, 100 percent increase in “Net foreign investment”, 100 percent increase in credit provided to private sector, 7.8 percent growth rate in banking, 5.7 percent increase in “Gross domestic fixed capital investment” and insurance sector which was 6.5 percent in previous year and 11.9 percent pre-tax profit of scheduled banks are recorded during financial year 2016 (SBP, 2016). But on the other hand, prudential regulations about bank risk-taking has been suffocating for banks. State Bank of Pakistan made it tough for banks to operate in the country over the past decade.

Additionally, a high level of non-performing loans (NPLs), weak supervision and liquidity issues are the factors affecting the performance of the banking industry in the country (Shafiq & Nasr, 2010). SBP forced the banks to comply with regulations provided by the Basel Committee on Banking Supervision (BCBS) to control the high-risk situation in the banking industry. BCBS provided the capital adequacy ratio to the banking sector that must be held by banks to manage the risk. Although, banks of Pakistan follow the regulations provided by the Basel Committee on Banking Supervision (BCBS) and maintain more than 8 percent capital adequacy ratio but in return risk-taking activities cannot be controlled. WorldBank (2016) highlighted that Pakistani banks maintain a 12.7 percent capital adequacy ratio in 2006 and with the passage of time it increased to 17.2 percent in 2015. But it is not effective to control the risk-taking activities because the NPLs increased from 6.9 percent to 12.4 percent from 2006 to 2015. These figures clearly highlighted the non-effectiveness of the capital adequacy ratio to manage the risk-taking activities of the banks in Pakistan.

Non-performing Loans (NPLs) ratio and Capital Adequacy Ratio (CAR) maintain by the Pakistani banks both highlighted the increasing trend from 2006 to 2015 and these figure are presented in Table 1.

Table 1 - Non-performing Loans & Capital Adequacy Ratio of Pakistan's Banks

Years	Non-performing Loans/ Total Loans (%)	Capital Adequacy Ratio
2005-2006	6.9	12.7
2006-2007	7.6	12.3
2007-2008	10.5	12.3
2008-2009	12.6	14.1
2009-2010	14.9	14.1
2010-2011	15.3	14.6
2011-2012	15.9	15.4
2012-2013	14.8	14.9
2013-2014	12.8	17.1
2014-2015	12.4	17.2

Source: World Bank (2016)

Past Studies

The risk is considered as exposure to danger for financial institutions and both financial institutions especially banks and risk are highly associated with each other.

Risk Taking

Risk taking can be defined as the willingness of banks to take extensive risk for a higher return (Buch, Eickmeier, & Prieto, 2014). Risk taking is also tightly interconnected with the liquidity of the institution. Transferability constraints and external funding are weakened due to greater risk tolerance. Resultantly, these weaker constraints support the high risk taking because these weaker constraints allow the institutions that



they engage in projects with higher risk-taking for high return expectations (Borio & Zhu, 2012). In addition, Jiménez, Lopez, and Saurina (2013), mentioned in their study on Spanish banks that the stability of the banking institutions can be affected by the high risk taking. The increasing the level of competition in the market forced the banks to take the higher risk that leads towards higher instability. Moreover, Bolton, Mehran, and Shapiro (2015) highlighted that extensive risk-taking of financial institutions affects depositors, taxpayers, creditors and financial system as a whole. Additionally, high-risk taking can badly affect the performance of the institutions when returns are not up to the expectations. Moreover, higher deposits motive and deposit insurance reduce the market discipline that forced the banks towards greater risk-taking (Khan, Scheule, & Wu, 2017). In addition, shareholders give preference to extensive risk taking due to limited liability, moral hazard issues, and convex pay-off systems. Therefore, shareholders of the banks have strong inducements to undertake extensive risky investments for their profit maximization goals (Mollah, Hassan, Al Farooque, & Mobarek, 2017).

Bank's higher risk-taking incentive was the major reason for the latest financial crisis suffered by the entire banking system of the world (Paligorova & Santos, 2017). Similarly, B. N. Ashraf (2017), mentioned that the United State was the origin of the financial crisis (2007-09) that raised the question on divergent bank risk-taking across countries. Extensive bank's risk-taking situation has been observed in the US banking system due to the high level of competition in the market, high profitability motives of shareholder and attraction of depositors and other stakeholders. This situation leads the US financial system towards the financial crisis that has an adverse impact on the banking sector of the world. These risk-taking incentives also lead the entire financial system towards the financial crisis. Moreover, Angeloni, Faia, and Duca (2015) mentioned that extensive risk-taking and leverage are the major reasons for the financial crisis in 2007 in the financial institutions of the world. Additionally, von Ehrlich and Radulescu (2017), conducted the study on United Kingdom banks and found that one of the pull factors of the global financial crisis was excessive risk-taking of the financial institutions.

Regulatory Capital

Basel Committee on Banking Supervision (BCBS) developed a framework for the financial stability of the financial institutions called the Basel Accord. The first regulation developed for minimum capital requirement called Basel Accord I after that it changed with the passage of time according to the financial environmental requirement into Basel Accord II and Basel Accord III (Hussain et al., 2012). This framework set minimum regulatory capital for every bank currently operating in the economy. Every bank must maintain at least 8 percent minimum capital against its risk-weighted assets (N. Alam, 2013). Furthermore, Karim, Hassan, Hassan, and Mohamad (2014), conducted the study on 14 Organization of Islamic Conference (OIC) countries and data collected from 186 conventional and 52 Islamic banks from 1999 to 2009. They analyzed that the minimum capital requirement is essential to ensure that banks have sufficient funds against adverse shocks and unexpected losses. Their study also found that regulatory capital requirement has a significant impact on lending behaviors of the financial institutions. The issue of regulatory capital requirement has become more vital after the financial crisis 2007-08 in the USA. One of the major reasons for the global financial crisis is insufficient equity capital and similar circumstances also observed during the Asian financial crisis in the 1990s. During the financial crisis, most of the financial institutions have a lack of equity capital to absorb the losses from loan defaults. Consequently, capital growth fell below then the growth of credit and risks of the assets that adversely impacted the bank's ability to lend and also slow down the economic activities of the banks. The regulatory capital requirement is crucial for banks in preventing them from failing. A financial institution with sound capital is able to deal with business opportunities more effectively and also deal with difficulties arising from expected and unexpected losses. Similarly, Cohen and Scatigna (2016), found that the logic behind the regulatory minimum capital requirement is to ensure that financial institutions must set aside some amount of capital for each investment they made. The riskier the financial institution, the

more capital is required to set aside. This makes ensure the safer return from investments for both depositors and shareholders of the banks.

One of the measures in ensuring the soundness of financial institutions by observing a reasonable amount of losses is a regulatory capital minimum requirement (Fatima, 2014). Moreover, Bridges et al. (2014), conducted the study on banks of the United Kingdom from 1990-2011 and found that capital requirements are the buffers against the unexpected losses of the business. An increase in regulatory capital, cut the loan growth for corporates, household lending, and commercial real estate. The financial crisis of the 1990s and 2007-08 has led to support of using the risk mitigating tool for a financial system called capital requirement. In addition, Maji and De (2015), conducted the study on 41 Indian commercial banks and investigated that capital regulations have gained attention after Basel Accord implementation in 1988 to enhance the soundness and competitive advantage in the banking sector. Additionally, Mili, Sahut, Trimeche, and Teulon (2017), examined that expansion of bank's lending without an increase in capital has forced the regulatory authorities to develop several control and procedures to avoid the insolvency situation in the banking sector. Furthermore, it is mandatory for every bank to implement the regulatory minimum capital requirements for its soundness (Hugonnier & Morellec, 2017). Similarly, Barth, Gomez-Biscarri, Kasznik, and López-Espinosa (2017), carried out a study on the listed and non-listed banks and examined that the banks operating in public capital market, cannot survive with the limited capital requirement. Banks must ensure a higher level of capital against unexpected losses exist in the market.

Regulatory Capital and Risk Taking

Excessive risk-taking of financial institutions has become one of the major reasons for the financial crisis of the 1990s and 2007-08 that enhance the importance of regulatory capital requirement in the banking system of the economy. Borio and Zhu (2012), observed that regulatory capital influences banks regarding measurement and management of risk in the institution. Moreover, Musa (2012) found his study that capital regulations change the risk-taking behavior of Islamic banks. Furthermore, Jiménez et al. (2013), investigated that regulatory capital has effective control of the risk-taking incentive of the institution. Similarly, Karim et al. (2014), found that the banks must set aside their capital according to their riskiness because this set-aside capital becomes buffer against the unexpected losses in the future. Moreover, regulatory capital is a vital parameter for judging the soundness and strength of financial institutions that protect the financial institutions against insolvency, excessive leverage and also keeps them out of danger. This regulatory capital is defined as the ratio of the bank's capital and risk-weighted assets. This ratio ensures that banks have sufficient capital in the business that enough to absorb uneven downturns or losses without becoming insolvent (Fatima, 2014). In addition, regulatory capital imposed restrictions on different types of activities of the financial institutions such as restriction on high-risk associated investment or taking the extensive risk (B. N. Ashraf, 2017). Additionally, Gersbach and Rochet (2017) and Hussain, Mosa, and Omran (2018) examined that regulatory capital has a negative impact on risk-taking of the financial institutions but it also reduces the liquidity of the institution. Similarly, Khan et al. (2017) and Hussain, Mosa, and Omran (2017), also found the bank's regulations regarding capital are avoiding the liquidity and excess risk-taking issues in the institutions.

The logic for preserving regulatory adequate capital is an indication of satisfactory financial resources that provide the cushion against failure and also found a strong inverse relationship between regulatory minimum capital ratio and risk-taking by Indian's commercial banks (Maji & De, 2015). Moreover, Kandrac and Schlusche (2017), mentioned in their study that regulatory capital imposed a restriction of loan growth that affects the risk-taking of the banks. Similarly, capital regulation applies constraints on the risk-taking the ability of banks. As a result, each bank's systemic risk is reduced (Stulz, 2016). Furthermore, B. Ashraf, Arshad, and Hu (2016) conducted the study on 21 commercial banks on Pakistan and examined that risk-based capital requirement has caused in reducing the risk-taking activities of the banks. Almost all of the



banks in Pakistan hold reasonable capital requirement to ensure the stability of the banks. Due to maintaining higher regulator capital ratio by Pakistani banks, the overall cost also increases that are connected with the costly equity capital of the banks. In addition, regulatory capital is main tool for the supervisors of the banks that they used to create incentives for the banks that they should be more cautious about the quality of the assets because the regulatory capital is considered as the indicator of solvency for the banks (de Moraes, Montes, & Antunes, 2016). Additionally, Osei-Assibey and Asenso (2015), conducted the study commercial banks of Ghana for the year 2006-2013. They found that regulations regarding capital control the risk-taking activities of the banks and also control non-performing loans (NPLs) of the institution. Moreover, Bitar, Saad, and Benlemlih (2016) conducted the study on commercial banks of MENA countries for the year 1999-2013. They examined that regulatory capital improves the protection against unexpected losses.

Research Structural and Hypotheses Development

A number of previous studies showed that regulatory capital (CAR) has a negative impact on the risk-taking of the banks. Based on these previous studies, it was hypothesized that:

H1: There is a negative relationship between regulatory capital and risk-taking by the Pakistani Banks.

In this study, risk-taking used as dependent variable and proxied by Z-score while regulatory capital used as an independent variable and proxied by Capital Adequacy Ratio (CAR). Rahman (2012), mentioned that Z-score measures the insolvency risk and calculated by this formula: $Z\text{-score} = (\text{ROA} + \text{CAP}) / S$ while capital adequacy ratio is calculated by this formula: $\text{Equity Capital} / \text{Risk-weighted Assets}$. Variables are mentioned in the framework in Figure 1.

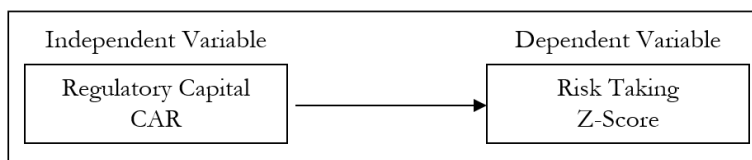


Figure 1 - Conceptual Framework of the study

Research Method

This study was conducted on the commercial banks of Pakistan and data were collected from the year 2005 to 2016. There are two types of banks in the country, Islamic and conventional.

Table 2 - Conventional Commercial Banks of Pakistan

Serial No	Bank Name	Serial No	Bank Name
01	United Bank Limited	13	NIB Bank
02	Allied Bank Limited	14	Soneri Bank
03	Muslim Commercial Bank	15	Summit Bank
04	Habib Bank Limited	16	National Bank of Pakistan
05	Faisal Bank	17	First Women Bank
06	Askari Bank	18	Sindh Bank
07	Standard Chartered Bank	19	Bank of Khyber
08	Bank Alfalah Limited	20	Bank of Punjab
09	Bank Al Habib	21	Deutsche Bank
10	Habib Metropolitan Bank	22	CITI Bank
11	JS Bank	23	Bank of Tokyo
12	Samba Bank	24	Indus. & Comm. Bank of China

Source: State Bank of Pakistan (2016)



Conventional banks are selected for the study because Islamic banks are different in nature and also very short in terms of quantity (only five) as compare with (twenty-four) conventional commercial banks. Conventional banks also have different types with respect to ownership such as (Fifteen) private, (Five) public and (Four) foreign banks. This study was selected all conventional commercial banks for investigation but two banks (Sindh bank & Bank of China) start operating after 2005 and eliminate from the investigation. The data was collected from the financial statement of remaining (twenty-two) banks for the year 2006 to 2015. Table 2 shows all types of banks selected in the study.

Results and Discussions

Data was collected from the financial statements of all above-mentioned banks for the analysis of the study. The analysis of data includes descriptive statistics that provides the summery of data set used in the study.

Table 3 highlighted the descriptive statistics of the dependent and independent variables used in the study. The dependent variable is Z-score while the independent variable is CAR. There are 264 (22 Banks x 12 years) observations in the study and mentioned in the table. The mean of z-score is 0.032 and CAR is 12.54 while the standard deviation of Z-score 15.27 and CAR is 1.78. The minimum value of Z-score is -80.68 while the maximum value is 99.95 and on the other hand, the minimum value of CAR is 6.47 and the maximum value is 16.9. Correlation of CAR with z-score is less than 1 which is only -0.0003.

Table 3 - Descriptive Analysis of Variables

Variables	Obs.	Mean	Std. Deviation	Min.	Max.	Correlation
Z-score	264	.0324	15.274	-80.68	99.95	1
CAR	264	12.534	1.7745	6.47	16.9	-0.0003

Hausman Test

Two most prominent panel data models such as random effect modal (REM) and fixed effect model (FEM) are being used by selecting appropriate one on the bases of the Hausman test. (Gujarati & Porter, 2003). If null hypotheses are rejected then the fixed effect model is appropriate and vice versa. The result of the Hausman test of this study is Prob. = 0.6638 which is greater than 5 percent which is the indication of acceptance of null hypotheses that means random effect model is appropriate for the study.

Random Effect Model (REM)

Characteristic of the random effect model is to treats intercept among individual differently. Thus, the estimation random effects model is as follows:

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \varepsilon$$

Where

ε = cross-section or individual specific error component

Table 4 presents the random effect GSL regression and shows that the model is a good fit because the overall probability value is less than 5 percent which is only 0.0432. There is a significant relationship between the CAR and Z-score because the probability value of CAR is less than 5 percent which is only 0.043. The coefficient value of CAR is .5499687 which shows a positive relationship between the variables and if there is a 1 percent increase in the independent variable, the dependent variable will also increase .5499 percent and vice versa.



Table 4 - Random Effect Model

Z-score	Coef.	Std. Error.	Z	P> z	(95% Conf. Interval)	
CAR	.5499	.2720	2.02	0.043	.016804	1.08313
_Cons	-5.452	3.4968	1.56	0.119	-12.3057	1.40164
Prob > chi2	=	0.0432				

Conclusion and Recommendations

Basel Committee on Banking Supervision (BCBS) reframe its regulations regarding minimum capital called Basel Accord III after financial crisis 2007-09. In response, the banks of Pakistan also maintain a high level of capital adequacy ratio but only maintaining the regulatory capital is not enough to minimize the risk-taking activities. Most of the factors are prevailing in the market such as competition, high-profit motives and loan growth that forced the owners towards risk-taking activities. This study concluded the significant positive relationship between regulatory capital and risk-taking by banks in Pakistan. However, previous studies found a negative relationship between the variables. Regulators are forcing the banks to maintain capital adequacy ratio and ignore the other factors that affect the risk-taking adversely. Resultantly, banks of Pakistan are keeping reasonable minimum capital ratio by increasing their capital but on the other hand, they are also holding the riskier investment to compete in the market and to accomplish high-profit motives that lead the banks towards crisis. Regulators must be a focus on all other factors that may cause a high-risk situation in the banks. This study is strongly recommended that there should be a mediator is necessary to explain this relationship and also an interesting area for future research.

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