MODERATING EFFECT OF RISK COMMITTEE ON THE RELATIONSHIP BETWEEN RISK MANAGEMENT AND FINANCIAL STABILITY IN COMMERCIAL BANKS OF PAKISTAN

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By

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ABSTRACT

This study examines the moderating effect of risk committee on the relationship between risk management and financial stability in Pakistan. Risk management is represented by risk factors, bank's capital regulation and governance factors, whereas financial stability is measured by ROA and ZROE. Using a sample of 28 commercial banks in Pakistan during 2007-2016, the research hypotheses are tested under panel regression models. The results show significant negative impacts of risk factors as measured by credit risk, operational risk, country risk and financial crisis on both ROA and ZROE. This signifies that the increasing trend in the risks would undermine financial stability. Conversely, governance factor of corruption control shows an adverse influence on ZROE, indicating that higher corruption creates greater instability. Meanwhile, political stability, absence of violence, government effectiveness, and voice and accountability have significant positive impacts on ZROE. The results imply, good governance could increase the banking sector financial stability. The results show a negative moderating effect of risk committee on the relationship between risk factors and ROA, indicating that higher involvement of risk committee adversely influenced the risk factors on ROA leading to lower financial stability. In contrast, capital regulation as measured by capital adequacy ratio is positively moderated with ROA, indicating stronger financial stability. Similar results are observed for ZROE that further confirmed the evidence. However, risk committee strengthens the negative relationship between market risk and ZROE, hence depressing the financial stability. The findings of the study provide insight to policy makers regarding the importance of risk committee in making strategic decisions. It is also suggested that representatives of the commercial banks should consider the above-mentioned risk factors for the betterment of the financial stability.

Keywords: Risk management, financial stability, risk committee, Pakistan

ABSTRAK

Kajian ini menilai kesan moderasi jawatankuasa risiko ke atas hubungan antara pengurusan risiko dan kestabilan kewangan di Pakistan. Pengurusan risiko diwakili oleh faktor risiko, peraturan modal bank dan faktor tadbir urus, manakala kestabilan kewangan diukur oleh ROA dan ZROE. Dengan mengunakan sampel 28 bank perdagangan di Pakistan bagi tempoh 2007-2016, hipotesis kajian diuji dengan aplikasi model regresi panel. Dapatan kajian menunjukkan pengaruh negatif signifikan terhadap faktor risiko yang diukur oleh risiko kredit, risiko operasi, risiko negara dan krisis kewangan dengan ROA dan ZROE. Ini menandakan bahawa peningkatan trend dalam risiko ini akan mengurangkan kestabilan kewangan. Sebaliknya, faktor tadbir urus kawalan rasuah mempunyai pengaruh negatif terhadap ZROE, menandakan bahawa semakin banyak rasuah menimbulkan ketidakstabilan kewangan. Sementara itu, kestabilan politik, ketiadaan keganasan, keberkesanan kerajaan, dan suara dan akauntabiliti mempunyai kesan positif yang signifikan terhadap ZROE. Oleh itu, tadbir urus yang baik dapat meningkatkan kestabilan kewangan sektor perbankan. Selain itu, kajian mendapati wujud kesan moderasi jawatankuasa risiko yang negatif antara hubungan faktor risiko dan ROA, menunjukkan bahawa penglibatan jawatankuasa risiko yang lebih tinggi mempengaruhi faktor risiko yang mengakibatkan kestabilan kewangan yang lebih rendah. Sebaliknya, peraturan modal yang diukur oleh nisbah kecukupan modal mempunyai kesan positif yang dimoderasikan dengan ROA, menunjukkan kestabilan kewangan yang lebih kukuh. Hasil kajian yang sama diperolehi untuk ZROE yang selanjutnya mengesahkan keputusan dapatan kajian. Walau bagaimanapun, jawatankuasa risiko mengukuhkan hubungan negatif antara risiko pasaran dan ZROE, dengan itu menghalang kestabilan kewangan. Penemuan kajian memberi pandangan kepada pembuat dasar tentang kepentingan jawatankuasa risiko dalam membuat keputusan strategik. Ia juga mencadangkan agar wakil-wakil bank perdagangan harus mempertimbangkan faktor-faktor risiko yang disebutkan di atas untuk memperbaiki kestabilan kewangan.

Kata kunci: Pengurusan risiko, kestabilan kewangan, jawatankuasa risiko, Pakistan

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LIST OF ABBREVIATIONS

Notation	Description
ABC	Agriculture Bank of China
AQ	Audit Quality
AT	Agency Theory
BOC	Bank of China
B.P LM	Breusch and Pagan Lagrangian Multiplier
C&CETA	Cash & Cash Equivalent to Total Assets
CAMEL	Capital Adequacy, Assets, Management Capability, Earnings, Liquidity and Sensitivity
CAR	Capital Adequacy Ratio
CBs	Conventional Banks
CCBC	China Construction Bank Corporation
CIR	Cost to Income Ratio
CLG1	Country-level Governance One
CLG2	Country-level Governance Two
CLG3	Country-level Governance Three
CLG4	Country-level Governance Four
CTR	Country Risk
CR	Credit Risk
CRMC	Credit Risk Management Committee
EPS	Earnings Per Share
FCI	Financial Crisis Impact
FE	Fixed Effect
FEM	Fixed Effect Model
FS	Financial Stability
GDP	Gross Domestic Product
GFC	Global Financial Crisis

GMM	Generalized Method of Moments
HM	Hausman
IBs	Islamic Banks
ICBC	Industrial & Commercial Bank of China
KASB	Khadim Ali Shah Bukhari
LM	Lagrange Multiplier
LR	Liquidity Risk
LSDVM	Least Square Dummy Variable Model
M1	Model One
M2	Model Two
M3	Model Three
MENA	Middle East & North Africa
MPT	Modern Portfolio Theory
MR	Market Risk
NBP	National Bank of Pakistan
NPLs	Non-performing Loans
NYSE	New York Stock Exchange
OLS	Ordinary Least Square
OR	Operational Risk
PSX	Pakistan Stock Exchange
PRM	Pooled Regression Model
RC	Risk Committee
REM	Random Effect Model
RM	Risk Management
ROA	Return on Assets
ROE	Return on Equity
SBP	State Bank of Pakistan
SECP	Securities and Exchange Commission of Pakistan

SHT	Stakeholders Theory
SOB	Size of Bank
VIF	Variance inflation factor
UK	United Kingdom
US	United States
ZROA	Z-score of Return on Assets
ZROE	Z-score of Return on Equity

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Over the last few decades, the issue of risk factors associated with the banking industry has attracted the interest of various stakeholders. However, the significance of the risk factors and their influence on banks vary from region to region. A series of financial and non-financial issues are observed in the banking sector of different economies with their adverse influence on the performance measures too. This chapter continues with the general overview in Sub-section 1.1.1 and it ends with the organization of the study in Section 1.7.

1.1.1 General Overview of the Study

The concept of risk is an inherent and integral part of business firms. The dynamic markets where businesses operate often create a situation of uncertainty because of competitiveness (Tchankova, 2002). Various strategies have been defined by business firms to mitigate the adverse effects of such an uncertain environment. The concept of uncertainty also increases the probability of losses (or the gains in some circumstances) which can manipulate the potential success of a business (Sania & Amjad, 2012). In the field of corporate finance, a risk is an unplanned event with consequences in the form of earning losses. There is also the possibility of forfeiture which may or may not occur (Bessis, 2011; Vyas & Singh, 2011).

Usually, the first step in Risk Management (RM) is risk identification which paves the path for the next steps as stated by (Tchankova, 2002). He further explains that risk identification includes sources of risks, hazards factors, perils, and exposure to risk. Sources of risk include such elements in the business environment that could bring both positive and negative outcomes. Besides, a hazard is an instance that enhances the chances of loss or gains (Dwyer, Zoppou, Nielsen, Day, & Roberts, 2004). Peril or threat is something relatively close to risk and has some non-profitable, adverse potential outcomes. Such hazards and perils could happen at any time due to unknown causes and volatile financial losses. Through risk identification, a business can effectively ensure RM (Arora & Sharma, 2014). Since the global financial crisis (GFC), some financial institutions have not effectively identifiy and assess the number of risk factors (Haselkorn, Khaykin, & Eaton, 2015). The significant factors under the title of business risks for financial institutions contain default risk of mortgages, liquidity loss for credit products, rapid loss (another category of liquidity risk) of secured funding, and litigation arising from the alleged fraud (Haselkorn et al., 2015).

Besides, the role of risk assessment for evaluating systematic financial stability (FS) of a banking system is very significant (Elsinger, Lehar, & Summer, 2006). Numerous techniques and tools are used by managers and business firms to assess the level of risk. For instance, stress testing is an important tool for the analysis of corporate strategy and the confidence continuance (Abbink, 2011). RM strategies for assets and liabilities of the

banks include rating models, value at risk (VaR), exposure ceiling and vintage analysis (Bilal, Talib, & Khan, 2013).

In addition, the concept of FS is very much challenging to measure and explain. The overall financial system could be explained as stable if there is no presence of volatility or financial distress (Gadanecz & Jayaram, 2009). The broader concept of FS is narrated with the smooth functioning of the complex financial system. By focusing on its broader perspective, FS means a condition where a financial system can absorb the anomaly and financial imbalances. Numerous indicators of FS focus on the external vulnerabilities, market pressure, and banking system exposures (Gadanecz & Jayaram, 2009). Moreover, several measures have been used in previous studies (Dale, Merton, & Bodie, 2009; Gray, Merton, & Bodie, 2007; Hawkins & Klau, 2000; Nelson & Perli, 2007). From the perspective of banks, FS can be measured through liquidity, credit, bond ratings, and profitability (Gadanecz & Jayaram, 2009). Since last decade, return on assets (ROA), return on equity (ROE), and capital ratio are also under consideration to quantify the FS in banking firms (Diallo & Al-Mansour, 2017; Fu, Lin, & Molyneux, 2014; Tabak, Fazio, Karine, & Cajueiro, 2016).

The role of risk committee (RC) is very significant towards RM and FS in recent years. Traditionally, the focus of studies for proper RM is on audit committee with the principal obligation to address and tackle the situation of financial unrest in business (Harrison,

1987; Korosec & Horvat, 2005). However, in contemporary environment, RC is admired as a specialized board committee (Subramaniam, McManus, & Zhang, 2009). Such committee is potentially a critical source in doing RM obligations for better FS. The existence of RC in banks is decidedly significant due to various reasons. For example, RM framwork in the banks combines the overall scope of risks, process/system needs to manage risk, and duties of individuals as involved in such practices (SBP, 2010b). For this purpose, there is a significant need for the existence of RC in the banks which can ensure the effective observation over risks being taken by the banks. Furthermore, RC needs to perform the obligations like developing policies/guidelines for major risk categories through identification, measurement, monitoring and finally the risk control mechanism (SBP, 2010b). Additionally, RC is also obligatory to oversee risk exposures, providing the advice on different risk strategies to board members, supporting Chief Risk Officier, and consideration of risk appetite for the bank (Srivastav & Hagendorff, 2016; SBP, 2010b). All these duties are meaningfully justifying the valuable existence of RC in the banks.

Among other strategic teams in banks, risk committee (RC) plays a significant and influential role towards RM practices (Abdullah et al., 2017). In order to prevent a business from internal financial crimes, corporate governance practices have been established and implemented in almost all the countries. For example, Malaysian Code of Corporate Governance (MCCG) as established during 1999 states that the board of directors defines RM framework under the shadow of internal control (Wahab, How, & Verhoeven, 2007). In this way, board members are primarily responsible for providing sound RM framework

which defines the risk tolerance for the RC. A common practice for some business organization indicates that duties for audit committee would include the supervision function for RM (Abdullah et al., 2017). However, a research question whether the RC should be organized as a separate committee from the audit committee is yet to be explored in the literature.

On the other hand, Brown, Steen and Foreman (2009) have expressed their view that the effectiveness of the audit committee (responsible for RM in some banks) is at a questionable position because such committee is already overloaded with numerous duties. Therefore, the audit committee cannot correctly perform its RM function. In this regard, authors like Fraser and Henry (2007) and Brown et al. (2009) have suggested a separate RM committee for the promotion of better RM practices. It is believed that the existence of RC can increase the significance of RM for securing the interest of various shareholders (Liebenberg & Hoyt, 2003).

Many dimensions are presented in existing studies to explain the concept of RC. For instance, it could be explained by size (e.g number of the directors and members in a committee), their freedom to take decisions with frequency of meetings (Ng, Chong, & Ismail, 2012). Besides, the establishment of RC can also increase disclosure for RM (Abdullah, Shukor, & Rahmat, 2017). However, the size of RC is a meaningful indicator

to present the RM practices in banks. In the present study, RC is used as a moderator to examine the relationship between RM and FS for commercial banks of Pakistan.

1.1.2 Banking Industry at World Glance

Present section has discussed the overview of the banking industry in the world economy for some understanding of trends in FS, performance and associated risk factors. The motive for providing some introductory material about the banking industry in the world economy is based on the deductive approach which focuses on moving from general to specific. For this reason, both risk and stability factors for some of the global banking firms are discussed, followed by the risk and FS trends in banking industry of Pakistan.

A common notion is that banks have always played a significant role in financial market. With the expansion of the world economy, international banks continue to grow in terms of assets and operational activities. Among the top ten banks globally, the Chinese banking industry has achieved a remarkable ranking. Table 1.1 provides an overview of top ten banking firms in the world economy, their country of origin, and services being offered.

Table 1.1
Top Ten Banks in the World

World Ranking	**Bank Name**	**Country**	**Services Offered**
1	Industrial and Commercial Bank of China (ICBC)	China	loans, business financing, e-banking, credit lines, and commercial loans.
2	China Construction Bank Corporation (CCBC)	China	Corporate banking, commercial loans, and credit lines.

Table 1.1 (Continue)

3	Agriculture Bank of China (ABC)	China	Deals with small farmers and large agricultural wholesale companies.
4	Bank of China (BOC)	China	Investment banking, insurance and investing services. It also provides personal loans, credit card services, and insurance.
5	HSBC Holdings (HSBC)	England	consumer and private banking facilities.
6	JPMorgan Chase & Co. (JPM)	United States	investment services, asset management, wealth management, and securities
7	BNP Paribas	France	Retail banking and investment solutions.
8	Mitsubishi UFJ Financial Group	Japan	consumer banking, as well as business and private banking
9	Bank of America (BAC)	United States	personal banking, small businesses, mid-sized businesses, and large corporations
10	Credit Agricole Group	France	Retail banking, specialized financial services, insurance and real estate.

Source: Johnston 2017, Industrial and Commercial Bank of China 2016

In the current financial environment, banks are dealing with a variety of challenges and critical risk factors, both in domestic and international market. As per the report of CSFI (2015), the world economy has a significant concern with banks as they are facing a variety of risk factors. These factors are under the title of macroeconomic, criminality, regulation, technology risk, political interference, quality of RM and credit risk (CR). Online security is also among significant issues in banks, requiring serious attention (Belás, Korauš,

Kombo, & Korauš, 2016). In the similar trend of thought, regulatory reforms, outsourcing, geopolitical risk, conduct risk, organizational change, money laundering and financial frauds are a few other significant categories (Betschinger, 2015; Black, Correa, Huang, & Zhou, 2016; McIntosh, 2016). Terrorism is also a substantial macroeconomic risk factor which has targeted the global financial markets (Chesney, Reshetar, & Karaman, 2011; Masciandaro, 2017).

Since the time of GFC, banks are required to build a capital cushion to secure themselves in the event of an adverse economic scenario. Although capital and liquidity requirements help to stabilize banks but other signifcant factors include slower trading at the cost of profitability and stricter lending standards as well. In Asia, banks and other financial institutions have faced several challenges. With the constant pressure over revenue sources, a new average return on equity (ROE) has been measured as 5-6%, which was 14 % during GFC in 2007 (Cushman & Workfield, 2017). Due to above-stated risk factors, FS of various banks in the world economy is under a challenging situation. It means that dealing with the situation of FS under the shadow of range of risk factors is a critical decisions for the banking industry. Figure 1.1 provides an outlook of average ROE for top 200 banks in the world economy, while Figure 1.2 indicates ROE for some specific international banking firms during 2004 to 2016(Q2) showing a significant decline in one of the stability measures for different banks in world economy. It is observed that banking sector in the world is facing the issue of lower FS over the recent two decades.

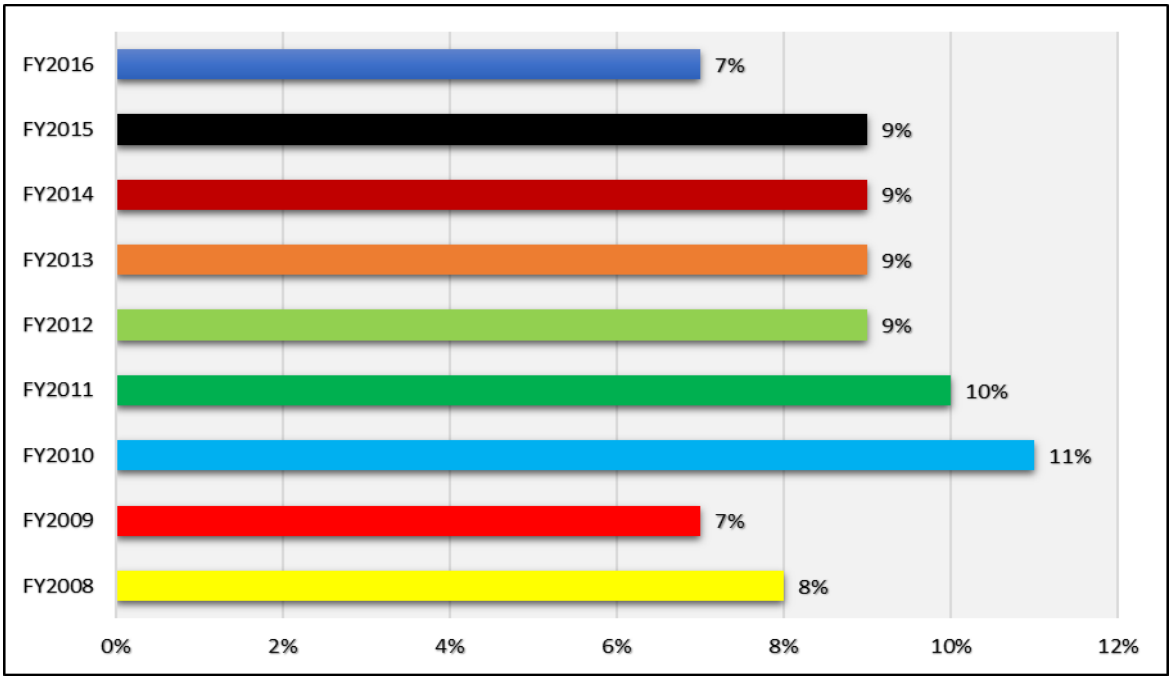

Figure 1.1
Average ROE (Top 200 Banks in World Economy)
Source: Ernst and Young, 2018

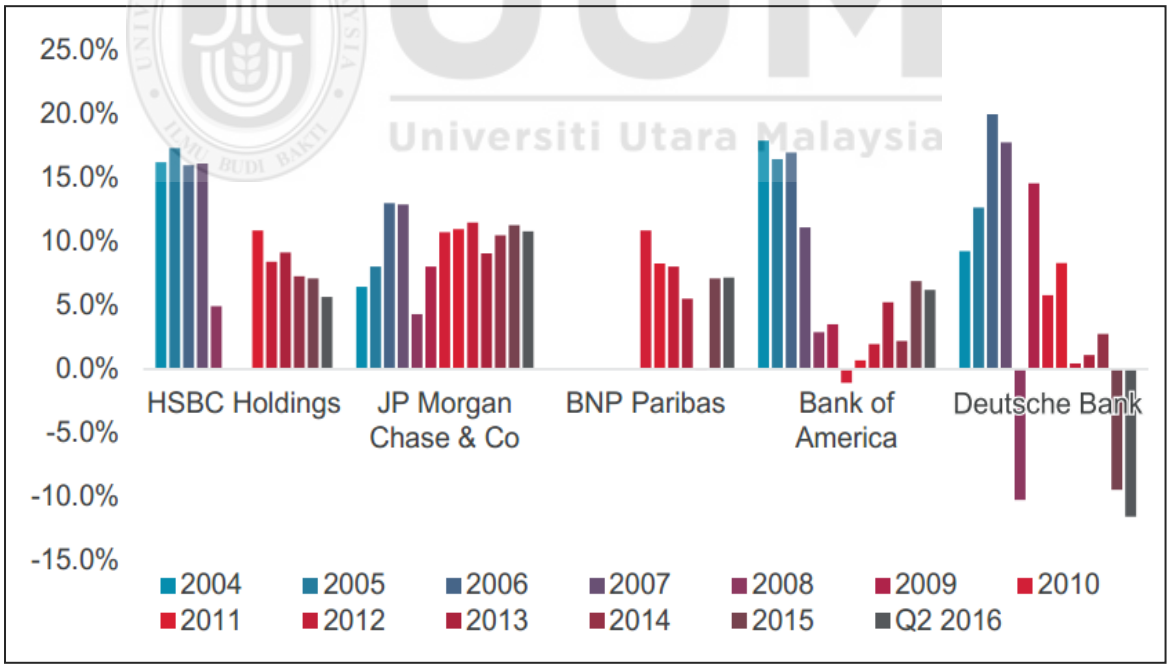

Figure 1.2
ROE for Some International Banks During 2004 to 2016(Q2)
Source: Cushman and Workfield, 2017

1.1.3 Banking Industry in Pakistan: A Review of the Last Two Decades

This section provides a detailed review of the banking industry in Pakistan, starting with the initial growth phase (2000-2005) along with the associated risk factors. The reason to cover the discussion for the first half of the last decade was that most of the commercial banks had started their operational activity in this time. Therefore, for better understanding, it is quite obvious to provide a significant review about the risk-return trends prior to the issue of instability in the local banks as experienced from 2007 to onwards.

It is accepted that the banking industry in Pakistan has played a crucial role in providing the financial background for the national economy (Javaid, Anwar, Zaman, & Ghafoor, 2011). The overall structure of the banking industry in Pakistan is divided into public, private, and foreign banks. Currently, there are five public sector banks, twenty local private banks, and five international banks in Pakistan (Arif & Anees, 2012; SBP, 2015b; SBP, 2017b).

The banking industry is considered as a primary lender to both public and private institutions. All banks in Pakistan are currently regulated by the State Bank of Pakistan (SBP), which is the supreme governing authority (SBP, 2017b). All financial institutions like banks, development finance institutions (DFIs), investment banks (IBs), insurance companies, leasing and exchange companies work under SBP. They act as members' financial institutions who are actively participating in the local financial market (Javaid et

al., 2011). SBP governs all these members through Banking Companies Ordinance, 1962 which has laid down certain guidelines. SBP must govern and monitor the performance of these institutions in the financial market. Additionally, SBP is also authorized to take necessary actions in case of any regulatory or compliance issue from these members (Arif & Anees, 2012).

Since 2000 till date, banks have gained good revenues as well as losses, which led to introducing various reforms (Iimi, 2004). For instance, the value of earning through return on assets (ROA) was 1.2 % in 2004 and 1.9 % in 2005. The diversification of portfolios witnessed an increase in revenue during the first half of the last decade (SBP, 2005b). Ostensibly, local banking system in Pakistan had a visible level of improvements regarding size and financial health during 2000 to 2005 (SBP, 2005a). The increase in the assets of the banking sector reached Rs.3.7 trillion from Rs.1.8 trillion during this period. Besides, the overall shifting of assets from public to the private sector also resulted in a significant growth during the same period (SBP, 2005a).

While several structural changes in banks resulted in cost-effectiveness in operations and better financial outcomes, such modification however also increased the risk exposure in overall financial composition (Khalid & Hanif, 2005; SBP, 2005b). The rising trend of advances had already caused an upward shift in the CR for banks (Haneef et al., 2012). Meanwhile, the substantial value of credit growth weakened the various indicators of

liquidity from the year 2003 onward. For instance, the ratios of advances to deposits and liquid assets to total assets had increased during this period as shown in Table 1.1. Such a mismatch in the maturity of assets and liabilities also increases the chance of liquidity gap (Arif & Anees, 2012; SBP, 2005b).

Table 1.2
Return on Assets, Loan to Deposits Ratio (LTDR) and Liquid Assets to Total Assets Ratio (LATA)

Years	ROA	LTDR	LATA
2000	0.3	66.2	35.5
2001	0.1	61.7	38.1
2002	0.9	54.9	46.7
2003	1.8	56.4	45.1
2004	1.9	65.8	36.6
2005	2.8	70.2	33.7

Source: State Bank of Pakistan, 2005a

Due to the increase in the liquidity risk (LR) and overall performance during 2000-2010, the value of market risk (MR) began to be judged in the form of interest rate. Besides, other challenges during this period included the inflationary environment and rise in the oil price too which had resulted in a current account deficit of Pakistan from 1878$ billion to -3.606$ billion during the first half of the decade, i.e. between 2001 to 2005 (World Bank, 2019). This inclination unfavorably affected the portfolio investment of various financial institutions with assets having long run maturity duration as compared to liabilities.

During the period between 2000 and 2005, other factors that contributed to both risks and rates of return included development of information technology (IT), launch of innovative products, outsourcing, mergers & acquisition, and like. Therefore, the consequences of operational risk (OR) cannot be be ignored. However, in spite of a number of frauds and forgeries, the performance of the banking sector was sound. For instance, up to the year 2005, total number of categories of OR like serious-medium and low-severity were recorded to 116,403 and 2239 (SBP, 2005a). Similarly, the performance of Islamic Banks (IBS) reflected a growth rate of 60 % during the period 2000 to 2005 (Ashraf, 2013). Additionally, balance sheet items like deposits, borrowings, capital and other funds also showed an appealing growth rate (Ghauri, Javaid, & Ramzan, 2012; SBP, 2005b).

From 2005 to 2010, the overall banking industry experienced instability in the form of ROA and ROE. Both these stability indicators, ROA and ROE, demonstrated a decline of 1.86 % to 0.48% and from 23.62% to 5.93% respectively (SBP, 2010a). The value of the non-performing loans (NPLs) to gross advances ratio confirmed an increasing trend (7.08 % in 2006 to 13.75 % in 2010). Meanwhile, the ratio of cash and cash equivalents to total assets revealed a decline from 13.6 % in 2006 to 10.35% in 2010.

During this period, GFC also started affecting the world economy and banking sector, in particular, both in developed and developing economies (Nazir, Safdar, & Akram, 2012a; Saeed & Zahid, 2016; Tafri, Hamid, Meera, & Omar, 2009). The balance sheet of local

banks in Pakistan showed a fall from Rs. 6.5 trillion in 2009 to Rs. 6.1 trillion in 2010 (SBP, 2010a). Additionally, an overall decline of 14%, 4 % and 5% in total shareholder's equity, liabilities, and assets was also observed. The value of total deposits had also decreased by 2 % during 2010 (SBP, 2010a). Since 2006 till date, the earning performance and FS have been in a questionable position. Both indicators (ROA and ROE) of FS are showing a declining trend. Figure 1.2 explains the overall movement of FS from 2006 to 2017.

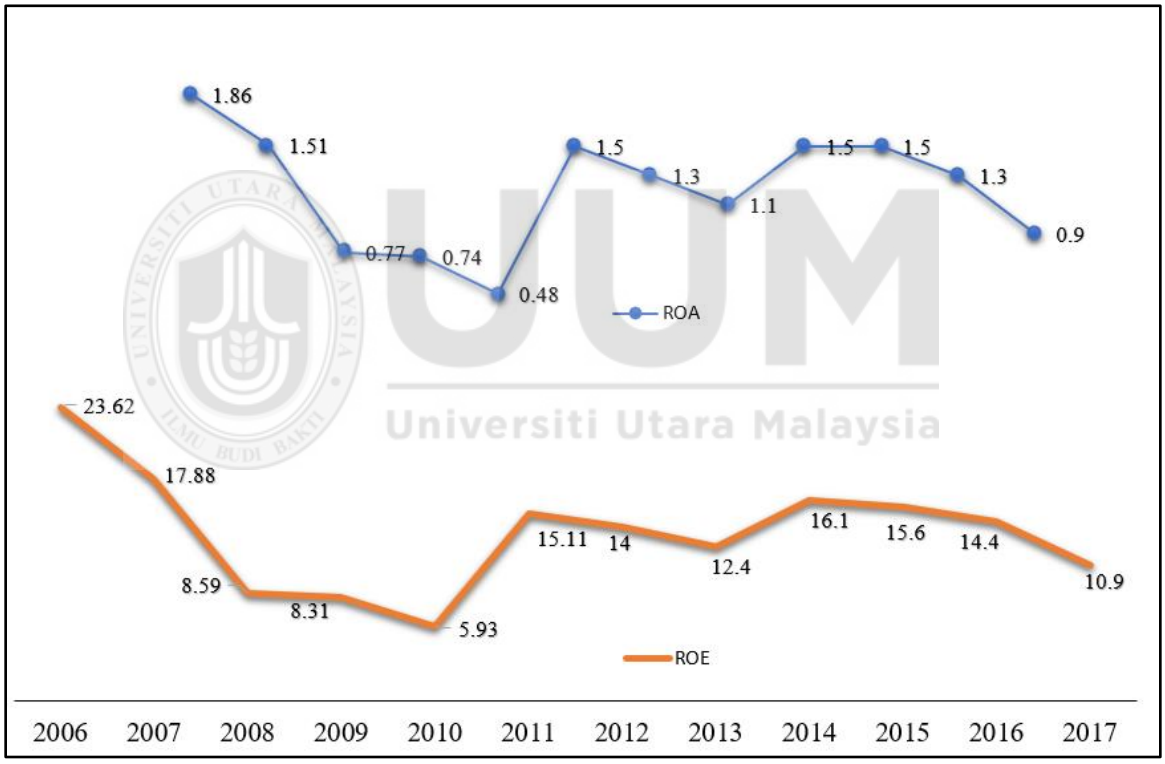

Figure 1.3
ROA and ROE for Overall Banks in Pakistan During 2006-2017
Source: SBP 2005a, 2010a, 2015b, 2017b

In addition, an overall analysis of the commercial banks suggests that the value of NPLs showed a gradual increase from Rs. 446.05 million in 2008 to Rs. 611.81 million in 2017 (SBP, 2017b). In the case of listed banks, e.g. National Bank of Pakistan (NBP) showed

the highest level of NPLs from 2005 to 2016. Figure 1.3 exhibits the overall scenario of NPLs for the listed banks in Pakistan Stock Exchange (PSX).

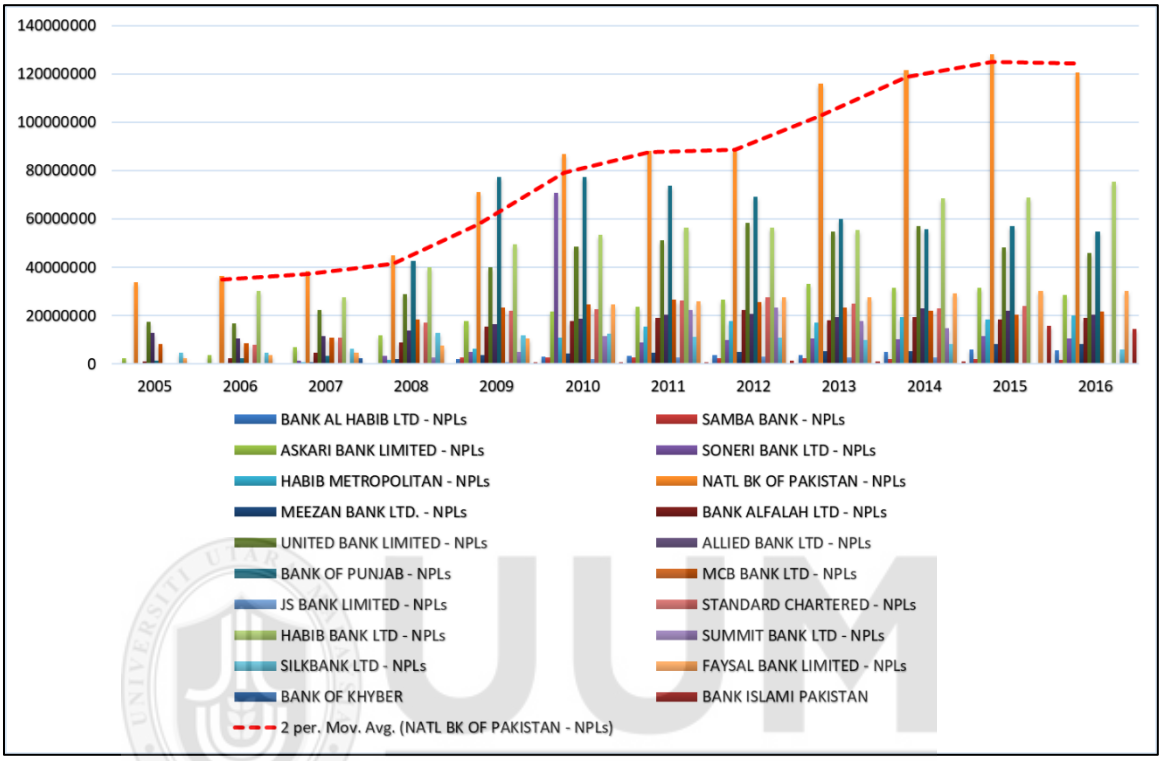

Figure 1.4
NPLs of All Listed Banks in Pakistan: 2005-2016
Source: Datastream, 2017

Furthermore, during the period between 2012 and 2016, in-depth investigation of the local industry revealed that approximately half of the commercial banks faced losses and decline in their operating profit. Out of twenty listed banks, particularly the Khadim Ali Shah Bukhari Bank (KASB), Summit Bank, Albaraka Bank and Silk Bank showed a series of decline in banks' earnings. Due to consecutive losses in ROA & ROE and negative level of capital adequacy ratio (CAR), SBP stopped the operational activities of KASB Bank

(SBP, 2015a). Some other banks like Habib, MCB, Allied, Meezan, Sonehri and United also faced problem in their FS.

Table 1.3 explains ROA and ROE for the listed banks, having continuous decline and loss in earnings over the last five years.

Table 1.3
ROA and ROE for Some Listed Banks

Sr. No.	**Years**	**2012**	**2013**	**2014**	**2015**	**2016**
	Ratios in	**%**	**%**	**%**	**%**	**%**
1	KASB ROE	-9.3	-23.0	-23.0	-	-
	KASB ROA	-0.89	-2.3	-2.3	-	-
2	SUMMIT ROE	-95.60	-172.70	18.24	14.64	-33.60
	SUMMIT ROA	-2.02	-1.45	0.16	0.13	-1.02
3	ALBARKA ROE	-9.70	-0.62	2.17	3.46	-1.34
	ALBARKA ROA	-0.87	-0.05	0.15	0.28	-0.12
4	SILK ROE	-1.86	-18.45	0.44	-2.56	1.11
	SILK ROA	-0.39	-1.26	0.08	-1.29	0.55
5	HABIBMETRO ROE	13.06	12.89	16.36	23.14	16.47
	HABIBMETRO ROA	1.12	1.13	1.24	1.57	1.16
6	MCB ROE	23.25	21.91	22.50	21.72	18.46

Table 1.3 (Continue)

	MCB ROA	2.75	2.67	2.63	2.45	2.06
7	ALLIED ROE	26.68	27.28	24.23	22.25	19.44
	ALLIED ROA	1.87	2.01	1.80	1.54	1.37
8	MEEZAN-BANK ROE	22.64	22.09	19.64	18.18	21.24
	MEEZAN-BANK ROA	1.28	1.20	1.04	0.95	1.00
9	SONEHRI ROE	0.70	0.61	0.74	0.87	0.67
	SONEHRI ROA	1.17	1.42	1.18	1.24	0.98
10	UNITED BANK ROE	2.00	1.82	2.03	1.82	1.69
	UNITED BANK ROA	1.79	1.79	1.81	1.59	1.51

Source: State Bank of Pakistan, 2016

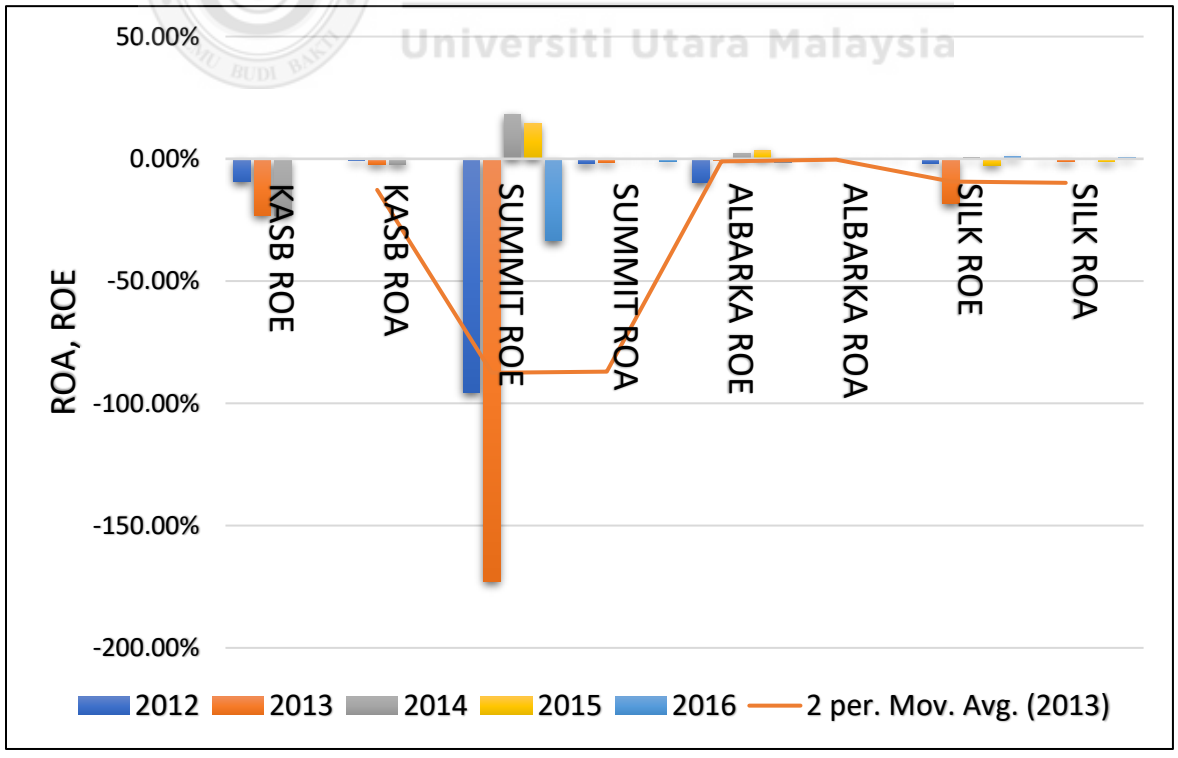

Figure 1.5
Banks with Series of Issues in FS indicators (ROA, ROE) 2012-2016
Source: SBP, 2016

In addition, for the supervision and regulation of the banking sector, SBP is playing its significant role. Various regulatory documents are issued by the SBP since the time of its establishment for the guidance and supervision of banking companies. Among several, SBP Act, 1956 and Banking Companies Ordinance, 1962 are very important (SBP, 2015c). For the formation, incorporation and share capital of the bank, SBP Act, 1956 provides the information framework along with the establishment of board of directors (BODs), monetary and fiscal policies and functions of the bank (i.e credit operations, reserve funds, roles and duties of the auditors, and liquidation of the bank, etc.) as expressed by (SBP, 2015c). Similarly, the role of Banking Companies Ordinance, 1962 is observed for the activities like licensing of banking firms, maintenance of liquid assets, reserve fund, cash reserves, restriction on the advances and loans, accounts and balance sheet, transaction of the banking business and suspension of the banking business (SBP, 2014a).

Furthermore, for the regulation of banking firms Banking Mohtasib in Pakistan was also established under Banking Companies Ordinance, 1962 (SBP, 2014a). As the banking firms are evolved to offer new and innovative products in the market, there are to be disagreements between the banking firms and the consumers. In this regard, the role of Banking Mohtasib is to mediate between the bank and the customer to reach an amicable solution (Pakistan Banking Mohtasib, 2019). Furthermore, to deal with the overall RM

practices by commercial banks, SBP has also provided a RM framework for the CBs and DFIs accordingly (SBP, 2010). The role of this documentary guideline is to provide the basic understanding about the four major types of bank risk; liquidity risk, credit risk, operational risk, and market risk. Both CBs and DFIs are guided for managing all these risk factors with the help of board and senior management oversight, systems and procedures, RM committee, controlled mechanism, and contingency planning as well (SBP, 2010).

For regulatory capital and related functions, Basel Accord with implementation mechanism is also adopted by SBP. For the regulatory capital, two standards under the title of minimum capital requirements and capital adequacy ratio (CAR) are settled for CBIs, DFIs, and Microfinance Banks to comply with. The overall framework of Basel capital consists of Basel I (implemented in 1997, only accounted for CR), Basel II (implemented in 2008, required the banks to calculate their CAR based on the market, credit and operational risk), and Basel III (implemented December 2013 to December 2019, with the increase in CAR of 10 % to 12.5 %) respectively (SBP, 2019).

Beside these regulatory framework, banks in Pakistan are facing both structural strengths as well as weaknesses in their RM practices. For example, one of the significant strength for most of the commercial banks while performing the RM activities is based on the hierarchy entitled as strategic level, micro level, and micro level respectively (SBP, 2010).

The strategic level of RM is a core activity as performed by the BODs and senior management. Whereas micro level considers the RM activities as done by individuals in the banks who take the risk on the behalf of the bank. Lastly, the RM practice at macro level encompasses the activities by middle management across the business line. However, as per the detailed investigation of RM practices followed by the commercial banks, since 2010 to date, no updated framework is provided for the banking firms to follow while dealing with contemporary risk factors. This issue is found as one of the most crucial weakness in the overall RM structure of the banking firms as provided by SBP. Furthermore, due to poor monitoring for the commercial banks by SBP, range of fraudulent activities (serious-medium and low-severity), mega money laundering through commercial banks with weak internal control of the banks were also observed since 2000 to date. All these issues are a serious threat for the commercial banks and indicating their Weak RM practices.

1.2 Problem Statement

Risk is considered as an integral part of a business. No firm can avoid the uncertainty and risk. The issue of continuance misfortune in financial terms have raised serious concerns for various reforms in risk management practices (Bilal et al., 2013). In the last couple of decades, the world economy and financial sectors have suffered a lot (McNally, 2009). In the previous decade, GFC of 2007-2008 had hit both developed and developing countries (Chaudhary & Abbas, 2017; Griffith-Jones & Ocampo, 2009; Nazir, Safdar, & Akram, 2012; Reinhart & Rogoff, 2009). Financial experts hold the view that this GFC was the largest in terms of loss exposure after the great depression of 1930. While the GFC affected

the financial industry in terms of stock return and stability, the question of continuing to perform healthy business activities arisen (Acharya & Richardson, 2009). Additionally, due to such systemic financial surprises and shocks, banks have divergently faced financial misfortune and their FS is at a noticeable situation (Haas & Lelyveld, 2014).

GFC also revealed the fact that banks were not appropriately handling various risk factors (Broll, Guo, Welzel, & Wong, 2015). In the overall scenario of crisis and instability, improper RM and its ultimate impact on the FS became burning issues. Recent financial misfortune has further created a situation of caution in the banking industry. Therefore, banks should reshape and redesign their RM practices in order to evaluate and manage such instances of financial depression (Bade, Rösch, & Scheule, 2011; Bilal et al., 2013).

In order to deal with various risk factors in the banking sector, Basel regulations (Basel I) were introduced by the Basel Committee on Banking Supervision (BCBS) in 1988. Subsequently, Basel II regulations were also announced in 2004 (separating the CR from the OR), and finally Basel III came in 2010 (Balin, 2008; BCBS, 2010). However, there was an improper implementation of these regulations in true letter and spirit (Bilal et al., 2013). Consequently, various members of global financial industry failed during the last decade (Demirguc, Kunt, Detragiache, & Merrouche, 2013; Feess & Hege, 2011). In the international context, players in financial markets faced a decline in their value of ROE just after GFC, as shown in Figure 1.1. As per the contemporary literature, causes of

financial failures are the increasing bad debts (Akter & Roy, 2017), poor accounting practices (Graham & Annisette, 2012), inadequate internal control (Bilal et al., 2013), risk mismanagement (Abraham, 2008), meager regulatory framework (Couppey-Soubeyran, 2010), and poor governance (Demaki, 2018).

In terms of Pakistan's economy, banks have confronted various challenges, among which various measurements of FS indicators like ROA and ROE are significant (Bouheni & Hasnaoui, 2017; Fu et al., 2014; Tabak et al., 2016). The time frame of 2000 to 2005 was observed as an emerging phase to study this crisis because various Islamic and conventional banks (ICBs) were also established in Pakistan (SBP, 2005b). The earning capacity in terms of ROA showed a good trend, but at the cost of higher liquidity and CR, as shown in Table 1.1. The empirical findings of Arif and Anees (2012) state the fact that Liquidity Risk (LR) negatively affected the ROA and ROE of local banks in Pakistan.

Meanwhile, the value of Market Risk (MR) like interest rate and inflation has also hit the local banks with a decline in ROA (Ahmad & Sattar, 2014; Malik, Khan, Khan, & Khan, 2014). In the last decade, however, the environment of innovation and advancement in technology in the local banking industry had opened a new way for OR. Various frauds and financial crimes were recorded with high, medium, and low severity (SBP, 2005a). From 2006 onwards, commercial banks too experienced volatility in their FS, as shown in Figure 1.2. The value of ROA and ROE decreased over the recent two decades with

investment losses in terms of increasing Credit Risk (CR) in the form of NPLs, as shown in Figure 1.3.

Furthermore, with constant challenges in FS, market growth had also not revealed its positive outcomes. Continuous depreciation in local currency (1$= Rs.60.68 in 2008 to 1$= Rs.104. in 2017), and higher inflation were among significant indicators for lower operating efficiency of banks (Ishfaq, 2015; Trading Economics, 2017). Besides, the instability in financial position and decline in the assets and equity portion in the balance sheet of local banks was already an ongoing phenomenon since 2011. Table 1.4 provides an overview of profit before tax, profit after tax, mark-up earnings, non-markup earnings, ROE, and ROA with their overall trend during 2015 to 2016. Besides, among market risk factors, the value of NPLs was another growing issue for a majority of commercial banks, as shown in Figure 1.4. Such a confronting situation of FS with increasing level of various risk factors provided a significant argument about inefficient utilization of assets and mismanagement by banking officials.

Table 1.4
FS Indicators and their overall Trend During 2015 to 2016

Years	**FS Indicators**	**Measurement in Rs & %**	**Overall Trend**
2015	Profit before tax	Rs. 326.89 billion	
2016	Profit before tax	Rs. 319.31 billion	Declining
2015	Profit after tax	Rs. 195.16 billion	
2016	Profit after tax	Rs. 193.19 billion	Declining

Table 1.4 (Continue)

2015	Mark-up earnings	Rs. 979.55 billion	
2016	Mark-up earnings	Rs. 944.55 billion	Declining
2015	Non-mark-up earnings	Rs. 220.11 billion	
2016	Non-mark-up earnings	Rs. 211.50 billion	Declining
2015	ROE	15.6 %	
2016	ROE	14.4 %	Declining
2015	ROA	1.5 %	
2016	ROA	1.3 %	Declining

Source: State Bank of Pakistan 2016

The volatility in FS was another significant issue during this period. Moving from general to specific, a few banks in Pakistan were still under objectionable financial situation. For example, the failure of KASB Bank in 2015. The earning losses were in the form of negative ROA and ROE as shown in Table 1.2. Therefore, SBP had to freeze the operational activities of KASB Bank until the final decision due to crucial risk factors and consistent earning losses (SBP, 2015a). The reasons for the failure of KASB Bank were: weak RM and non-compliance of SBP regulations regarding minimum capital requirements (Dawn, 2015; SBP, 2015a). Besides, the problem of lowering FS in terms of ROA and ROE was not explicitly linked to one or two key role players. Several members from overall banking industry have faced this issue as stated under Table 1.2. Meanwhile, the overall argument about risk factors and their association with stability indicators like

ROA and ROE has been supported in several previous studies (Molyneux & Thornton, 1992; Sufian, 2009; Sufian & Habibullah, 2009; Tan & Floros, 2014; Tan et al., 2017).

Besides, the governance structure in Pakistan had also made a deep impact on the banking industry. Due to the administrative negligence and lack of good governance, Pakistan ranked among countries that failed to control corruption and witnessed issues like political instability, violence, government's ineffectiveness and lack of accountability (Global Economy, 2017, 2018a, 2018b). In recent years, a series of financial frauds and mega corruption scandals mostly in Pakistan's commercial banks have been increased (Pakistan Today, 2018). The key reasons stated for such financial deceptions in commercial banks were money laundering and fake accounts cases which represents low control over corruption (The News, 2019). All these facts provided a significant justification about poor governance at macro level in Pakistan which has directly affected banking firms.

The current literature lacks studies that incorporate the RM with FS in the Pakistani context; it only addresses key risk factors like liquidity, credit, operational and market based measures and their impact on financial performance. Meanwhile, very little attention has been paid to the concept of FS. Such a prevailing gap in the past literature suggests a theoretical issue and needs serious attention. Moreover, the relationship between RM and FS without the consideration of RC seems inappropriate. This is due to the reason that RC is a key committee in the banking firms responsible for managing overall RM which is

essential to achieve the strategic objectives (Waemustafa & Sukri, 2015). Similarly, RM is central to corporate governance when its impact on FS is observed in the presence of RC. Furthermore, among other boards in business, RC considers the obligation of RM (Yatim, 2010), in order to provide better stability in banks (Fu et al., 2014; Soedarmono, Machrouh, & Tarazi, 2011). All these reasons provide enough evidence for the consideration of RC between RM and FS relationship.

In the current critical domain, RC and its role provide significant suggestions to defend the idea that RM and RC are positively associated with each other (Tao & Hutchinson, 2013). However, insufficient attention has been paid in the context of Pakistani banks towards identifying the role of RC. It cannot be denied that an agency relationship exists between banking sector management and their shareholders, where BODs act as agents. However, a detailed review of literature reveals that there is also a theoretical gap regarding the moderating role of RC, while explaining the relationship between RM and FS in commercial banks of Pakistan. Therefore, based on the stated issues, following are the research questions and research objectives which are under attention in present research:

1.3 Research Questions

1. What is the relationship between risk types (e.g. liquidity, credit, operational, market, country and financial crisis) and financial stability?
2. What is the relationship between regulation on the bank's capital (e.g. adequacy ratio) and financial stability?

3. What is the relationship between governance factors (e.g. audit quality, country-level governance) and financial stability?
4. What is the moderating effect of risk committee on the relationship between risk management and financial stability?

1.4 Research Objectives

1. To examine the relationship between risk types and financial stability in commercial banks of Pakistan.
2. To examine the relationship between regulation on bank's capital and financial stability.
3. To examine the relationship between corporate governance factors and financial stability.
4. To examine the moderating effect of risk committee on the relationship between risk management components and financial stability.

1.5 Scope of the Study

From the perspective of overall financial market, this study has investigated commercial banks, working under the regulations of SBP. At present, overall thirty commercial banks are working in Pakistan which includes public, private, foreign, Islamic, and conventional banking firms (SBP, 2017b). More specifically, out of these 30 commercial banks, 20 are listed in Pakistan Stock Exchange (PSX). All these banks have enjoyed real confidence from their investors and stakeholders. Besides, these banks also cover a major share in the country's economy, compared to other members in the overall financial market. For the

current study, members like microfinance institutions, investment banks, modaraba companies, non-banking financial institutions, and development financial institutions have been deliberately excluded due to the nature of research problem raised and as discussed earlier.

The audit quality and country-level governance factors have also been selected as key indicators to analyze their relationship with FS. For the FS, ROA and Z score of ROE were under consideration. Besides, the size of bank (SOB) and gross domestic product (GDP) were selected as control variables. The methodological scope of the study is very significant as it covers a comprehensive panel data approach to achieve the stated objectives. For this study, the scope regarding time duration was from 2007 to 2016 with annual observations.

1.6 Significance of the Study

Stability in financial terms is essential for banking firms as it reflects their better financial position and ensures future growth. Similarly, RM measures adopted in financial institutions like banks play a significant role in situations of financial distress and economic shocks (Commission, 2011; Wallison, 2011; Wallison & Burns, 2011). Due to frequent economic and financial unrests globally, field of studies and practices in RM have got much significance (Bezzina, Grima, & Mamo, 2014). Based on these stated arguments, the significance of the present study can be explained through both theoretical and practical approaches:

1.6.1 Theoretical Significance

The present study emphasizes on RM and its linkages with FS by adding the moderating effect of RC in commercial banks of Pakistan. Numerous studies earlier have focused on risk and profitability and related issues (Achugamonu, Osunkoya, Aiyepeku, Adetiloye, & Akinjare, 2016; Basharat, Arshad, & Khan, 2014; Berríos, 2013; Chong, 1991; Eken & Kale, 2013; Fredriksson & Moro, 2014; Gallo, Apilado, & Kolari, 1996; Heggestad, 1977). However, little attention has been paid to FS of commercial banks in Pakistan.

Meanwhile, commercial banks are dealing with all types of financial products and provide a range of financial services, involving in both systematic and non-systematic risk factors. Accordingly, a need for a theoretical framework is felt which can cover maximum risk factors for reducing financial fragility. Such a theoretical contribution through present research is very significant as it could fulfil the gaps in contemporary literature. In addition, one of the significant theoretical contributions of this study is to examine the moderating effect of RC between RM and FS. To the best of author's search, a limited number of research studies are available, covering the horizon of RC and its relationship with RM and FS. Therefore, this study will enrich the body of knowledge in the area of RM practices of banks and their relationship with FS under the interactive effect of RC. Such theoretical benefits will be seen as a substantial contribution to the field of finance and banking, helping stakeholders in their relevant decision-making process.

1.6.2 Practical Significance

As stated in the problem statement, commercial banks in Pakistan are facing severe financial challenges with increasing risks both at micro and macro levels. Such practical issues provide justified evidence for this study, not only to address these issues but also to suggest guidelines to resolve. The practical implications of the current study emanate from the fact that it purely focuses on FS under the shadow of various risk factors with moderating effect of RC. More precisely, in order to overcome the conflict of interest between shareholders and banking sector management, practical guidance is required. This study can provide useful guidelines for the principal and potential shareholders in banks who are evaluating risk factors and their impact on FS prior to making investment decision. The regulators in the banking sector can also find this study as meaningful evidence to improve their decision-making process under the RM-FS framework. Additionally, the study findings can likewise contribute to understanding the true nature of banking trends for stakeholders from local and international community in Pakistan.

1.7 Organization of the Study

The present research work consists of five chapters. Chapter one covers the general overview of the study, the banking industry at world glance with special reference to Pakistan. Besides, problem statement, research questions, research objectives, scope and significance of the study are also included under this chapter. Chapter two presents the literature review about RM, FS, and RC. A critical review of the relationship between independent and dependent variables with underpinning and supporting theories has been presented under in similar chapter. For a better understanding, literature gap has also been

explained under chapter two as well. Chapter three focuses on research framework, hypotheses development and operational definition of variables. It discusses the population and sample size, description of selected firms, measurement methods of variables, econometric models, and methods for data analyses. Chapter four provides the evidence of the empirical findings, discussion about results and their linkages with research questions and research objectives. It also covers the relationship between the selected variables, based on the underpinning and supporting theories. Chapter five comprises of the conclusions, contributions, and implications of the study. It also addresses limitations and recommendations for future research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Prior to presenting the critical and empirical studies of the subject under study, this chapter first discusses the concept of RM and FS in order to provide a theoretical and critical review for both explanatory and outcome factors with RC as a moderator. A theoretical discussion on the control variables of the study has also been covered under this chapter. Significantly, the relationship between variables in the light of underpinning theories and the gap in the literature are also examined in this chapter.

2.2 Concept of Financial Risk

All types of businesses face risk as a natural element. It is a condition that increases the exposure of uncertain events and increases chance of losses while manipulating the success of financial institutions (Khalid & Amjad, 2012). Financial risk can be categorized into two types: systematic and non-systematic. Systematic risk is associated with the overall economy in the market while non-systematic risk is linked with the firm or specific class of assets (Gitman, Juchau, & Flanagan, 2015). Various strategies have been defined in the existing literature to mitigate the harmful effects of risk (Oldfield & Santomero, 1997). These studies show that some risk categories are inevitable when associated with specific assets. Contextually, banks are specialized in dealing with various kinds of risk and reap significant benefits. For instance, they increasingly face CR in various financial products such as interbank transactions, foreign exchanges, financial futures, bonds, swaps, equities,

and trade financing (Al-Tamimi & Al-Mazrooei, 2007). Therefore, financial RM in banks is very much significant for their survival and growth.

2.3 Risk Management (RM) in Banks

The concept of RM and its effectiveness has been accepted as an essential foundation for overall bank management. Besides, for the development of economy, banking sector has played a dynamic role in making use of the idle capital in an optimal way (Sharma, Chami, & Khan, 2003). For prudent banking practices, RM therefore is a cornerstone. All banking firms in today's economy are working under the environment of volatility and risk (Al-Tamimi & Al-Mazrooei, 2007). Various risk dynamics are threatening the banks for their ultimate survival and success. In other words, banks are known as businesses of risks and for this reason efficiency in RM is significantly required. The recent financial distress has shaken the banking institutions in the world economy, hence forcing the bank management to reshape risk modelling to handle such financial depression (Rosch and Scheule, 2007). In addition, the financial crises of the twentieth century has created some serious ineffectiveness in old RM models in different regions like US, Europe, and even in Middle East too (Gourinchas & Obstfeld, 2012). Eventually, the governing and regulatory authorities finally realized the need to observe the flaws of poor RM for reshaping their futile risk disciplines (Bilal et al., 2013). Carey (2001) rightly asserts that RM constitutes a crucial decision for banks to survive in the financial sector. Meanwhile, financial risk experts have broadened their view to improve the effectiveness of the RM in the banks to ensure the best compliance of risk and reward ratios. For a better understanding of RM in banks, the risk types need a closer examination.

2.4 Risk Types

2.4.1 Liquidity Risk (LR)

The concept of liquidity risk (LR) and its management is an integral component in the RM mechanism for all types of financial intermediaries (Majid & Rais, 2003). Financial institutions like banks should consider a proper mechanism for the identification, measurement, monitoring and controlling strategies for LR (Barfield & Venkat, 2009; Cornett, McNutt, Strahan, & Tehranian, 2011; Goodhart, 2008). An established and systematic framework can help banks to significantly identify and recognize LR and secure themselves from financial distress (Guglielmo, 2008). The growing dependence on capital market funds by banks has further increased the severity of LR (Falconer, 2001). A severe outcome for this kind of risk is reflected in widespread capitalization catastrophe in short periods. Such a crisis may evolve into a fire-sale risk, which may arise due to getting more share in the non-liquid assets in the firm's balance sheet (Arif & Anees, 2012). Various options are available for banks to avoid such risk. For instance, banks can mitigate such financial unrests by primarily focusing on different financial ratios like liquid to total assets and liquid to total liabilities (Goddard, Molyneux, & Wilson, 2009).

Moreover, in order to secure business operations from funding risks of shorter duration, banks can hold assets with higher liquid characteristics (Holmström & Tirole, 2000). Increasing cash reserve is another good strategy but not cost-effective (Holmström & Tirole, 2000). Liquidity shield for financial institutions may only be in the form of cash

and cash equivalents, which secures the firm for only an uncertain period. Another way could be the imposition of liquidity requirement by the central bank, though banks may avoid such conditions as they have to depend too much on government funds. Besides, such a situation only increases the dependency ratio (Jeanne & Svensson, 2004; King & Atkins, 2007).

During the period of financial crisis, monitoring and management of LR reflects the ability of managers (Simplice, 2010). Merrouche and Schanz (2010) have pointed out a good example of banks in the United Kingdom (UK). Identifying LR in their banks is a periodical decision with the primary focus on payment methods. Such a practice is justified from the fundamental fact that right from the initial stages, there is no assurance for banks to get back their payments from counterparties. Therefore, it is necessary to stop all payment activities. Moreover, foreign banks are somehow different because they have multinational and divergent sources of liquidity. These multinational banks can procure stability in their own positions and play a vital role in stabilizing the financial market as evident in the findings of Dinger (2009), who held a similar argument about transnational banks. He stated that the financial market and banking system in a dynamic economy could be significant performers to provide partial insurance of liquidity.

During the last three decades, the concept of LR and its management has been widely addressed to by researchers in ICBs (Ali, 2004; Cihák & Hesse, 2008; Iqbal, 2012; Samad

& Hassan, 1999; Zaher & Kabir Hassan, 2001; Zineldin, 1990). Azis and Shin (2015) have specifically discussed three broad phases of liquidity in a global context with their implication in South Asia. The first phase started in 2008 with an estimated capital inflow of $2.1 trillion. The second phase was based on the concept of policies of assets and quantitative easing. Finally, the third phase which started in the second quarter of 2013 has been known as taper tantrum. In short, due to its significance, LR management is considered as a significant component in the overall RM of financial institutions (Majid & Rais, 2003).

The balance sheets of banks are also growing in complexity and have made the management of LR more challenging (Guglielmo, 2008). This issue has been experienced in both developed and developing countries particularly in the last few years as observed in studies on LR management (Arif & Anees, 2012; Iannotta, Nocera, & Sironi, 2007; Soedarmono et al., 2011).

2.4.2 Credit Risk (CR)

The exposure of credit risk (CR) has been accepted as a crucial dilemma for banks. After bad financial experiences, banking supervisors are convinced that lending mistakes are more prevalent and widespread (Jesus & Gabriel, 2006). It is observed that loan holders may fail to repay the principal portion of the debt at the time of maturity. For securing investors from such a risk of default, the returns over corporate bonds are higher than other modes of investment (Gitman et al., 2015). The investments in government securities could

be presumed as free from such default risk (Lee & Lee, 2006). While quantifying the portion of CR in a business, there is a need is to evaluate the probability of default for the principal obligator (Koulafetis, 2017). However, the optimal control for the credit primarily depends upon the input mechanism (Cossin & Aparicio, 2001).

The role of CR in affecting the FS of the banking firms is widely discussed in the literature. For example, Wagner and Marsh (2006) have studied the effect of CR transfer and its impact on the improvement of stability in banks. It is observed that transfer of CR from banking to non-banking firms is more beneficial comparatively to banking sector. Therefore, it is the obligation of the regulators to work for designing those instruments which can favorably help to transfer aggregate CR for better stability. In addition, the role of CR in determining the FS is widely examined in ICBs. For this purpose, Hassan, Khan and Paltrinieri (2019) have provided a comprehensive assessment while studying the trends in banking sector stability and CR. It is observed that Islamic banks are more efficient in managing the CR for better stability.

Meanwhile, the impact of CR on stability indicators like ROA, ROE is widely examined in the literature. For instance, Ekinci and Poyraz (2019) have analyzed the causal impact of CR on these stability measures during the time of 2005 to 2017 where CR is observed through NPLs in deposit banks. Their result suggest that significant relationship exists

between the stability measures like ROA, and ROE and CR, hence reasonable focus is required for the management of such risk factors with some modern techniques.

During the last decade, research work by Goodhart (2005) the influence of CR on FS along with financial regulations. Author has reasonably claimed that significant attention is required for the systematic management of the risk factors like CR which further reflected in better stability. Davies and Ng (2011) have raised their concern for the rise of sovereign CR for FS. It is claimed that different improvements regarding RM practices to handle the FS issues is required.

The role of RC in CRM is very significant in banking firms. Among others, RC is primarily responsible for developing the policies and procedures for proper management of CR in banking firms as per their risk profiles. However, for better understanding of the role of RC in CR and FS relationship following duties are identified as expressed by (Aggeorgia, 2019):

- Reviewing the bank credit and risk management related policies under the shadow of revised regulations, lending initiatives and providing the bank with revised credit policies.
- Monitoring CR and portfolio performance based on the reports, audits, and other documentary evidences to determine appropriate actions.
- Reviewing of the CR compliance by the bank as per the set standards by banking supervisory committee.

- Reviewing with the management significant CR exposure along with the steps taken by the management.
- Reviewing the methodology being adopted by the bank management for establishing the allowance for loan loss.
- Reviewing the type and quality of the reporting criteria regarding CRM.
- Conducting the evaluation of the committee's performance along with recommendations for the board chairman for necessary decisions.

After the GFC of 2007, a new regulation under the title of Basel III was introduced. The focus of this regulation was more on CR in both normal and stressful situations as explained by Varotto (2011). He analyzed the Basel Accords incremental capital charges, which capture CR losses. Meanwhile, other studies have also emphasized on the measurement of credit default size and nondefault components (Longstaff, Mithal, & Neis, 2005).

Arellano (2008) found that income fluctuation and economic crisis were more frequent trends in emerging markets as compared to developed economies. While focusing on the Argentinian economy, he found that occurrence of default risk was more during time of recession. Such a situation is costlier for borrowers who are risk-averse to pay their non-contingent debt amount. Since default risk holds significant attention for any banking firm, Basel regulations provide a guideline to measure and calculate the desired requirement of capital, which can secure banks from risk factors (Lefcaditis, Tsamis, & Leventides, 2014).

In their study on Greek companies under the financing shadow of Greek commercial banks, Lefcaditis et al. (2014) focused on portfolios having a range of CR and observed similar situation.

Besides, credit risk management (CRM) in banks is among core interests of various studies. For instance, Al-Tamimi and Al-Mazrooei (2007) have provided empirical evidence about the banking industry of UAE. Using the questionnaire technique, authors divided their work into two components: default risk and methods for its identification. Their findings explain that among other risk factors, CR is under significant consideration by the management of selected banks.

Among several performance indicators, CR in the form of NPLs is also widely observed as evident in studies like (Abid, Ouertani, & Zouari-Ghorbel, 2014; Makri, Tsagkanos, & Bellas, 2014; Messai & Jouini, 2013). Their focus was to access the short-run and long-run dynamics for NPLs in banks. Through the granger causality technique, it has been found that there exists a long-term relationship between NPLs, exchange rate, and inflation. Therefore, consideration of CR among key risk factors is very substantial. The present study has also focused on CR in the form of NPLs.

2.4.3 Operational Risk (OR)

Operational risk (OR) and its exposure is not something which is novel to banks in the financial market (Lindblom & Willesson, 2010). For OR, Basel II regulations have developed a calculation of advanced measurement approach, based on internal models of banks (Moosa, 2008). Such dynamic trends have also focused on moving the corporate ventures more towards OR. The financial distress for banks is also termed as harmful, resulting from an off event in their day-to-day operating events (Flores, Bónson-Ponte, & Escobar-Rodriguez, 2006; Moosa, 2008; Wahlström, 2009). However, operational practices by banks to monitor and control their venture from such negative financial consequences are found not mature enough.

Studies have exemplified operational events that have resulted in financial shocks with billions of losses to Barings Bank (Ross, 1997; Sheaffer, Richardson, & Rosenblatt, 1998) or a loss of millions of dollars to Irish banks due to rough trading (Dunne & Helliar, 2002). By considering the OR, Basel Committee on Banking Supervision (BCBS) has introduced specific capital requirements (Gillet, Hübner, & Plunus, 2010). Moreover, the context of OR for the banks is fundamentally different from other classes of risk factors as it is embedded in all types of products offered by banks. The portion of OR in total risk chart is about 10 to 30 % (Ames, Schuermann, & Scott, 2015). Hence, the Basel regulations were developed to address such categories of risk (Dionne, 2013).

From the context of European financial companies, the announcement of various operational losses has negatively affected the prices of stock (Sturm, 2013). However, the generalization of OR has captured various other industries as well. The study of Perera, Kimura, Kerr and Lima (2010) has encapsulated the framework of OR for non-financial companies of Brazil. Similarly, Murphy, Shrieves and Tibbs (2009) have covered the variety of illegal activities like bribery, copyright, and antitrust violation under the title of OR. The framework of Basel II specifically addressed the OR category with market and CR elements. It ensured a minimum requirement of capital which considers that banks will hold specific balance of capital for these risk classes (Chernobai, Rachev, & Fabozzi, 2008). As per Basel regulations, OR must consider various datasets, based on internal and external levels, and scenario analysis with internal control factors (Prorokowski, 2015).

Additionally, operational loss events faced by European financial institutions have been examined by Kaspereit, Lopatta, Pakhchanyan and Prokop (2017). Their findings have a viewpoint that OR is a firm-based factor and could be controlled by banking organisations. Another study conducted by Gillet et al. (2010) examines the stock market response after operational losses with its primary focus on time duration from 1990 to 2004 for 154 events of European and US-listed companies. They observed that such announcement about the declaration of losses has negative consequences.

Besides, OR in IBs has also received significant attention in recent years. The fundamental theme of Basel Accords applies to both CBs and IBs in Malaysia (Abdullah, Shahimi, & Ghafar Ismail, 2011). Additionally, the association between the size of the banks and ownership structure is also under researcher's interest (Sharifi et al., 2016). At the same time, Bajaj (2016) conducted research work on Indian banking industry with the consideration of Basel regulations for OR. Aloqab, Alobaidi and Raweh (2018) explained that after the GFC, OR has created various issues for financial institutions. Their study indicates that it is vital to work for the management of OR under the defined framework of Basel I, II, and III respectively. Meanwhile, authors have also focused on the various dimensions of OR as discussed in the literature. In addition, Barakat, Ashby, Fenn and Bryce (2019) have expressed their view that OR in financial institutions have potentially harmed the repute of the business. Additionally, the role of public information can be considered as moderator when the equity-based and debt-based reputational effects are reflected through OR announcement.

In recent time, trends in OR specifically in IBS are also observed by the researchers. For instance, Elamer, Ntim, Abdou and Pyke (2019) have examined the Shariah supervisory board and governance structure for the OR disclosure with the sample of 63 IBs, working in Middle East & North Africa (MENA) region. Their findings have provided some robust analyses when control for the various bank-related and country-level variables.

In the economy of Pakistan, OR and its management is a growing topic for banks, working under the shadow of SBP. RM guidelines have also been provided by SBP including on OR. The key focus of these guidelines is upon the explanation for the concept of OR and losses, identification of governance structure for banks, defining various tools for OR, and their present scenario. In addition, acceptable level of OR and risk mitigation techniques are also explained under this framework (SBP, 2014b). All the discussion above explains that the focus on OR is still in its emerging stage in various regions from the context of banks. Therefore, various issues are needed to clarify regarding OR and its management for better stability of the banks.

2.4.4 Market Risk (MR)

The concept of market risk (MR) covers the phenomenon of risk of losses due to a change in the price of equity, interest rate or change the price of commodities (Milanova, 2010). To manage the risk from market, banks have organized a variety of highly sophisticated techniques (Mehta, Neukirchen, Pfetsch, & Poppensieker, 2012). Various studies have been conducted to cover the idea of MR and its disclosure for banks. For instance, Savvides and Savvidou (2012) carried out a study that focused on cross-country analysis. From the overall banking sector, 30 firms from developed economies were selected. The content analysis explained that there was a significant difference both in the countries and their banks to disclose the MR. Another study by Ernst and Young (2008) has focused on various categories of MR. These are the interest rate risk for banks, exchange rate risk, equity price risk, exposure of subprime loans, and other assets related to mortgage. Besides, the

consideration of MR and its association with the performance of the banking firms has also been reviwed in previous studies. Ekinci (2016) has considered MR in the form of interest rate risk and foreign exchange risk. Findings of his study explain that foreign exchange risk has a significant influence on the performance of selected banks.

Additionally, the loss in the form of the liquidity portfolio from substantial motives of interest rate and currency rate has also been discussed. Research studies unanimously agree that policies and control of MR should be under consideration with well specified aims and objectives. Authors like Milanova (2010) has explained various objectives while dealing with MR which include protecting banks from uncertain losses, understanding of MR and its control, creating an information system, and establishing a good banking structure.

The concept of MR has also been examined in emerging economies. The study of Aydemir and Ovenc (2016) focused on the impact of short-term interest rate and slope of the yield curve on the earnings of banks. Under the title of financial risk, the interest rate has also been studied in the context of Malaysian commercial banks (Tafri et al., 2009). It is found that interest rate risk has a significant influence on performance of banks. In addition, several other studies have observed the interest rate risk and other MR indicators with their impact on bank's earnings and FS (Bikker & Vervliet, 2017; Hussain, Ihsan, & Hussain, 2016; Malik et al., 2014). Consequently, the present study aimed to focus on the interest rate as a critical indicator of MR.

2.4.5 Country Risk (CTR)

Due to its macroeconomic nature, the country risk impacts the entire economy. Since 1990, a growing trend in the global financial market has been observed due to value at risk (VaR). It measures the most significant portion of losses faced by business firms in their portfolio (Bredin & Hyde, 2004; Hyde & Bredin, 2004). Business firms like banks often face the exposure of CTR in the form of exchange rate and their performance may be affected by currency fluctuations (Chamberlain, Howe, & Popper, 1997). Their study measured the exposure of exchange rate sensitivity for return on equities in US banks. Their findings provided significant evidence for an adequate measure of CTR. However, sensitivity analysis could be suggested as a benchmark. In the recent past, the exposure of foreign exchange for the equity stock return has been studied by (Iorio & Faff, 2015). Their findings are consistent with the Australian equities markets, which are exposed to currency fluctuation.

The exposure of exchange rate risk (ERR) is also addressed by Adler and Dumas (1980) through regression value of assets on exchange rates. Additionally, the study of Choi, Elyasiani and Kopecky (1992) also examined the impact of exchange rate exposure on the banking industry. However, the critical question is to measure the exposure of CTR, for which a few steps are subtle but significant. For instance, a bank without any asset or

liability of foreign currency can quickly be exposed to ERR as it reflects the financial outcomes of local the local economy (Chamberlain et al., 1997).

The link of derivative exposure with the exchange and interest rate has been of serious concern for past researchers. For instance, Choi and Elyasiani (1997) have focused on US commercial banks during 1975 to 1992. By using seemingly unrelated simultaneous method, a cross-sectional dependence, heteroskedasticity and serial correlation, the betas for the exchange rate were found to be more significant, compared to interest rate factor. Additionally, they also found a significant association between currency derivatives, interest rate of banks, and their exchange rate.

In another study, Atindéhou and Gueyie (2001) have focused on exchange rate and sensitivity of Canadian banks during 1988 to 1995. They inspected the three-factor asset pricing theory. Their findings provided a compelling argument that earning of stock for banks is sensitive to the exposure of exchange rate. However, their findings for sensitivity are not stable over time as there exists asymmetric reaction to currency rate. The results of Merikas (1999), however, are in line with the exchange rate movements which influence the earning capabilities of Greek banks.

The exposure of exchange rate in the Asian financial crisis of 1997 and GFC of 2007 was analyzed (Jeon, Zhu, & Zheng, 2017). A comparative study was conducted during the period 1994 to 2013 using the stock return and exchange rates. Their findings are consistent with the argument that stock return is significantly affected in most Asian states. Additionally, the effect of ERR in East Asian economies like Malaysia and Singapore was examined by Aftab and Rehman (2017). Data was collected from 65 industries in both states for the implication of Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model. Their findings explain that currency risk has significantly influenced selected industries in the long-run.

The effect of the exchange rate has also been studied on the value of banking sector of Pakistan in the form of stock price. In their study, Jawaid and Haq (2012) have examined this relationship through cointegration approach. They found that there existed a long-run and negative, but significant association between exchange rate and stock prices of banks. The robustness of results has been tested through sensitivity analysis. Meanwhile, the association between exchange rate fluctuations and interest rate is positive and significant. For the final suggestion, it is stated that both the exchange rate and interest rate are core indicators for determining the investment decision in the banking industry of Pakistan.

Furthermore, the study of Abdalla and Murinde (1997) investigated the currency risk and value of the firm in emerging financial markets like Korea, India, Pakistan, and the

Philippines. They found that firm value in the form of stock price is closely related to CTR. Based on such findings, the present study has also considered CTR to check its impact on the FS of commercial banks in Pakistan.

2.4.6 Financial Crisis Impact (FCI)

The financial crisis in the year 2007 hit the world economy and specifically the banking industry. It shocked the entire global economy from 2007 to 2009 and is known as the most devastating since the great depression of 1930 (Sivakumar & Krishnaswami, 2011). The aftershocks of GFC spread from the US to the UK, Greece, and to Ireland. Initially, GFC was active in low-interest rate regimes. It was found that a massive amount of foreign funds was used to provide support in housing construction. This situation encouraged the consumption of debt financing in the USA specifically, where the Federal administration allowed everyone to get home at the lowest rate of 1%. Based on this relaxing debt facility, loans were granted to everyone without checking their creditworthiness (Sivakumar & Krishnaswami, 2011). Because of such financial innovations, individuals were granted with subprime mortgages who finally failed to pay back the loan amount. Various financial institutions were abortive in the US and Europe, including Asia, Africa because of "too-big-to-fail" theory.

Several studies have been conducted to examine the impact of such crisis on the economic health of a country. It is worth mentioning that financial crises erode substantially the bailout cost of most banks. Such types of charges have made a significant impact on the

economy because of the cyclical effect of risk (Bouheni & Hasnaoui, 2017). Furthermore, it has been stated that during the time of financial crisis, European banks were the principal source of various risks. However, the effect of the GFC on the FS, fragility, and bankruptcy of banks is still under considerable debate. For instance, Fu et al., (2014) examined the impact of financial crisis on competition and FS for Asia Pacific. It was found that due to bankruptcy and FS, financial crisis has negatively affected the banking sector. In a country like Pakistan, financial crisis has hit the banking sector directly. It is found that GFC has affected the liquidity, size, investment return, and quality of assets (Nazir et al., 2012). So, based on above arguments, the present research has considered financial crisis impact to be an important factor to determine the FS of commercial banks in Pakistan.

2.5 Regulation on the Bank Capital

2.5.1 Capital Adequacy Ratio (CAR)

Financial regulations too are reflected in the form of RM (Ojo, 2010). In this connection, the concept of capital adequacy ratio (CAR) and its portion in the financial record of a business are considered as an underlying layer for prudential supervision (BIS, 2004). The concept of minimum capital requirement for starting of business firms like a bank with the adequacy of capital demonstrates a natural constituent (BCBS, 2002). For this purpose, a new Basel accord was presented by the committee which described the major components of capital. These include a minimum requirement for capital, a review process by the

supervisory committee, and some market disciplines as described by (Ojo, 2010). He further highlighted the importance of capital adequacy in risk management.

In various banks around the globe, the Basel accord regarding capital requirements is examined thoroughly, both theoretically and empirically. For instance, Manlagnit (2015) analyzed the efficiency of Basel accord II to study the cost factors of commercial banks in the Philippines during 2001 to 2011 and observed that a higher capital requirement tends to improve the efficiency of cost. Besides, guidelines were also provided to policymakers to proceed with the reforms in the form of better capital requirement.

In another study, Vermorken and Vermorken (2011) focused on the financial regulations and provided a new framework for comparing Basel accord in the Eurozone. Pakravan (2014), similarly, aimed to review the earlier literature from the context of Basel regulations for capital adequacy. It recommended that Basel regulations should act as a compound mechanism regarding variation in the measurement of risk-based assets in banks.

Gottschalk and Griffith-Jones (2010) have examined the Basel II regulations in low-income countries. Their core aim was to investigate the trends in Basel accord, capital requirement, and challenges for the implementation in selected countries. By implementing survey

research, authors found that the sampled countries were vigilant about the Basel regulations. A few countries followed the Basel I recommendations while others went for Basel II. A theoretical discussion about Basel regulations and capital adequacy has been covered in the study of Kaur and Kapoor (2015) in the context of banking industry at global level. Their findings reveal the awareness about the Basel accords and increase in compliance in various part of global economy. The banking industry in the United Arab Emirates (UAE) is also following Basel II regulations, as stated by (Al-Tamimi, 2008). Their findings conclude that the banking sector in UAE during the last decade was quite prepared for the implementation of Basel Regulations to settle at capital level. Besides, numerous studies have focused on the level of capital ratio and FS (Arnold, Borio, Ellis, & Moshirian, 2012; de Souza, 2016; Mili, Sahut, & Trimeche, 2014; Oduor, Ngoka, & Odongo, 2017). Based on these theoretical and empirical evidence, the present study considered the inclusion of CAR as a regulation on the bank's capital in the commercial banks of Pakistan.

2.6 Governance Factors

2.6.1 Audit Quality (AQ)

During the last two decades, financial users, researchers, and legislators have conducted various debates on the concept of audit quality (AQ). Numerous factors fall under the title of AQ but there is no single definition to explain it fully. For instance, audit effectiveness is among the key examples to explain the concept of AQ (Greenhalgh & Peacock, 2005;

Mcmullen & Raghunandan, 1996). In a general context, the theme of the audit is to serve an organization efficiently. However, the effective audit must be conducted by some quality management system of an organization (Brandes & Schultz, 1996). Likewise, numerous principles define the effectiveness of audit. These include conduct of audit as per the set standards, linkages of audit plan with a firm's goals, explanation of auditor's qualification and competency, and so on. Additionally, examination of audit effectiveness, connection of preceding audit programs, and acceptable level of risk during audit also reflects the effectiveness of the audit.

The concept of earning management and its linkages with the role of the audit committee for ensuring quality reporting has been discussed by Lin, Li and Yang (2006). By using the multivariate logistic regression technique, they found a negative link between the audit committee and remuneration paid to it. The question of audit fee and audit quality is also addressed by Hoitash, Markelevich and Barragato (2007). Auditor's profitability (earning of auditor) as a new proxy, reflects the independence of the auditor. The notion behind this issue is that earning of auditors is influenced by risks by adjusting fee and efforts of the auditor. It is also observed that audit quality and the total fee are negatively associated with each other. By discussing the concept of audit reforms, Sikka, Filling and Liew (2009) opened the debate on contemporary practices about auditing. Their findings state that an auditor's financial strength depends upon the company who is paying to them. Besides, they argue that conventional audit quality approach is not a significant indicator for providing an effective outcome.

For the internal audit in Greek banking industry, Koutoupis and Tsamis (2009) inspected the branches and credit facilities. Their findings are consistent with the earlier results that stated that the traditional approach of the audit was not helpful for the covering of risk. They also explained that a majority of Greek banks were not focusing on banking regulations. These also constitute Basel accords and accounting standards for professional practices of internal audit. Under different levels of task complexity, the association between performance incentives and judgment of audit performance were examined by Mohd-Sanusi and Mohd-Iskandar (2006). Considering the Malaysian economy, they found that audit judgment and performance were positively linked to the performance incentive. The effectiveness of audit for banks in Bangladesh was studied by Siddiqui and Podder (2002) who explained that out of fourteen banks, seven were overstated in their current situation of profitability. Additionally, financial statements too failed to provide quality opinion for banking firms. Based on these findings, they raised a question about level of effective audit.

Furthermore, the oversight function of the audit committee to reflect audit quality has also been reviewed in the literature from the context of bank's risk-taking and RM effectiveness. Sun and Liu (2014) have found that audit committees with the long tenure of the board have lower idiosyncratic and total risk. However, those banks having busy directors on their audit committees have a higher level of idiosyncratic and total risk. Both of these above situations claim that effectiveness of audit committee may coerce the

banking firms from risk-taking activities. Expanding this discussion, Sun and Liu (2014) state that the fundamental assumption of option theory claims that bank management is influenced to invest in those projects where risk taking is high. For this reason, audit committee in the banks can influence such management's decision with the oversight of both risk assessment and RM respectively. In this regard, whenever the audit committee discover those projects having high-risk but low return and where bank management has decided to invest, the BODs can deny accepting such proposals (Sun & Liu, 2014). This fact justifies that high quality audit of the committee can discourage high-risk/low return projects and uphold high-risk/high-return projects, hence involve in RM practices of the banks. Meanwhile, this involvement significantly demonstrates the audit quality in the banks as performed by audit committee for better financial outcomes. It is also believed that audit committee effectiveness may increase the RM effectiveness for the banks.

Meanwhile, the role of audit quality in terms of involvement of internal auditors in RM is also explored. Sarens and De Beelde (2006) have highlighted the trend of quality of audit committee who has highlighted the severe shortcomings in RM practices in Belgian companies. Such observations by the audit committee demonstrates the value of internal auditors. Authors further claim that internal auditors are playing a pioneer role for standardized, documented and transparent RM system. Based on this discussion, the present study has therefore considered the AQ among significant factors in RM framework for better FS of the commercial banks of Pakistan.

2.6.2 Country-Level Governance (CLG)

The concept of country-level governance (CLG) is also reflected as a broader theme. It covers elements like the infrastructure for quality living, well qualified and educated labor force in an economy, stability at macro level, less corruption, and an efficient legal system (Asiedu, 2005). Regarding better governance at the country level, there are more chances for foreign companies to invest in the local market. Some studies were conducted to evaluate the effect of CLG on the performance of banks. These governance factors include political stability, voice and accountability, and absence of violence with government effectiveness. Regulatory quality, the rule of law and control of corruption also define the CLG as stated by Ho, Lin, & Tsai (2016) who discovered that CLG increases the performance of banks in developing countries.

The broader theme of governance has captured both corporate and country perspectives in defining the value of the firm, as expressed by Cumming, Hou and Wu (2017). Their findings have explained that CLG for the selected firms of Latin America has a significant association with earning management. For policymakers, it is suggested that the promotion of effective CLG mechanism, both assets and resources should be well utilized (Cumming et al., 2017). The evidence of Gani (2011) discusses the earnings management and governance of a country. It is observed that firms with strong governance put lower focus on earning management.

The impact of the country's corruption (a dimension of country governance index) on the banks has also been examined in previous studies. For instance, a study by Shen and Lin (2012) has addressed this relationship between government-owned and private banks. It considered the political inference hypothesis to define how political influence depresses the performance of public banks. Political influence is measured through a situation where bank executive is replaced after every 12 months when general elections take place in the country. Their findings also explained that the performance of political banks was worse than that of non-political banks. Such a performance indicates poor governance too. The present study therefore focuses on such measures of CLG in order to evaluate its impact on the financial stability of commercial banks in Pakistan.

2.7 Financial Stability (FS)

Like the concept of price stability in an economy, the concept of financial stability (FS) is not easy to explain and measure. Various financial systems are currently working in a global context, and there is a complex interaction between them. However, during the last two decades, financial analysts and researchers in banking and finance domains have explained the idea of FS (Gadanecz & Jayaram, 2009). The study of Goodhart (2006) has theoretically evaluated the FS and its measurement and concluded that it is crucial to evaluate FS as it is related to the overall economic system. For banks, various studies have indicated the role of FS. These studies have focused on factors like cyclical behavior, bank competition, reforms, foreign ownership, liquidity, credit, operational and MR in order to understand FS (Bouheni & Hasnaoui, 2017; Fu et al., 2014; Lee & Hsieh, 2014). FS is also observed from the context of social capital (Jin, Kanagaretnam, Lobo, & Mathieu, 2017).

Banks are considered as a significant player for economic development and long-term stability. During the last six decades, factors like financial distress, poor leadership, uncertainty in financial trends, and political interference are observed in banking industry (Muriithi & Louw, 2017). Under the shadow of corporate finance, various indicators are detected to analyze the trends in FS (Gadanecz & Jayaram, 2009).

Different policymakers and researchers in the academic field have defined the quantitative measures of FS. At the country level, it is measured through GDP growth rate. However, from the perspective of corporate sector, leverage ratios, time interest and fixed payment covered ratios, profitability measures, capital ratios and asset quality are some common measures of FS (Gadanecz & Jayaram, 2009). In the study of Hesse and Čihák (2007), the stability of cooperative banks is observed through firm-based and industry-related factors. For instance, loan to assets ratio, cost to income ratio, and diversity in earnings are firm based measures. While market share, Herfindahl-Hirschman index, inflation, interest rate and exchange rate are macroeconomic measuers of FS.

The study of Berger, Klapper and Turk (2009) has tested the impact of loan risk, bank equity capital, and bank risk for twenty-three developed states and 8235 banks. Their findings suggest that competition and stability theory of bank with a high degree of market strength have less exposure to risk. Additionally, their data set provided a supportive

argument for competition-stability relationship. They also stated that loan portfolio risk increases with the market power and may offset with the higher capital equity ratios.

Cihák and Hesse (2008) have examined the FS of ICBs for eighteen banking systems in different regions of the world. They found that small IBs tend to be more stable, compared to small CBs. In addition, larger IBs are not stable relatively to CBs. Finally, the market share for IBs has no significant impact on financial strength of other banking players in the selected economies.

In the existing literature, the emerging concept of FS has covered various dimensions. These are in the form of ROA, ROE, capital ratio, and their usage to calculate the Z-score (Bouheni & Hasnaoui, 2017; Jin et al., 2017). However, the other indicators like standard deviation of ROA and standard deviation of ROE are also under observation to clarify the idea of FS. However, better stability can be reflected if the effect from macroeconomic indicators is controlled. In this perspective, research findings of Fu et al. (2014) provide a symmetrical evidence. The present study has therefore considered FS as a major dependent variable in the context of commercial banks of Pakistan.

2.8 Moderator of the study

2.8.1 Risk Committee (RC)

RM and its linkage with the FS is very crucial for the survival of business firms like banks. The concepts like RM committee, risk disclosure and financial results are closely associated to each other (Abdullah, Shukor, & Rahmat, 2017). Similar findings have been explained in the study of Nahar, Jubb and Azim (2016) that RC and RM are closely linked to both market and accounting-based measures of performance (ROA, ROE). Such performance measures are the most significant indicators of FS (Bouheni & Hasnaoui, 2017a; Fu et al., 2014; Soedarmono et al., 2011).

Considering the global trend about RM framework and related committees, the New York Stock Exchange (NYSE) has defined some standards. It suggests that the listed firms must establish the audit committee or a specialized committee for risk assessment and management (Bates & Leclerc, 2009). In the UK, Integrated Governance Solutions (IGS) have recommended that banking firms should establish a board RC with the prime obligation to oversight and advice the board about the contemporary risk exposure and future strategies as well. It is argued that the presence of RC may increase the independence of risk governance. The obligation of RC can also increase the reliability of RM information under the title of agency theory, which defines the separate roles of such a committee (Subramaniam, Carey, de Zwaan, & Stewart, 2011).

In the wake of GFC, a significant discussion was initiated regarding how financial institutions should improve their RM oversight (Hines & Peters, 2015). It is now widely accepted that RM committee represents the utilization of corporate governance mechanism. For financial firms like banks, the importance of RM practices can be viewed in the sense that one-third of them have created a RC (Keenan, 2010). The reason for the formation of RC in banks is primarily due to the nature of the business as they face some homogenous and distinct risk factors (Hines & Peters, 2015). In the light of crisis during 2008, there is also an ongoing debate among practitioners and regulators about the risk governance roles to be embraced by the board. The critical point of this debate explains whether the BODs should define a separate RM committee to identify and monitor the critical risk factors. Moore and Brauneis (2008) demonstrate that risk oversight should be strengthened because specific business resources are being utilized for the evaluation of risk profile.

Besides, various factors have been identified in the past studies, defining their role as crucial determinants for the formation of RC or audit committee. Pincus, Rusbarsky and Wong (1989) examined one such factor of giving incentives for the formation of audit committees. It was argued in their study that firms form an audit committee under different situations such as high leverage horizons, low managerial equity, more members as external directors, and high business size. However, findings by Bradbury (1990) provided a different argument where managerial equity ownership, size of the firm, big number of eight auditors and leverage factors are not associated to the formation of the audit committee for carrying out RM practices. Likewise, Eichenseher and Shields (1985) have

defined that firms that hired new auditors are more interested in formation of audit committees under a situation where descendant belongs to big eight auditors. In another study, Pagach and Warr (2010) argue that firms with higher risk and volatility in their operating cash flows are more likely to adopt enterprise risk management and likely to form RM committee. Besides, some research studies have empirically examined RC and its relationship with performance. It is believed that firms with an important governance mechanism have enjoyed higher performance and value (Gompers, Ishii, & Metrick, 2003).

RC has various dimensions like size, frequency of meetings and independence. The size of RC is explained in terms of number of directors or board members in the team (Ng et al., 2012). Bedard, Chtourou and Courteau (2004) assert that big sized RC provides strength and diversity and proves very useful in removing potential problems in businesses. There are other empirical findings that are consistent with this argument and have suggested that size of RC defines the performance of a company. Pearce and Zahra (1992) have also argued that the resource dependency supports the size notion in a sense that larger committee means more resources to utilize in addressing the business issues. In addition, a larger audit committee (in some organizations responsible for RM) can boost the power of committee members (Kalbers & Fogarty, 1993). It is also a common notion that RC can address the risk matters in a more effective way (Ng et al., 2012).

In recent years, the moderating effect of RM committee and audit committee between the relationship of RM disclosure and firm performance has been empirically examined. In their study, Abdullah and Shukor (2017) have considered these two governance mechanisms for analyzing their interactive terms as performance indicators in non-financial firms in Malaysia. Along with the content analysis, multivariate statistical approached was applied to examine the moderating effect of both selected committees. Their findings significantly suggest that risk governance mechanism plays its role for investors in examining and evaluating RM information. Although the audit committee in some organizations is responsible for RM practices, their expertise required for RM is doubtful as explained by (Fraser & Henry, 2007).

Turning to the economy of Pakistan, the RM framework as defined by SBP includes liquidity, credit, operational and market risk factors under its core observation (SBP, 2010b). For oversight and management of all these risk indicators, RM framework is defined, covering the scope of risk, process and procedure to manage risk, and duties of various individuals involved in RM practices. For this purpose, SBP has instructed commercial banks and DFIs to develop a separate department or RM committee which can appropriately perform such functions. It is further suggested that each banking firms in local financial market can develop a subcommittee under the title of credit risk management committee (CRMC), which can directly report to RC. However, the central RM committee or RC can include the members from other subcommittees like credit, market, operational, and liquidity (SBP, 2010b). In this regard, SBP has further highlighted

the duties and responsibilities for RM committee. These include the development of strategic policies and guidelines for significant risk categories, resource allocation for RM committee, and preparation of comprehensive and fully documented guidelines with relevant staff members.

Additionally, reviewing and approving market risk and its limit, ensure the robustness of financial models and management information system related to risk reporting under the obligation of RC in local banks of Pakistan (SBP, 2010b). Based on the above discussion, the size of RC is considered as a key moderator in the present study to explain the relationship between RM and FS in commercial banks of Pakistan.

2.9 Control Variables of the Study

In the existing literature, numerous factors are under discussion with their significant impact on FS of banks. These are in the form of micro-economic or firm-based factors, as well as macroeconomic or country-based factors. Firm based are those factors which are under the control of management while macro factors considered beyond the control of management. In the present study, the following control variables are added in the model:

2.9.1 Size of Bank (SOB)

In the existing literature, the size of the bank (SOB) is a most cited proxy having a significant impact on earnings and FS of the banks. It is measured by taking the natural log of total assets of a firm. As compared to small banks, large banks have more diversification

in their risk-taking behavior and have a better access to financial and capital markets (Shim, 2013). A famous proposition "too-big-to-fail" explains that large banks face a high level of probability of being bailed-out at the time of financial distress. As explained by Bertay, Demirgüç-Kunt and Huizinga (2015), SOB has covered the too-big-to-fail concept. Besides, large banks face the issue of moral hazard because of government policies. In numerous studies, SOB is considered as a core control variable. For instance, Bouheni and Hasnaoui (2017) in their research work, added SOB as a control variable due to its significant association with risk and FS. Their study explained that for all measures of FS, SOB has a highly significant and positive impact. In another study of Clark, Radić and Sharipova (2017), on FS through Z-score, the impact of SOB was examined as a control variable. Outcomes of the study explain the fact that for both measures of FS (ZROA, ZROE), SOB has a positive and significant impact. Besides, various other studies have used SOB as a controlling factor while examining the relationship between risk and FS (Diallo & Al-Mansour, 2017; Jin et al., 2017; Soedarmono et al., 2011). The present study has considered SOB as a first control variable in its research framework.

2.9.2 Gross Domestic Product (GDP)

The impact of gross domestic product (GDP) on FS has been examined in various studies. The value of GDP is measured through a natural log of total value of goods and services in a domestic market, hence it becomes the most cited measure of GDP (Bouheni & Hasnaoui, 2017; Clark et al., 2017). In the study of Horvath and Vaško (2016), GDP is considered as a control variable to check the robust impact of various explanatory factors of FS. Ho et al. (2016) have empirically investigated the performance of banks with country governance

and considered GDP growth rate as macroeconomic control variable. It is found that GDP growth rate has a significant influence on ROA. Bouzgarrou, Jouida and Louhichi (2017) have observed the macroeconomic indicators as control variables while examining the risk of financial crisis and performance of 170 commercial banks. The main reason to consider the GDP as a macroeconomic control variable is that higher GDP increases the demand for interest and non-interest earning activities.

Additionally, in the upturn of economy, default risk is lower compared to downturn. Ahamed and Mallick (2017) have examined the financial inclusion and FS for 2600 banks in 86 countries by controlling the effect of GDP growth rate and GDP per capita. It was found that the GDP growth rate has a significant impact on 1-5 quantile equations of Z-score for ROA. Based on the findings of Krause, Sondershaus and Tonzer (2017) and Sanfilippo-Azofra, Torre-Olmo, Cantero-Saiz, and López-Gutiérrez (2018), the present study has included GDP as its second control variable.

2.10 Theories of Risk Management and Financial Stability

Numerous theories deal with the concepts of RM and FS. From the perspective of banks, some essential underpinning and supporting theories that have received global attention include as under:

2.10.1 Agency Theory (AT)

The concept of agency theory (AT) was introduced by Jensen and Meckling (1976) under the title of "Theory of Firm: Managerial Behavior, Agency Cost and Ownership Structure". Their significant contribution under this label provided a dominant theoretical framework in the field of corporate governance (Daily, Dalton, & Cannella, 2003; Lan & Heracleous, 2010). At present, the adoption of AT exists in all business firms and various academic fields like accounting, finance, political science, organizational behavior and in sociology (Fama & Jensen, 1983; Jensen & Meckling, 1976; Kiser & Tong, 1992; Kosnik & Bettenhausen, 1992; Ronen, Kashi, & Balachandran, 1995). More specifically, the extensive existence of agency issue in various business firms has made AT as among the most significant theoretical assumptions in the field of finance and economics (Panda & Leepsa, 2017).

Additionally, in the literature of management and economics, AT is observed as the oldest theory (Daily, Dalton, & Rajagopalan, 2003). The central concept under the shadow of AT discusses the issue in the firms due to the separation of two parties (owners and managers) as it helps to control the action of business agents under various governance mechanisms. In the case of a company, ownership is entitled through stocks/shares as held by individuals or groups who are known as shareholders (principals). In this way, shareholders provide the authority to agents to run the operational activity on their behalf (Jensen & Meckling, 1976). However, agency conflict arises when these agents work for their self-interest instead of shareholders/principals (Panda & Leepsa, 2017).

In the literature context, a contractual relationship between principal and agent is widely discussed. The principal is the person or the main party who owns the business and agent manages the day to day affairs in business on behalf of their owners. Although both parties are residing under one platform i.e. the firm, there is a conflict of interest between them. This conflict can be termed as agency problem or agency issue. Researchers in the field of finance and economics divide the agency problem into three major categories: "Type I" category is between owners and their agents, which primarily arises due to information asymmetry and a difference in risk-sharing behavior (Jensen & Meckling, 1976). Business owners assign the task to their mangers regarding business management so that they will work for the benefit of their owners. However, agents/managers are more interested in maximizing their benefits, which is known as agent's self-satisfying behavior (Williamson, 1988). This principal-agent conflict and misalignment of interest are due to diffused ownership structure and low monitoring (Panda & Leepsa, 2017).

The underlying assumption for "Type II" agency issue is the mismatch between major and minor shareholders/owners of business. Major shareholders hold the majority of business shares while minor shareholders possess very less portion of ownership. This difference in ownership provides major shareholders as a key position with high voting power, compared to minor shareholders. In this regard, major shareholders can take those decisions or influence over those decisions which can provide them more benefit (Fama & Jensen, 1983). Such types of agency problem exists either in a company or a country or both, where

the ownership powers are primarily in the hands of a few persons having family ownership (Demsetz & Lehn, 1985).

The agency problem between shareholders and creditors is entitled as "Type III". Such conflict arises due to financing decisions and projects undertaken by shareholders in a business (Damodaran, 2010). In this regard, shareholders try to invest in risk-based projects to get maximum expected return. However, the cost of financing increases due to higher risk in projects and there is a decline in the value of external debts. In this way, creditors are directly affected. On the other hand, if the project is fruitful, the shareholders enjoy the significant returns, while creditors' income is limited in the form of fixed interest payments. Additionally, the loss in the risky projects compels the creditors to share some loss (Panda & Leepsa, 2017). Figure 2.1 indicates three types of agency issues as observed in the past literature.

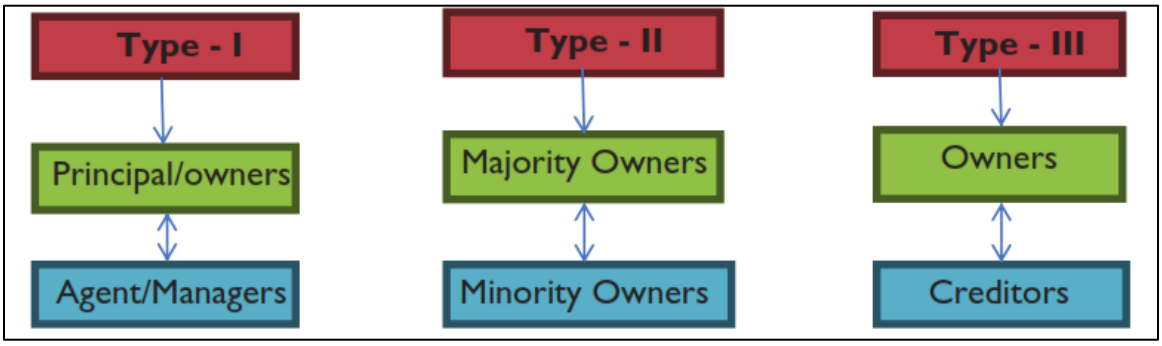

Figure 2.1
Various Types of Agency Problem
Source: Panda and Leepsa, 2017

The implementation of AT increased during the 1980s when organizations started to perceive the role of managers in the form of agents (Zajac & Westphal, 2004). As RM

practices, AT explains the agency issues while focusing on the management's attitude towards risk (Smith & Stulz, 1985). There seems to be a mismatch of interest between stockholders, debt holders, and management of business firms (Mayers & Smith Jr, 1987). In the last three decades, management concerns for implementation of RM has been investigated with the perspective of AT. The notables are from the context of risk-taking approach of executives and agency cost (Bosse & Phillips, 2016; Géczy, Minton, & Schrand, 1997; MacCrimmon & Wehrung, 1990; Nguyen & Faff, 2002; Tufano, 1998). However, it is essential to think about the horizon of AT for the economic point of view with risk sharing between principal and agent (Eisenhardt, 1989).

AT provides substantial evidence for RM regarding hedging, which helps to test several hypotheses. For instance, positive linkage for hedging is to decrease the risk, which is useful for firms with high debt to equity ratio (Klimczak, 2007). Jassim, Dexter, and Sidhu (1988) have studied the concept of AT and expressed that managers in a company may pursue interests different from those of shareholders, which finally turns into agency conflict. Such conflicts of opinion affect the business structure in the form of investment, compensation, capital structure and financial reporting (Jassim et al., 1988).

In banks, managers are forced to take risk in the presence of capital required to cover the opportunity cost of idle capital (John, Saunders, & Senbet, 2000). Besides, the concept of too-big-to-fail provides a critical argument and leads towards a high-risk level. Banks

understand their significance regarding FS, and in case of any financial unrest, they will be bailed out to avoid further financial disturbance (Battilossi, 2009; Hellmann, Murdock, & Stiglitz, 2000). Finally, in case of failures, there is a mismatch of interest in shareholders and managers, wherein shareholders will not bear the extra cost of failure (Alexander, 2006).

For a better financial system, therefore, the well-being of a bank is essential (Adams & Mehran, 2003). In overall business activities, the role of the BODs defines that they act on behalf of the shareholders. Under the context of AT, there should be a risk tradeoff between principal and agent (Wiseman & Catanach, 1997). This tradeoff will help to reach the optimal output for a business (Donnellan & Rutledge, 2016). However, FS can only be achieved when there is a significant focus on governance structure (Lupu, 2015). This concept is widely accepted for banks and other non-financial institutions (Diallo, 2017; Tunay & Yüksel, 2017). Besides, it is also argued that corporate governance ensures the FS through reliability and credibility to shareholders and depositors (Lupu, 2015).

Furthermore, managers are key agents of their owners as they are responsible for managing the risk of banks for better FS. In this regard, the role of BODs is vital because of their presence in the development of strategic policies. Therefore, AT may be considered as underpinning theory as it reflects both factors of RM (duties of managers) and FS (outcomes of RM). Turning towards the context of the present research, the problem of

increasing risk in commercial banks of Pakistan is causing lower FS. This issue has seriously raised a few reservations of shareholders, who are known as key owners in local commercial banks. Such mishandling has created a conflict of interest between bank owners and their managers which can be termed as agency issue. Therefore, this study has observed AT as underpinning theory to cover the broader context of RM and its impact on FS in local banks of Pakistan.

2.10.2 Stakeholder Theory (SHT)

The concept of stakeholder theory (SHT) was initially developed and presented in mid-80s as a managerial instrument (Freeman, 2010). The primary focus of SHT was to create a balance of interest between various parties of a business. Under corporate strategies and policies, SHT has been given due attention in past studies (Klimczak, 2007). Meanwhile, the extension of implicit contract theory to other fields like from employment to sales and to financing is the most significant contribution (Cornell & Shapiro, 1987). In high technology and service industry, the trust of consumers can contribute towards value stability of an enterprise in future as explained by (Klimczak, 2007). The author claims that the value of these contracts is implicit and sensitive to the cost of financial unrest and bankruptcy. The practices of RM may also take the trickle-down approach resulting in expected cost and increase in the value of a business (Klimczak, 2005).

Donaldson and Preston (1995) have provided a conceptual understanding of SHT. They claimed that various parties are associated with a business firm. All persons or groups have

their legitimate interest in a business enterprise, and there is no prima facie priority of one set of interest over others. Therefore, double-headed arrows, as depicted under Figure 2.2 indicate the two-way relationships between parties as represented with same size and shape.

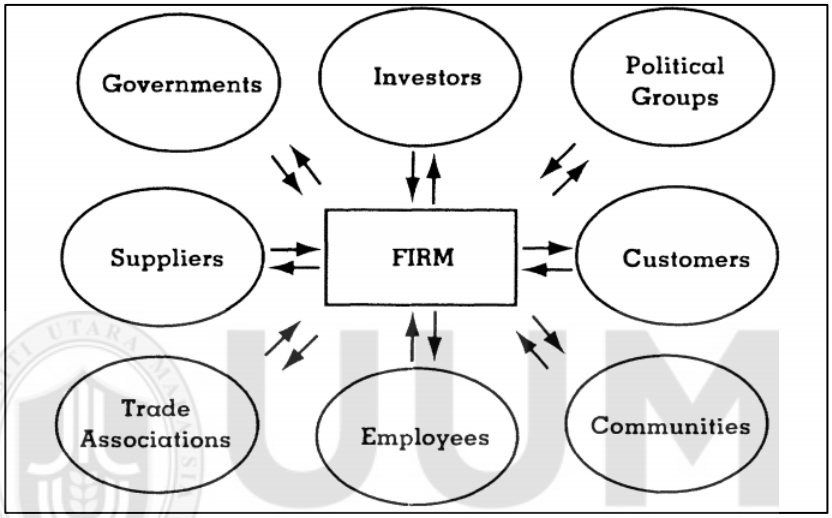

Figure 2.2
The Stakeholder Model
Source: Donaldson and Preston, 1995

The central theme of SHT holds that values are an explicit part of any business firm. For this purpose, business firms demand from managers to articulate values with stakeholders (Freeman, Wicks, & Parmar, 2004). Besides, SHT focuses on the way of doing business by managers and to create their relationship with stakeholders as expressed by Freeman et al. (2004) who identified two central questions as targeted by SHT. The first is linked with the primary objective of a business, while the second brings stakeholders and business together. If the interest of stakeholders is considered jointly, it will be the duty of managers to retain this relationship in the right direction (Freeman et al., 2004). To keep a right

relationship with stakeholders, managers should adequately manage all kinds of risks. Therefore, SHT provides new insight into the rationale of RM. However, it was tested indirectly for the hypothesis of financial distress (Smith & Stulz, 1985; Judge, 2006).

Moreover, the testing of SHT as RM approach has been empirically examined by Klimczak (2005). It has also been inspected in various studies, employed to observe the social and financial performance of corporations. For instance, Ruf, Muralidhar, Brown, Janney and Paul (2001) examined the idea of SHT to investigate the relationship between corporate social and financial performance. The findings of their study explained that the dominant group is that of the shareholders who can get a financial reward when managers properly perform their obligations. Some other studies hold the view that SHT and financial performance are related to each other (Berman, Wicks, Kotha, & Jones, 1999; Preston & O'bannon, 1997; Van der Laan, Van Ees, & Van Witteloostuijn, 2008).

Based on the above discussion, it is argued that business managers are responsible for managing business activities, including risk for excellent financial outcomes. Better financial performance regarding ROA and ROE leads to FS in businesses like banks (Kumar, 2016). Thus, the present study has also considered SHT as a supportive theory to study the relationship between RM and FS while focusing on benefits of various stakeholders of local commercial banks in Pakistan.

2.10.3 Modern Portfolio Theory (MPT)

To maintain the investment structure, all investors have a range of options. Among various alternatives, a significant decision is to choose the investment in each class with a specific proportion (Shipway, 2009). Markowitz (1968) suggested the approach of modern portfolio theory (MPT) for which he formulated a portfolio platform (Elton & Gruber, 1997). In his study, Markowitz provided guidelines for investors to develop an efficient frontier, depending upon risk-return preferences. The essential proposition in this model is based on mean and variance, holding constant variance, as well as the constant expected rate of return. The fundamental assumption behind portfolio theory is to consider the risk-return tradeoff. Therefore, the main point was to observe the rationale investors around the globe who could construct their efficient portfolios (Gitman et al., 2015).

The impact of the portfolio (or diversification in the investment model) on financial performance has been widely examined in banking firms (Tah, Tah, Martinez, & Martinez, 2016). However, the critical point is to discuss portfolio diversification and portfolio specialization. The traditional model of portfolio has been focused on the point that diversification minimizes the occurrence of economic unrest (Diamond, 1984). On the other hand, the advocates of portfolio specialization like Winton (1999) explain that when there is a higher likelihood of the chance of being insolvent for a business, diversified investments will expose the firm. Such a situation takes the entire financial institutions like banks towards financially distress (Winton, 1999). The performance of the portfolio may be affected by default risk of securitized assets and their diversification (Tah et al., 2016).

Some earlier studies have focused on this risk-return linkage to explain the idea of MPT. For instance, Berger, Hasan and Zhou (2010) have concentrated that specialized banks can increase their rate of return with lower value of risk. Another study by Hiraki, Liu, and Wang (2015) states that industry specialized funds have outperformed the industry diversified funds.

Various other studies have implemented the portfolio theory in different banking sectors. Bebczuk and Galindo (2008), for instance, focused on the banking firms in Argentina. They explain that diversification strategy as taken by management is beneficial for risk reduction and profitability. Other studies like Rossi, Schwaiger and Winkler (2009) provided findings for Australian Banks; the study of Acharya, Hasan and Saunders (2006) for Italian Banks, Behr, Kamp, Memmel and Pfingsten (2007) for German Banks, and Tah et al. (2016) for the US Banks. All these researchers have shared the similar view that risk reduction is reasonably addressed through portfolion diversification.

As stated earlier, the central concept of MPT is the investment diversification, which provides better returns to investors. However, the volatility in return is also associated with the diversification in investment. For instance, Mathuva (2016) has experienced a limited diversification benefits. Koong, Law and Ibrahim (2017) too examined the credit expansion and FS in the Malaysian context. Findings of their study indicate that expansion of credit facilities by banks has negatively affected the FS index of Malaysian banks. This negative

synchronization is due to the mismanagement in designing policies and presence of CR in the form of NPLs. Besides, some other studies have considered investment diversification, return measures and FS in banking firms as well (Amidu & Wolfe, 2013; Ashraf, Ramady, & Albinali, 2016; Hwang, Xu, & In, 2018; Lee, Hsieh, & Yang, 2014).

More specifically in commercial banks of Pakistan, there is a significant problem of higher CR in the form of NPLs. Such issue has not only affected the earning capacity of the banks but has also increased the operating cost, default probabilities with lower FS. In this way, diversification in the loan portfolio is of grave concern, which is the core assumption of MPT. Additionally, the increasing level of CR in commercial banks of Pakistan has raised the question about little focus on portfolio specialization; the second dimension of MPT. Therefore, this study has significantly added MPT as supporting theory to provide a logical understanding of risk factors (specifically CR) and their outcomes in the form of financial fragility.

2.11 Review of the Risk Factors, Capital Regulations, Governance Measures and Financial Stability

This section covers the critical discussion on various risk factors and their association with key indicators of FS.

2.11.1 Liquidity Risk (LR) and Financial Stability

There is no dearth of studies on the relationship between liquidity risk (LR) and FS through ROA in both developed and developing economies. During the last decade, Kosmidou, Tanna and Pasiouras (2005) investigated the LR during 1995 to 2002 with ROA in UK commercial banks. It was found that LR regarding liquid assets to short-term funding has a significant and positive relationship with ROA. Shen, Chen, Kao and Yeh (2009) too examined various LR measures with ROA for commercial banks of twelve advanced economies from 1994 to 2006. Their findings explain that LR lowers the ROA for selected banks.

In their research work, Mahdi and Abbes (2017) study the MENA region for both Islamic and conventional banks. They have found a positive and significant association between LR and ROA. The study of Ghenimi, Chaibi and Omri (2017) has examined the effect of liquidity and other risk factors on bank's stability. They have found that ROA is positively and significantly associated with the LR of the banks. Based on their findings, they have suggested various policy implications for banking sector management and supervisors. Their findings are consistent with those of (Wasiuzzaman and Tarmizi, 2010).

In their study, Berger, Boubakri, Guedhami and Li (2019) have stated the idea that although IBs have got significant growth, little is known about their liquidity creation and its relationship with the FS. They have addressed the relationship between liquidity and FS

for IBs in 24 countries during the time of 2000 to 2014. Findings of their study reveals that IBs are more efficient in creating the liquidity, compared to CBs. However, creation of liquidity by CBs resulted in less FS at national level, specifically in high-income economies. However, liquidity creation by IBs in these economies have not reported any type of less FS at macro-level.

Hassan, Khan and Paltrinieri (2019) have provided a comprehensive assessment for the LR of IBs comparatively to IBs along with CR. To address this objective, they have collected the data for 52 IBs and CBs from Organization of Islamic Cooperation Countries (OICC) during 2007-2015 with annual observation while applying the simultaneous structural equation approach. They have found that there is a negative association between LR and CR in IBs. Additionally, during the time of financial crisis, both IBs and CBs have provided a negative association with FS. However, in managing both liquidity and CR, IBs have outperformed CBs. On the other hand, Keister (2019) has examined the trend of Basel III liquidity regulation through liquidity coverage ratio which can impact on short term interest rate with the implementation process of monetary policy. Author has discussed the fact that central bank can react to his develop framework while implementing the monetary policy for promoting FS through liquidity regulations.

LR affects both the performance and reputation of banking sector (Jenkinson, 2008). In an empirical study, Perera, Skully and Chaudhry (2013) reviewed commercial banks in South

Asian region. Data was collected for Bangladesh, Pakistan, India, and Sri Lanka for dynamic panel regression method. Based on the empirical findings, it was suggested that there exists a negative and significant relationship between LR and ROA. However, their study has several limitations. Due to various constraints, some other bank-specific factors like off-balance-sheet activities and a composite measure of deregulation and financial liberalization were not included in the model.

There are also a few very current studies, focusing on the LR and FS indicators like volatility in ROA and ZROA. For instance, the study of Bouheni and Hasnaoui (2017) examined their association for 722 commercial banks from 16 countries of Eurozone, covering the period of 1999 to 2013. For the LR, the ratio of liquid assets to total assets was also calculated. By applying the generalized method of moments (GMM) approach, it was found that LR has a significant and negative association with the ZROA but the negative and insignificant link with volatility in ROA.

Soedarmono et al. (2011) examined the association between loan to deposit ratio (LDR) and FS through ZROA. For this purpose, data was collected for various commercial banks from 12 Asian countries, including Pakistan from 2001 to 2007. Regression approaches like fixed effect and GMM were applied with two-stage least square (2SLS) model. Their study explained the fact that ZROA was significantly and negatively related to LR under fixed-effect model. While under the GMM approach, this association was positive and

insignificant. Besides, it was also explained that various other risk factors are significantly affecting the FS. In addition, Lee and Hsieh (2014) examined the link between ZROA and LR in terms of liquid assets to total assets. It was found that LR has a negative association with the FS through ROA in the selected region. Similar findings were extracted after testing the barrier of new entry in the market. Besides, after testing the quality of supervision of selected banks, it was found that the association between LR and Z-index was negative.

The relationship between the second indicator of FS (ROE) and LR has been examined in numerous studies. During the last decade, Shen et al. (2009) have observed the association between liquidity and ROE in developed economies. They have found that LR has an adverse impact on ROE. Onakoya and Onakoya (2013) conducted a comparative analysis for both Islamic and conventional banks in the UK with the premise that LR can be measured through loan to deposit ratio, cash and portfolio investment to deposit ratio, and loan to asset ratios. Their findings provided evidence that CBs and IBs have a mean liquidity ratio of 112 % to 210% during 2007 to 2011. Additionally, the value of ROE during the time of the study was 6.71 % for conventional banks and -5.65 % for IBs. Their findings indicate that although IBs have higher liquidity ratio, yet they experience a negative ROE during the period of 2007 to 2011.

In another study, Ghenimi et al. (2017) considered the LR model for banks in the MENA region. Their findings explain that the average level of LR and ROE in selected banks were .090 percent and 10.99 percent respectively. Furthermore, empirical outcomes explain that association between liquid assets to total assets and ROE is positive but insignificant. Their findings are consistent with (Rahman & Banna, 2016). Furthermore, research contribution by Iqbal (2012) viewed the LR and its management as the significant risk mechanism for banks in Pakistan. He found that there exists a significant and positive association between LR and ROE. At the same time, Ariffin (2012) also examined the link between ROE and LR for the financial performance of Malaysian banks during 2006 to 2008. Based on descriptive statistics, they observed that on an average, Islamic banks have 41.63 % ROE with 0.34 % of LR. Their findings provide a good understanding of this comparison. However, insufficient time duration was among the key limitations of the study.

For developed economies, the association between LR and FS indicators like volatility in ROE and ZROE was examined by (Bouheni & Hasnaoui, 2017). It was found that LR regarding liquid assets to total assets ratio had a significant association with volatility in ROE and ZROE. However, after the consideration of co-movements between lending, business cycle and capital of the bank, this association was found significant and positive.

Soedarmono et al (2011) empirically analyze the trends in ZROE of 12 Asian countries through descriptive statistics with panel regression models like GMM and fixed effect. It

was found that ROE has a significant and negative association with loan to deposit ratio. However, under GMM, this relationship was insignificant. In another study of Lee and Hsieh (2014), it was found that ZROE has a significant and negative association with LR (liquid assets to total asset ratio). Hence, the relationship between LR and FS measurement through ROE offers the rationale to analyze it in the present research.

For effective liquidity RM by the commercial banks, analyzing the role of RC is very important. As per the findings of SBP (2010), the prerequisites for an effective liquidity RM covers an informed board, efficient management, and staff with the relevant expertise (normally members of RC). Therefore, it is assumed that members of board like RC must understand the profile of LR in the bank along with the tools for its resourceful management. Another influence of RC in managing the LR specifies that it needs to ensure that bank is capable enough to confront uneven liquidity issues.

Another significant involvement by the bank management like RC is to ensure on and off-balance sheet position of the bank for LR management. This capability can provide the bank with forecasting the future cash flows along with funding requirements (SBP, 2010). It is the prime obligation of the bank to define liquidity policies as recommend by the Asset-Liability Committee with the approval from the board members like RC. This process also signifies the involvement of RC in LR management practices (SBP, 2010).

Accordingly, the above discussion provided enough evidence to consider LR as key determinant of FS in commercial banks of Pakistan in the current study.

2.11.2 Credit Risk (CR) and Financial Stability

The association between credit risk (CR) in the form of non-performing loans (NPLs) and ROA has also received significant attention in the current literature. For instance, Ghosh (2017) focused on NPLs and their relationship with ROA for 100 commercial banks in the United States (US). Data was collected for the time duration of the last quarter of 1992 to the first quarter of 2016 with the static fixed effect and dynamic GMM estimation approaches. The findings of the study suggest a negative and significant association between log value of ROA and NPLs. Kargi (2011) examined the CR and its relationship with ROA in Nigerian banks. Key financial ratios were considered for the time period between 2004 and 2008, using descriptive, correlation, and regression techniques. The results of the study reveal that CR has a significant impact on ROA. Additionally, increasing CR causes a decline of 51.60% in ROA of selected banks. Based on significant findings, it was suggested that there is a need for management's attention towards setting of active credit policy.

Kolapo, Ayeni and Oke (2012) examined the association between CR and ROA in commercial banks of Nigeria from 2000 to 2010. Their findings explain that 100 % increase in the level of CR causes a decline of 6.2 % in ROA. Similarly, Waemustafa and Sukri

(2015) have analyzed the association between CR and ROA for banks in Malaysia. A sample of 13 Islamic and 15 conventional banks was selected for the period 2000 to 2010. Their findings state that for both conventional and Islamic banks, CR and ROA have a negative but insignificant association under the pooled regression model. It was also suggested that future research can be re-conducted on unique characteristics of Islamic banks.

In order to investigate the relationship between CR and ROA, Berríos (2013) collected a sample from the Mergent online database for 200 banks. For a better sample size, both public and private banking firms were considered. Their empirical outcomes explained a positive association between prudent lending, loan to deposit ratio, and ROA. In a similar study, Nikolaidou and Vogiazas (2017) have devoted their attention towards the Sub-Saharan banking system for the CR and ROA. They found that in Uganda, ROA and NPLs had a negative and significant association. Their findings are consistent with the economic theory, which explains that as the value of ROA increases, CR declines.

Besides, based on meta-analysis for commercial banks, Fisseha (2015) contributed significantly to existing literature by revealing that NPLs had a significant and negative association with ROA. Similarly, Sufian and Habibullah (2010) examined the impact of the financial crisis on bank performance in the Indonesian economy from 1990 to 2005 and found significant evidence that CR had a positive and significant association with ROA.

Ghenimi et al. (2017) conducted their empirical analysis for CR model and ROA in the MENA region for a sample of 49 commercial banks. Their findings too enlightened that there was a negative and significant association between explanatory and outcome factors. These findings also provided the management with more risk understanding and to serve as underpinning guideline for CR management.

The measurement of FS through ZROA was presented in the study of Soedarmono et al. (2011) who focused on Hong-Kong, China, Indonesia, Pakistan, India, Philippines, and other countries from the South Asian region. The reason to select this region was that it faced financial crisis during 1997-98. The value of loan loss reserve ratio (CR measure) to examine the trends in ZROA was under observation. Their findings indicate that CR in the selected banks has a significant and negative relationship with ZROA as presented under fixed effect approach. However, the association between ZROA and CR is positive but insignificant by using GMM approach.

Among the principal risk factors, the severity of CR is the most significant for banks (Giesecke, 2004). Researchers in the field of finance and RM have explored the association between CR and ROE. For instance, the study of Hosna, Manzura and Juanjuan (2009) has examined the NPLs and ROE in Swedish banks from 2000 to 2008. Their findings explain that CR is negatively and significantly associated with ROE. However, the critical

limitation of their study covers the limited sample size as they considered only four commercial banks in Sweden.

Research work of Takang and Ntui (2008) has explored the relationship between CR and ROE for Qatar central bank. They found that NPLs have a negative and significant relationship with ROE. As per their findings, with every 1 % increase in the value of NPLs, there is a significant decline in ROE. Besides, they also suggested that for better CR management, a team was necessary which can deal with portfolio planning and risk-taking capacity of banks.

In order to analyze the impact of CR on ROE of Chinese banks, Tan et al. (2017) adopted the two-step GMM for the period from 2003 to 2013. Their findings explain that CR has a significant relationship with ROE. Whereas, Saeed and Zahid (2016) consider CR through NPLs for big five commercial banks in the UK, applying the multiple regression techniques for 2007 to 2015. Their findings too explained that there exists a positive and significant association between the CR and ROE. However, among the fundamental limitations, the sample size was debatable.

Fredrick (2013) examined the asset quality with capital adequacy, assets management capability, earnings, liquidity, and sensitivity (CAMEL) indicators, and ROE in

commercial banks of Kenya. The findings of the study explained that there exists a significant and positive relationship between ROE and asset quality ratio. Adekunle, Alalade, Agbatogun and Abimbola (2015) examined the commercial banks of Nigeria for NPLs, loan and advance loss provision, and ROE. For this purpose, ten commercial banks were selected for the period from 2006-2010. Their results indicate that CR is significantly related to ROE. They also suggested that in order to get better performance in the form of ROE, the minimum level of NPLs are good.

The effect of CR management on ROE is also examined by Alshatti (2015) for commercial banks of Jordan. The findings of the study suggest that CR (NPLs) has a significant positive relationship with ROE. However, the study recommended considering various factors like efficient CR management system and sound credit grant process. From the perspective of Pakistan, Ali, Akhtar and Ahmed (2011) examined the linkage between CR and ROE based on a study of both private and public sector commercial banks from 2006 to 2009. The study found that a high CR has a negative and significant relationship with ROE and suggested considering both financial and non-financial firms in future research.

The study of Soedarmono et al. (2011) has considered the value of loan loss reserve to total loans for 12 Asian countries including Pakistan. The Z-score for ROE was calculated to measure the value of FS in selected banks from 2001 to 2007. Findings of their study indicate that the value of loan loss reserve had a significant and negative link with ZROE

under the GMM, but it was negative and insignificant under fixed-effect method. Based on these significant findings, their study provided an excellent outline for the management of banking industry in South Asian region.

Recently, Al Hussaini (2019) has empirically investigated the effect of CR on FS as measured through Z-score of ROE and ROA in the banking sector of GCC member states. A sample of 20 CBs was collected, and panel regression models were applied. It was observed that significant effect of CR on FS exists in selected banking firms. However, financial sector development and GDP were used as control variables while exploring the relationship between CR and FS. Besides, the study was limited in terms of sample size where future research could be considered to include more banking firms from selected countries.

Hassan et al. (2019) have observed the trends of FS in both CBs and IBs under the liquidity and CR factors. It is found that in IBs, CR is negatively associated with LR and during the time of global crisis of 2007. However, the performance of IBs in managing the CR is much better, comparatively to CBs under full sample of the study.

Another research study by Bouheni and Hasnaoui (2017) has focused on ZROE and volatility of ROE as a measure of FS. The study calculated loan loss provision for the

sample of 722 commercial banks in Eurozone. They found that the loan loss provision had a positive and significant association with the volatility in ROE. Their significant contribution showed that a higher value of Z-Score measured lower volatility and low-value measure higher volatility. Jin et al. (2017) also investigated the relationship between non-performing loans and ZROE by taking the negative Z-Score for sample of public and private banks. Their findings explain that average NPLs had a significant and positive association with negative Z-Score for ROE.

In managing the overall CR for the bank, it is the overall obligation of board members under the title of RC to approve policies and related strategies. However, various range of responsibilities define the RC involvement in CR management (SBP, 2010). These are below the headings of demarcating the risk tolerance of the bank for CR, ensuring the exposure of CR is maintained at prudent level, certifying that top management dealing with CR has sound knowledge and expertise, and making it evident that sound principles for the identification, monitoring, and controlling of CR are implemented (SBP, 2010). Addition to this, every bank is primarily responsible to establish RC for the CR management which comprises of head of credit department. It is also observed that RC in the banks is involved in ensuring the fact that CR is within the boundaries.

2.11.3 Operational Risk (OR) and Financial Stability

Operational risk (OR) and ROA have been empirically examined in various research studies. For instance, Kosmidou (2008) investigated Greek Banks during the period of financial integration of the European Union from 1990 to 2002. Cost to income ratio (CIR) was considered to reflect the impact of OR on ROA. Based on the selected banks, CIR was found to have a significant and negative association with ROA. Authors like Vennet (2002) has investigated this association between cost and ROA for all international banks working in Europe. Their findings explain that CIR has a negative relationship with ROA in selected banks.

In his study, Saeed (2015) explored the relationship between OR and ROA in the context of 27 Malaysian banks from 2005 to 2013. The findings of generalized least square method explained that OR was significantly related to ROA. Besides, the study of Said and Tumin (2011) also provided evidence for the relationship between ROA and OR both in Malaysian and Chinese banks. They also found that key operational ratios had a significant influence on ROA for banks in China. But this relationship was found not valid in the case of Malaysian banks.

Hesse and Poghosyan (2016) have studied the impact of cost inefficiency and ROA for major oil-exporting countries in the MENA region. Four regression models were developed, based on the annual growth, deviation from HP filter, and Hamilton (2003) oil

shock. They found a significant and adverse effect of CIR in all four regression models for ROA. Among principal limitations, control for house prices was found much important because it could be considered as a significant and influential indicator for ROA in IBs.

Besides, various other measures for OR like the ratio of operating expenses to loans, interest expenses to total deposits and overhead costs were also identified in the existing literature. Meanwhile, the association of these factors with ZROA was examined through empirical research work. Soedarmono et al. (2011), for instance, explained that overhead cost had a significant and negative association with ZROA, but negative and insignificant association with ZROA through GMM and fixed effect panel models, respectively.

In a study of Diallo and Al-Mansour (2017), the association between bank overhead cost and ROA was examined through a log value of Z-Score. A sample from 26 countries was selected from various insurance companies, and panel regression analyses were conducted. It was found that overhead cost of banks had a significant and positive association with FS. Besides, the relationship between bank cost and ZROA was observed by controlling the effect of various financial variables. The study found that bank cost had a positive and significant association with ZROA. This study also provided significant guidelines to various policymakers, and suggested improvements that could be taken up in empirical findings by using other measures of FS.

The relationship between OR and ROE has also been examined in numerous studies. Vennet (2002) has analyzed the cost and efficiency in Europe by taking a sample of 2375 European banks from seven developed countries. Findings of the study indicate that CIR and ROE have a significant relationship in selected regions. However, the study suggested that with the increasing level of competition, banks should further strengthen their cost and performance. For future research, it was recommended that sources of efficiency and differences between various banks should be under consideration.

Ding, Fung and Jia (2017) compare the effect of operational efficiency on ROE, made a comparison between American and Chinese banks over 2008 to 2014. They found that during the time of financial crisis, there existed an insignificant difference; however, after the financial crisis, a significant difference between the US and Chinese banks were observed in terms of structural changes and overall stability position. Concerning the cost efficiency, there too existed a significant difference in both regions before and after the financial crisis.

Similarly, in another study, Mehta and Bhavani (2017) explored the association between cost efficiency and ROE in UAE banks. For this purpose, balanced-panel data was collected from 2006 to 2013. Findings of regression analysis demonstrated that CIR had a significant and negative impact on ROE. This relationship was also consistent under fixed

effect regression outcomes. The central gap of their research was non-consideration of those changes which were incurred during the time of the financial crisis in 2008.

Besides, there are a few other studies such as Haque (2014) who studied the linkages between CIR and ROE in banks for the period between 2009-2013 from the Indian perspective. Almazari (2013) considered Saudi banks to examine the relationship between CIR and ROE from 2007-2011. Data was collected from annual financial statements of nine banks, listed in the stock exchange. The findings of this study confirmed that CIR had a negative and significant link with ROE. Additionally, Said and Tumin (2011) examined the impact of bank-specific factors on financial outcomes. For this purpose, operating expenses were selected to check their impact on ROE. Findings of the study revealed that operating expenses had a significant impact on ROE for commercial banks in Malaysia and China. Soedarmono et al. (2011) examined the relationship of ZROE with the ratio of operating expenses to total assets in South Asia. ZROE reflected a negative and highly significant association under fixed effect approach. While in the case of GMM, this association was experienced as positive and insignificant.

In addition, RC and its role in managing the OR is also observed in the recent years. A common notion is that ultimate obligation of the OR is towards the board members (RC) which needs high placement of effective organizational culture and tolerance level for such risk (SBP, 2010). Meanwhile, RC is responsible to examine and assess the OR inherent in

range of products/services, processes and systems (SBP, 2010). However, for the banking firms and its core management team like RC, measurement of OR is not an easy task as it requires number of techniques.

2.11.4 Market Risk (MR) and Financial Stability

The association between market risk (MR) and ROA has reasonably been observed in previous studies. Aydemir and Ovenc, (2016) observed the association of interest rate and ROA in emerging economies. Findings of their study provided evidence that there existed an insignificant relationship between the value of interest rate and ROA under fixed effect estimator.

The study of Ekinci (2016) has also focused on the value of MR regarding interest rate and foreign exchange risk in the region of Turkey. The time duration of the study was 2002 to 2015. The findings of the study explained that MR factors had a significant influence on return of the business and recommended better management of MR could contribute towards efficient functioning of the banking system. Said and Tumin (2011) also explained the linkage of interest rate with ROA. For this purpose, both Malaysian and Chinese banks were selected. The value of interest rate also explained a significant and negative impact on ROA.

For Kenyan Banks, Kelvin (2016) examined the impact of MR on ROA from 2010-2015. The factor of MR was measured through financial leverage, level of interest rate, and exposure of foreign exchange from 2010-2015. A sample of 42 registered banks was selected. Empirical findings explained that selected predictors had a significant and negative association with ROA. Besides, it was also recommended that exposure to MR could be mitigated through financial derivatives. Such efforts played a significant role to reduce the effect of interest rate risk and currency risk.

Tafri et al. (2009) have also examined the impact of financial risk and its impact on ROA for Malaysian banks from 1996 to 2005. Interest rate risk was considered as a critical indicator of ROA from the market. Both Islamic and conventional banks were observed with the application of panel unit root test. Empirical findings stated that interest rate risk had a significant impact on ROA for CBs in Malaysia. However, the impact of interest rate risk over ROA for IBs was found positive but insignificant. The reason for this insignificant impact was that IBs did not deal with interest rates directly.

The relationship between MR and ROE has been explored in numerous studies. For instance, Bikker and Vervliet (2017) have studied the impact of low-interest rate environment on the soundness of US banking for ROE. They considered dynamic and static modeling with various estimation methods. Findings of their study explained that a low-interest-rate environment impaired the banks in terms of ROE. Besides, it also clarified

that in order to maintain the level of financial earnings under a low-interest environment, banks should set low provisioning. Such setting in return will positively affect their FS. At the same time, banks with higher risk exposure and those expanding their operations could not also be compensated.

Aydemir and Ovenc (2016) investigated the level of short-term interest rate and ROE for banks in emerging market. By using the dynamic panel regression model for the period 2002 to 2014, their findings revealed short-term interest rate having a negative association with ROE in short run, but in the long run, this effect was positive. Besides, it was found that the monetary policy of the government had significantly affected the ROE in all banks working in emerging economies, particularly Turkey. However, in the case of UK banks, it was discovered that ROE was significantly sensitive to the interest rate.

Likewise other risk factors in the banks, the concern for the management of MR starts with the involvement from top management like RC with an effective oversight. It is believed that RC may influence the bank's ability to manage the MR with several aspects (SBP, 2010). For example, RC is responsible to delineate the overall MR tolerance as per the available capital of the bank. For this reason, RC should confirm that adequate human and technical resources are devoted to effectively manage MR (SBP, 2010). Additionally, overall organizational structure defines the behaviour by which MR is managed. This structure involve the establishment of RC, Asses-Liability Management Committee and

Middle-office. In this regard, RC would influence the bank's ability to effectively manage the MR with devise policies and guidelines for identification, measurement, and controlling of all MR categories (SBP, 2010). Meanwhile, ability of the RC to influence the bank's ability for managing the MR would also be reflected with the review and approval of MR limits while ensuing the robustness of applied financial models for the calculation of MR (SBP, 2010). In this regard, the two significant examples for the MR are the interest rate and exchange rate whose dealing and controlling show the RC capabilities in influencing the bank to manage such risk factors.

2.11.5 Country Risk (CTR) and Financial Stability

Country risk (CTR) is another significant factor which can potentially affect the banking industry. Various indicators have been identified in previous studies as essential proxies of CTR namely, political risk by Deseatnicov and Akiba (2016), forex risk by Hyde and Bredin (2004) and Umar and Sun (2015). The relationship between CTR in the form of political risk and ROA for Turkish banks was examined by Şanlısoy, Aydın and Yalçınkaya (2017). Using the ARDL approach, the study found that political instability had a significant and negative relationship with ROA.

Additionally, it was also argued that for a significant growth in economy, proper implementation of political stability was very necessary. Yalçinkaya, Şanlisoy and Aydin (2016) investigated the impact of political risk on ROA for banks in Turkey. For this

purpose, political risk index was used along with other endogenous and exogenous set of variables. They found that ROA in the banking sector was negatively affected by political risk in the selected regions.

Osundina, Ademola, Olamide and Moses (2016) have examined the impact of exchange rate risk on the value of ROA for banks in Nigeria from 2005 to 2014. The average annual value of Naira (local currency) was used to measure the fluctuation in the exchange rate as compared to US dollars for a period of ten years. By applying the panel regression models and Hausman test, the study found that the exchange rate fluctuation had an insignificant effect on ROA. It was therefore suggested to control any further depreciation in the value of the local currency (Naira).

Besides, John (2016) has empirically investigated the impact of exchange rate risk on the value of ROA for banks in Sudan. By using the correlational analysis and multiple regression techniques, they found that fluctuation in the exchange rate had a weak negative association with ROA. However, the exchange rate in South Sudan seemed to be higher for the Sudanese Pound against the US dollar. The study suggested that the Central Bank of Sudan should adopt adequate measures to secure the domestic currency.

Financial Stability in terms of ROE and CTR as a form of exchange rate has been widely examined in the existing literature. Combey and Togbenou (2017) have empirically investigated the impact of real exchange rate on the ROE for the banks through a pool mean group estimator. Their findings indicate that there exists a significant and negative association between ROE and exchange rate. Besides, their findings also provided an excellent guideline to policymakers and bank managers. Another study by Isaac (2015) was conducted in the context of Nigerian banks. Volatility in the exchange rate was examined as a key risk indicator. His findings explain that there exists a significant association between the return of banks and exchange rate risk in Nigeria. Kriel (2012) also reviewed the association between CTR in the form of political risk and ROE for various business firms in Africa during the period 2002-2009. It was found that the association between political risk and ROE was positive and significant. However, the relationship between CTR and financial stability in the form of ZROA, ZROE, SDROA, and SDROE has not been adequately explored. So, there is a reasonable gap in the existing literature and therefore there is a need to examine the association between CTR and Z-score measure of FS.

2.11.6 Financial Crisis Impact (FCI) and Financial Stability

Fiordelisi and Mare (2015) have explained the association between financial crisis and Z-score of ROA. A sample from various European Union cooperative banks was selected for the period 1998 to 2009. For the measurement of FC, a dummy variable was also created (1 if the time is between 2007-2009, otherwise 0). In order to study the relationship of FC

with the Z-ROA, Granger causality test was applied. Five regression equations were developed to check the association of FC and Z-Score of ROA. The findings of the study revealed that there existed a significant association between the log of Z-Score and FC in the second model. However, with the addition of some other explanatory variables in the model, this association was found negative and significant. In the second attempt, with the robust log value of Z-score (ROA), findings of the study explained that the financial crisis had a significant and positive association with the Z-ROA.

Horvath and Vaško (2016) have explored the relationship between banking crisis and transparency of FS from 2000 to 2011, with a sample of 110 countries. After applying the panel regression technique, it was found that the banking crisis dummy and FS transparency had a positive but insignificant association. However, after taking the square value for the transparency of the FS index, this association was contrary but insignificant for the selected sample. As per the final consideration, the banking crisis was not associated with the FS. It was also suggested that communication with the central bank can increase or decrease the level of FS. The present study has considered the relationship between FCI and FS in terms of ZROA for the commercial banks in Pakistan.

The FCI and its association with the FS for ROE has also been examined and presented in recent studies. For instance, Fiordelisi and Mare (2015) selected the Eurozone banks from 2005 to 2012 to check the association between FS-ROE and FCI. By applying the panel

regression approach, it was found that crisis time has a significant and negative association with Z-Score. Besides, it was also explained that the level of FS increases with the market power. However, more injection of capital and relief into the assets can be a useful strategy to make banks sound and stable.

2.11.7 Capital Adequacy Ratio (CAR) and Financial Stability

Numerous studies have been conducted to explore the relationship between capital adequacy ratio (CAR) and ROA. For instance, the study of Osborne, Fuertes, and Milne (2009) examined the relationship between CAR and ROA for the US banking sector. By applying both stress and non-stress conditions, it was found that those banks which have surplus capital exhibited a strong negative association with ROA. Additionally, for capital structure, three groups namely; small size and low risk, small size and medium risk, and small size with high risk were established over 1970-2010. It was found that for small size and low risk, ROA and capital structure had significant association from 1977 to 1985.

Yet, this relationship was insignificant from 1986 to 2000. However, a significant association was found between 2001 and 2010. For small size and low risk, this relationship was significant over 1977-1990, insignificant from 1991 to 1995, significant from 1996 to 2005, and insignificant from 2006 to 2010 respectively. However, for the small size and high-risk, the relationship between capital structure and ROA was significant over the whole time. In their study, Anbar and Alper (2011) have conducted an empirical analysis

to examine the relationship between ROA and CAR for commercial banks in Turkey. Findings of the study indicate that there was a positive but insignificant relationship of CAR with ROA.

Mathuva (2009) conducted a research study on commercial banks of Kenya for the period from 1998-2007. Among various outcome factors, ROA was also selected to check the impact of capital adequacy for banks. Tier 1 capital, leverage ratio, equity capital to asset ratio, and total capital to total asset ratio were calculated for the selected banks. Findings of the study indicate that there existed a significant relationship between core capitals to assets with ROA. However, insignificant and negative association was found between equity capitals to asset ratio. Additionally, a positive and significant link was examined among core capital to risk-weighted assets, total capital to assets, and ROA.

Ofoeda, Gariba and Amoah (2016), however, examined the relationship between capital requirements and ROA for non-bank financial institutions in Ghana. Panel and correlated standard errors model techniques were applied. Results of the study indicate a positive and significant relationship between the CAR requirement of 10 % and available capital for the selected banks. Based on the findings, their study is a good contribution to the existing literature on non-banking financial institutions. However, consideration of longer time duration with improved methodology could have resulted in more accurate findings.

In addition, a few studies have also examined the association between CAR, ZROA, and volatility of ROA. In their study, for instance, Bouheni and Hasnaoui (2017) have made a significant contribution by focusing on the regulatory capital under the guidelines of Basel regulations. CAR ratio has a significant negative and significant positive association for ZROA and Volatility of ROA, respectively. Their methodological contribution was very much significant in the sense that GMM dynamic estimator has controlled the unobserved heterogeneity in the model.

Osborne et al. (2009) have examined the association between capital level and ROE in the US banking industry. They found out that for small size and medium-risk groups of banks, standard deviation of ROE had a significant relationship with capital structure. However, this relationship showed a mixed trend for small size and low risk, and small size with high-risk groups. Anbar and Alper (2011) also observed the association between CAR and ROE for Turkish banks. Findings of the study explain that capital adequacy was positively linked to the value of ROE, but this relationship was not significant. Ofoeda et al. (2016) conducted a study in Ghana to examine the association between capital adequacy and ROE. Their findings explain a significant and positive association of CAR with ROE in the selected region.

The factor of capital ratio has also been examined with ZROE and volatility in ROE. Bouheni and Hasnaoui (2017) found that both of these stability measures have a positive

association with capital ratio. However, for the ZROE, this relationship was insignificant, and for the volatility of ROE, their association was negative under the consideration of full sample. Jin et al. (2017) consider the Z-score regarding ROE and its relationship with the capital ratio for Tier 1 capital to risk-weighted assets. The time duration of the study was pre-crisis; from 2000 to 2006. Their empirical findings explain that the average value of capital ratio has a negative and significant relationship with negative Z-score for ROE. However, this association was significant and negative for the sample of public banks, private banks, private and audited banks, and finally private and unaudited banks. In addition, abnormal residuals for negative ZROE were also calculated. It was found that the average capital ratio had a significant negative relationship with the full sample of both public and private banks.

2.11.8 Audit Quality (AQ) and Financial Stability

The relationship between audit quality (AQ) and ROA was examined in numerous studies. Various proxies have been used in existing studies to measure the quality of audit. For instance, Moutinho, Cerqueira and Brandao (2012) have explored the linkage between the audit fee and ROA for US-listed firms, covering the time duration of 2000-2008. Fixed effect regression estimator was applied to get the empirical evidence on the relationship between audit fee and ROA. Findings of the study explain that there was a significant and negative association between audit fee and ROA for the selected firms in the US. In another study by Stanley (2011), audit fee and log of audit fee were adopted to examine their relationship with ROA of US public companies. Both descriptive and inferential techniques

were applied. Findings of the study revealed that the audit fee had negative and significant relationship with ROA.

Sayyar, Rohaida and Sidi Zaleha Abdul-Elhabib (2015), in their empirical study, have considered two factors; audit fee and a log of audit fee. These proxies were used to measure the quality of audit fee for listed companies in Malaysia. The time duration of the study was from 2003 to 2012. Findings of the correlation matrix explained that there was a positive association between the log of audit and ROA. However, by applying the multivariate regression techniques, the association between ROA and Log of audit fee was found to be significant which means there is no relationship between them. Based on their findings, researchers recommended that further studies may be conducted by considering other indicators of audit quality. These are the types of audit firms and specialist auditors. The study of Matoke (2016) explored the association between AQ and ROA for listed companies in Nairobi Securities Exchange. For the AQ, size of the audit firm, auditor's independence, attributes of the audit team, and experience of auditors have been considered. By using primary measures, it was found that ROA was linked with various proxies of AQ. Based on these findings, consideration of AQ for better stability is very essential to examine in this study.

In both developed and developing economies, various studies have explored the association between audit fee and ROE. The study of Moutinho et al. (2012) focuses on the relationship

between the audit fee and ROE in US non-financial firms. Findings of the fixed-effect model explain that the ratio of audit fee to assets is significantly and negatively linked with ROE.

Ondieki (2013) have examined the association between internal audit standards and their association with the level of ROE from the context of commercial banks of Kenya. By applying the inferential statistical techniques, it was found that internal audit standards have a significant and positive link with ROE in commercial banks. Although, the association between AQ regarding various measures and ROE has been examined in earlier studies, very little attention was devoted to the integration of AQ and FS, specifically in the banking sector. Therefore, this study decided to empirically investigate the relationship between AQ and selected measures of FS in commercial banks of Pakistan.

2.11.9 Country Level Governance (CLG) and Financial Stability

The role of country-level governance (CLG) in explaining FS through ROA has also been under critical attention in past research studies. For instance, Chen and Liao (2011) have examined the relationship between ROA and CLG by selecting a sample from 70 countries over 1992-2006 for both foreign and domestic banks. Essential proxies for CLG were; control of corruption, government effectiveness, and regulatory quality. Findings of the study revealed that ROA was negatively and significantly associated with regulatory quality and government effectiveness in the host country.

Ho et al. (2016) collected the data from 39 countries 1996 to 2007 in order to evaluate the effect of country-level governance over ROA. The variables selected included voice and accountability, absence of violence and political stability along with the effectiveness of the government. Meanwhile, quality in terms of regulations, control of corruption and the rule of law were also added in regression models. Their findings indicate that CLG and ROA were associated with each other.

For CLG, indicators like the rule of law and investment opportunities can also be considered. A study by Soedarmono et al. (2011) on South Asia calculated LERNER index, based on the rule of law index and investment opportunities index. FS was also measured through SD of ROA and ZROA. Their relationship with LERNER index was examined through fixed-effect and GMM approach. It was found that FS in terms of ROA had a significant and positive association with LERNER index under fixed effect regression estimations. However, this association was insignificant under GMM model.

The association between CLG with ROE has also been explored in the existing literature. Chen and Liao (2011) collected data from various foreign and domestic banks. Descriptive and regression outcomes were presented to provide a better explanation for the association between ROE and CLG. Their study explained that all the selected factors of governance had a significant and adverse relationship with the level of ROE. Another study by Soedarmono et al. (2011) examined the association between the Lerner index and the SD

of ROE and ZROE. Their findings explained that the rule of law and investment opportunities had combined effect in the Lerner index. Such association indicates a positive and significant link with SDROE in both fixed-effect and GMM models. Therefore, in order to examine the relationship between RM and FS, consideration of CLG is very significant.

2.12 Summary of All Literature

Table 2.1 presents a summary review of earlier studies with their sample, methodology, variables, and findings.

Table 2.1
Summary of Literature Review

Authors and Year	Sample	Method of Research	Independent Variable/s	Dependent Variable	Findings/ Relationship
Hassan, Khan, and Paltrinieri (2019)	52 Islamic and conventional banks	Regression analysis-simultaneous equations	Liquidity and credit risk	ZROA	Significant and negative relationship between liquidity and stability. Negative relationship between liquidity and credit risk
Al Hussaini (2019)	Banks in GCC member states	Multiple regression	Credit risk	ZORA	Significant and negative
Al Hussaini (2019)	Banks in GCC member states	Multiple regression	Credit risk	ZORE	Significant and negative
Ferhi (2018)	Banking firms in MENA	GMM	credit risk	Capital ratio	Conventional banks have higher credit risk

Table 2.1 (Continue)

Bouheni and Hasnaoui (2017)	722 banks from Europe	Regression analysis	Credit risk	ZROE	Significant and positive
Bouheni and Hasnaoui (2017)	722 banks in Eurozone	GMM technique	Liquidity risk	ZROE	Significant and positive
Bouheni and Hasnaoui (2017)	Commercial banks in the EU	GMM approach	Capital adequacy	ZROA	Significant and negative
Combey and Togbenou (2017)	Commercial banks	Pool mean group estimator	Country risk	ROE	Significant and negative
Diallo and Al-Mansour (2017)	Insurance companies from 26 countries	Panel regression	Operational risk	ZROA	Significant and positive
Ghenimi, Chaibi, and Omri (2017)	MENA region	Regression approach	Liquidity risk	ROE	Positive and insignificant
Ghenimi et al. (2017)	49 Banks in MENA region	Regression analysis	Credit risk	ROA	Significant and negative
Ghosh (2017)	100 Us banks	GMM-FE approach	Credit risk	ROA	Negative and significant
Jin, Kanagaretnam, Lobo, and Mathieu (2017)	European banks	GMM method	Capital average adequacy	ZROE	Significant and negative
Mehta and Bhavani (2017)	UAE banks	Regression analysis	Operational risk	ROE	Significant and negative
Şanlısoy et al., (2017)	Turkish banks	Lagged ARDL	Country risk	ROA	Significant and negative
Aydemir and Ovenc (2016)	Banks from emerging economies	Regression analysis	Operational risk	ROE	Significant and negative in the short run, significant and

Table 2.1 (Continue)

					positive in the long run
Horvath and Vaško (2016)	110 countries	Panel regression	Banking crisis risk	Transparency of Financial stability index	Positive and insignificant
Osundina, Ademola, Olamide, and Moses (2016)	Nigerian banks	Panel regression	Country risk	ROA	Significant and negative
Saeed and Zahid (2016)	Big 5 commercial banks, UK	Multiple regression	Credit risk	ROE	Significant and positive
Alshatti (2015)	Commercial banks in Jordan	Regression analysis	Credit risk	ROE	Significant and Positive
Fiordelisi and Mare (2015)	Eurozone banks	Panel regression	Financial crisis	ZROE	Positive and significant
Saeed (2015)	27 Malaysian banks	GLS method	Operational risk	ROA	Significant and positive association
Waemustafa and Sukri (2015)	28 banks in Malaysia	Regression analysis	Credit risk	ROA	Negative and insignificant
Malik, Khan, Khan, and Khan (2014)	Public and private banks in Pakistan	Regression	Operational risk	ROA	Significant association
Berríos (2013)	200 banks	Regression	Credit risk	ROA	Positive and significant
Ondieki (2013)	Commercial banks of Kenya	Inferential statistics	Internal audit standards	ROE	Significant and positive
Perera, Skully, and Chaudhry (2013)	Commercial banks of South Asia	GMM estimates	Liquidity risk	ROA	Significant and negative

Table 2.1 (Continue)

Bokhari, Ali, and Sultan (2012)	12 banks from Pakistan	Regression technique	Capital adequacy	ROE	Negative and insignificant
Moutinho, Cerqueira, and Brandao (2012)	US publicly traded firms	Fixed effect regression	Audit fee	ROA	Negative and significant
Moutinho et al., (2012)	US non-financial firms	Fixed effect	Audit fee	ROE	Significant and negative
Anbar and Alper (2011)	Turkish banks	Regression analysis	Capital adequacy	ROA	Positive and significant
Soedarmono, Machrouh, and Tarazi (2011)	South Asian countries	Fixed effect, GMM estimates	Liquidity risk	ZROA	Significant and negative
Soedarmono et al. (2011)	12 Asian countries	GMM-FE approach	Liquidity risk	ZROE	Significant and negative
Soedarmono et al., (2011)	South Asian banks	GMM approach	Credit risk	ZROA	Significant and negative
Soedarmono et al., (2011)	South Asia	GMM approach	Operational risk	ZROE	Significant and negative
Soedarmono et al. (2011)	South Asian countries	GMM approach	Credit risk	ZROE	Significant and negative
Said and Tumin (2011)	Malaysian and Chinese banks	Regression analysis	Operational risk	ROA	Significant and negative

Table 2.1 (Continue)

Osborne, Fuertes, and Milne (2009)	US banks	Regression	Capital adequacy	SDROE	Significant relationship
Shen, Chen, Kao, and Yeh (2009)	Commercial banks in 12 advanced economies	Unbalanced pooled Regression	Liquidity risk	ROA	Significant and negative
Shen et al. (2009)	Developed economies	Two-stage least-square 2SLS	Liquidity risk	ROE	Negative and significant
Kosmidou (2008)	EU banks	Regression	Operational risk	ROA	Significant and negative
Kosmidou, Tanna, and Pasiouras (2005)	UK Banks	Regression analysis	Liquidity risk	ROA	Significant and positive

2.13 Literature Discussion on RM and FS for Banks in Pakistan

Literature work has reasonably justified the relationship between RM and FS for the banking firms in Pakistan. For instance, Akhtar, Ali and Sadaqat (2011) conducted a comparative analysis between conventional and IBs for commercial banks of Pakistan. It was found that CBs are better in ROA and LR management as compared to IBs. However, their study considered very limited time and the sample size of twelve conventional and Islamic. Besides, Iqbal (2012) has investigated the relationship between LR and ROA. His findings explained the fact that there was a significant positive association between ROA and LR in both conventional and Islamic banks. In another study, Arif and Anees (2012) too focused on the banking system of Pakistan. Data for 22 banks were collected for the

period between 2004 and 2009. The findings of multiple regression analysis explain that LR in the banking sector of Pakistan has a significant association with earnings.

Raashid, Rasool and Raja (2015) have investigated the association between CR and ROA by taking the sample of 26 banks from Pakistan from 2006 to 2011. By using the fixed effect regression model, their findings explain that NPLs have a significant and negative impact over ROA. Based on these findings, they claimed that the banking industry in Pakistan was on outlier and deviates from the rest of banks at world glance. Another study by Abbas, Zaidi, Ahmad and Ashraf (2014) focused on CR exposure and ROA in commercial banks of Pakistan. They explained similar findings that CR in the banking sector was adversely associated with ROA.

In addition, Gul, Irshad and Zaman (2011) also studied the impact of loan on ROE in Pakistani banks from 2005 to 2009. Empirical results explained that ROE and value of the loan were negatively associated with each other. The study of Abbas et al. (2014) in Pakistan's context examined the exposure of CR for ROE. By applying the fixed effect regression model, it was found that NPLs have a negative effect on ROE. Similarly, Shahid, Hassan, and Rizwan (2015) also focused on IBs in Pakistan in order to check the impact of CR on ROE. Their study explained a significant and negative relationship in both explanatory and outcome variables under pooled regression and fixed-effect model.

Chaudhary and Abbas (2017) studied the impact of GFC on Pakistani banks and found that there was a significant and negative association between CIR and ROA. Dawood (2014) too focused on banks in Pakistan and examined the association between cost efficiency and ROA. Cost efficiency was measured by calculating total cost over total income for 23 commercial banks from 2009 to 2012. The study found cost efficiency having a significant and negative link with ROA. However, insufficient time duration of the study was viewed as a major limitation which should be addressed in future.

Malik et al. (2014) have conducted their research effort to examine the market interest rate and its relationship with ROA for banks in Pakistan. A lending interest rate of banks was considered as a proxy market factor. Findings of their study demonstrated that interest rate had a greater effect on ROA for private banking firms as compared to public banks in Pakistan. In the context of Pakistan, Zaman, Arslan, Sohail and Malik (2014) have analyzed the relationship of interest rate with ROE. By considering the time duration of 2007 to 2011, a correlation and regression analysis was carried out. The study found that the interest rate had a negative and significant relationship with ROE. However, among the fundamental limitations, sample size of twenty banks and the time period of five years were found too restrictive. Besides, financial crisis and their impact on the banking industry in Pakistan has also been addressed by (Nazir et al., 2012). However, literature primarily from the perspective of FCI and ZROE is very much limited, which is under attention in the present research

In another study, Bokhari, Ali and Sultan (2012) too analyzed the relationship between CAR and ROE for the banking sector of Pakistan. Empirical analyses were conducted for a sample of 12 banks for the period from 2005 to 2009. Their findings explain that there exists a negative but insignificant relationship between ROE and capital adequacy for commercial banks in Pakistan. However, major limitations observed was a very small sample size of 12 commercial banks from a very large banking industry and also limited time duration.

2.14 Literature Gap

The problem statement of the current research and the review of the previous studies reveal various issues related to of FS from the perspective of commercial banks in Pakistan. Risk factors like liquidity, credit, market, and the country context are targeting the commercial banks of Pakistan which need serious attention. Therefore, from the context of the theoretical, empirical and critical review, following literature gaps from the context of Pakistan have been identified:

1. A close review of the existing literature has though made evident that FS in the form of ROA and ROE provide reasonable corpus of research. However, little attention has been paid to developing economies like that of Pakistan. This indicates a significant gap in the literature to address and examine the FS of commercial banks of Pakistan.
2. It is observed that the increasing adverse impact of credit and other risk factors has not been fully monitored and controlled in commercial banks of Pakistan which creates instability too. This concern has hinted at a noticeable gap which needs both

theoretical and practical solution. Therefore, research contribution with this study has covered these gaps.

3. The relationship between RM and FS has though been covered in the existing literature, but various RM and governance factors still need attention in commercial banks of Pakistan. For instance, AQ in the form of audit fee, CTR, CLG, and stability measures have been given very little attention in the previous studies.
4. Risk committee in any business is the most significant team of board members and risk officers. As per the researcher's best findings, the moderating role of RC in the relationship between RM and FS has not reasonably been observed in previous literature in Pakistani context. Therefore, it has provided a considerable opportunity to cover this theoretical and empirical gap, especially in the framework of commercial banks of Pakistan.
5. From the methodological context, most previous studies have focused on simple descriptive and linear regression as dealing with commercial banks of Pakistan. Such limitation in the methodology has provided significant evidence to apply the panel regression models while examining the relationship between RM and FS.
6. Though the concept of RM has been considered with various risk factors in the previous literature, however, compact observation has been done to the division of RM into three major categories, specifically in Pakistan. These are : risk types, regulation on bank capital and governance factors. The present study has tried to bridge this gap and provide a comprehensive theoretical understanding based on these categories with the supplementary justification from AT, SHT and MPT.

2.15 Summary of the Chapter

This chapter provides a review of previous studies on RM and FS. First part has discussed the concept of financial risk, risk management and its factors. Besides, RM-FS, risk committee and two control variables (the size of bank and GDP) have also been discussed in the first part of this chapter. The second part of the chapter covers the underpinning and supporting theories. For this purpose, agency theory, modern portfolio theory, and stakeholder theory have been discussed in order to understand the relationship between variables. In the third part, a review of literature has been presented, based on the relationship between independent and dependent variables of the study. The last section of this chapter highlights the literature gaps for a better understanding of research framework.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research framework of this study followed by hypotheses development, in order to examine the relationship between the variables, and operational definitions. This chapter also discusses the research design of this study explaining the research approach, nature of the data set and time duration of the study. Besides population, data collection, and measurement of the variables have also been also discussed under this chapter. Various econometric models are also presented to show how the research objectives and hypotheses would be attained. Finally, there are data analyses methods like diagnostic tests and panel models with a summary of the chapter in the end. Overall the chapter encompasses the title of research methodology in a comprehensive and integrated way.

3.2 Research Framework

To examine the relationship between RM and FS with the moderating effect of RC is among the significant objectives in the present study. The component of RM has been divided into three major categories. The first category discusses risk types, which includes liquidity risk, credit risk, operational risk, market risk, country risk, and financial crisis risk. The second category engages the RM framework and examines the regulation on bank's capital through capital adequacy ratio. The third category is based on governance variables, covering factors like audit quality, and country-level governance measures. For

studying FS, two indicators (ROA, ZROE) have been added in the framework of this study. Besides, the moderating role of RC between the relationship of RM and FS for commercial banks of Pakistan has been examined. Additionally, bank size and GDP are considered as control variables. Figure 3.1 below explains the theoretical relationship between independent, dependent, moderator and control variables under the shadow of underpinning and supporting theories.

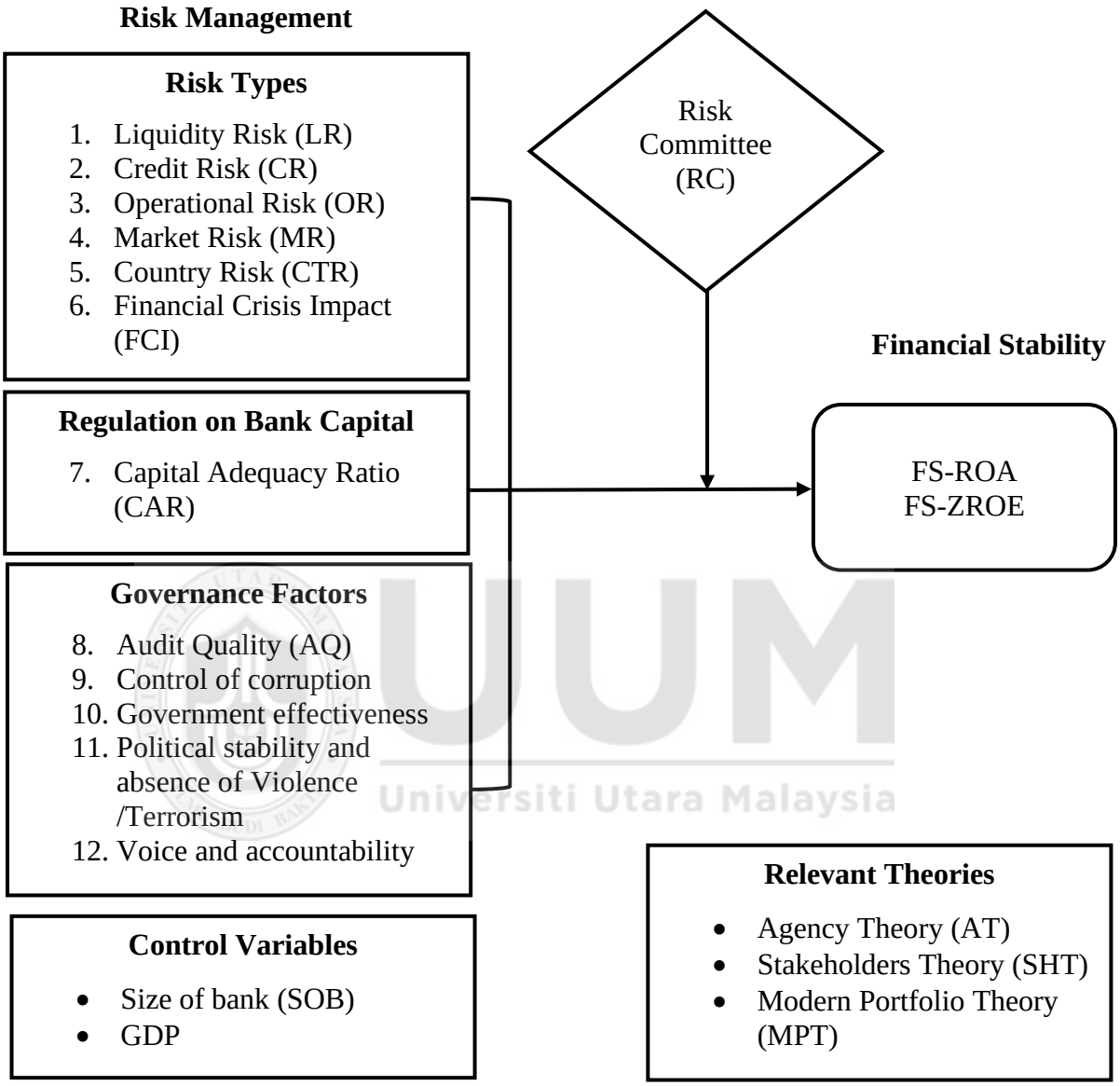

Figure 3.1
Research Framework

3.3 Hypotheses Development

Based on research objectives (chapter one) and detailed review of the literature (chapter two) on the relationship between variables of this study, various research hypotheses were developed. To address the objectives (1-3), following hypotheses (H1-H24) were proposed and empirically tested:

3.3.1 Risk Management (RM) and Financial Stability (FS-ROA)

H1: There is a significant relationship between liquidity risk and financial stability in terms of ROA.

H2: There is a significant relationship between credit risk and financial stability in terms of ROA.

H3: There is a significant relationship between operational risk and financial stability in terms of ROA.

H4: There is a significant relationship between market risk and financial stability in terms of ROA.

H5: There is a significant relationship between country risk and financial stability in terms of ROA.

H6: There is a significant relationship between financial crisis impact and financial stability in terms of ROA.

H7: There is a significant relationship between capital adequacy and financial stability in terms of ROA.

H8: There is a significant relationship between audit quality and financial stability in terms of ROA.

H9: There is a significant relationship between control of corruption or CLG1 and financial stability in terms of ROA.

H10: There is a significant relationship between government effectiveness or CLG2 and financial stability in terms of ROA.

H11: There is a significant relationship between political stability and absence of violence/terrorism or CLG3 and financial stability in terms of ROA.

H12: There is a significant relationship between voice and accountability or CLG4 and financial stability in terms of ROA.

3.3.2 Risk Management (RM) and Financial Stability (FS: ZROE)

H13: There is a significant relationship between liquidity risk and financial stability in terms of ZROE.

H14: There is a significant relationship between credit risk and financial stability in terms of ZROE.

H15: There is a significant relationship between operational risk and financial stability in terms of ZROE.

H16: There is a significant relationship between market risk and financial stability in terms of ZROE.

H17: There is a significant relationship between country risk and financial stability in terms of ZROE.

H18: There is a significant relationship between financial crisis impact and financial stability in terms of ZROE.

H19: There is a significant relationship between capital adequacy and financial stability in terms of ROE.

H20: There is a significant relationship between audit quality and financial stability in terms of ZROE.

H21: There is a significant relationship between control of corruption or CLG1 and financial stability in terms of ZROE.

H22: There is a significant relationship between government effectiveness or CLG2 and financial stability in terms of ZROE.

H23: There is a significant relationship between political stability and absence of violence/terrorism or CLG3 and financial stability in terms of ZROE.

H24: There is a significant relationship between voice and accountability or CLG4 and financial stability in terms of ZROE.

To achieve the fourth objective of the study, following hypotheses (H1a-H11b) were developed and empirically examined. Details are as under:

3.3.3 Moderating Effect of Risk Committee (RC) between RM and FS-ROA

H1a: Risk committee moderates the relationship between liquidity risk and financial stability in terms of ROA.

H2a: Risk committee moderates the relationship between credit risk and financial stability in terms of ROA.

H3a: Risk committee moderates the relationship between operational risk and financial stability in terms of ROA.

H4a: Risk committee moderates the relationship between market risk and financial stability in terms of ROA.

H5a: Risk committee moderates the relationship between country risk and financial stability in terms of ROA.

H6a: Risk committee moderates the relationship between capital adequacy ratio and financial stability in terms of ROA.

H7a: Risk committee moderates the relationship between the quality of audit and financial stability in terms of ROA.

H8a: Risk committee moderates the relationship between CLG1 and financial stability in terms of ROA.

H9a: Risk committee moderates the relationship between CLG2 and financial stability in terms of ROA.

H10a: Risk committee moderates the relationship between CLG3 and financial stability in terms of ROA.

H11a: Risk committee moderates the relationship between CLG4 and financial stability in terms of ROA.

3.3.4 Moderating effect of risk committee (RC) between RM and FS-ZROE

H1b: Risk committee moderates the relationship between liquidity risk and financial stability in terms of ZROE.

H2b: Risk committee moderates the relationship between credit risk and financial stability in terms of ZROE.

H3b: Risk committee moderates the relationship between operational risk and financial stability in terms of ZROE.

H4b: Risk committee moderates the relationship between market risk and financial stability in terms of ZROE.

H5b: Risk committee moderates the relationship between country risk and financial stability in terms of ZROE.

H6b: Risk committee moderates the relationship between capital adequacy ratio and financial stability in terms of ZROE.

H7b: Risk committee moderates the relationship between audit quality and financial stability in terms of ZROE.

H8b: Risk committee moderates the relationship between CLG1 and financial stability in terms of ZROE.

H9b: Risk committee moderates the relationship between CLG2 and financial stability in terms of ZROE.

H10b: Risk committee moderates the relationship between CLG3 and financial stability in terms of ZROE.

H11b: Risk committee moderates the relationship between CLG4 and financial stability in terms of ZROE.

3.4 Operational Definitions of the Variables

An operational definition of variables explains the specific way in which they are measured and considered in a research study. Table 3.1 explains the operational definitions of independent, dependent, moderator and control variables of the study.

Table 3.1
Operational Definitions and Findings/Relationship

Variables	Definition	Findings/Relationship
Liquidity Risk	Liquidity risk (LR) suggests that an investment cannot be liquidated easily in the market at a reasonable price. Both the size and depth of the market affects the liquidity risk (Gitman et al., 2015). Liquid assets uses for the payment of current liabilities.	LR has a Negative and significant relationship with SDROA and SDROE, while positive and significant relationship ZROE and ZROA (Soedarmono et al., 2011).
Credit Risk	Credit risk (CR) explains the type of financial risk in which borrowers of funds may not be able to pay the loan. Because of CR, lender may lose the principal/ interest or both the amounts. The value of CR for the banking sector is often measured through Non-performing loan or NPLs (Lee & Hsieh, 2014).	Negative and significant association between FS and CR is observed in the literature (Berríos, 2013; Ghosh, 2017).
Operational Risk	The operational risk considers operating cost of the bank as the proportion of total income. Higher operational cost reflects internal inefficiency and adversely associated with earnings and operating income (Mathuva, 2009).	Significant positive and significant negative influence of OR is observed for the stability measures (Hesse & Poghosyan, 2016; Saeed, 2015)
Market Risk	The concept of market risk (MR) covers the chance or probability that there will be a decline in the value of investment because of various market factors. Such factors are independent of the investment and can be in the form	There exists an insignificant relationship between the MR through interest rate and ROA (Aydemir & Ovenc, 2016).

Table 3.1 (Continue)

	of political, social, or economic factors (Gitman et al., 2015).	
Country-level risk	Country risk (CTR) comprises various risk factors associated with a state or a region. It includes political risk, economic risk, financial risk, and various composite factors at a macroeconomic level (Toma, Chiriță, & Șarpe, 2011).	Country risk is negative associated with FS of the banks (John, 2016; Şanlısoy, Aydın, & Yalçınkaya, 2017)
Financial Crisis	The impact of financial crisis is considered as a significant change in the credit volume, large-scale problems in the balance sheet, typically of multi-dimensional events (Claessens & Kose, 2013).	FCI is adversely associated with the banking sector stability (Fiordelisi & Mare, 2015).
Capital Adequacy Ratio	Capital adequacy ratio (CAR) involves the financial transactions for banks which are required to maintain their capital at a reasonable level. The defined level of capital is known as capital adequacy or capital at a minimum level. This capital is used to avoid the critical risk factors like liquidity risk, credit risk market risk, and operational risk (Bokhari et al., 2012).	CAR is found to be a positive indicator of the banking sector stability (Ofoeda, Gariba, & Amoah, 2016).
Audit Quality	The concept of audit quality (AQ) can be explained as core techniques used by auditors to recognize the misleading facts in financial statements and relevant reports (Sayyar et al., 2015). Various proxies have been defined in the literature to operationalize audit quality (i.e auditor's	Audit fee is positively associated with the FS (Sayyar et al., 2015).

Table 3.1 (Continue)

	remuneration, auditor independence, repute of audit firm etc.).	
Country-level Governance	The idea of country-level governance (CLG) explains the fact how the quality of infrastructure, macroeconomic stability, well-educated labour force, efficient legal system, political stability and low level of corruption exist within a state (Asiedu, 2005).	CLG factors have shown mixed trend as determinants of FS of the banks (Ho, Lin, & Tsai, 2016; Soedarmono et al., 2011).
Financial Stability	Financial stability (FS) represents the context of a financial system and its vital role players. A financial system may be stable in a situation when there is no excessive volatility, crisis, or financial stress. The broader concept of financial stability covers the positive contribution of overall well-functioning of financial markets and financial systems (Gadanecz & Jayaram, 2009).	FS has shown both positive and negative relatinship with the risk factors and macroeconomic dynamics (Bouheni & Hasnaoui, 2017; Fu et al., 2014; Lee & Hsieh, 2014)
Risk Committee	Risk Committee (RC) refers to the number of directors or members responsible for the overall risk management and its disclosure in a business (Abdullah, Shukor, & Rahmat, 2017).	RC, RM and FS of the banks are closely associated to each other (Hines & Peters, 2015; Moore & Brauneis, 2008)
Size of Bank	Size of a bank (SOB) expresses the total assets of the bank at a given time (Subramaniam et al., 2009). In various studies, bank size is	Size of the bank (SOB) is a most cited proxy having a significant impact on earnings and FS of banks (Bertay et al., 2013;

Table 3.1 (Continue)

	used as a key determinant of persistent earnings.	Bouheni & Hasnaoui, 2017).
Gross Domestic Product	The factor of gross domestic product (GDP) is explained as production of goods and services in a country over time. GDP is considered as a macroeconomic factor, which has significantly affected the banking sector (Duraj & Moci, 2015; Mahdi & Abbes, 2017).	GDP has its significant and positive impact on range of stability measures of the banks (Bouzgarrou et al., 2017; Ahamed & Mallick, 2017).

3.5 Research Design

Research design refers to the specific process used to complete a research study. It covers the entire framework, from the selection of research methodology to data analyses (Flick, 2014). The present research study is based on a research design that also addresses research questions and research objectives. In order to conduct research, usually, two research approaches are employed : deductive approach and inductive approach (Sekaran & Bougie, 2016). The deductive approach considers the testing of existing theory through some hypotheses development (Wiles, Crow, & Pain, 2011). The deductive approach of research is based on a general theory with the body of knowledge, followed by specific knowledge as gained through a research process (Kothari, 2004). The inductive approach moves from specific to general and helps to generate new theories (Bryman & Bell, 2011). The present research study has adopted the deductive approach, where existing theories are tested and

empirically justified. Besides, research questions and objectives have also been addressed through hypotheses testing. For hypotheses testing, the dataset was purely quantitative.

3.6 Nature of the Data and Sources

In order to address the study objectives, secondary data was collected from various available sources of commercial banks in Pakistan from 2007 to 2016 with annual observations. These sources include published annual reports of commercial banks, official website of SBP, and yearly financial statement analysis of SBP. Besides, online data source of world bank (World Development Indicator WDI), and Thomson Reuters database (Datastream) were also referred to. The nature of selected data covered both dimensions of time series and cross-sectional units of observations. Due to this reason, it is entitled as a panel or longitudinal data (Wooldridge, 2015). Panel data has various characteristics like providing more degree of freedom, reducing the level of multicollinearity and more efficiency in empirical findings (Gujarati, 2009).

3.7 Population and Data Collection

In the overall financial market of Pakistan, commercial banks are working under the title of public sector, private sector, specialized, local, and foreign banks etc. More specifically as per the findings of SBP (2017b), there are five public sector commercial banks, twenty local private sector banks, and five foreign banks. All these banks are making a total

population of thirty commercial banks in Pakistan. These commercial banks represent 88 % market share in the overall financial market. Besides, all these commercial banks enjoyed significant confidence from their investors. Out of these thirty commercial banks, 20 are listed in PSX with their significant influence in financial market through their performance and operational activities.

In existing literature, numerous studies have considered commercial banks in Pakistan to conduct their empirical analyses (Akhtar & Nishat, 2002; Ali et al., 2011; Badar & Javid, 2013; Chaudhary & Abbas, 2017; Ishaq, Karim, Zaheer, & Ahmed, 2016; Khan, Farooq, & Ullah, 2010; Shafiq & Nasr, 2010; Sheikh, Sheikh, Qureshi, & Qureshi, 2017). An in-depth investigation of data sources of this study revealed that two of the commercial banks (Bank of China Limited, NIB Bank Ltd.) were excluded due to missing data for the study period. Therefore, data for 28 commercial banks was finally collected and empirically examined during the time of 2007-2016 with yearly observations. Both of these dimensions (i.e *i*=28 commerical banks, *t*=10 years) have provided the evidence that data nature of the present research is unbalanced panel as some variables have missing observations (details are under descriptive results, chapter 4).

3.8 Measurement of the Variables

For the measurement of variables and their literature sources, Table 3.2 provides comprehensive details.

Table 3.2
Measurement of the Variables

Variable	Measurement	Sources
Financial Stability: ROA	$ROA_{i,t} = \frac{\text{Net Income After Tax}}{\text{Total Assets}} * 100$	(Albaity, Mallek, & Noman, 2019)
Financial Stability: ROE	$ZROE_{i,t} = \frac{ROE}{SDROE}$	(Bouheni & Hasnaoui, 2017)
Liquidity Risk	Liquid assets/total assets	(Curtis, Garin, & Mehkari, 2017)
Credit Risk	Non-performing loans/gross advances	(Ghosh, 2017)
Operational Risk	Cost to income ratio	(Chaudhary & Abbas, 2017)
Market Risk	Real Interest rate	(Kunt and Huizinga, 1999)
Country Risk	Average annual exchange rate	(Osundina, Ademola, Olamide, & Moses, 2016)

Table 3.2 (Continue)

Financial Crisis Impact	Dummy variable equal to 1 for the crisis period (2007 to 2012) and 0 otherwise.	(Tong, Singh, & Li, 2017)
Capital Adequacy Ratio	Equity /total assets	(Căpraru & Ihnatov, 2014)
Audit Quality	Natural log of audit fee	(Sayyar et al., 2015)
Country-Level Governance one	Control of corruption	(Tong, Singh, & Li, 2017b)
Country-Level Governance two	Political Stability and Absence of Violence/Terrorism: Estimate	(Kaufmann, Kraay, & Mastruzzi, 2008)
Country-Level Governance three	Government Effectiveness: Estimate	(Kaufmann, Kraay, & Mastruzzi, 2008)
Country-Level Governance four	Voice and Accountability: Estimate	(Kaufmann, Kraay, & Mastruzzi, 2008)
Risk committee	Size of risk committee	(Ng et al., 2012)
Size of Bank	Log of total assets of the business	(Subramaniam et al., 2009)
Gross Domestic Product	Log of GDP	(Mahdi & Abbes, 2017)

Although various proxies of FS are provided in the existing literature of finance and banking, present study has utilized the ZROE (measured through ROE divided by standard deviation in ROE or SDROE). Several reasons might be considered for using ZROE as a principal measure of FS. First, banks (mainly commercial in nature) need to assume the risk in making the profit and ultimately become insolvent as they expose to various risk types. For this purpose, without considering the risk in their earning capacity may not justify the argument that earnings are under the shadow of risk. In this example, the SDROE primarily consider the risk in making the profit over equity (ROE). Second, using ZROE in terms of SDROE may assume as a significant contribution in the existing literature where primarily focus on Z index for ROE (ROE plus equity to total asset ratio, divided by SDROE), and volatility in ROE (VOL-ROE) is widely observed. Using this alternative measure (ZROE) as a main measure of FS can extant the theoretical and empirical literature in the relevant fields. Third, using ZROE as a main measure for FS can provide a reasonable justification about distance to default and commercial banks' ability to react (positive/negative) against various bank-based and market-based factors as observed under present research. Besides, research contribution by Saif-Alyousfi, Saha, and Md-Rus (2018) have reasonably justified the usage of ZROE through SDROE as a main measure of FS in banking sector.

3.9 Econometric Models of the Study

The nature of data in the present study is panel covering both characteristics of units of observations or entities *i* over a period of time *t*. Based on the assumption of panel data

(unit of observations or entities are >1 and time will also be >1), following models were applied in the present study to achieve the research objectives.

3.9.1 Panel Regression Models for RM and FS

- Pooled Regression Model (PRM)
- Fixed Effect Model (FEM)
- Least Square Dummy Variable Model (LSDVM)
- Random Effect Model REM (REM)

The first three objectives of the study were addressed by testing the research hypotheses of H1-H24 through above panel econometric models. A detailed description of each model is explained as under:

3.9.1.1 Pooled Regression Model (PRM)

Pooled regression model (PRM) is a very familiar statistical technique, allowing the researchers to effectively hold the effect of other factors (error terms). As per its parameters, it is known as the linear model, which helps to explain the relationship with the specific set of variables. The method of ordinary least square (OLS) can be easily applied to estimate multiple regression equations (Wooldridge, 2015). In general, a multiple regression equation is presented as:

$$Y = a + b_1 * X_1 + b_2 * X_2 + ... + b_n * X_n + \varepsilon \quad \text{--Equation 3.1}$$

By replacing the above general equation, following multiple regression equations are developed for the present study:

For DV1: FS-ROA

$$Y(FS-ROA) = \partial + \beta_1 LR + \beta_2 CR + \beta_3 OR + \beta_4 MR + \beta_5 CTR + \beta_6 FCI + \beta_7 CAR + \beta_8 AQ + \beta_9 CLG_1 + \beta_{10} CLG_2 + \beta_{11} CLG_3 + \beta_{12} CLG_4 + \beta_{13} SOB + \beta_{14} GDP + \varepsilon$$ --Equation 3.2

For DV2: FSZ-ROE

$$Y(FS-ZROE) = \partial + \beta_1 LR + \beta_2 CR + \beta_3 OR + \beta_4 MR + \beta_5 CTR + \beta_6 FCI + \beta_7 CAR + \beta_8 AQ + \beta_9 CLG_1 + \beta_{10} CLG_2 + \beta_{11} CLG_3 + \beta_{12} CLG_4 + \beta_{13} SOB + \beta_{14} GDP + \varepsilon$$ --Equation 3.3

3.9.1.2 Fixed Effect Model (FEM)

The primary reason for using the fixed-effect model (FEM) is that it helps researchers to analyze the impact of variables which can vary over time (Torres-Reyna, 2007). FE explores the association between the set of predictors and outcome(s) variables within the entity or unit of observations *i* as expressed by (Gujarati, 2009). Each unit of observation has its dimensions/individual characteristics which may or may not influence the predictors of the study (Torres-Reyna, 2007). The core examples of *i* cover the company, country, or individuals (Wooldridge, 2015). FE regression model assumes that something within the entities can impact or bias the predictors or outcome variables, therefore, significant attention is required to control this effect (Torres-Reyna, 2007). Additionally, it is assumed that there are some time-invariant features, and there should be no correlation with the characteristics of the individuals or the entities (Nwakuya & Ijomah, 2017). If the entities are correlated, then the assumption for using the FE is not suitable (Torres-Reyna, 2007). Consequently, the researcher should move to another model (probably the use of random effect or RE). The equation for the FE becomes:

$$Y_{it} = b1x_{it} + a_i + u_{it}$$ --Equation 3.4

Where:

α_i (i=1…. n) is the unidentified intercept value for each entity or unit of observation.

y_{it} is the outcome factor for a separate equation where i = unit of observation and t = time.

X_{it} denotes one independent variable or predictor factor of the study.

b_1 is the coefficient for that IV or predictor factor of the study.

u_{it} is the error term.

Now by converting the above general fixed effect equation into the more specific format, it is as follow:

For DV1: FS-ROA

$$Y_{it}(FS-ROA) = \beta_0 + \beta_1 LR_{it} + \beta_2 CR_{it} + \beta_3 OR_{it} + \beta_4 MR_{it} + \beta_5 CTR_{it} + \beta_6 FCI_{it} + \beta_7 CAR_{it} + \beta_8 AQ_{it} + \beta_9 CLG_1 + \beta_{10} CLG_2 + \beta_{11} CLG_3 + \beta_{12} CLG_4 + \beta_{13} SOB + \beta_{14} GDP + \gamma_2 E_2 ..... + \gamma_{28} E_{28} + u_{it}$$ --Equation 3.5

For DV2: FS-ZROE

$$Y_{it}(FS-ZROE) = \beta_0 + \beta_1 LR_{it} + \beta_2 CR_{it} + \beta_3 OR_{it} + \beta_4 MR_{it} + \beta_5 CTR_{it} + \beta_6 FCI_{it} + \beta_7 CAR_{it} + \beta_8 AQ_{it} + \beta_9 CLG_1 + \beta_{10} CLG_2 + \beta_{11} CLG_3 + \beta_{12} CLG_4 + \beta_{13} SOB + \beta_{14} GDP + \gamma_2 E_2 ..... + \gamma_{28} E_{28} + u_{it}$$ --Equation 3.6

Where:

$FS-ROA$ = financial stability in terms of return on assets or ROA (DV1).

$FS-ZROE$ = financial stability in terms of Z score of return on equity or ZROE (DV2).

LR = liquidity risk for commercial banks in Pakistan (IV1).

CR = credit risk for commercial banks in Pakistan (IV2).

OR = operational risk for commercial banks in Pakistan (IV3).

MR = market risk for commercial banks in Pakistan (IV4).

CTR = country risk for commercial banks in Pakistan (IV5)

FCI = financial crisis impact for commercial banks in Pakistan (IV6)

CAR = capital adequacy ratio for commercial banks of Pakistan (IV7)

AQ = audit quality for commercial banks in Pakistan (IV8)

CLG_1 = country-level governance one or CLG1 in Pakistan (IV9)

CLG_2 = country-level governance two or CLG2 in Pakistan (IV10)

CLG_3 = country-level governance three or CLG3 in Pakistan (IV11)

CLG_4 = country-level governance four or CLG4 in Pakistan (IV12)

SOB = Size of the banks in Pakistan (control variable 1)

GDP = gross domestic product of Pakistan (control variable 2)

β_0, $\beta_1 .. \beta_{11}$ = regression parameters for outcome, predictors, and control variables of the study.

$\gamma_2 \ldots \gamma_{28}$ = coefficients for the binary entities

u_{it} = is the error term

3.9.1.3 Least Squares Dummy Variable Estimator (LSDVM)

Least Square dummy variable model (LSDVM) is another type of FE model (Nwakuya & Ijomah, 2017). It not only controls the effect of heterogeneity of entities or time but also shows that effect by creating the dummy variables (Torres-Reyna, 2007). For a better understanding, present study applied LSDVM to present such entities that have their significant influence over outcome variables of the study. For using the LSDVM, two steps were involved. In the first one, there was a creation of dummy variables for the selected entities (Nwakuya & Ijomah, 2017).

$$D_{kit} = 0 \text{ if } k \neq i \text{ --Equation 3.7}$$

$$D_{kit} = 1 \text{ if } k = i \text{ --Equation 3.8}$$

After the creation of dummy variables, a regression method was applied for predictors, outcomes, and control variables. The following regression equations were estimated for the present study:

For DV1: FS-ROA

$$Y_{it}(FS-ROA) = \beta_0 + \beta_1 LR_{it} + \beta_2 CR_{it} + \beta_3 OR_{it} + \beta_4 MR_{it} + \beta_5 CTR_{it} + \beta_6 FCI_{it} + \beta_7 CAR_{it} + \beta_8 AQ_{it} + \beta_9 CLG_1 + \beta_{10} CLG_2 + \beta_{11} CLG_3 + \beta_{12} CLG_4 + \beta_{13} SOB + \beta_{14} GDP + \alpha_2 D_{2it} ..... + \alpha_{28} D_{28it} + \varepsilon_{it}$$ --Equation 3.9

For DV2: FS-ZROE

$$Y_{it}(FS-ZROE) = \beta_0 + \beta_1 LR_{it} + \beta_2 CR_{it} + \beta_3 OR_{it} + \beta_4 MR_{it} + \beta_5 CTR_{it} + \beta_6 FCI_{it} + \beta_7 CAR_{it} + \beta_8 AQ_{it} + \beta_9 CLG_1 + \beta_{10} CLG_2 + \beta_{11} CLG_3 + \beta_{12} CLG_4 + \beta_{13} SOB + \beta_{14} GDP + \alpha_2 D_{2it} ..... + \alpha_{28} D_{28it} + \varepsilon_{it}$$ --Equation 3.10

3.9.1.4 Random Effect Model (REM)

The fundamental assumption for random effect (RE) is that across the selected entities *i*, variation is supposed to be random. Therefore, it is not linked with the set of predictors or explanatory variables (Bell & Jones, 2015; Torres-Reyna, 2007). Additionally, in the words of Greene (2005) "the crucial distinction between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with the regressors in the model, not whether these effects are stochastic or not". Moreover, if the researcher has a significant reason to explain that heterogeneity in the entities of the model has some influence on outcome factors, then the RE should be used (Torres-Reyna, 2007). Besides, a random effect helps to add the time-invariant variables in the model, which are absorbed by the intercept in the FE (Torres-Reyna, 2007). Based on the above discussion, in general, RE model can be expressed as follows:

$$Y_{it} = \beta X_{it} + \alpha + u_{it} + \varepsilon_{it}$$ --Equation 3.11

Where

Y_{it} = dependent variable of the model

β = regression coefficient

X_{it} = explanatory variable for each entity *i* and time *t*

u_{it} = between-entity error

ε_{it} = within-entity error

Replacing the above equation in the present study, it is expressed as follows:

For DV1: FS-ROA

$$Y_{it}(FS-ROA) = \beta_0 + \beta_1 LR + \beta_2 CR + \beta_3 OR + \beta_4 MR + \beta_5 CTR + \beta_6 FCI + \beta_7 CAR + \beta_8 AQ + \beta_9 CLG_1 + \beta_{10} CLG_2 + \beta_{11} CLG_3 + \beta_{12} CLG_4 + \beta_{13} SOB + \beta_{14} GDP + u_{it} + \varepsilon_{it}$$ --Equation 3.12

For DV2= FS-ZROE

$$Y_{it}(FS-ZROE) = \beta_0 + \beta_1 LR + \beta_2 CR + \beta_3 OR + \beta_4 MR + \beta_5 CTR + \beta_6 FCI + \beta_7 CAR + \beta_8 AQ + \beta_9 CLG_1 + \beta_{10} CLG_2 + \beta_{11} CLG_3 + \beta_{12} CLG_4 + \beta_{13} SOB + \beta_{14} GDP + u_{it} + \varepsilon_{it}$$ --Equation 3.13

After applying the fixed and random effect regression models, their comparison was conducted in the next step. This comparison provided a final suggestion for accepting the research hypotheses. For this purpose, Hausman (HM) test was applied as observed in the studies of (Adkins, Campbell, Chmelarova, & Carter Hill, 2012; Hausman, 1978).

For HM test, the followings were the null and alternative hypotheses (Torres-Reyna, 2007).

H_{mo}: unique errors or μ_i are not correlated with the regressors of the model.

or

The preferred model is random effect.

H_{m1}: unique errors or μ_i are correlated with the regressors of the model.

or

The preferred model is fixed effect.

Overall findings of HM test have provided the evidence that RE is more appropriate between FE/RE. After accepting the RE, comparison between RE and OLS regression is applied to suggest a final model. For this purpose, the Breusch-Pagan Lagrange multiplier (B. P LM) test was applied by considering the following two hypotheses as suggested by (Torres-Reyna, 2007).

H_{LMo}: across the selected entities, the variance is zero.

H_{LM1}: across the selected entities, the variance is not zero.

Based on the stated finding under results and discussion, Ho is accepted (for both of the stability measures), providing the evidence that RE is more appropriate to accept research hypotheses.

3.9.2 Regression Models for Moderator, RM, and FS

The fourth objective of the study was to examine the moderating effect of RC on the relationship between RM and FS in commercial banks of Pakistan. As per the above discussion, RE is considered more appropriate to accept the direct relationship between the RM and FS. Therefore, a similar approach is applied to examine the moderating effect of RC between RM-FSROA and RM-FSZROE. In their study, Saha and Yap (2014) have applied the RE approach along with other panel models to examine the moderating effect of political instability and terrorism for tourism development. This study has adopted the RE methodology to examine the moderating effect of RC in RM-FS relationship.

The following equations are developed and empirically examined:

For DV1= FS-ROA

$$Y_{it}(FS-ROA) = \beta_0 + \beta_1 LR + \beta_2 CR + \beta_3 OR + \beta_4 MR + \beta_5 CTR + \beta_6 FCI + \beta_7 CAR + \beta_8 AQ + \beta_9 CLG_1 + \beta_{10} CLG_2 + \beta_{11} CLG_3 + \beta_{12} CLG_4 + \beta_{13} SOB + \beta_{14} GDP + u_{it} + \varepsilon_{it} \quad \text{--Equation 3.14}$$

$$Y_{it}(FS-ROA) = \beta_0 + \beta_1 LR + \beta_2 CR + \beta_3 OR + \beta_4 MR + \beta_5 CTR + \beta_6 FCI + \beta_7 CAR + \beta_8 AQ + \beta_9 CLG1 + \beta_{10} CLG2 + \beta_{11} CLG3 + \beta_{12} CLG4 + \beta_{13} SOB + \beta_{14} GDP + \beta_{15} RC + u_{it} + \varepsilon_{it} \quad \text{--Equation 3.15}$$

$$\begin{aligned} Y_{it}(FS-ROA) &= \beta_0 + \beta_1 LR + \beta_2 CR + \beta_3 OR + \beta_4 MR + \beta_5 CTR \\ &+ \beta_6 FCI + \beta_7 CAR + \beta_8 AQ + \beta_9 CLG1 + \beta_{10} CLG2 + \beta_{11} CLG3 \\ &+ \beta_{12} CLG4 + \beta_{13} SOB + \beta_{14} GDP + \beta_{15} RC + \beta_{16}(LR * RC) \\ &+ \beta_{17}(CR * RC) + \beta_{18}(OR * RC) + \beta_{19}(MR * RC) \\ &+ \beta_{20}(CTR * RC) + \beta_{21}(CAR * RC) + \beta_{22}(AQ * RC) \\ &+ \beta_{23}(CLG1 * RC) + \beta_{24}(CLG2 * RC) \\ &+ \beta_{25}(CLG3 * RC) + \beta_{26}(CLG4 * RC) + u_{it} + \varepsilon_{it} \end{aligned} \quad \text{--Equation 3.16}$$

For DV1= FS-ZROE

$$Y_{it}(FS-ZROE) = \beta_0 + \beta_1 LR + \beta_2 CR + \beta_3 OR + \beta_4 MR + \beta_5 CTR + \beta_6 FCI + \beta_7 CAR + \beta_8 AQ + \beta_9 CLG_1 + \beta_{10} CLG_2 + \beta_{11} CLG_3 + \beta_{12} CLG_4 + \beta_{13} SOB + \beta_{14} GDP + u_{it} + \varepsilon_{it}$$ --Equation 3.17

$$Y_{it}(FS-ZROE) = \beta_0 + \beta_1 LR + \beta_2 CR + \beta_3 OR + \beta_4 MR + \beta_5 CTR + \beta_6 FCI + \beta_7 CAR + \beta_8 AQ + \beta_9 CLG1 + \beta_{10} CLG2 + \beta_{11} CLG3 + \beta_{12} CLG4 + \beta_{13} SOB + \beta_{14} GDP + \beta_{15} RC + u_{it} + \varepsilon_{it}$$ --Equation 3.18

$$\begin{aligned} Y_{it}(FS-ZROE) &= \beta_0 + \beta_1 LR + \beta_2 CR + \beta_3 OR + \beta_4 MR + \beta_5 CTR \\ &+ \beta_6 FCI + \beta_7 CAR + \beta_8 AQ + \beta_9 CLG1 + \beta_{10} CLG2 + \beta_{11} CLG3 \\ &+ \beta_{12} CLG4 + \beta_{13} SOB + \beta_{14} GDP + \beta_{15} RC + \beta_{16}(LR * RC) \\ &+ \beta_{17}(CR * RC) + \beta_{18}(OR * RC) + \beta_{19}(MR * RC) \\ &+ \beta_{20}(CTR * RC) + \beta_{21}(CAR * RC) \\ &+ \beta_{22}(AQ * RC) + \beta_{23}(CLG1 * RC) \\ &+ \beta_{24}(CLG2 * RC) + \beta_{25}(CLG3 * RC) \\ &+ \beta_{26}(CLG4 * RC) + u_{it} + \varepsilon_{it} \end{aligned}$$ --Equation 3.19

Where:

$FS-ROA$ = Financial Stability in return on Assets

$FS-ZROE$ = Financial Stability in Z score of Return on Equity

LR = liquidity risk

CR = credit risk

OR = operational risk

MR = market risk

CTR = country risk

FCI = financial crisis impact

CAR = capital adequacy ratio

AQ = audit quality

CLG1 = country-level governance one

CLG2 = country-level governance two

CLG3 = country-level governance three

CLG4 = country-level governance four

SOB = size of the business for commercial banks in Pakistan

GDP = gross domestic product

RC = risk committee

LR*RC = interaction effect between liquidity risk and risk committee

CR*RC = interaction effect between credit risk and risk committee

OR*RC = interaction effect between operational risk and risk committee

MR*RC = interaction effect between market risk and risk committee

CTR*RC = interaction effect between country risk and risk committee

CAR*RC = interaction effect between capital adequacy ratio and risk committee

$AQ*RC$ = interaction effect between audit quality and risk committee

$CLG1*RC$ = interaction effect between country-level governance one and risk committee

$CLG2*RC$ = interaction effect between country-level governance two and risk committee

$CLG3*RC$ = interaction effect between country-level governance three and risk committee

$CLG4*RC$ = interaction effect between country-level governance four and risk committee

β_0 , $\beta_1 .. \beta_{26}$ = Regression Parameters for outcome, predictors, control, moderator variable, and interactive terms of the study.

u_{it} = between-entity error

ε_{it} = within-entity error

3.10 Data Analysis and Methods

For data analysis, the present study applied both descriptive and inferential statistics. Descriptive statistics help to explain the nature of data set in the form of mean, median, mode, standard deviation, and other normality measures (Douglas, William, & Samuel, 2002; Sharma, 2010). This research has applied specific measures of descriptive statistics to define the data and its trends. Besides, regression diagnostics are applied to check the normality, multicollinearity, linearity, and model specification (Zeng, 2016). Such

diagnostic tests are very useful as they describe and highlight the hidden issues in data sets. In the next step, panel regression models are applied to check the relationship between the variables. For the moderation effect of RC, RE regression approach was adopted. All the above-stated analyses were conducted in STATA-14.

3.11 Summary of the Chapter

The present chapter provides a discussion about research framework, key variables, research design, population, and data collection techniques. It explains the nature of the data sets and econometric models. For the measurement of variables, key sources and their proxies are presented appropriately. In addition, hypotheses are developed based on research objectives and aligned with regression models. To examine the moderating effect of risk committee, econometric equations were also developed and discussed under this chapter.

CHAPTER FOUR

ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter covers the topics for data analyses and discussion of empirical findings, based on various models, as discussed in chapter three. As discussed earlier in previous chapters, there is a significant issue of lower FS in commercial banks of Pakistan due to poor RM practices. This problem has provided enough evidence to examine and suggest some policy implications for the banking industry of Pakistan where the interest of range of stakeholder is significantly associated. The present section provides an introduction about the related topics. Section two presents the outcomes of descriptive statistics. Subsequently, regression assumptions like a correlation matrix for the multicollinearity and other diagnostic analyses are presented in section three. In the fourth section, panel regression analyses are performed, and outcomes are presented to cover research objectives (1-3) and related hypotheses. Section five covers the discussion about the fourth objective of the study. Section six covers an overall summary of the analyses and discussion of results.

4.2 Descriptive outcomes of the study

Descriptive statistics of the data explains its nature through the number of observations, mean value, standard deviation of the mean and minimum-maximum trends. It covers the central tendency, variation with the symmetrical measures of the data through skewness. Table 4.1 presents the summary statistics from 2007 to 2016 for commercial banks in Pakistan. Column one provides the details for both maximum-minimum numbers of

observations. It is found that maximum number of observations is 280, while the minimum number is 251. The discrepancy in the range of observations is due to the missing values for some of the variables in the period of study.

In the second column (Table 4.1), mean values are presented for all predictors, outcomes, and control variables. Mean values of the data set are considered useful measures to summarize the data in a precise form and for the comparison between different variables. All other measures like dispersion, skewness, and kurtosis are calculated through mean value (Sharma, 2010).

The mean score for ROA is .68 percent and 2.55 percent for ZROE, respectively. The value of deviation from the mean for both stability measures is 1.56 percent and 3.55 percent correspondingly. It indicates that ZROE has a higher deviation in the mean compared to the ROA. The positive mean score for ROA and ZROE indicates that from 2007 to 2016, on average, both the stability measures have a positive return over assets and equity investment. The range for ROA shows the lowest value of -6.40 percent, demonstrating that commercial banks in Pakistan have faced negative return over their assets, financial fragility, and lower stability. However, the highest value for ROA is recorded as 5.30 percent, indicating maximum return generated by commercial banks over the last ten years of the study. Figure 4.1 provides a graphical trend of FS-ROA for selected commercial banks in Pakistan.

Table 4.1
Descriptive Statistics of the Study

Variable	Observations	Mean	Std.Dev	Min	Max
ROA	280	0.68	1.56	-6.40	5.30
ZROE	280	2.55	3.55	-3.37	16.85
LR	280	11.02	9.32	3.09	64.40
CR	261	10.02	8.50	0.02	51.56
OR	255	58.01	15.31	19.97	103.21
MR	280	2.74	4.34	-5.08	8.32
CTR	280	88.81	14.10	60.74	104.77
FCI	280	0.60	0.49	0	1
CAR	272	12.06	10.60	-3.10	61.40
AQ	251	6.540	0.63	4.78	8.19
CLG1	280	-0.91	0.13	-1.07	-0.75
CLG2	253	-2.59	0.12	-2.81	-2.40
CLG3	253	-0.72	0.10	-0.81	-0.46
CLG4	252	-0.85	0.06	-0.97	-0.76
SOB	271	8.20	0.63	6.74	10.47
GDP	280	11.32	0.09	11.18	11.45
RC	274	4.08	1.204	2	9

Dependent variable is financial stability as measured by ROA = net income after tax/ total assets, and ZROE =return on equity/ standard deviation in return on equity; liquidity risk LR= liquid assets/total assets; credit risk CR= Non-performing loans/gross advances; operating risk OR= Cost to income ratio, market risk MR= real interest rate; country risk CTR= average annual exchange rate; financial crisis impact FCI= dummy variable equal to 1 for the crisis period (2007 to 2012) and 0 otherwise; capital adequacy ratio CAR= Equity /total assets; audit quality AQ= natural log of audit fee; country-level governance one CLG1= control of corruption; country-level governance two CLG2= Political Stability and Absence of Violence/Terrorism: Estimate; country-level governance three CLG3= government effectiveness: estimate; country-level governance four CLG4= voice and accountability: estimate; risk committee RC= size of risk committee; size of bank SOB= log of total assets; gross domestic product GDP= Log of GDP.

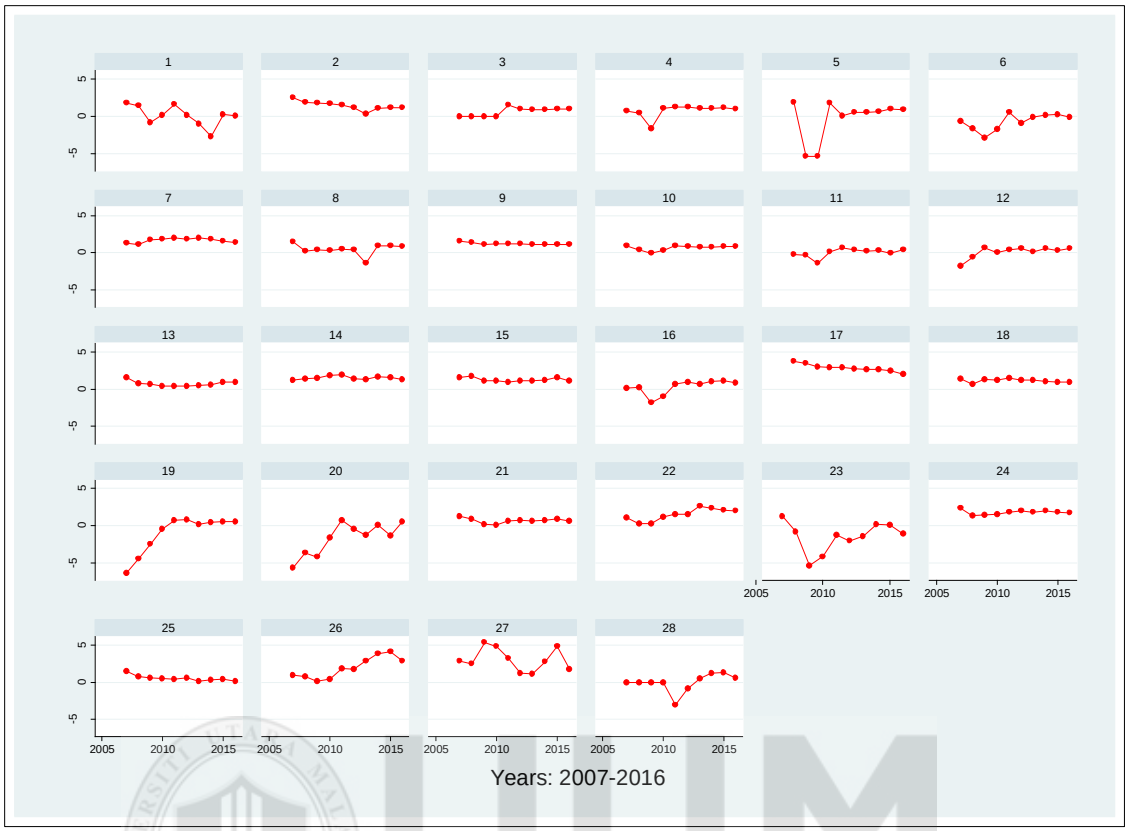

Figure 4.1
FS-ROA Trend Over 2007-2016
Source: SBP 2005, 2010, 2015, 2017

Specifically, for ZROE, it was found that an average score of 2.55 is experienced by commercial banks, with a deviation of 3.55 percent. Minimum observation for ZROE was recorded as -3.37 percent, demonstrating a situation of lower stability and a maximum of 16.85 percent, showing higher stability from 2007 to 2016. To analyze the overall trend of ZROE, Figure 4.2 gives a graphical trend for the selected commercial banks of the study.

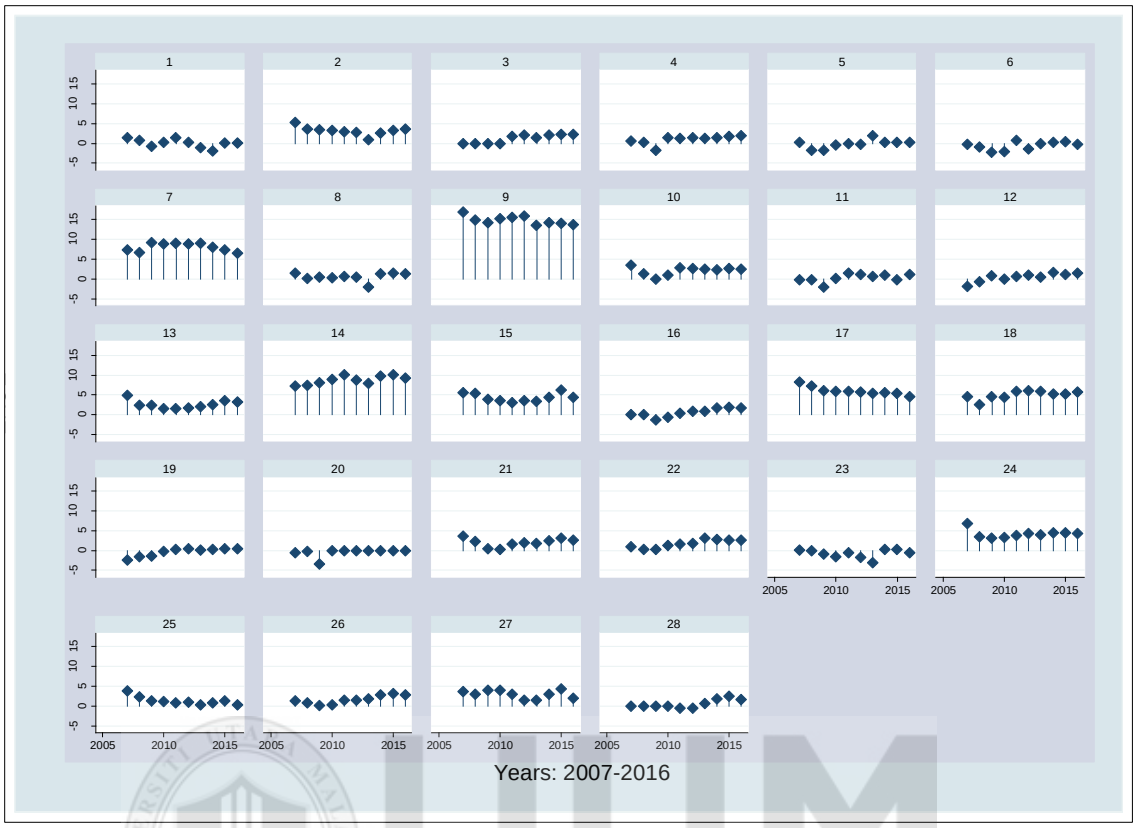

Figure 4.2
FS-ZROE Trend Over 2007-2016

The mean result for LR was obtained to 11.02 percent with a standard deviation of 9.32 percent. The maximum value for LR was 64.40 percent, showing the excessive/abnormal liquidity position of commercial bank in Pakistan (SBP, 2010a, 2016). For CR, the average value of NPLs to gross advances indicated a result of 10.02 percent with the dispersion of 8.50 percent. As discussed in the problem statement, commercial banks in Pakistan are facing an increasing value of lower asset quality regarding NPLs and same is presented when the data trends are studied through descriptive statistics. The minimum value of CR was seen .02 percent, and the highest was 51.56 percent, lowering the stability of commercial banks in Pakistan. This highest CR through NPLs are also presented under the

findings of (SBP, 2016). Figure 4.3 and 4.4 demonstrate the trends in LR and CR over the period of study.

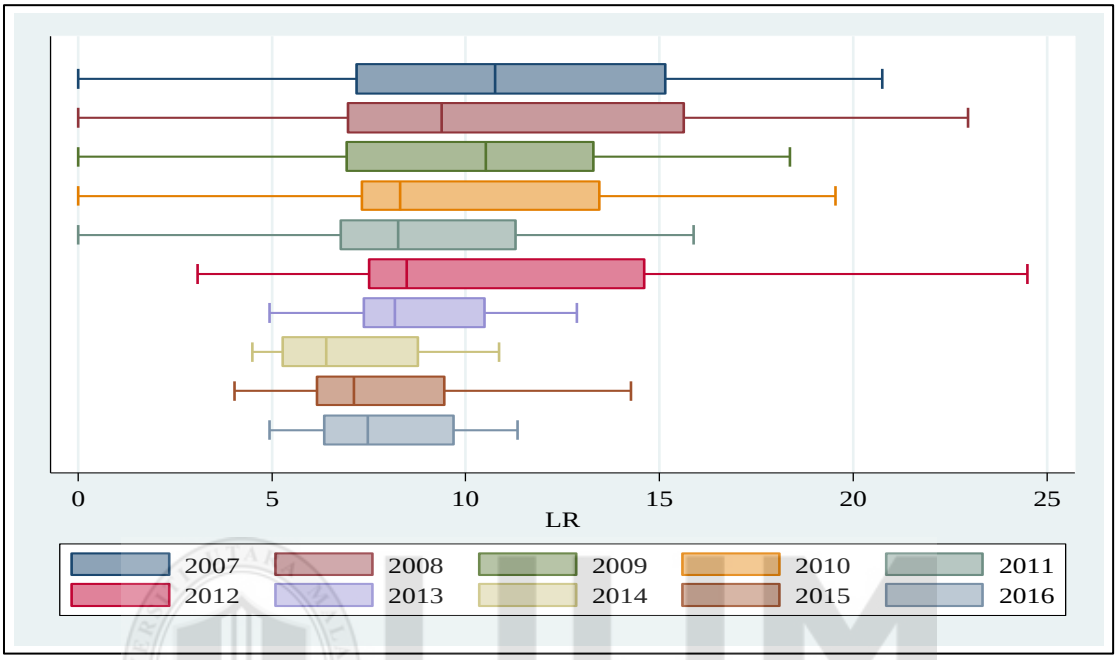

Figure 4.3
Liquidity Risk Trend Over 2007-2016
Source: SBP 2005, 2010a, 2015, 2017

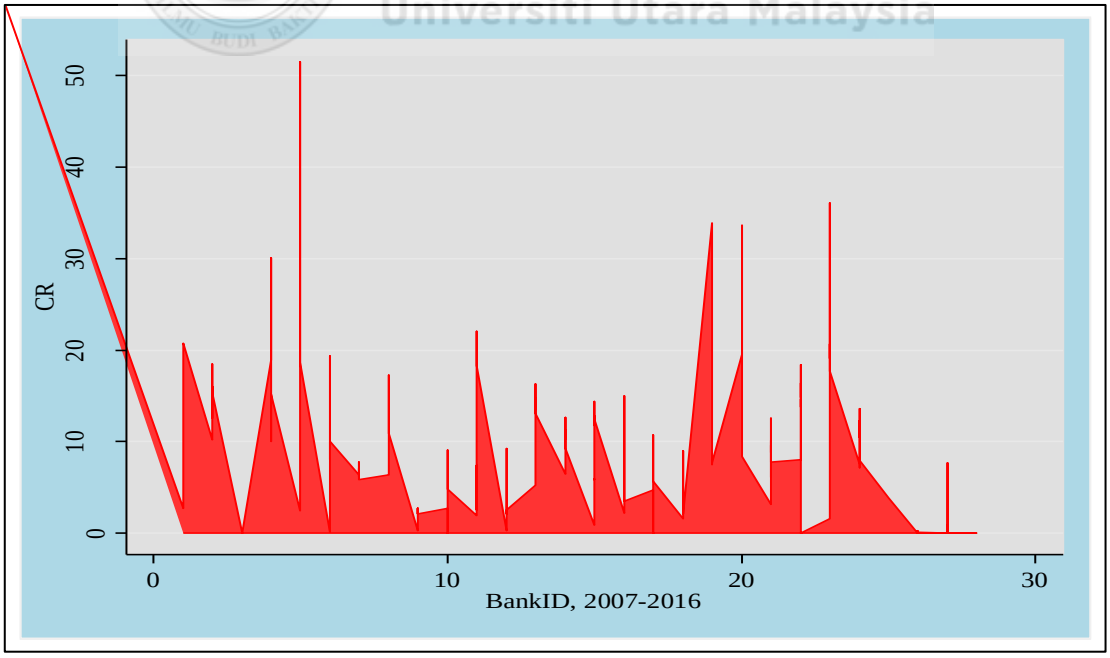

Figure 4.4
Credit Risk Trend Over 2007-2016
Source: SBP 2005, 2010a, 2015, 2017

For OR, CIR ratio is selected as a key proxy, indicating an average value of 58.01 percent. It means that increasing cost regarding interest and non-interest expenses is declining the income of the banking sector in Pakistan, showing a higher level OR. Deviation in the mean score for OR is highest compared to all the variables. It explains a substantial variation over the past and current decade. Minimum score of OR is recorded at 19.97 percent while the highest is 103.21 percent. The highest OR is due to the reason that banks like KASB Bank, Summit, and Silk Bank were not very much efficient to control their operating cost (SBP, 2015a, 2015b). All these facts are defending the argument that higher OR is susceptible to excessive volatility and instability in CBs. Figure 4.5 demonstrates the trends in OR during 2007-2016 for local commercial banks.

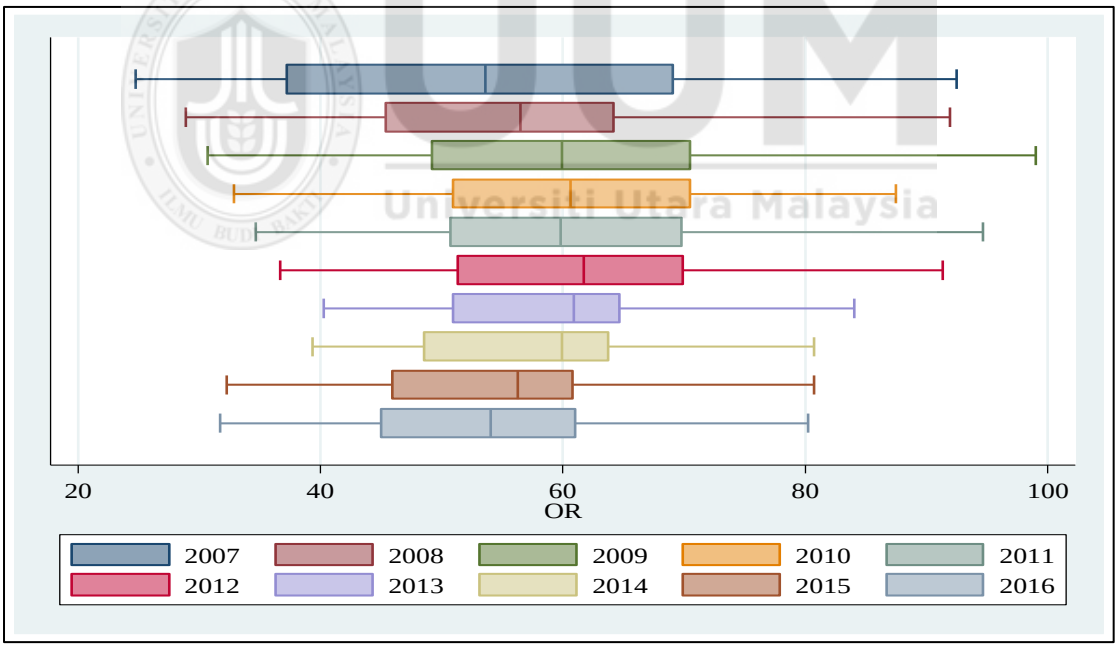

Figure 4.5
Operational Risk Trend Over 2007-2016
Source: SBP 2005, 2010a, 2015, 2017

In addition, MR is measured through the real interest rate in the economy, indicating an average trend of 2.74 percent with deviation from the mean of 4.34 percent. It shows that in the economy of Pakistan, lending interest rate is adjusted for the inflation factor as measured through GDP deflator. Figure 4.6 provides graphical trends in MR in terms of the real interest rate in the economy of Pakistan from 2007-2016.

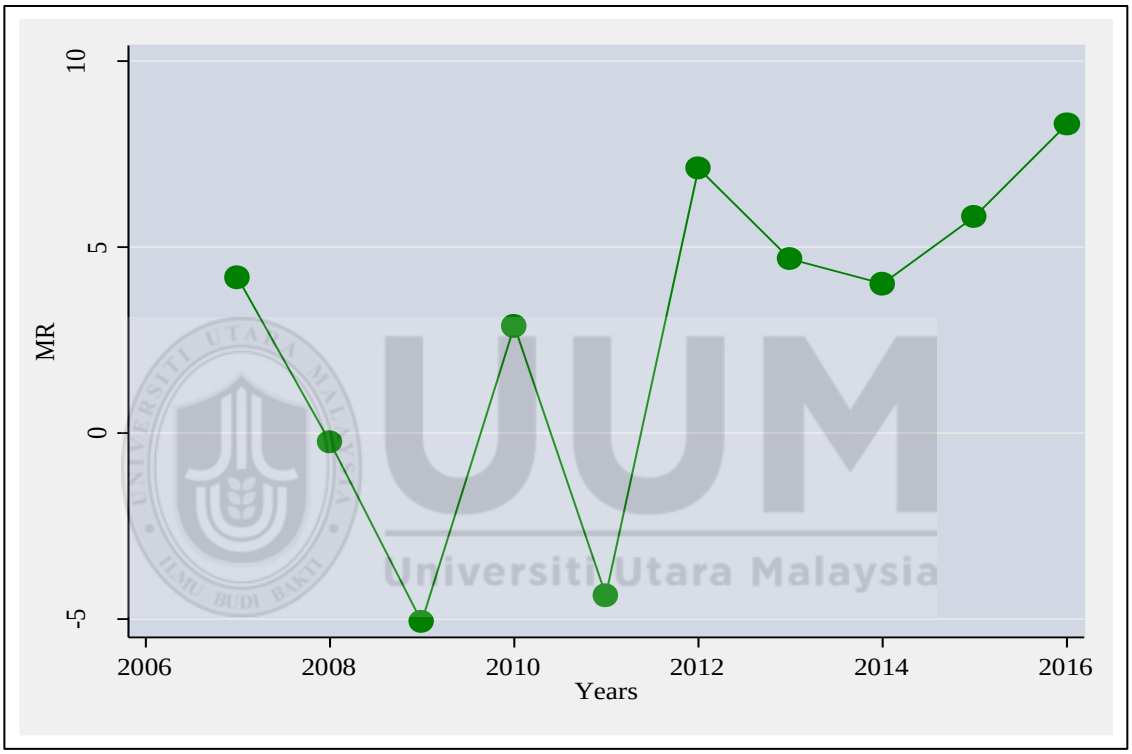

Figure 4.6
Market Risk Trend Over 2007-2016
Source: World Bank, 2017

For the CTR, variation in the exchange rate is observed. The mean value for CTR is 88.81 indicating an almost 89 percent variation in the local currency of Pakistani rupee (PKR), comparatively to US dollars. It means that higher CTR is exposed to the stability of local commercial banks. Since the last decade, Pakistan is facing currency risk in the local and international market as the depreciation of the rupee in exchange of US dollars is

increasing. Throughout the study period, the lowest exchange rate was 60.74 (PKR/USD) and the highest of 104.77, respectively (Trading Economics, 2017). Figure 4.7 provides a yearly trend in CTR as measured through exchange rate for commercial banks in Pakistan.

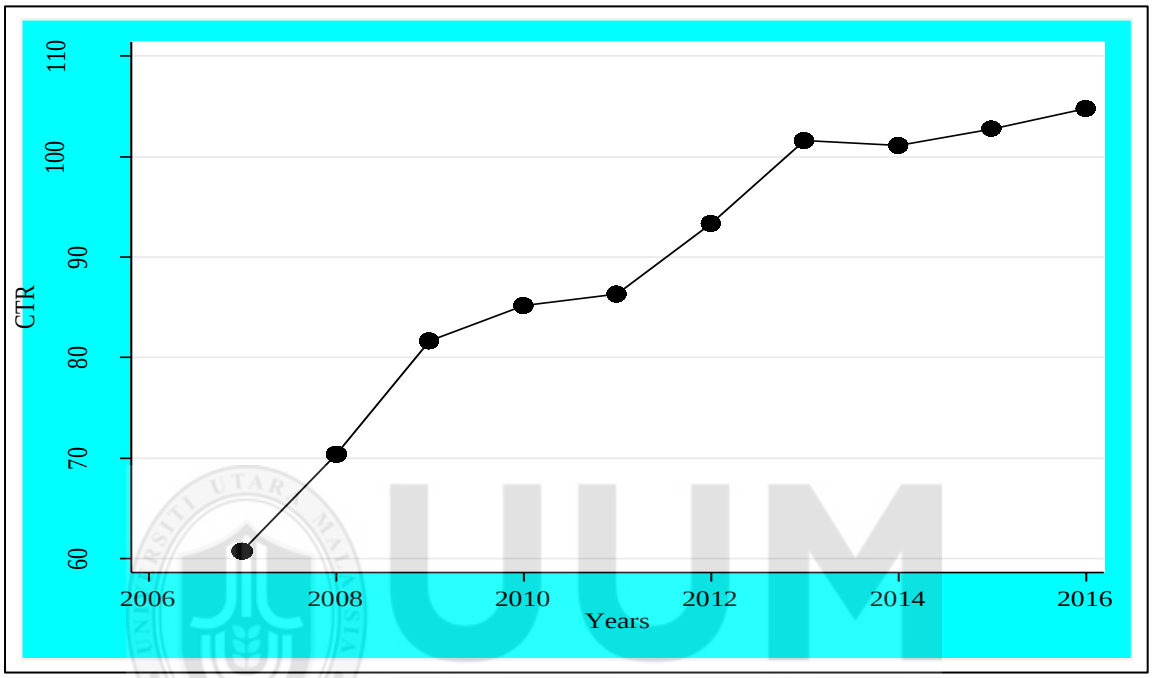

Figure 4.7
Country Risk Trend Over 2007-2016
Source: World Bank, 2018

To consider the international risk, FCI was added in the model. It was measured through a dummy variable, indicating the period of crisis (2007-2012) equal to 1, otherwise 0. For the regulation of the bank's capital, CAR has a mean value of 12.06 percent during 2007-2016. As per the Basel regulations, SBP has defined an average value of at least 10 percent of the CAR for commercial banks. However, an average value of 12.06 percent explains a reasonable shield for banks to address both expected and unexpected financial shocks. The highest ratio for the CAR is recorded at 61.40 percent, while the lowest is -3.10 percent, indicating a mixed amount of capital shield as presented by commercial banks in Pakistan.

Figure 4.8 presents the trends of CAR for commercial banks of Pakistan during the sample period of interest.

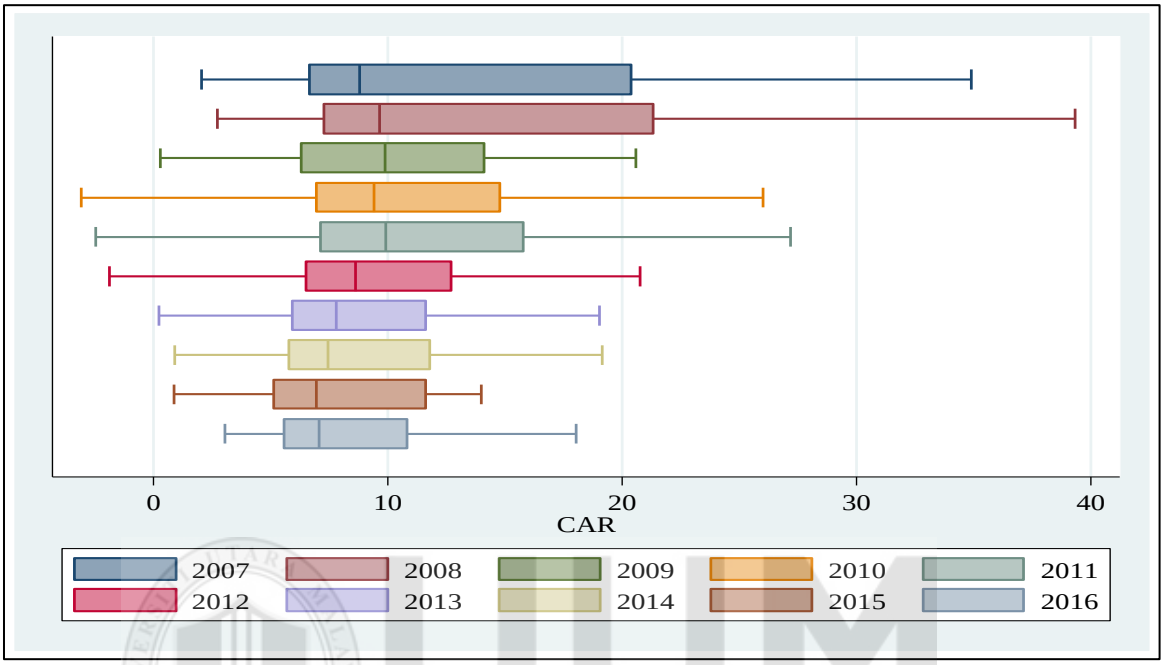

Figure 4.8
Capital Adequacy Ratio Over 2007-2016
Source: SBP 2005, 2010, 2015, 2017

To measure the AQ, audit fee is added along with governance factors. Mean value of audit fee (log) is 6.54 percent, while the maximum trend for the log amount is 8.19 percent respectively. In commercial banks of Pakistan, audit fee is recorded under the title of auditor's remuneration, paid to maintain the quality of financial statements.

While analyzing the governance structure in Pakistan, it is observed that control of corruption (CLG1) has a mean value of -.91. The global trend of this governance indicator shows that its score could be in the range of -2.5 to 2.5, expressing worst to best control

over corruption (Global Economy, 2017). The stated average value of -.9 specifies that over the recent two decades, Pakistan has a higher negative score in corruption control, reflecting governance problem. Minimum and the maximum score for the CLG1 is -1.07 to -0.75, providing the fact that Pakistan is struggling for better control over corruption in its economy.

Besides, the second indicator of country-level governance (CLG2) was measured through political stability and absence of violence/terrorism. Mean score for CLG2 is -2.59, demonstrating a low level of political instability and violence/terrorism in the country over two decades. Pakistan has faced massive loss over the last fifteen years because of political instability and terrorist attacks in the country. Thousands of causalities with a loss of more than 28459.89 million dollars to the economy is experienced due to terrorist attacks in the country (Pakistan Economic Survey, 2014). The minimum score for CLG2 is -2.81, while the maximum is -2.40, show some serious governance issues in the form of political instability (Javed, Waseem, Shabbir, & Mushtaq, 2018; Trading Economics, 2018).

The third indicator of country-level governance (CLG3) is government effectiveness. It shows a mean score -.72 explaining a lower level of quality of public service in Pakistan. Range of data for CLG3 is -2.5 to 2.5 with a standard normal distribution as defined by (Global Economy, 2018a). Both highest and lowest scores for CLG3 show that since 2007, Pakistan is facing the issue of poor governance structure in terms of effective government.

The last indicator of country-level governance (CLG4) is measured through voice and accountability, which predicts the extent to which citizens are free to select a government along with freedom of expressions. Mean score of CLG4 is -.85, expressing a lower level of freedom of expression, henceforth showing a poor governance structure (Global Economy, 2018b). Maximum and minimum observations for CLG4 are -.97 and -.76 respectively. For RC, an average number of members is 4 (approximately) with the deviation from the mean of 1.204 and maximum of 9. It shows that in commercial banks of Pakistan, on average, four members are responsible for managing the RM obligations and related policies. Besides, control variables are added under the title of SOB and GDP. Figure 4 represents an overview of CLG1-CLG4 from 2007 to 2016, whereas, Figure 4 indicates an overall descriptive look for all the variables of the study.

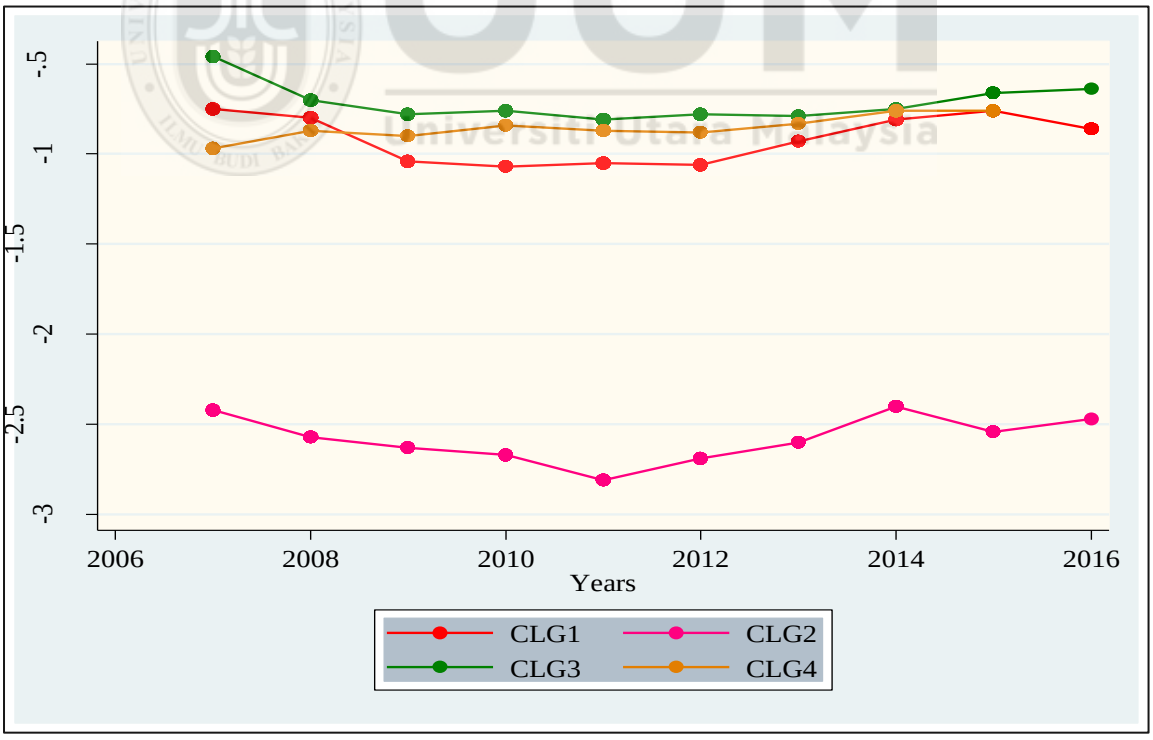

Figure 4.9
Country Level Governance (CLG) Trend 2007-2016
Source: Global Economy, 2017a, 2018a, 2018b, Trading Economics, 2018

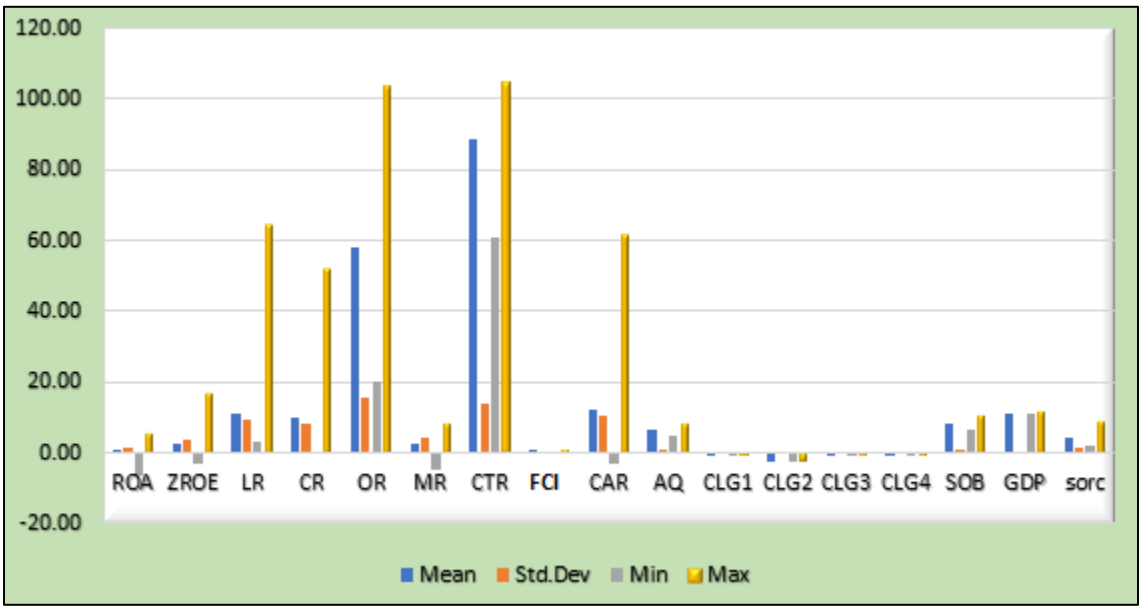

Figure 4.10
Overall Descriptive Nature of the Variables

4.3 Regression Assumptions

4.3.1 Correlation Matrix of the Study

After the detailed discussion on descriptive findings, Table 4.2 presents the correlation matrix, indicating the strength and direction of the association between the explanatory variables. The sign of correlation coefficient (r) expresses the directions of association. While its value clarifies the strength of the relationship, ranging from +1 to -1 as expressed by (Sharma, 2010). The level of association between the LR and CR is -.2349 percent, indicating a weak and negative relationship. This association is significant at 5 percent. The association between the LR and OR is .0249, demonstrating a low positive but insignificant relationship. The level of association between LR and MR and between LR and CTR is -.0326 and -.0877, which is negatively insignificant at 5 percent. The

association between the LR and CAR is .6546, expressing an above moderate level of relationship between them. This association is acceptable at 95 % level of confidence. The rest of the explanatory variables have no significant association with the LR for commercial banks in Pakistan.

For CR, the value of association with OR is .5557, which is moderate and positively significant at 5 percent. In addition, the relationship between CR and CAR is -.1934, suggesting a weak and negative but significant correlation. The relationship between AQ and CR is weak and positive, but significant. For CLG1, CLG2, and CLG3, CR is negative but significantly associated at 5 % chance of error. The association with all these governance factors and CR is below .25, signifying a weak correlation. However, the correlation of CR with CLG4 is weak and positive but insignificant.

Besides, column four (Table 4.2) considers the level of association for OR with other predictors of the study. The relationship of OR with AQ, CLG1, CLG2, and CLG3 is weak and negative, but significant at 5 percent. For MR and CTR, correlation is positively significant and close to moderate level. The relationship between MR and CLG1-CLG4 is positive but acceptable at 95% confidence level. Additionally, the value of CTR has a weak and significant association with CAR and AQ. However, for the CLG3, this correlation is -.5930, and .8499 for CLG4, respectively.

For CAR, correlation is found to be negatively significant and weak with AQ. Meanwhile, explanatory variable under the title of CLG4 show a very low association with AQ. However, the association between the CLG1 and CLG2 was highly positive and significant, indicating a good interdependency between both. The reason behind this high association is that both the governance factors have nearly a similar score of poor governance structure in Pakistan. Furthermore, the correlation between CLG2 and CLG3 is .6629, specifying a positive and significant relationship. The relationship between CLG3 and CG4 was also found to be negatively significant below moderate level.

For checking the issue of multicollinearity between variables, various statistical tests are presented in past literature. For this purpose, variance inflation factor (VIF), provides the argument that whether or not the presence of high correlation between variables is problematic in further econometric analysis (Craney & Surles, 2002; O'brien, 2007; Robinson & Schumacker, 2009). As a rule of thumb for VIF, a value greater than 10 indicates an issue of multicollinearity between variables and needs further investigation. Table 4.2 provides the individual VIF and the mean score for explanatory variables of the study.

As per the findings, VIF for all the explanatory variables is below ten, which suggests that there is no problem of multicollinearity. The mean VIF for all the independent variable is 4.06. Therefore, consideration of the set of predictors for the panel models is appropriate

and acceptable. Besides, the value of tolerance as calculated through 1/VIF is another score to detect the issue of collinearity (O'brien, 2007). A tolerance value of less than .10 can be comparable with VIF of 10. As per the findings in Table 4.2, tolerance level shows that there is no issue for high collinearity, supporting the argument in the same way as explained through VIF. Figure 4.11 provides the view of correlation matrix between the variables.

Table 4.2
Correlation Matrix of the Study

	LR	**CR**	**OR**	**MR**	**CTR**	**CAR**	**AQ**	**CLG1**	**CLG2**	**CLG3**	**CLG4**
LR	1										
CR	-0.2349*	1									
	0.0001										
OR	0.0249	0.5557*	1								
	0.692	0.0000									
MR	-0.0326	-0.0866	-0.0887	1							
	0.5872	0.1629	0.1581								
CTR	-0.0877	0.0758	-0.0007	0.4578*	1						
	0.1433	0.2225	0.9908	0.0000							
CAR	0.6564*	-0.1934*	-0.0605	-0.0928	-0.1423*	1					
	0.0000	0.0017	0.3358	0.1267	0.0189						
AQ	0.013	0.1940*	-0.2158*	0.0978	0.2174*	-0.1565*	1				
	0.8382	0.0024	0.0007	0.1223	0.0005	0.0136					
CLG1	-0.048	-0.2104*	-0.2023*	0.3822*	-0.0915	-0.007	0.0052	1			
	0.4236	0.0006	0.0012	0.0000	0.1267	0.9089	0.9342				
CLG2	-0.0346	-0.1972*	-0.1552*	0.4361*	-0.11	-0.0315	-0.0078	0.8284*	1		
	0.5834	0.0024	0.019	0.0000	0.0807	0.6238	0.9072	0.0000			
CLG3	0.0151	-0.2003*	-0.1622*	0.3159*	-0.5930*	0.062	-0.1121	0.7292*	0.6629*	1	
	0.8106	0.002	0.0142	0.0000	0.0000	0.3339	0.0927	0.0000	0.0000		
CLG4	-0.0948	0.0593	-0.0293	0.3058*	0.8499*	-0.119	0.1961*	0.1691*	0.1294*	-0.4147*	1
	0.1332	0.3663	0.661	0.0000	0.0000	0.0636	0.0031	0.0071	0.0402	0.0000	
	LR VIF	**CR VIF**	**OR VIF**	**MR VIF**	**CTR VIF**	**CAR VIF**	**AQ VIF**	**CLG1 VIF**	**CLG2 VIF**	**CLG3 VIF**	**CLG4 VIF**
Mean = 4.06	1.21	1.72	1.81	2.51	8.23	1.14	1.25	7.43	3.48	8.45	7.42

Table 4.2 (Continue)

SQRT-VIF	1.1	1.31	1.35	1.58	2.87	1.07	1.12	2.73	1.86	2.91	2.72
Tolerance	0.8288	0.5817	0.5527	0.3989	0.1215	0.8755	0.7994	0.1347	0.2878	0.1184	0.1348
Squared	0.1712	0.4183	0.4473	0.6011	0.8785	0.1245	0.2006	0.8653	0.7122	0.8816	0.8652

Dependent variable is financial stability as measured by ROA = net income after tax/ total assets, and ZROE =return on equity/ standard deviation in return on equity; liquidity risk LR= liquid assets/total assets; credit risk CR= Non-performing loans/gross advances; operating risk OR= Cost to income ratio, market risk MR= real interest rate; country risk CTR= average annual exchange rate; capital adequacy ratio CAR= Equity /total assets; audit quality AQ= natural log of audit fee; country-level governance one CLG1= control of corruption; country-level governance two CLG2= Political Stability and Absence of Violence/Terrorism: Estimate; country-level governance three CLG3= government effectiveness: estimate; country-level governance four CLG4= voice and accountability: estimate; risk committee RC= size of risk committee; size of bank SOB= log of total assets; gross domestic product GDP= Log of GDP. Note: (0.05) significance level.

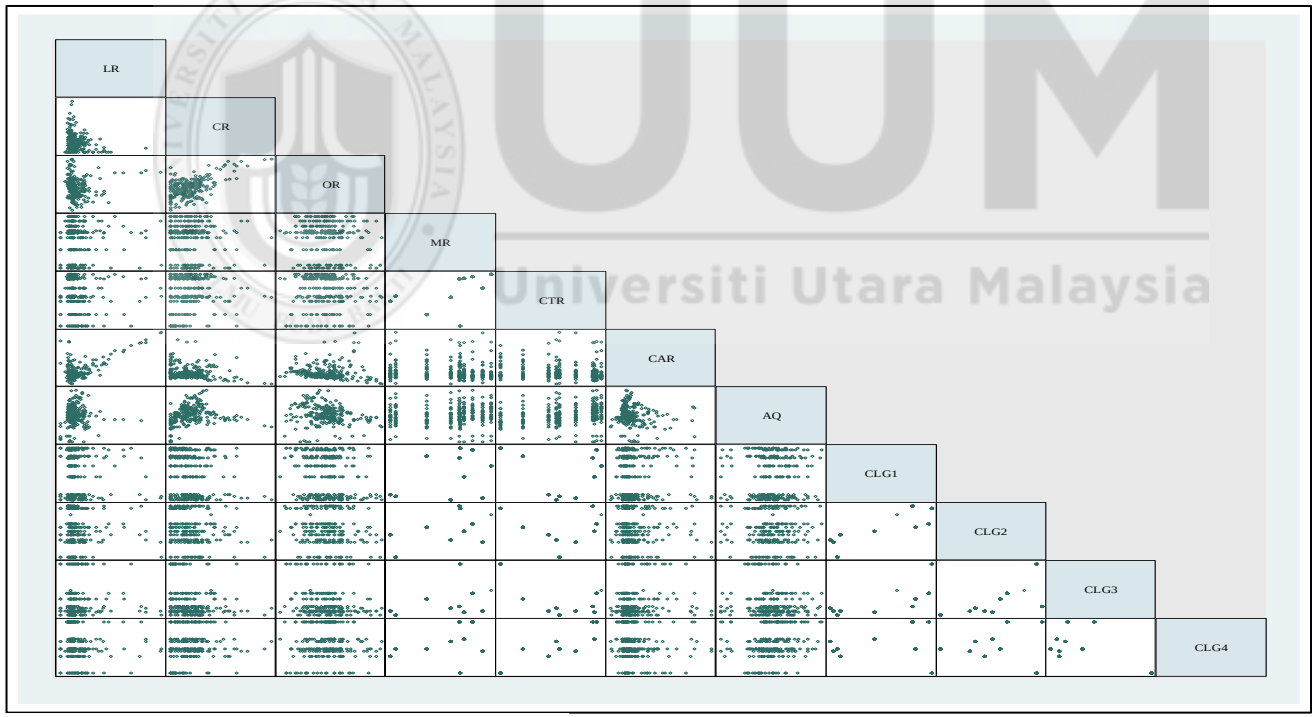

Figure 4.11
Correlation Matrix

4.3.2 Normality of Residuals: FS-ROA

After correlation analysis, normality of residuals is an essential assumption under OLS estimation (Schmidt & Finan, 2018). It is assumed that residuals or error terms should independently and identically be distributed (Berry, 1993; Chatterjee & Hadi, 2015; Osborne & Waters, 2002). For this purpose, various methods are defined in previous literature of financial econometrics and business statistics. Kernel-density estimate is among the significant approaches to highlight the normal distribution of the residuals along with normal density (Silverman, 2018). Figure 4.12 shows the normal distribution of residuals (FS-ROA) as developed through k-density command in STATA-14. It was found that both kernel density estimate, and normal density were identical, but with a slight peak of kdensity.

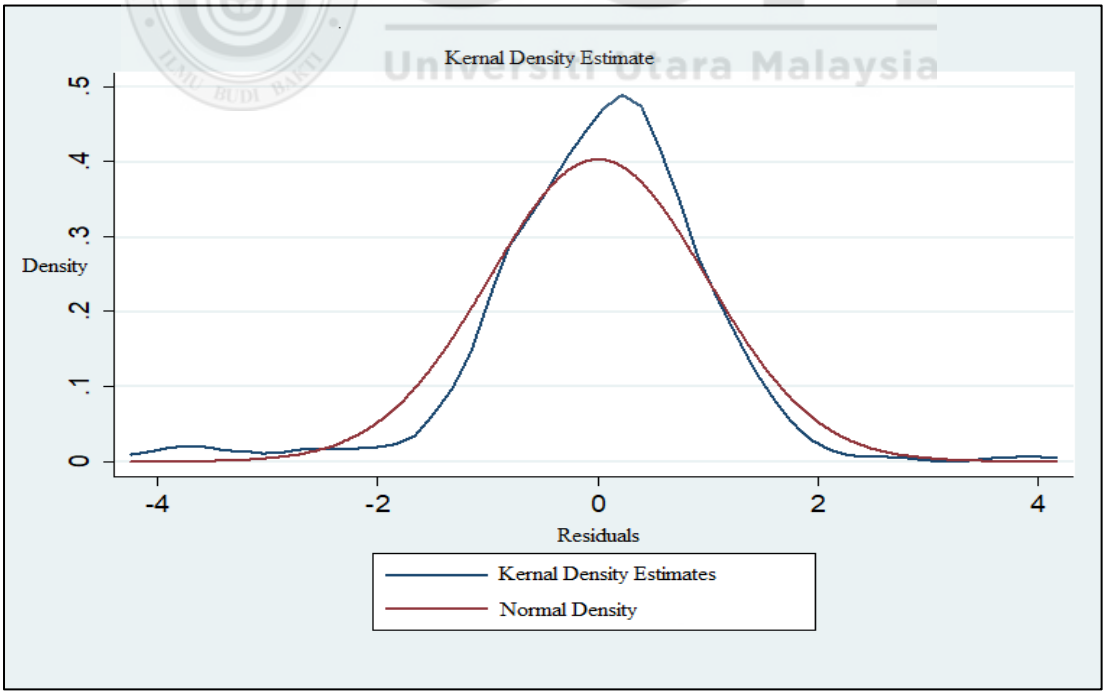

Figure 4.12
Normality of Residuals (FS-ROA)

For ZROE, normal distribution of residuals is presented through a normal probability plot, as generated through “pnorm” command in STATA-14 (Brennan, 2010; Mitchell, 2008; Park, 2015). As presented under Figure 4.13, it is believed that there is no indication for the non-normality of the residuals for ZORE. Therefore, it is accepted for both measures of FS that residuals are close to normal distribution.

4.3.3 Normality of Residuals: FS-ZROE

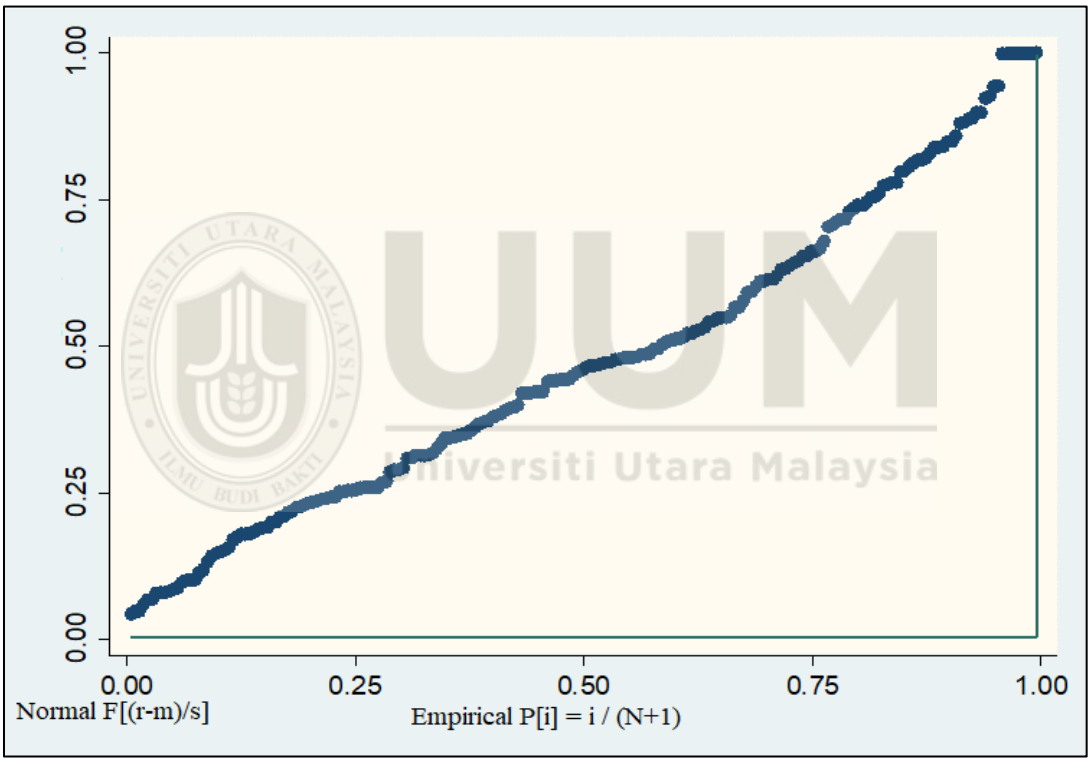

Figure 4.13
Normality of Residuals (FS-ZROE)

4.3.4 Checking Linearity: FS-ROA and FS-ZROE

Linear association between the fitted values and outcome variable assumes that the scatter plot will provide a trend line between both (Jann, 2008; Panagiotidis, 2002). For the fitted values of the regression model and FS-ROA, Figure 4.14 indicates the linearity graph. It is observed that maximum data points are below the line, covering an angle of 45 degrees. Due to this pattern of the data as most of the points are below the line, the problem of heteroskedasticity exits which can bias the regression results. To avoid this issue, present study has applied the technique of robust regression panels to control for the heteroskedasticity along with autocorrelation. Similarly, Figure 4.15 shows the graph between fitted values and FS-ZROE. It is observed that the trend of linearity is slightly disturbed because data points are below the line. Therefore, for the second measure of FS; ZROE, robust standard error are provided, hence controlling the issues like heteroskedasticity along with autocorrelation.

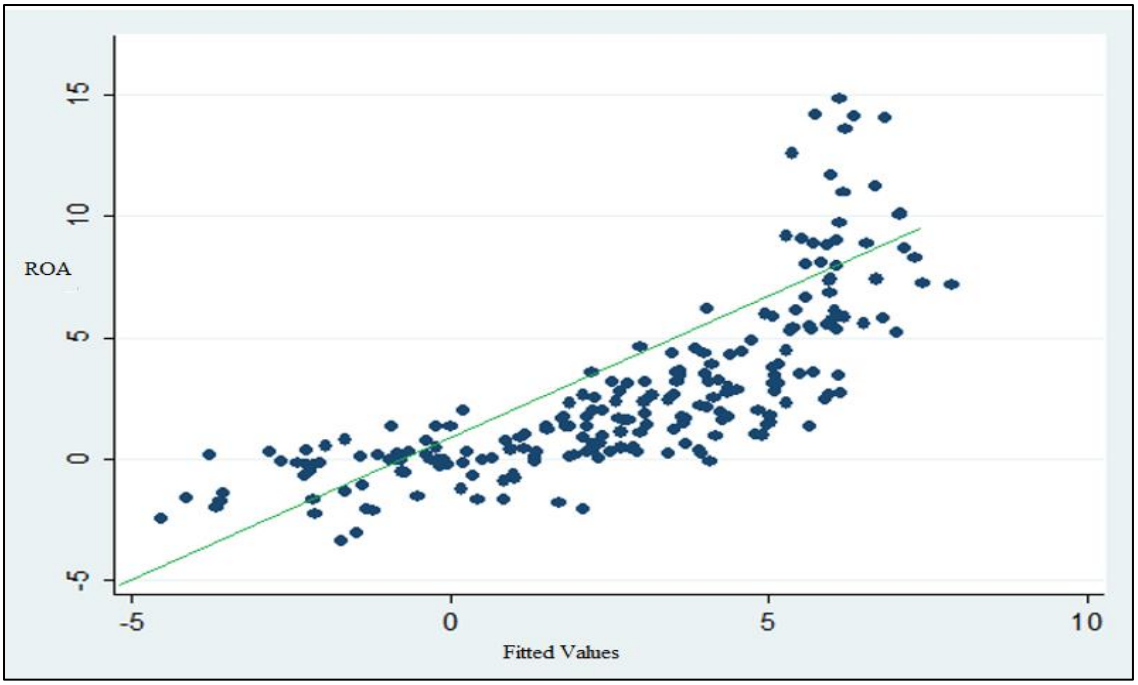

Figure 4.14
Linearity Graph between Fitted Values and FS-ROA

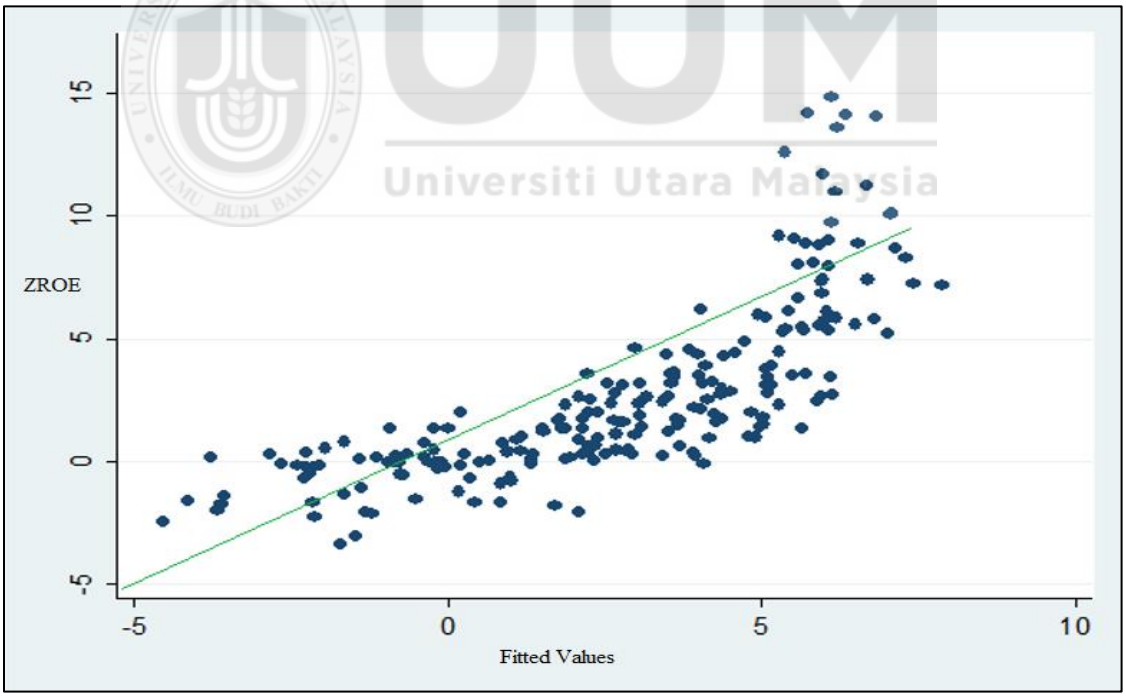

Figure 4.15
Linearity Graph between Fitted Values and FS-ZROE

4.3.5 Model specification

For model specification, link-test is applied after OLS estimation in STATA-14 (Cleves, Gould, Gould, Gutierrez, & Marchenko, 2008; Mehmetoglu & Jakobsen, 2016). Link-test creates two new variables under the title of "_hat" commonly known as a variable of prediction and "_hatsq" known as squared prediction (Setzer, 2006). In the next step, both of these variables are used as predictors for checking the model specification.

The following hypotheses were developed and empirically examined:

$H0_I$: Regression model for ROA has no specification error/model is correctly specified.

$H1_I$: Regression model for ROA has a specification error/model is not correctly specified.

$H0_L$: Regression model for ZROE has no specification error/model is correctly specified.

$H1_L$: Regression model for ZROE has a specification error/model is not correctly specified.

To indicate which hypotheses will be accepted or rejected, findings for the link-test are presented below.

Under Table 4.3, the value of _hatsq has a coefficient of .0335 with the standard error of .0635, insignificant at 5 percent with the critical ratio of .51. This is in favor of the null hypothesis ($H0_I$) which states that regression model for ROA has no specification error/ model is correctly specified. Similarly, Table 4.4 shows the fact that the coefficient for _hatsq is .111 with a standard error of .075, respectively. This value is insignificant at 5

percent, means that the regression model for ZROE has no specification error/model and is correctly specified; hence fails to reject $H0_L$.

Table 4.3
Link Test for Model Specification (FS-ROA)

FS-ROA	Coef.	Std. Err.	T	P>t
_hat	.3798292	1.217497	0.31	0.755
_hatsq	.0335351	.0653741	0.51	0.609
_cons	2.763339	5.560708	0.50	0.620

Table 4.4
Link Test for Model Specification (FS-ZROE)

ZROE	Coef.	Std. Err.	T	P>t
_hat	-1.447738	1.2675	-1.14	0.255
_hatsq	.111834	.075339	1.48	0.277
_cons	12.82577	6.809783	1.88	0.061

4.4 Discussion on First, Second, and Third Research Objective

To achieve the research objectives from one to three, panel regression models under the titles of pooled ordinary least square (OLS), fixed effect, least-square dummy variable, and random effect are developed and tested. Mainly, regression equations from 3.2 to 3.17 were observed for the panel models to empirically examine the impact of risk types, regulation

on the bank's capital, and governance factors on FS. A discussion based on these models helped to achieve the first three research objectives and to check the hypotheses from H1 to H24. Table 4.5 presents the findings of pooled OLS for the key explanatory variables and both stability measures. For the overall goodness of the models, F-statistics was calculated through mean square value of the model divided by the mean square residuals (Kuznetsova, Brockhoff, & Christensen, 2017). The value of F-statistics specifies whether the coefficients in robust regression OLS are significantly different from zero.

For this purpose, the following hypotheses were developed and tested.

H0: Robust OLS regression model for FS-ROA is not a good fit/all the regression coefficients for FS-ROA are not significantly different from zero.

Ha: Robust OLS regression model for FS-ROA is a good fit/ all the regression coefficients for FS-ROA are significantly different from zero.

The significance level of Model 1 (M1) under Table 4.5 is less than 1 percent, showing that robust OLS regression model for FS-ROA is a good fit. The value of explained variance in FS-ROA as predicted by all the explanatory variables under the risk types, regulations on bank's capital, and governance factors is .605 percent, signifying a reasonable variation. This variation measures the overall strength of association and does not direct the extent to which any specific explanatory variable is associated with the FS-ROA. Besides, individual effect of various risk factors, bank capital and governance is also presented through their coefficients along with robust standard error.

Table 4.5
OLS Regression Estimations for FS-ROA and FS-ZROE

	(M1)	(M2)
VARIABLES	**ROA**	**ZROE**
	Risk Types	
LR	-0.0179	-0.153***
	(0.0176)	(0.0309)
CR	-0.0369**	-0.173***
	(0.0178)	(0.0239)
OR	-0.0496***	-0.0187
	(0.00722)	(0.0198)
MR	0.0548*	0.0416***
	(0.0299)	(0.00558)
CTR	-0.223***	-0.215***
	(0.0663)	(0.00413)
FCI	-2.594***	-1.999***
	(0.879)	(0.0787)
	Regulation on Bank's Capital	
CAR	-0.0169	-0.0387
	(0.0157)	(0.0284)
	Governance Factors	
AQ	-0.489***	-1.262***
	(0.173)	(0.339)
CLG1	-12.17***	-10.06***
	(3.885)	(0.296)
CLG2	0.961	-0.624*
	(1.287)	(0.313)
CLG3	0.660	1.804***
	(2.255)	(0.297)
CLG4	6.857*	5.438***
	(3.709)	(0.487)

Table 4.5 (Continue)

	Control Variables	
SOB	1.197***	4.640***
	(0.169)	(0.477)
GDP	21.62***	14.74***
	(5.819)	(0.785)
Constant	-228.2***	-173.9***
	(59.20)	(5.968)
R-squared	0.605	0.572
Prob > F	0.0000	0.0000

Dependent variable is financial stability as measured by ROA = net income after tax/ total assets, and ZROE =return on equity/ standard deviation in return on equity; liquidity risk LR= liquid assets/total assets; credit risk CR= Non-performing loans/gross advances; operating risk OR= Cost to income ratio, market risk MR= real interest rate; country risk CTR= average annual exchange rate; financial crisis impact FCI= dummy variable equal to 1 for the crisis period (2007 to 2012) and 0 otherwise; capital adequacy ratio CAR= Equity /total assets; audit quality AQ= natural log of audit fee; country-level governance one CLG1= control of corruption; country-level governance two CLG2= Political Stability and Absence of Violence/Terrorism: Estimate; country-level governance three CLG3= government effectiveness: estimate; country-level governance four CLG4= voice and accountability: estimate; size of bank SOB= log of total assets; gross domestic product GDP= Log of GDP. Robust standard errors in parentheses as adjusted for heteroskedasticity and autocorrelation, *** p<0.01, ** p<0.05, * p<0.1 indicating level of significance.

For LR, the effect on FS-ROA is negatively insignificant. The value of -.0179 implies that increasing level of LR in commercial banks is negatively impacting on ROA, but this effect is not statistically substantial to accept research hypothesis. It means that more investment in liquid assets by commercial banks could not provide any evidence about its impact on FS-ROA, therefore it needs to be revised. The excessive liquid assets in commercial banks further indicate the mis-utilization of cash and related reserves. The presented findings are consistent with the Ghenimi, Chaibi and Omri (2017) who have observed a negative but

insignificant relationship between LR and ROA while dealing with the stability of banking firms in MENA region.

The coefficient of -.0369 (Table 4.5) explains that increasing level of CR in commercial banks of Pakistan is negatively and significantly affecting FS-ROA, symmetrical to the findings of (Ghosh, 2017; Soedarmono, Machrouh, & Tarazi, 2011). This negative influence of CR on FS-ROA indicates that commercial banks in Pakistan are not performing well in terms of controlling the adverse effect of CR on FS-ZROA. Similar findings are presented in the past literature which suggest that increasing NPLs are found to be among the major risk issues in commercial banks.

Among the bank-based risk measures, OR has its negative and significant impact on FS-ROA. Similar results are presented by (Said & Tumin, 2011). This relationship indicates that commercial banks with a higher degree of OR tend to face more instability. It further implies that due to higher operational cost and weak internal control, CIR is negatively and significantly affecting the banking sector stability in Pakistan. This relationship further states the inefficiency in operational activities, which needs to be examined both by the bank management and SBP. However, the effect of MR is found to be significantly positive on FS-ROA, specifying an increasing interest rate tends to put an effect of .0548 in the stability of commercial banks. In this regard, the present effect of interest rate as the core proxy of MR on FS-ROA is consistent with (Malik, Khan, Khan, & Khan, 2014).

Through the CTR, the effect of exchange rate volatility on FS-ROA is -.223, specifying a highly significant impact. Due to continuous depreciation in local currency and higher volatility in the exchange rates, commercial banks in Pakistan have faced the problem of financial fragility during the last and recent decade. This effect of CTR over FS is consistent with the findings of (Anbar & Alper, 2011; Combey & Togbenou, 217).

Furthermore, because of FCI from 2007 to 2012, stability through ROA in commercial banks was negatively affected. It means that FS-ROA of commercial banks in Pakistan is vulnerable to international risk factor. Such empirical findings are identical to the results as presented by Fiordelisi and Mare (2014), who have found a significant and negative association between FCI and FS. However, the effect of CAR on FS-ROA is found to be insignificant. It explains that capital regulations do not make impact on stability, which is similar to the empirical outcomes of (Acaravci & Çalim, 2013). This insignificant relationship of CAR with FS-ROA may be due to excessive reserve of capital as maintained by commercial banks which is no longer as a core determinant of FS-ROA. However, implementing a strict policy for keeping the CAR at 10 percent as defined by SBP might provide different findings in future research.

Through governance factors, the impact of AQ on FS-ROA was found highly significant and negative. It implies that higher payments in the form of audit fee lead towards lower stability in commercial banks. Therefore, more remuneration to auditors is not beneficial

for commercial banks and needs to be revised by BODs and relevant authorities. These empirical findings are further supported in the study of Moutinho, Cerqueira and Brandao (2012) who have observed a significant and negative association between audit fee and ROA. In addition, CLG1 explained significant and negative influence on the bank's stability, inferring that the control of corruption in Pakistan is deficient, which in return, increases the financial instability in commercial banks.

As stated under problem statement and descriptive findings, the control over corruption in Pakistan is very low with a negative ranking. In the meantime, the impact of CLG2 and CLG3 seems to be insignificant, specifying no association of government effectiveness, and political stability with FS-ROA. It explains that both political stability and absence of violence and government effectiveness do not directly impact the first measure of FS for commercial banks in Pakistan. The reason for this insignificant influence may be the nature of these governance factors (CLG2-CLG3) as macroeconomic governance measures and no linkages with the banking industry, comparatively to CLG1.

Moreover, the impact of CLG4 on FS-ROA was found positive and significant, explaining that voice and accountability shows a positive impact on bank sector stability. Besides, SOB and GDP were added in the model as control variables, showing their significant and positive impact on FS-ROA, consistent with (Irawati & Maksum, 2018). Further, the value

of explained variation (R^2) through all regressors is .605, demonstrating a reasonable variation in the first measure of FS.

For the second measure of FS, ZROE was calculated. To check the fitness of the model, following hypotheses are developed:

$H0_1$: Robust OLS regression model for FS-ZROE is not good fit/all the regression coefficients for FS-ZROE are not significantly different from zero.

Hb: Robust OLS regression model for FS-ZROE is a good fit/ all the regression coefficients for FS-ZROE are significantly different from zero.

The overall fitness of the model indicated p-value of less than 1 percent (0.000) under Model 2 (M2, Table 4.5), accepting the argument that coefficients for the regression model (OLS) for ZROE are statistically different from zero, therefore supporting Hb. The impact of LR on ZROE is -.153, significant at 1 percent. It directs that increasing LR in commercial banks of Pakistan was creating financial fragility and lower stability when it is measured through Z-score of ROE. This fact is consistent with Hassan, Khan, and Paltrinieri 2019) who have experienced a significant and negative association between LR and FS for both Islamic and conventional banks.

For CR, the coefficient of -.173 shows a negative and significant effect on ZROE, defending the proposition that assets quality for the commercial banks is adversely

affecting the commercial bank's stability. A similar influence of CR on bank stability is found by (Soedarmono et al., 2011). Through OR, effect on ZROE is positive but insignificant, saying that there is no relationship between them. It means that OR has no direct influence over the stability measure of ROE. The reason for this insignificant influence may be the nature of ZROE, which is assumed as better stability measure for banks, compared to ROA, hence not affected by OR in banks.

For MR, highly significant and positive influence on ZROE is observed. It means that a real interest rate in the economy is positively affecting the banking sector stability. Besides, risk factors like CTR and FCI have shown their adverse influence on Z measure of FS. It shows that depreciation in the local currency and international risk factors are adversely influencing on the banks, hence lowering their stability. Through various risk measures (liquidity, credit, operational, market, country, and FCI), and their adverse influence on FS, it is observed that there is a presence of agency issue in local banks of Pakistan. It implies that these risk factors have their adverse influence on the stability where risk managers, credit officials, and RM department seems to be inefficient for controlling their surprising influence on FS. The more the adverse influence of risk factors on bank stability, the greater is the unrest among shareholders and vice versa.

In addition, the influence of CAR as a principal measure of regulation on bank's capital shows a negative but insignificant impact on ZROE. For the governance factors, coefficient

of -1.262, explains that higher payment to the auditors in the form of remuneration has its adverse effect on ZORE. It shows that banks should control higher payments to auditors for better stability in financial terms. Additionally, CLG1 and CLG2 seem to affect the second measure of bank stability negatively. It shows that poor control over corruption and low effectiveness in the government is not better for commercial banks to adore better stability. However, CLG3 and ClG4 have shown their positive and significant influence on FS-ZROE, indicating that political stability and absence of violence with regulatory quality is beneficial for bank stability when it is measured through equity investment.

The control variables of the study, SOB and GDP, showed a positive relationship with ZROE, similar to the findings of (Soedarmono et al., 2011). Besides, the finding for the R^2 explains an overall variation of 57.2 percent in FS-ZROE as explained by risk factors, regulations on bank's capital and governance indicators.

In the next panel analysis, the effect of individual entities (banks) is spread out over the dummies through LSDVM as expressed by (Torres-Reyna, 2007). It implies that the issue of heterogeneity between firms can be controlled and expanded over the individual dummies for, a higher accuracy of regression coefficients, as shown in Table 4.6. Under LSDVM (M1), the effect of CR on FS-ROA is -.0544, explains that NPLs are putting an adverse impact on the first measure of stability, followed by the findings of (Kingu, Macha, & Gwahula, 2018). Meanwhile, OR specifies a significant and negative impact on FS-

ROA, consistent with empirical results of (Mathuva, 2009). It means that both credit and operational risk measures adversely impact the banking sector of Pakistan.

Table 4.6
Panel Regression Estimation for ROA and ZROE under LSDVM

VARIABLES	(M1) FS-ROA	(M2) FS-ZROE
	Risk Types	
LR	0.0382	-0.000371
	(0.0259)	(0.0203)
CR	-0.0544***	-0.0585***
	(0.0167)	(0.0140)
OR	-0.0485***	-0.0299***
	(0.0102)	(0.00618)
MR	0.0449	0.0321***
	(0.0281)	(0.00372)
CTR	-0.235***	-0.201***
	(0.0660)	(0.00495)
FCI	-2.696***	-1.941***
	(0.879)	(0.0412)
	Regulations on Bank's Capital	
CAR	-0.0214	-0.0305**
	(0.0194)	(0.00991)
	Governance Factors	
AQ	-0.479	-0.282
	(0.301)	(0.347)
CLG1	-13.73***	-10.02***
	(3.596)	(0.426)
CLG2	1.480	1.380***
	(1.467)	(0.252)

Table 4.6 (Continue)

CLG3	1.583	2.397***
	(2.006)	(0.266)
CLG4	8.882**	5.434***
	(3.503)	(0.733)
	Control Variables	
SOB	0.498	1.461**
	(0.885)	(0.491)
GDP	25.10***	21.63***
	(6.012)	(0.886)
	Entities with significant influence on FS	
_Ibankid_4	1.454*	0.807*
	(0.798)	(0.420)
_Ibankid_7	1.260	6.016***
	(1.404)	(0.682)
_Ibankid_9	0.343	12.50***
	(1.242)	(0.515)
_Ibankid_13	1.221	1.344*
	(1.146)	(0.703)
_Ibankid_14	0.284	5.754***
	(1.732)	(1.617)
_Ibankid_15	1.319	2.804**
	(1.215)	(0.852)
_Ibankid_16	0.594	-0.00108
	(0.803)	(0.749)
_Ibankid_17	1.507	3.295***
	(1.532)	(0.734)
_Ibankid_18	0.213	2.945***
	(1.067)	(0.833)
_Ibankid_23	0.259	-0.638*
	(0.879)	(0.283)

Table 4.6 (Continue)

_Ibankid_24	1.106	1.761*
	(1.594)	(0.871)
Constant	-259.4***	-231.3***
	(60.19)	(7.746)
R-squared	0.705	0.956
Firm Dummies	Yes	Yes
Wald Test (*p*-value)	0.000	0.000

Dependent variable is financial stability as measured by ROA = net income after tax/ total assets, and ZROE =return on equity/ standard deviation in return on equity; liquidity risk LR= liquid assets/total assets; credit risk CR= Non-performing loans/gross advances; operating risk OR= Cost to income ratio, market risk MR= real interest rate; country risk CTR= average annual exchange rate; financial crisis impact FCI= dummy variable equal to 1 for the crisis period (2007 to 2012) and 0 otherwise; capital adequacy ratio CAR= Equity /total assets; audit quality AQ= natural log of audit fee; country-level governance one CLG1= control of corruption; country-level governance two CLG2= Political Stability and Absence of Violence/Terrorism: Estimate; country-level governance three CLG3= government effectiveness: estimate; country-level governance four CLG4= voice and accountability: estimate; size of bank SOB= log of total assets; gross domestic product GDP= Log of GDP. Robust standard errors in parentheses as adjusted for heteroskedasticity and autocorrelation, *** p<0.01, ** p<0.05, * p<0.1 indicating level of significance.

Through CTR and FCI, coefficients for FS-ROA were -.235 and -2.696 respectively. It shows that both country and international risk factors have created financial instability in commercial banks of Pakistan with their negative and significant influence. The effect of regulation on bank's capital on FS-ROA is insignificant along with the governance factor; AQ, CLG2, and CLG3. However, for CLG1, it is found that a higher level of corruption in the economy of Pakistan has shaken the FS-ROA, a similar case in the economy of Nigeria was expressed by (Aburime, 2009).

In the meantime, the impact of CLG4 explains that better opportunity for voice and accountability is positively affecting FS-ROA. Additionally, among the control variables, only the factor of GDP was significantly and positively associated with the first measure of stability. Besides, the addition of dummy variables to show and control the heterogeneity effect on the relationship between explanatory and outcome variables is also presented under Table 4.4 (M1-M2). The significance of LSDVM for FS-ROA can be identified through the better value of $R^{2,}$ which is .705 percent. It shows robustly explained variation in FS-ROA while controlling the effect of individual entities (banks) during 2007-2016.

For ZROE, the effect of CR is significant and negative, following the research findings by (Ghenimi, Chaibi, & Omri, 2017). Similarly, risk factors of bank operations (OR), exchange rate volatility (CTR), and FCI are also showing their negative influence on FS-ZROE. Through regulation on bank's capital, CAR shows an adverse impact on ZROE, significant at 5 percent. For CLG, all four measures have shown their significant effect on second measure of FS. Additionally, both control variables have also provided significant and positive findings, consistent with (Soedarmono et al., 2011).

Besides, the value of explained variation (R^2) under M2 (Table 4.6) is found to be 95.6 percent, showing the best fit of the data points, closer to the regression line.

After LSDVM, the fixed effect, covariance model, or within estimator panel regression model was tested through STATA-14. Table 4.7 explains the findings of FEM. Findings for FS-ROA (M1) specify that CR is significantly and negatively affecting the bank stability, following the research findings of (Ghosh, 2017; Soedarmono et al., 2011). Likewise, OR showed its significant and negative influence on FS-ROA. For CTR and FCI, coefficients were -.235 and -2.696, explaining their adverse relationship with FS-ROA. The negative and significant relationship of credit, operational, country and international risk factors with FS-ROA implies that commercial banks in Pakistan have faced the issue of lower stability due to mismanagement of these risk factors.

Table 4.7
Fixed Effect Panel Regression for FS-ROA and FS-ZROE

VARIABLES	**(M1)** **FS-ROA**	**(M2)** **FS-ZROE**
	Risk Types	
LR	0.0382	-0.000371
	(0.0259)	(0.0190)
CR	-0.0544***	-0.0585***
	(0.0167)	(0.0131)
OR	-0.0485***	-0.0299***
	(0.0102)	(0.00578)
MR	0.0449	0.0321***
	(0.0281)	(0.00348)
CTR	-0.235***	-0.201***
	(0.0660)	(0.00463)
FCI	-2.696***	-1.941***
	(0.879)	(0.0385)

Table 4.7 (Continue)

Regulations on Bank's Capital		
CAR	-0.0214	-0.0305**
	(0.0194)	(0.00927)
Governance Factors		
AQ	-0.479	-0.282
	(0.301)	(0.325)
CLG1	-13.73***	-10.02***
	(3.596)	(0.398)
CLG2	1.480	1.380***
	(1.467)	(0.236)
CLG3	1.583	2.397***
	(2.006)	(0.249)
CLG4	8.882**	5.434***
	(3.503)	(0.686)
Control Variables		
SOB	0.498	1.461**
	(0.885)	(0.459)
GDP	25.10***	21.63***
	(6.012)	(0.828)
Constant	-258.8***	-229.8***
	(60.05)	(7.309)
R-squared	0.5245	0.3797
Prob > F	0.0000	0.0000

Dependent variable is financial stability as measured by ROA = net income after tax/ total assets, and ZROE =return on equity/ standard deviation in return on equity; liquidity risk LR= liquid assets/total assets; credit risk CR= Non-performing loans/gross advances; operating risk OR= Cost to income ratio, market risk MR= real interest rate; country risk CTR= average annual exchange rate; financial crisis impact FCI= dummy variable equal to 1 for the crisis period (2007 to 2012) and 0 otherwise; capital adequacy ratio CAR= Equity /total assets; audit quality AQ= natural log of audit fee; country-level governance one CLG1= control of corruption; country-level governance two CLG2= Political Stability and Absence of Violence/Terrorism: Estimate; country-level governance three CLG3= government effectiveness: estimate; country-level governance four CLG4= voice and accountability: estimate; size of bank SOB= log of total assets; gross domestic product GDP= Log of GDP. Robust standard errors in parentheses as adjusted for heteroskedasticity and autocorrelation, *** p<0.01, ** p<0.05, * p<0.1 indicating level of significance.

Through country governance, CLG1 and CLG4 indicate mixed findings, supporting the argument that higher corruption is adverse, while voice and accountability positively impacts FS-ROA. For control variables, only GDP is significant under FE output for the first measure of FS. However, the value of robust R^2 is 52.4 percent, predicts a moderate variation in FS-ROA by all explanatory and control variables of the study.

For FS-ZORE, the impact of credit and operational risk is negative and highly significant, indicating that low quality of assets and higher operational cost are not better for the stability of commercial banks. For the risk factors like CTR and FCI, significant and negative impact on ZROE is observed. Through CAR, coefficient of -.0305 signals that capital ratio negatively affects the Z measure of FS in commercial banks of Pakistan. It shows that excessive reserve of capital is not beneficial for banking sector stability. It is consistent with research findings of (Mathuva, 2009). For governance factors, control of corruption (CLG1) explains an adverse impact on FS-ZROE, whereas, remaining three measures of CLG have shown their positive and significant influence on FS-ZROE. Besides, both control variables (M2) have shown their significant effect on bank stability, supported by (Soedarmono et al., 2011). Figure 4.16 and 4.17 observe the heterogeneity effect for both stability measures over 2007-2016 in commercial banks of Pakistan.

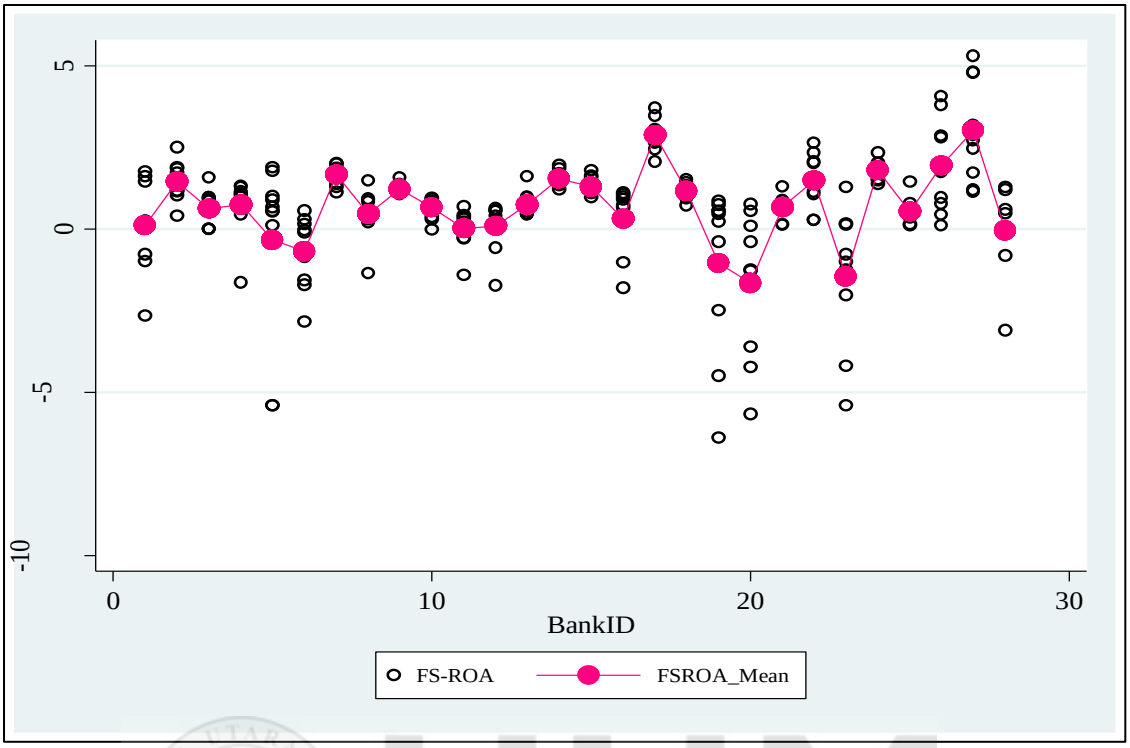

Figure 4.16
Fixed Effect Heterogeneity Across the Entities for FS-ROA

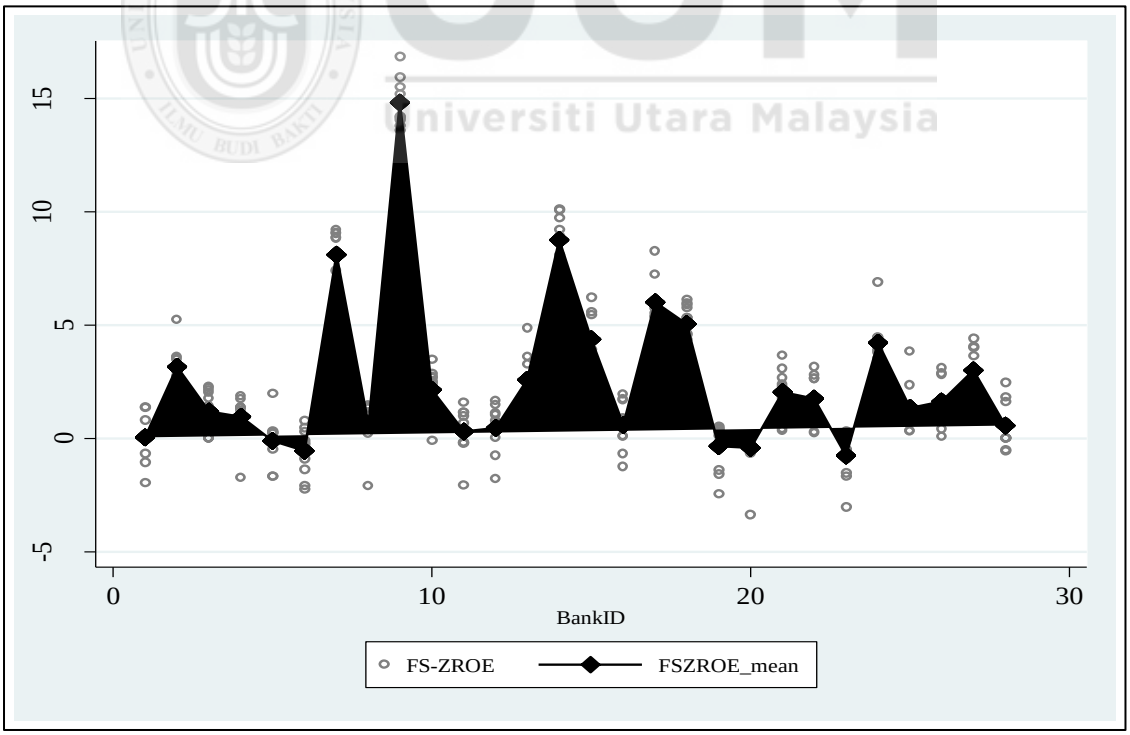

Figure 4.17
Fixed Effect Heterogeneity Across the Entities for FS-ZROE

After the comprehensive analysis through pooled OLS and FE models, the next step was to discuss the findings for RE estimator. It illustrates that variation across the entities is assumed to be uncorrelated and random with the predictors in the model (Bell & Jones, 2015; Torres-Reyna, 2007).

Table 4.8 provides the findings for RE estimation. Turning to the impact of risk factors, LR explains a positive but insignificant impact on FS-ROA, while CR expresses significantly negative impact on the stability because of the low asset quality and higher NPLs in commercial banks of Pakistan. Similar findings are presented in the research work of (Fu, Lin, & Molyneux, 2014; Soedarmono et al., 2011). This cynical and significant effect of CR supports AT that duties of the risk management team, credit officers, and board members are at a questionable position because of inefficient CRM practices. Such adverse influence of CR on FS-ROA defends the presence of agency issue (Type I) as expressed by (Panda & Leepsa, 2017).

Table 4.8
Random Effect Panel Regression for FS-ROA and FS-ZROE

Variables	(M1) FS-ROA	(M2) FS-ZROE
	Risk Types	
LR	0.00317	0.00100
	(0.0211)	(0.0119)
CR	-0.0406***	-0.0623***
	(0.0123)	(0.0155)
OR	-0.0484***	-0.0306***
	(0.00756)	(0.00811)
MR	0.0520*	0.0339***
	(0.0281)	(0.00306)
CTR	-0.229***	-0.206***
	(0.0665)	(0.00428)
FCI	-2.651***	-1.943***
	(0.885)	0.00100
	Regulations on Bank's Capital	
CAR	-0.0118	-0.0198
	(0.0143)	(0.0144)
	Governance Factors	
AQ	-0.487***	-0.337
	(0.177)	(0.233)
CLG1	-12.64***	-9.694***
	(3.593)	(0.226)
CLG2	1.137	1.325***
	(1.470)	(0.140)
CLG3	0.809	1.742***
	(1.939)	(0.259)
CLG4	7.406**	4.867***
	(3.448)	(0.540)

Table 4.8 (Continue)

	Control Variables	
SOB	1.213***	2.614***
	(0.249)	(0.370)
GDP	22.46***	19.93***
	(5.856)	(0.805)
Constant	-237.0***	-220.2***
	(59.65)	(5.772)
R-squared	0.6024	0.5078
Wald Test (p-value)	0.0000	0.0000

Dependent variable is financial stability as measured by ROA = net income after tax/ total assets, and ZROE =return on equity/ standard deviation in return on equity; liquidity risk LR= liquid assets/total assets; credit risk CR= Non-performing loans/gross advances; operating risk OR= Cost to income ratio, market risk MR= real interest rate; country risk CTR= average annual exchange rate; financial crisis impact FCI= dummy variable equal to 1 for the crisis period (2007 to 2012) and 0 otherwise; capital adequacy ratio CAR= Equity /total assets; audit quality AQ= natural log of audit fee; country-level governance one CLG1= control of corruption; country-level governance two CLG2= Political Stability and Absence of Violence/Terrorism: Estimate; country-level governance three CLG3= government effectiveness: estimate; country-level governance four CLG4= voice and accountability: estimate; size of bank SOB= log of total assets; gross domestic product GDP= Log of GDP. Robust standard errors in parentheses as adjusted for heteroskedasticity and autocorrelation, *** p<0.01, ** p<0.05, * p<0.1 indicating level of significance.

Additionally, an adverse impact of CR on FS-ROA implies that higher NPLs is among the critical reasons for the uneven financial situation in commercial banks of Pakistan. The increasing value of NPLs in the country is among the significant issues which need serious attention. This inefficiency in RM has created a conflict of interest between the directors/agents and shareholders (principals) with higher agency cost because of mis-utilization of funds, as justified by (Demsetz, Saidenberg, & Strahan, 1997; England, 1988;

Palia & Porter, 2007; Zainuldin, Lui, & Yii, 2018). The failure of KASB Bank in recent years has fortified the idea that mismanagement of risk, the inefficiency of the risk officials, and special financial incentives to the family board members lead to financial distress and ultimate bankruptcy (SBP, 2015a). In this case, major shareholders (family owners of KASB Bank) have neglected the interest of minor shareholders, hence creating an agency issue (Type II).

Additionally, Summit, Al-Baraka, and Silk Bank have faced the same issue of mishandling the risk factors like NPLs with higher operating cost, capital mismanagement, and financial fragility (SBP, 2016). All these factors provide enough evidence that there is a presence of agency problem in commercial banks, which needs to be addressed on an immediate basis. Turning toward the assumption of SHT, it is extracted that higher CR and its impact on FS-ROA is not only creating issues for shareholders but also disturbing various stakeholders too. Whereas, MPT suggests that there should be a significant focus on both portfolio diversification and portfolio specialization factors, which seems to be missing in case of commercial banks of Pakistan.

Besides, the impact of OR on FS-ROA is -.0484, significant at 1 percent. It explains that there is an issue of higher operational cost and weak internal control system in the commercial banks, which in return, affects the banking sector stability. This fact is consistent with (Mathuva, 2009; Petria, Capraru, & Ihnatov, 2015). Such results argue that

there is a conflict of interest between the banking sector management and their owners because of higher OR exposure and low FS; Type I of the agency problem. Failure in controlling the operational issues and fraudulent activities directly impacts the goodwill of banks with the creation of agency complications (Gitman et al., 2015; Mauer & Ott, 2000; Taiwo, Agwu, Babajide, & Isibor, 2016; Wellalage & Locke, 2011).

Additionally, MR has a significant impact of .0520, specifying a positive association between the real interest rate and FS-ROA. However, poor fiscal and monetary policies and other governance issues at the country level lead to higher exchange rate volatility. The coefficient of CTR (under M1) is -.229 narrates that depreciation in the local currency has adversely affected the stability of the banks, recapping agency issue at a macro level. This issue reflects the failure of various policies defined by the local government and SBP for exchange rate stability. Gradual depreciation of a domestic currency in Pakistan highlights that more attention is required to overcome financial calamity in commercial banks as experienced through instability in the exchange rates. Due to mismanagement of exchange rate with higher volatility, present findings support the presence of agency issue (Type I) where country officials work as agents for general public and specifically for the banking sector owners.

FCI shows a significant and negative effect on FS-ROA which means that international risk factor like the global crisis of 2007-2009 is vulnerable for the local banks in Pakistan,

followed by the results of (Ghosh, 2014; Lindblom, Olsson, & Willesson, 2011). Additionally, regulation on bank's capital explains a negative but insignificant relationship with FS-ROA (M1). It shows that excessive capital reserve in commercial banks does not influence the first measure of FS. Through governance factors, AQ demonstrates a negative and significant impact on FS-ROA, as shown in M1 (Table 4.8). It shows that higher payment as remuneration to auditors adversely affects the banking sector stability. This outcome justifies the presence of agency problem where higher remuneration to auditors as settled by the board of directors has a negative impact on FS. Such decisions by board members are not favoring their shareholders, reflecting a Type I of agency issue due to lower FS. Such a problem is significantly highlighted by (Gilson & Gordon, 2013; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000).

For country governance, CLG1 shows a significant and negative relationship with FS-ROA. It means that weak governance structure and low control over corruption in Pakistan has adversely affected the banking sector stability. This relationship again supports AT and agency conflict between bank owners and country administration. Though CLG2 and CLG3 make a positive but insignificant effect on FS-ROA is, whereas CLG4 demonstrates a positive relationship with FS-ROA for commercial banks in Pakistan. Additionally, both the control variables specify their highly significant and positive association with FS-ROA. As per R^2 (M1), overall variation in the first measure of FS through risk factors, regulation on bank's capital, governance measures and control variables is 60.25 percent, with highly significant value of wald test.

For FS-ZROE, empirical findings are consistent with FS-ROA. Risk factors like CR, OR, CTR, and FCI have shown a highly significant and negative influence on FS-ZROE. These results are dominating the AT suggesting that risk managers of commercial banks and country representatives are not managing the bank-based and macroeconomic risk factors appropriately. Such acts also indicate their inefficiency in RM and excessive approach towards risk-taking, creating a conflict of interest between the managers and shareholders. Additionally, the argument of SHT claims that stakeholders can get a reward when the managers perform their obligations in an appropriate way (Ruf, Muralidhar, Brown, Janney, & Paul, 2001). This is a fundamental idea of SHT which argues that a firm should create value for its overall stakeholders, not only for the shareholders.

Meanwhile, findings under RE suggest that there is a need to focus on RM practices for banking sector stability, which can create value for its stakeholders. Additionally, considering the RM disclosure, SHT implies that risk measurement checklist can play its significant role for understanding the nature of risk and value creation for the stakeholders (Azlan, Rosli, & Mohd Hassan, 2009).

For the governance factors, the impact of AQ on FS-ZROE is found to be negative but insignificant. While CLG1 explains that Pakistan has a lower rank in recent years over control of corruption, which negatively affects the stability of banks. It argues that

corruption is a significant reason for poor governance structure which should be reconsidered on serious grounds. However, it is observed that all other three indicators of country governance (CLG2-CLG4) are positively and significantly affecting FS-ZROE.

The constructive influence from these three governance measures implies that the banking sector is getting positive results from the effectiveness of the government, political stability, and absence of violence, and voice and accountability. Although, there was a problem of poor governance in these indicators at governance level, however, in the recent time, Pakistan has improved its position in terms of eliminating the terrorism from the country, political stability and being effect government. Additionally, both control variables have also shown their significant positive impact on FS-ZROE under RE findings, consistent with (Ho, Lin, & Tsai, 2016; Soedarmono et al., 2011). The value of R^2 for the second measure of FS is 50.78 percent with a significant p-value of wald test statistics.

After a detailed analysis of all panel regression models, the next step was to make a comparison between models. This process required to suggest the best model for managerial implication and decision-making regarding research hypotheses. In the first step, HM test was applied to compare coefficients of FE and RE for FS-ROA as suggested by (Torres-Reyna, 2007; Wong & Tang, 2018).

Following hypotheses are under consideration for HM test.

H_{mo}: The preferred model is random effect.

H_{m1}: The preferred model is fixed effect.

Table 4.9 below presents the coefficients of FE and RE and the difference between both for FS-ROA. To finally accept H_{mo} or H_{m1}, the value of prob>chi2 value was checked. If this value is less than .05 percent, fixed effect considers as good for decision making, hence H_{m1} will be accepted, otherwise rejected (Torres-Reyna, 2007). The value of prob>chi2 is .7339, insignificant at .05 percent, supporting H_{mo} or fail to reject the null hypothesis. It means that the preferred model is RE. After the HM test, the next step was to conduct a comparison for RE and pooled OLS regression (Torres-Reyna, 2007). As explained earlier, the B.P LM test was applied by considering the following two hypotheses:

H_{LM0}: across the selected entities, the variance is zero.

H_{LM1}: across the selected entities, variance is not zero.

If H_{LM1} is accepted, it considers that random effect is a satisfactory model for decision making between random and OLs regression estimation, otherwise not (Bell & Jones, 2015; Feyzioglu, Swaroop, & Zhu, 1998). Table 4.9 also shows the findings for B.P LM test. The value of chibar2 is 11.17, significant at 5 percent. It means that between random and OLS regression estimators, RE is finally accepted for the decision making and acceptance of research hypotheses as developed for exploring the relationship between risk factors, capital regulations, governance factors, and FS-ROA.

Table 4.9

Hausman test for FE/RE and Breusch and Pagan Lagrangian Multiplier Test for RE/OLS Regression: FS-ROA

Variables	(b) Fixed	(B) Random	(b-B) Difference
LR	0.03815	0.003167	0.034986
CR	-0.0544	-0.04058	-0.01383
OR	-0.0485	-0.04838	-6.90E-05
MR	0.04491	0.052016	-0.00712
CTR	-0.2346	-0.22871	-0.0059
FCI	-2.6957	-2.65054	-0.04514
CAR	-0.0214	-0.01185	-0.00954
AQ	-0.4791	-0.48731	0.008351
CLG1	-13.726	-12.6365	-1.08905
CLG2	1.48010	1.137384	0.342714
CLG3	1.58284	0.808716	0.774122
CLG4	8.88244	7.405728	1.476713
Hausman (HM) test for FE/RE			
	chi2(14) = 10.38		
	Prob>chi2 = 0.7339		
Breusch and Pagan Lagrangian multiplier (B.P LM) test for random effects			
	Var	sd=sqrt(Var)	
ROA	2.47896	1.574471	
E	0.89427	0.9456584	
U	0.13537	0.3679286	
	chibar2(01)=11.17***		
	Prob > chibar2=0.0004		

Dependent variable is financial stability as measured by ROA = net income after tax/ total assets; liquidity risk LR= liquid assets/total assets; credit risk CR= Non-performing loans/gross advances; operating risk OR= Cost to income ratio, market risk MR= real interest rate; country risk CTR= average annual exchange rate; financial crisis impact FCI= dummy variable equal to 1 for the crisis period (2007 to 2012) and 0 otherwise; capital adequacy ratio CAR= Equity /total assets; audit quality AQ= natural log of audit fee; country-level governance one CLG1= control of corruption; country-level governance two CLG2= Political Stability and Absence of Violence/Terrorism: Estimate; country-level governance three CLG3= government effectiveness: estimate; country-level governance four CLG4= voice and accountability: estimate, *** p<0.01, ** p<0.05, * p<0.1 indicating level of significance.

Table 4.10 provides the remarks for the research hypotheses on the relationship between RM and FS-ROA.

Table 4.10
Hypotheses Remarks: FS-ROA

Hypotheses	Descriptions	Remarks
H1	There is a significant relationship between liquidity risk and financial stability in terms of ROA.	Not supported
H2	There is a significant relationship between credit risk and financial stability in terms of ROA.	supported
H3	There is a significant relationship between operational risk and financial stability in terms of ROA.	supported
H4	There is a significant relationship between market risk and financial stability in terms of ROA.	supported
H5	There is a significant relationship between the country risk and financial stability in terms of ROA.	supported
H6	There is a significant relationship between financial crisis risk and financial stability in terms of ROA	supported
H7	There is a significant relationship between capital adequacy and financial stability in terms of ROA	Not supported
H8	There is a significant relationship between audit quality and financial stability in terms of ROA	supported

Table 4.10 (Continue)

H9	There is a significant relationship between CLG1 and financial stability in terms of ROA	supported
H10	There is a significant relationship between CLG2 and financial stability in terms of ROA	Not supported
H11	There is a significant relationship between CLG3 and financial stability in terms of ROA	Not supported
H12	There is a significant relationship between CLG4 and financial stability in terms of ROA	supported

After the comparison of panel regression models for FS-ROA, next step is to repeat the same process for the FS-ZROE. Table 4.11 indicates the difference of coefficients between the fixed and random effect through HM test and their significance level. The following hypotheses are under consideration for HM test of FS-ZROE:

H_{mo}: unique errors or μ_i are uncorrelated with the regressors of the model.

or

The preferred model is random effect.

H_{m1}: unique errors or μ_i are correlated with the regressors of the model.

or

The preferred model is fixed effect.

To accept FE or RE for FS-ZROE, Prob>chi2 is compared with .05 significance level. The value of 0.1394 specifies that the difference in the coefficients is not systematic. Therefore, the preferred model is RE. In the next step, B.P LM test is applied to find either RE is acceptable for decision making, or OLS estimation is more appropriate. For this purpose, the following hypotheses are developed:

$H_{oB.P1}$: across the selected entities, variance is zero.

$H_{1B.P1}$: across the selected entities, variance is not zero.

Findings through B.P LM test explain that Prob > chibar2 is significant at .05, means that the preferred model is random effect for the final consideration. Based on these findings, Table 4.7 explains the status of research hypotheses for FS-ZROE.

Table 4.11
Hausman Test for FE/RE and Breusch and Pagan Lagrangian Multiplier Test for RE/OLS Regression: FS-ZROE

Variables	(b) Fixed	(B) Random	(b-B) Difference
LR	-0.00037	0.001	-0.00137
CR	-0.05854	-0.06228	0.003747
OR	-0.02994	-0.03063	0.00069
MR	0.032063	0.033931	-0.00187
CTR	-0.20128	-0.20614	0.004863
FCI	-1.94082	-1.9426	0.00178
CAR	-0.03051	-0.01981	-0.0107
AQ	-0.28169	-0.33745	0.055753

Table 4.11 (Continue)

CLG1	-10.0188	-9.69386	-0.32494
CLG2	1.37982	1.324928	0.054891
CLG3	2.397434	1.742201	0.655233
CLG4	5.434495	4.866778	0.567717

Hausman (HM) test for FE/RE

chi2(13)= 18.50

Prob>chi2 = 0.1394

Breusch and Pagan Lagrangian multiplier (B.P LM) test for random effects

chibar2(01) = 511.03***

Prob > chibar2=0.0004

Dependent variable is ZROE =return on equity/ standard deviation in return on equity; liquidity risk LR= liquid assets/total assets; credit risk CR= Non-performing loans/gross advances; operating risk OR= Cost to income ratio, market risk MR= real interest rate; country risk CTR= average annual exchange rate; financial crisis impact FCI= dummy variable equal to 1 for the crisis period (2007 to 2012) and 0 otherwise; capital adequacy ratio CAR= Equity /total assets; audit quality AQ= natural log of audit fee; country-level governance one CLG1= control of corruption; country-level governance two CLG2= Political Stability and Absence of Violence/Terrorism: Estimate; country-level governance three CLG3= government effectiveness: estimate; country-level governance four CLG4= voice and accountability: estimate, *** p<0.01, ** p<0.05, * p<0.1 indicating level of significance.

Table 4.12
Hypotheses Remarks: FS-ZROE

Hypotheses	Descriptions	Remarks
H13	There is a significant relationship between liquidity risk and financial stability in terms of ZROE.	Not supported
H14	There is a significant relationship between credit risk and financial stability in terms of ZROE.	supported
H15	There is a significant relationship between operational risk and financial stability in terms of ZROE	supported

Table 4.12 (Continue)

H16	There is a significant relationship between market risk and financial stability in terms of ZROE	supported
H17	There is a significant relationship between country risk and financial stability in terms of ZROE	supported
H18	There is a significant relationship between financial crisis risk and financial stability in terms of ZROE	supported
H19	There is a significant relationship between capital adequacy and financial stability in terms of ZROE	Not supported
H20	There is a significant relationship between audit quality and financial stability in terms of ZROE	Not supported
H21	There is a significant relationship between CLG1 and financial stability in terms of ZROE	supported
H22	There is a significant relationship between CLG2 and financial stability in terms of ZROE	supported
H23	There is a significant relationship between CLG3 and financial stability in terms of ZROE	supported
H24	There is a significant relationship between CLG4 and financial stability in terms of ZROE	supported

4.5 Discussion on Fourth Objective

Under this section, empirical findings for the moderating effect of RC on the relationship between RM and FS are presented. This relationship is investigated through econometric equations of 3.16 and 3.19, where former explains the moderating effect of RC on the relationship between RM and FS-ROA, and later shows RC as a moderator between RM and FS-ZROE. These equations are based on the RE estimator for checking the moderating effect as supported by the research methods of (Saha & Yap, 2014). Besides, the hypotheses from H1a to H11b are developed and empirically tested to examine the moderating effect of RC between RM-FS.

For plotting the interaction graphs, "margin plot" option is applied in STATA-14. For this purpose, model three (M3, Table 4.13) was run for finding the coefficients of explanatory, moderator, and interactive variables of the study. In the next step, regression output is stored with the help of "est sto regression" command. Subsequent step considered the high and low values of the variables, based on the +-1 SD from the mean of the estimated sample. After generating the mean score of the variables, the regression output was restored through "est restore regression" command for its consideration in calculating the marginal predictions. These predictions were based on the high and low values for both independent and moderator variable of the study. The same process is repeated for each of the significant interaction effect in both stability measures. In the last step, interactive plots were generated and presented.

Table 4.13 shows the findings for the Equations; 3.14, 3.15 and 3.16 respectively. To examine the moderating effect, interactive terms were generated for each of the explanatory variables with RC in STATA-14. Findings for Equation 3.14 were presented under M1 (Table 4.13). It shows that risk factors like credit, operational, market, country, and GFC made significant impact on FS-ROA. Additionally, AQ, CLG1, and CLG4 have shown their significant influence on the first measure of FS. Without RC and addition of any interactive term, the overall explanatory power of the M1 (Table 4.13) in terms of R^2 is 60.24 percent, with significant wald test statistics. However, with the addition of RC in Model 2, the value of R^2 is observed as 59.86 percent (ΔR^2= -0.38). It shows that the direct influence of RC on FS-ROA is insignificant with the adverse influence on the explanatory power of the M2.

In addition, M3 (Table 4.13) considers the effect of all explanatory variables, RC and interaction terms between key regressors and RC. For the interaction effect between LR and RC, the coefficient of -.0364 indicates that RC is negatively and significantly moderating the relationship between LR and FS-ROA. This effect is compared with the coefficient of LR under M1.

Table 4.13

Moderating Effect of RC on the Relationship Between RM and FS-ROA

Variables	(M1)	(M2)	(M3)
	Risk Types		
LR	0.00317	0.00476	0.154**
	(0.0211)	(0.0213)	(0.0486)
CR	-0.0406***	-0.0414***	-0.112***
	(0.0123)	(0.0127)	(0.0273)
OR	-0.0484***	-0.0480***	-0.0615*
	(0.00756)	(0.00775)	(0.0325)
MR	0.0520*	0.0480*	0.212***
	(0.0281)	(0.0279)	(0.0453)
CTR	-0.229***	-0.215***	-0.314***
	(0.0665)	(0.0633)	(0.0291)
FCI	-2.651***	-2.521***	-2.361***
	(0.885)	(0.865)	(0.0994)
	Regulation on Bank's Capital		
CAR	-0.0118	-0.0109	-0.277***
	(0.0143)	(0.0145)	(0.0804)
	Governance Factors		
AQ	-0.487***	-0.496***	-1.450**
	(0.177)	(0.181)	(0.444)
CLG1	-12.64***	-11.86***	-7.968**
	(3.593)	(3.359)	(2.666)
CLG2	1.137	1.143	3.434*
	(1.470)	(1.440)	(1.503)
CLG3	0.809	0.348	-13.58**
	(1.939)	(1.899)	(4.270)
CLG4	7.406**	6.720**	17.28***
	(3.448)	(3.228)	(4.652)

Table 4.13 (Continue)

Control Variables			
SOB	1.213***	1.220***	1.009***
	(0.249)	(0.254)	(0.150)
GDP	22.46***	21.52***	21.41***
	(5.856)	(5.654)	(1.347)
Moderator and Interaction Terms			
RC		-0.0159	-6.590**
		(0.0854)	(2.009)
LR*RC			-0.0364***
			(0.00661)
CR*RC			-0.0425***
			(0.00880)
OR*RC			0.00241
			(0.00649)
MR*RC			-0.0463***
			(0.0128)
CTR*RC			0.0290***
			(0.00745)
CAR*RC			0.0677***
			(0.0188)
AQ*RC			0.286**
			(0.0886)
CLG1*RC			-0.843
			(0.828)
CLG2*RC			-0.568
			(0.429)
CLG3*RC			3.602**
			(1.158)
CLG4*RC			-3.108**
			(1.334)

Table 4.13 (Continue)

Constant	-237.0***	-228.0***	-201.8***
	(59.65)	(57.98)	(17.74)
R-Square	0.6024	0.5986	0.6545
Wald Test (*p*-value)	0.000	0.000	0.000

Dependent variable is financial stability as measured by ROA = net income after tax/ total assets, and ZROE =return on equity/ standard deviation in return on equity; liquidity risk LR= liquid assets/total assets; credit risk CR= Non-performing loans/gross advances; operating risk OR= Cost to income ratio, market risk MR= real interest rate; country risk CTR= average annual exchange rate; financial crisis impact FCI= dummy variable equal to 1 for the crisis period (2007 to 2012) and 0 otherwise; capital adequacy ratio CAR= Equity /total assets; audit quality AQ= natural log of audit fee; country-level governance one CLG1= control of corruption; country-level governance two CLG2= Political Stability and Absence of Violence/Terrorism: Estimate; country-level governance three CLG3= government effectiveness: estimate; country-level governance four CLG4= voice and accountability: estimate; risk committee RC= size of risk committee; size of bank SOB= log of total assets; gross domestic product GDP= Log of GDP. Robust standard errors in parentheses as adjusted for heteroskedasticity and autocorrelation, *** p<0.01, ** p<0.05, * p<0.1 indicating level of significance.

Although the coefficient of LR under M1 is positive and insignificant, however, with the consideration RC between LR and FS-ROA, negative and significant moderation exists as presented in Figure 4.18. This result suggests that the relationship between LR and FS-ROA would negatively describe by the RC, where LR becomes more adverse in explaining the FS-ROA when there is a presence of RC as a moderator. It means that the role of RC in the commercial banks is in a questionable position. The presence of RC in managing the relationship between LR and FS-ROA reflects a lack of managerial expertise and poor performance. This discussion further implies that there is an agency issue in commercial banks of Pakistan due to the significant and negative value of interaction effect (LR*RC) on FS-ROA. Such practices lead towards creation of conflict between shareholders and top-level management while handling the depositors' interest.

Additionally, in order to control the mismanagement of LR in banks by RC, there is need to evaluate the RM efficiency of risk departments and their officers through robust governance mechanism as suggested by (Panda & Leepsa, 2017). Therefore, the coefficient of interaction term between LR and RC has significantly defended the argument that with the involvement of RC, an adverse relationship between LR and FS-ROA exists, hence H1a is supported. Figure 4.18 provides the graphical view of the moderating effect of RC on the relationship between LR and FS-ROA. For interpreting the interaction graphs, research studies by Ajili and Bouri (2018); and Dardas and Ahmad (2015) are considered. It shows that commercial banks with higher RC are negatively affecting the relationship between LR and FS-ROA, comparatively to those banks where RC is low.

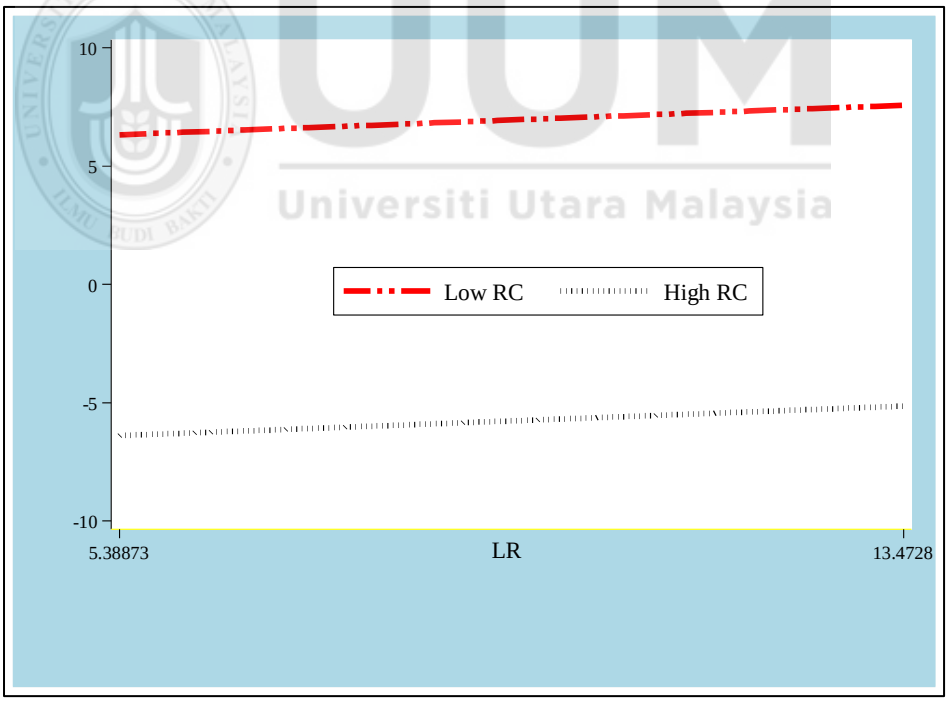

Figure 4.18
Moderating Effect of RC on LR-FSROA Relationship

For interaction term between CR and RC, coefficient is -.0425, specifying an adverse and significant role of RC while moderating the relationship between CR and FS-ROA. The direct effect of CR on FS-ROA is also negative and significant at 1 percent as presented under M1(Table 4.13). However, after the presence of RC, this relationship is more negative and significant at 5 percent. The coefficient of interaction (CR*RC) explains that with the presence of RC as a moderator, the relationship between CR and FS-ROA is more negatively defined. This fact accepts H2a, which specifies that RC moderates the relationship between CR and FS in terms of ROA.

As mentioned in the problem statement, increasing NPLs is a serious financial threat for the commercial banks of Pakistan, raising severe concerns about RM committee. Additionally, research findings of the moderating effect of RC between CR and FS-ROA strengthen the view that the credit department misuses the deposits in commercial banks, causing an agency problem (Type I). It means that there is a significant need to properly examine the duties performed by the credit officers and members of the RC in commercials banks. Furthermore, the weak structure of the loan portfolio as defined by the CR officers is primarily responsible for lower asset's quality and higher NPLs. Such issue supports the agency theory, which claims that risk managers in commercial banks are inefficient in managing CR for better stability in financial terms.

Besides, considering the fundamental assumption of SHT, it was found that adverse of interaction term (CR*RC) on the FS-ROA has not only disturbed the shareholders but all the other stakeholders in the local financial market. Besides, the contrary effect of RC between CR and FS-ROA provides evidence that there is a lack of RM expertise in commercial banks by RC and credit officers. This argument reasonably justifies the MPT, emphasizing that there is a need to construct an optimal portfolio observing both factors of diversification and specialization. Figure 4.19 depicts that RC strengthens the negative relationship between CR and FS-ROA in commercial banks of Pakistan. This graph could explain that for the commercial banks with higher RC, a negative influence on FSROA is observed while it interacts with CR.

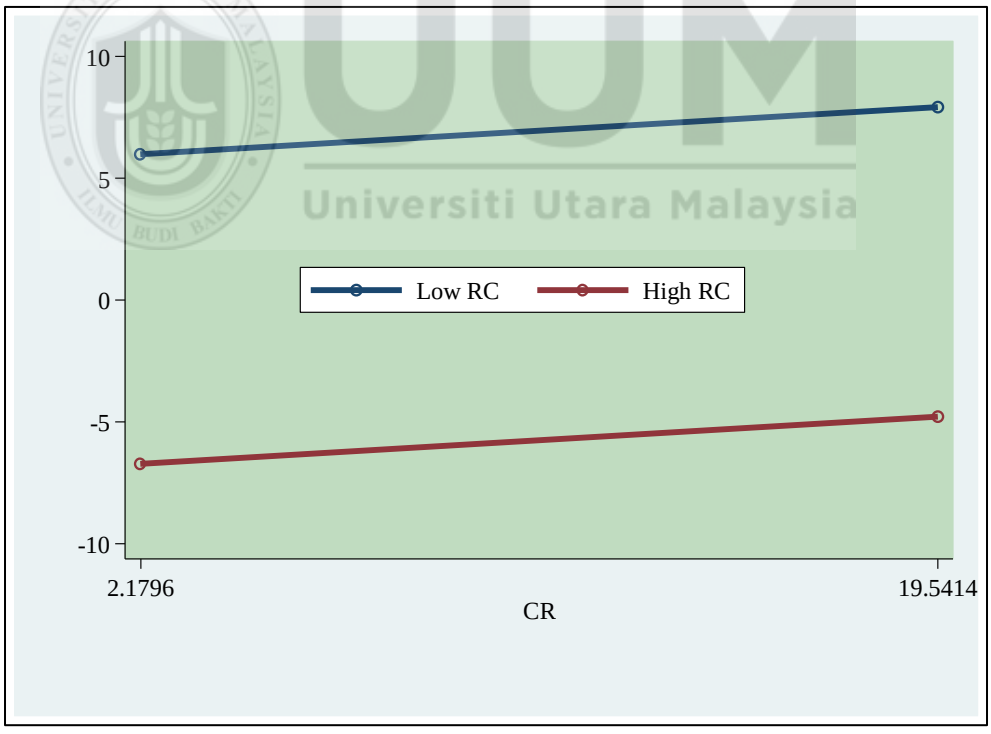

Figure 4.19
Moderating Effect of RC on CR-FSROA Relationship

The effect of OR on FS-ROA is found to be significantly negative under M1 as presented in Table 4.13. However, the coefficient of the interaction term between OR and RC is positively insignificant. It means there is no moderating role of RC in explaining the relationship between OR and FS-ROA, illustrating that it fails to accept H3b. This insignificant moderating effect may justify the reason that RC has no influence over operating cost and related administrative expenses, whose direct effect on FS-ROA is found to be significantly negative. Although RM framework by SBP has focused on the OR, however, no specific guideline is yet to be provided for the RC to focus on operational cost and its management. This might be the reason for insignificant influence of RC on OR-FSROA relationship. This fact further specify that there is a need to restructure the RM framework with the significant focus on OR for RC in coming time.

The coefficient of MR under M1(Table 4.13) is .0520, showing a positive and significant relationship with FS-ROA. However, with the presence of RC as a moderator in the relationship between MR and FS-ROA, significant and negative effect was observed. This fact strengthens the argument that the association between MR-FSROA is adversely affected by the members of RC, showing their managerial inefficiency for RM and FS-ROA relationship. Additionally, the argument under AT (type 1) reasonably justifies the presence of agency problem in commercial banks because of the adverse role of RC in handling MR for better stability.

Considering the assumption of SHT, the contrary impact of the interaction term (MR*RC) elucidates that there is a need to consider the interest of all stakeholders like customers, employees, creditors, and governmental agencies who are affected by lower stability of the banks. Figure 4.20 presents the moderating effect of RC between MR-FSROA relationship. It would explain that for the commercial banks with higher RC, negative impact on FSROA is observed with it is interacted with MR, comparatively to the commercial banks with low RC. Based on the above discussion, it is found that H4a (risk committee moderates the relationship between market risk and financial stability in terms of ROA) is supported.

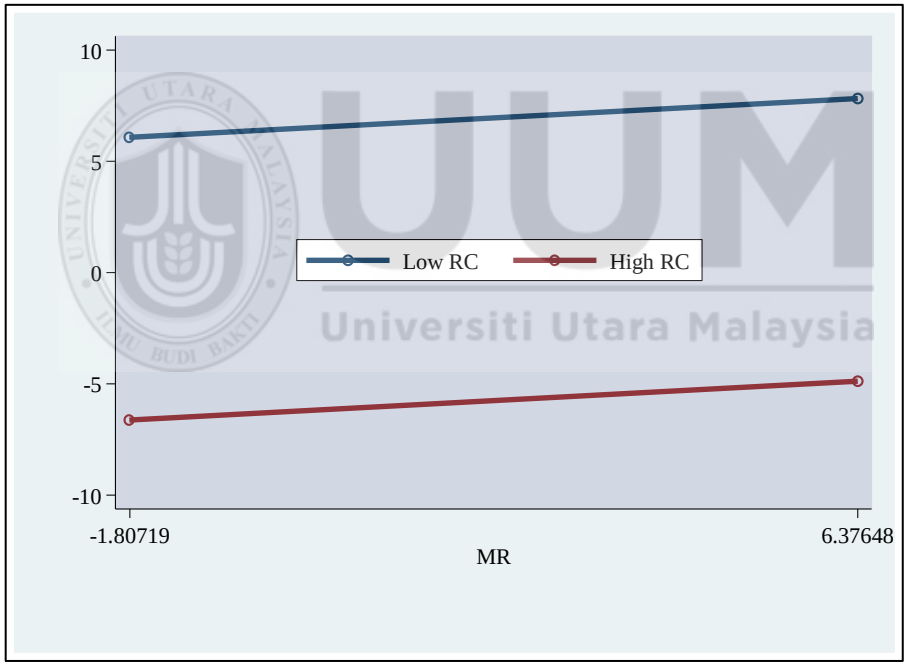

Figure 4.20
Moderating Effect of RC on MR-FSROA Relationship

For examining the moderating role of RC between CTR and RC, the interaction term (CTR*RC) was generated. Before the presence of RC, the direct effect of CTR on FS-ROA

was significant and negative, demonstrating an adverse outcome of exchange rate fluctuation on FS-ROA. However, the coefficient of interaction term (CTR*RC) indicates a positive and significant moderating effect of RC between CTR-FSROA relationship. This result would imply that RC has a moderating role in lowering the negative relationship between CTR and FS-ROA. More specifically, a decisive role by RC is observed when its presence between CTR-FSROA relationship is examined. This fact provides the favor for the constructive view of RC as they are involved in lowering the negative relationship between CTR and FS-ROA.

Additionally, the positive view of AT argues that managers/agents act in favor of the their principals if their work contract is based on reasonable incentives (Panda & Leepsa, 2017). In commercial banks, members in RC are the representatives of BODs, and commercial banks are bound to provide them a range of remunerations. These are under the title of managerial remuneration, contribution to retirement funds, medical, house-rent, maintenance, furnishing, utilities, conveyance, and other financial rewards (SBP, 2017a). Based on such incentives, a positive aspect of AT exists by RC while moderating the CTR-FSROA relationship. Figure 4.21 presents the graphical trend of this relationship which explains that banks with the low RC tends to positively influence on CTR-FSROA relationship, compared to the commercial banks where the RC is high.

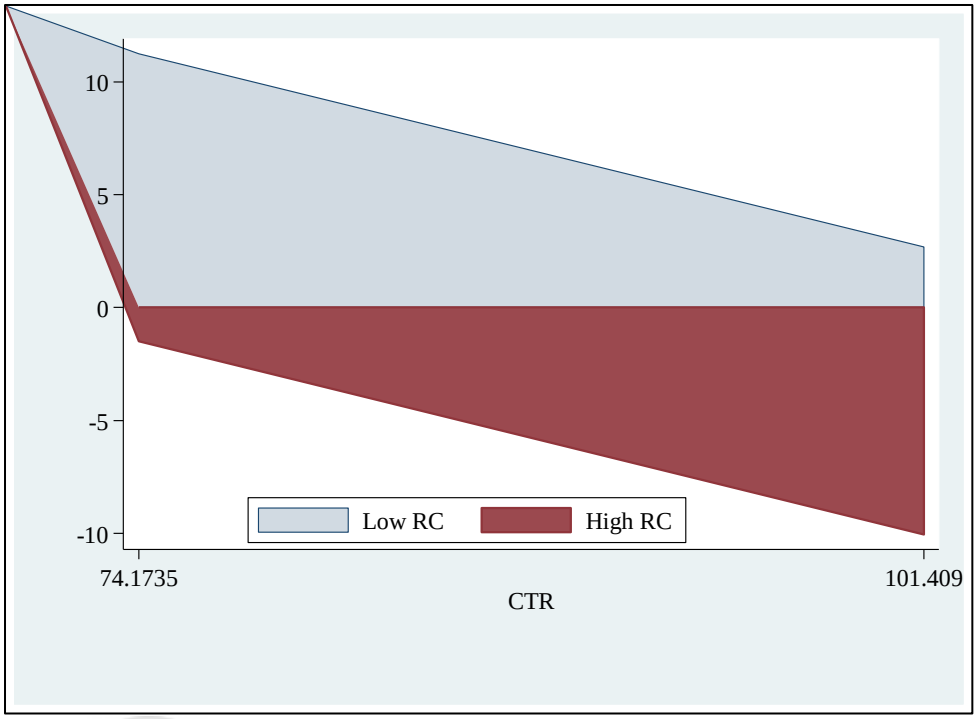

Figure 4.21
Moderating Effect of RC on CTR-FSROA Relationship

Through CAR, direct effect on FS-ROA under M1 was found negative. However, with the presence of RC, the coefficient of interaction between CAR and RC indicates a positive and highly significant influence on FS-ROA. It means that RC significantly and positively moderates the relationship between CAR and FS-ROA. This association argues that excessive CAR is beneficial only when the role of RC interacts as a moderator between CAR and FS-ROA. Furthermore, the positive moderating effect of RC implies that members of RC are efficiently playing their role in defining a constructive relationship between CAR and FS-ROA. Such empirical facts again defend the positive view of AT where the decisive role of members from BODs in terms of RC is observed, whenever they are rewarded with a range of incentives (Panda & Leepsa, 2017).

Meanwhile, as the RC constructively moderates the CAR-FSROA relationship, it further provides the support for the SHT, where interests of other stakeholders in financial market and local community are reasonably considered. Based on such findings, it is accepted that "risk committee moderates the relationship between capital adequacy ratio and financial stability in terms of ROA", favoring the H6a. Figure 4.22 shows a graphical presentation of moderating effect of RC between CAR and FS-ROA. It shows that commercial banks with Low members in RC have their positive and significant influence on CAR-FS-ROA.

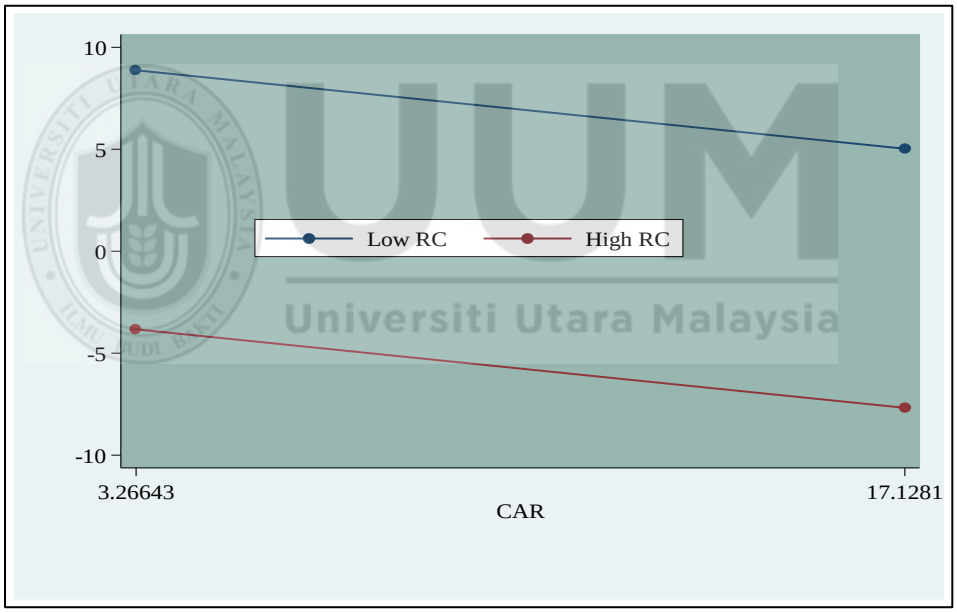

Figure 4.22
Moderating Effect of RC on CAR-FSROA Relationship

Among the governance factors, effect of AQ on FS-ROA is significant and negative as per findings under M1 (Table 4.13). However, the interaction term between AQ and RC shows a positive and significant influence on AQ and FS-ROA relationship. The coefficient of

.286 clarifies that RC is playing its productive role in explaining the association between AQ and FS-ROA.

More specifically, higher payments to auditors for the inspection and rectification of financial errors in financial statements are beneficial for banks only when RC shows its inevitable presence. Once again, the positive view of AT supports the argument that with the presence of RC between AQ and FSROA, commercial banks in Pakistan can improve their stability. This positive moderating effect of RC not only secures the interest of shareholders, but the other parties too, as described under the shadow of SHT. Based on the above discussion, it is signified that H7a is supported. Figure 4.23 describes an overview of the moderating effect of RC between AQ-FSROA relationships. It indicates that low RC is positively moderating the relationship between AQ and FS in terms of ROA as compared to high RC in commercial banks of Pakistan.

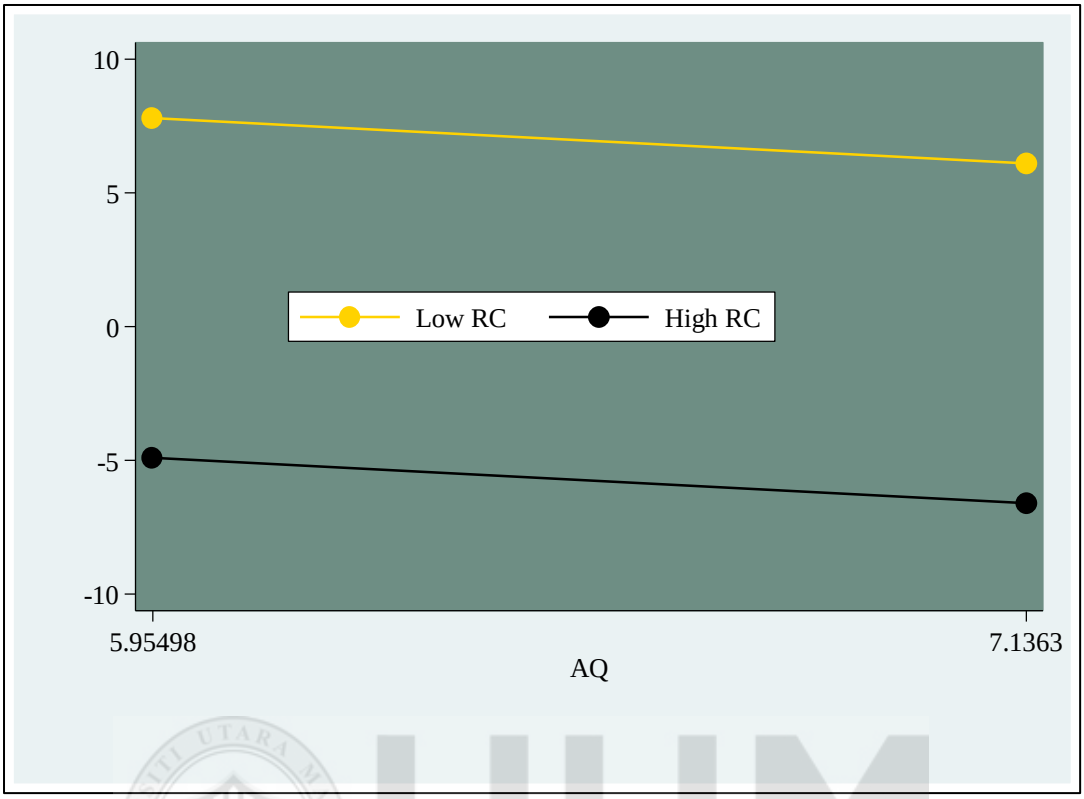

Figure 4.23
Moderating Effect of RC on AQ-FSROA Relationship

Besides, the effect of CLG1 (control of corruption) on FS-ROA is highly significant and negative, as presented under M1 (Table 4.13). However, the interaction effect of RC with CLG1 indicates a negative but insignificant influence on FS-ROA. It means that there is no moderating effect of RC in defining the association between CLG1 and FS. Although the direct effect is highly significant, the insignificant moderating effect specifies no influence of RC on FSROA when moderating with CLG1. The reason for this insignificant moderating effect might be that of the control of corruption as macroeconomic governance measure, while RC demonstrates its nature as a bank-specific governance measure. At second, due to limited influential capabilities of RC, it has little/no control over

macroeconomic governance dynamics like CLG1. In addition, various financial frauds in Pakistan at macro-level like money laundering has provided enough evidence for the involvement of some commercial banks which put the position of RC at questionable rank. Based on such justifications, it is inferred that RC does not moderate the relationship between CLG1 and FS-ROA, hence fail to accept the H8a.

Through CLG2, the effect on FS-ROA is positively insignificant. However, with the moderating effect of RC, interaction term (CLG2*RC) shows a negative but insignificant moderating impact on the relationship between CLG2-FSROA. This insignificant moderating effect would justify the nature of political stability and absence of violence as macroeconomic governance factor, whereas RC as microeconomic. Due to this significant difference, the role of RC while interacting with CLG2 provides no evidence to significantly influencing the first measure of FS.

Additionally, through CLG3, impact on FS-ROA is positive and insignificant, considering no impact of government effectiveness on banking sector stability (ROA). However, it is observed that the interaction term between CLG3 and RC is positively and significantly moderating the CLG3-FSROA relationship. This effect supports the assumption that with the presence of RC, government effectiveness would increase the stability of commercial banks. The prescribed role of RC defends the positive view of AT which states with right RM expertise of RC, principals/owners of the firms can reduce the agency cost not only

with incentives but also through monitoring the activities of their agents as prescribed by (Martin, Wiseman, & Gomez-Mejia, 2019; Panda & Leepsa, 2017). It means that lower the conflict between banking sector management and shareholders, more the productive role of RC is observed while interacting between CLG3 and FSROA.

Following this argument, the positive interactive effect of RC is reasonably justified between CLG3-FSROA and accepts the statement that "risk committee moderates the relationship between CLG3 and financial stability in terms of ROA". Figure 4.24 provides a graphical view of the moderating effect of RC between CLG3 and FS-ROA relationship. It shows that low RC positively influences on the relationship between CLG3 and first measure of FS in commercial banks of Pakistan, comparatively to high RC.

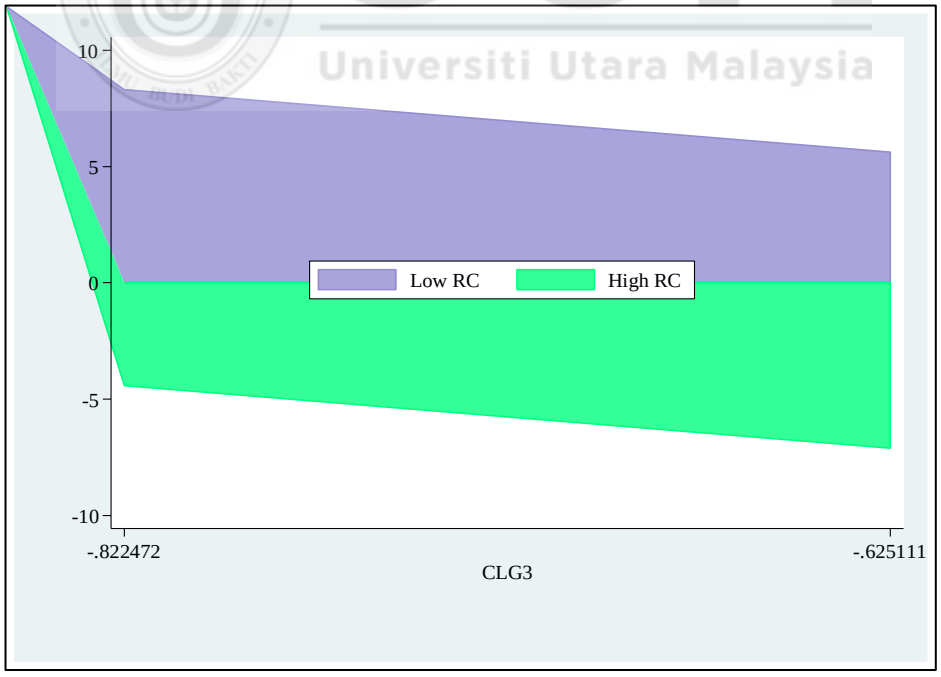

Figure 4.24
Moderating Effect of RC on CLG3-FSROA Relationship

In addition, the coefficient of an interaction effect between CLG4 and RC is significant and negative, signposting that RC is adversely moderating the relationship between CLG4 and FS-ROA. It explains that negative moderation of RC is observed when voice and accountability (CLG4) affects the FS-ROA. Although the direct influence of CLG4 on FS-ROA is positive and highly significant, however, with the interaction of RC, its effect is negative for FS-ROA (ß = -3.108, $p<0.05$, M3, Table 4.13). It shows that whenever RC interacts between CLG4-FSROA, its presence adversely affect their relationship. It shows that with the influence of RC, the effect of CLG4 on FS-ROA is contrary, showing the presence of agency problem as directors' existence between country governance (voice and accountability) and FS-ROA is adverse.

Figure 4.25 signifies that H11a (risk committee moderates the relationship between CLG4 and financial stability in terms of ROA) is supported. It shows that banks with high RC can negatively influence on the relationship between CLG4 and FS-ROA, comparatively to low RC.

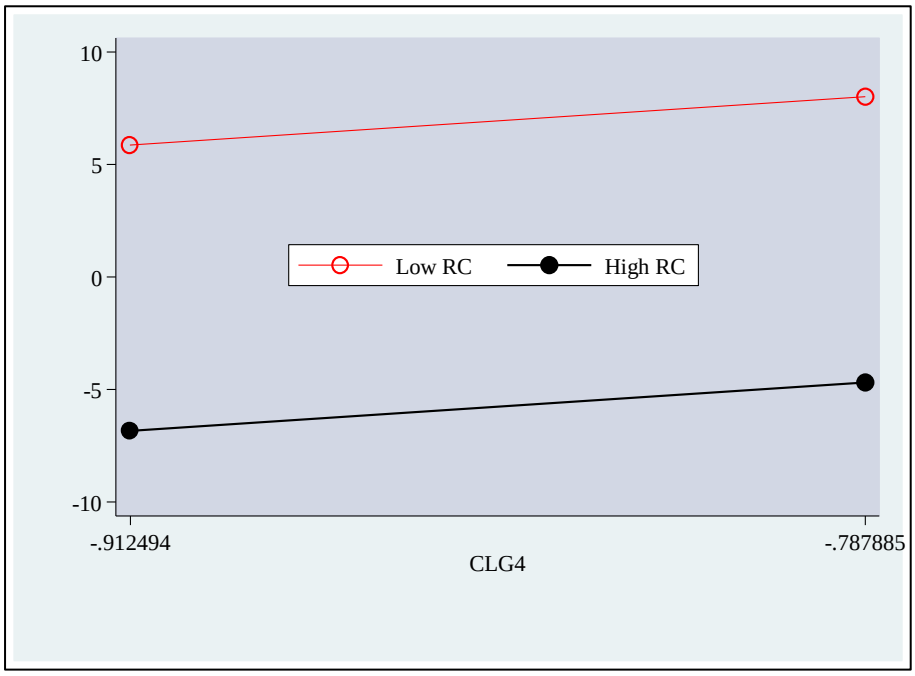

Figure 4.25
Moderating Effect of RC on CLG4-FSROA Relationship

Additionally, it could be observed that the addition of interactive terms under M3 (Table 4.13) has improved the value of explained variation (ΔR^2 =0.0521).

Based on the above findings, Table 4.14 explains the status of research hypotheses for the moderating effect of RC between RM-FSROA relationship.

Table 4.14
Hypotheses Remarks: Moderating Effect of RC between RM-FSROA

Hypotheses	Descriptions	Remarks
H1a	Risk committee moderates the relationship between liquidity risk and financial stability in terms of ROA	supported
H2a	Risk committee moderates the relationship between credit risk and financial stability in terms of ROA	supported
H3a	Risk committee moderates the relationship between operational risk and financial stability in terms of ROA	Not supported
H4a	Risk committee moderates the relationship between market risk and financial stability in terms of ROA	supported
H5a	Risk committee moderates the relationship between country-level risk and financial stability in terms of ROA.	supported
H6a	Risk committee moderates the relationship between capital adequacy ratio and financial stability in terms of ROA	supported
H7a	Risk committee moderates the relationship between quality of audit and financial stability in terms of ROA	supported
H8a	Risk committee moderates the relationship between CLG1 and financial stability in terms of ROA	Not supported
H9a	Risk committee moderates the relationship between CLG2 and financial stability in terms of ROA	Not supported

Table 4.14 (Continue)

H10a	Risk committee moderates the relationship between CLG3 and financial stability in terms of ROA	supported
H11a	Risk committee moderates the relationship between CLG4 and financial stability in terms of ROA	supported

Table 4.15 presents the findings for the moderating effect of RC on the relationship between RM and FS in terms of ZROE. M1 indicates the findings through RE while exploring the relationship between RM-FSZROE. M2 presents the addition of RC as explanatory variable/moderator while exploring this relationship. Additionally, M3(Table 4.15) provides the impact of all regressors, RC, control variables, and interactive terms on the second measure of FS.

The value of the coefficient for the interaction between LR and RC is negatively insignificant, implying that there is no role of RC as a moderator between LR-FSZROE relationships. The reason for this insignificant interaction could be the nature of higher liquid assets in the balance sheet whose direct effect on FS-ZROE is also found to be insignificant. Furthermore, insignificant moderating effect explains that RC has no influence in instigating the LR for determining the commercial bank's stability as measured through ZROE. However, the change in the measure of LR like deposits to total assets, current assets to current liabilities may provide better findings.

Table 4.15
Moderating Effect of RC on the Relationship between RM and FS-ZROE

Variables	(M1)	(M2)	(M3)
	Risk Types		
LR	0.00100	0.00502	0.0182
	(0.0119)	(0.0131)	(0.0212)
CR1	-0.0623***	-0.0618***	0.0416
	(0.0155)	(0.0164)	(0.0641)
OR1	-0.0306***	-0.0309***	-0.0574
	(0.00811)	(0.00921)	(0.0410)
MR	0.0339***	0.0307***	0.141*
	(0.00306)	(0.00494)	(0.0629)
CTR	-0.206***	-0.204***	-0.213***
	(0.00428)	(0.00605)	(0.0201)
FCI	-1.943***	-1.924***	-2.538***
	(0.0475)	(0.0528)	(0.181)
	Regulations on Bank's capital		
CAR	-0.0198	-0.0188	0.0333
	(0.0144)	(0.0139)	(0.0592)
	Governance Factors		
AQ	-0.337	-0.348	0.00184
	(0.233)	(0.235)	(0.519)
CLG1	-9.694***	-9.635***	-10.38***
	(0.226)	(0.274)	(1.062)
CLG2	1.325***	1.241***	-0.0880
	(0.140)	(0.138)	(0.914)
CLG3	1.742***	1.616***	-2.521**
	(0.259)	(0.327)	(1.051)
CLG4	4.867***	5.269***	11.16***

Table 4.15 (Continue)

	(0.540)	(0.629)	(2.187)
	Control Variables		
SOB	2.614***	2.513***	2.022**
	(0.370)	(0.397)	(0.726)
GDP	19.93***	20.04***	22.68***
	(0.805)	(0.921)	(3.129)
	Moderator and Interaction Terms		
RC		0.0205	2.393
		(0.0797)	(1.902)
LR*RC			-0.000341
			(0.00628)
CR*RC			-0.0283*
			(0.0145)
OR*RC			0.00640
			(0.00864)
MR*RC			-0.101***
			(0.0282)
CTR*RC			-0.0186*
			(0.00955)
CAR*RC			-0.0144
			(0.0100)
AQ*RC			-0.0346
			(0.115)
CLG1*RC			9.945***
			(2.580)
CLG2*RC			1.955
			(2.879)
CLG3*RC			0.509
			(1.193)

Table 4.15 (Continue)

CLG4*RC			-0.158
			(2.441)
Constant	-220.2***	-220.8***	-256.6***
	(5.772)	(7.527)	(37.22)
R-square	0.5078	0.5063	0.4994
Wald Test (*p*-value)	0.000	0.000	0.000

Dependent variable is financial stability as measured by ROA = net income after tax/ total assets, and ZROE =return on equity/ standard deviation in return on equity; liquidity risk LR= liquid assets/total assets; credit risk CR= Non-performing loans/gross advances; operating risk OR= Cost to income ratio, market risk MR= real interest rate; country risk CTR= average annual exchange rate; financial crisis impact FCI= dummy variable equal to 1 for the crisis period (2007 to 2012) and 0 otherwise; capital adequacy ratio CAR= Equity /total assets; audit quality AQ= natural log of audit fee; country-level governance one CLG1= control of corruption; country-level governance two CLG2= Political Stability and Absence of Violence/Terrorism: Estimate; country-level governance three CLG3= government effectiveness: estimate; country-level governance four CLG4= voice and accountability: estimate; risk committee RC= size of risk committee; size of bank SOB= log of total assets; gross domestic product GDP= Log of GDP. Robust standard errors in parentheses as adjusted for heteroskedasticity and autocorrelation, *** p<0.01, ** p<0.05, * p<0.1 indicating level of significance.

The interaction term between CR and FSZROE shows a negative and significant effect on FSZROE (ß = -0.0283, p<0.1, M3, Table 4.15). It observes that due to the presence of RC, significant and negative moderation exists between CR and FS-ZROE. The direct association between CR and FS-ZROE is highly significant and negative under M1 (Table 4.15). However, with the addition of RC as a moderator, this relationship is less adverse and negative. This lower negative moderating effect of RC between CR-ZROE relationships would state that increasing NPLs are affecting the stability of commercial banks. However, with the involvement of RC, their adverse influence on FS-ZROE is reduced. This moderating effect further defends the proposition that members in RC are putting their efforts in lowering the negative effect of CR on FS-ROA. Based on this

relationship, it is observed that the positive view of AT exists in commercial banks of Pakistan, while examining the association between CR-FSROA with the presence of RC.

Additionally, as per SHT, securing the interest of other stakeholders like financial institutions, governmental agencies, employees, and customers is also the principal obligation of the business (Freeman, 1999). This decline in a negative relationship between CR-FSZROE (because of moderating effect of RC) implies that interest of various stakeholders would also be secured by the commercial banks that were affected under direct effect of CR on ZROE.

The assumption of MPT suggests that portfolio specialists should inject the capital in those projects which could balance the factors of risk and return (Cornett & Saunders, 2003; Krouse, 1970). However, excessive CR and the moderating effect of RC between CR and FS-ROE specify that still there is a need to control the negative effect of weak loan portfolio having increase NPLs. For this purpose, integration of portfolio diversification and specialization could help the credit departments in commercial banks of Pakistan. Figure 4.26 enlightens the moderating effect of RC between CR and FS-ROE. It shows that banks with low RC dampens negative relationship between CR and FS-ROE, comparatively to high RC.

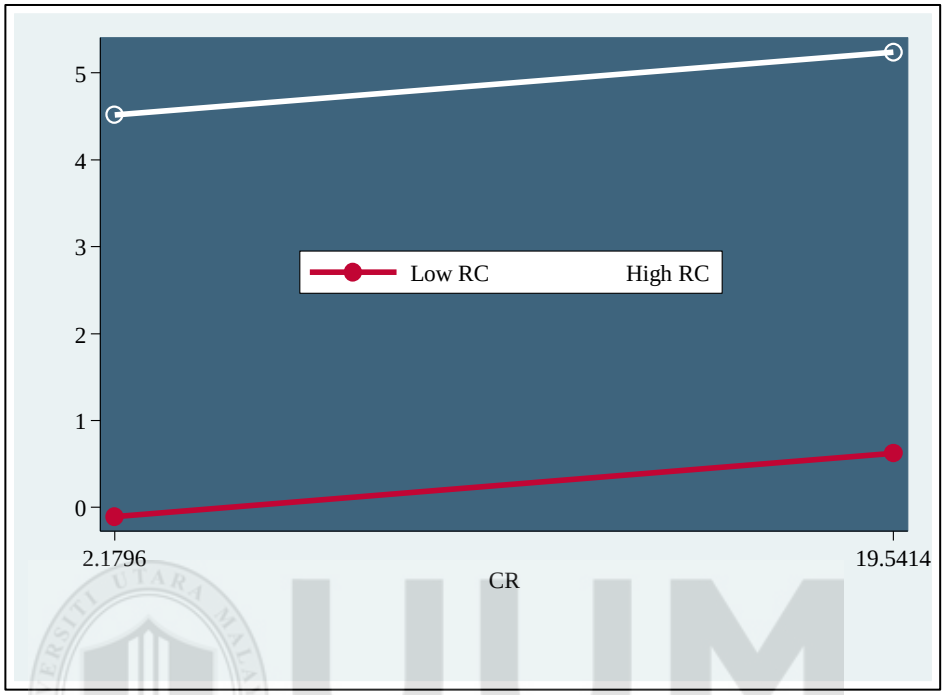

Figure 4.26
Moderating Effect of RC on CR-FSZROE Relationship

The interaction term between OR and RC indicates a coefficient of .0064, predicting that there is no influence of RC in predicting the relationship between OR and FS-ZROE. The direct influence of OR on ZROE is significantly negative, but with the moderating effect of RC, this effect is positive but insignificant. It shows that the presence of RC between OR-FSZROE has failed to provide any evidence about their managerial significance. Therefore, it is inferred that H3b (risk committee moderates the relationship between operational risk and financial stability in terms of ZROE) is not accepted.

For MR-FSZROE relationship, the moderating effect of RC is negative and significant (ß = -0.101, p<0.01, M3, Table 4.15). The main effect of MR on ZROE under M1 is positively significant, implying that higher interest rate is positively affecting the FS-ZROE. However, the negative coefficient of the interaction term (MR*RC) strengthens the argument that agency issue is significantly presented as RC is mismanaging the relationship between MR and FS-ZROE. Additionally, the fundamental assumption of SHT could observe here which directs that business success lies in satisfying all the stakeholders who are disturbed by lower FS in banking firms of Pakistan because of the negative moderating effect of RC. Figure 4.27 explains the moderating effect of RC on MR-FSZROE relationship. It indicates that low RC negatively moderates the relationship between MR and second measure of FS, compared to high RC.

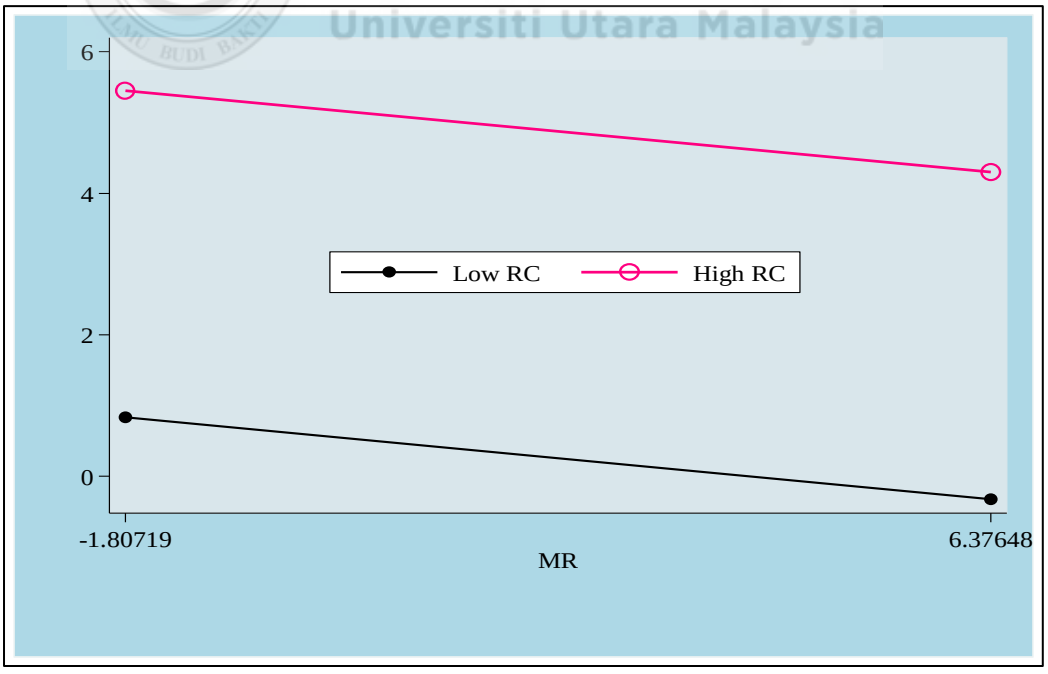

Figure 4.27
Moderating Effect of RC on MR-FSZROE Relationship

Besides, the interaction term between CTR and RC indicates the fact that the effect on FS-ZROE is significant and negative. It means that with the presence of RC as a moderator, the relationship between CTR and FS-ZROE is negatively low (ß = -0.0186, p<0.1, M3, Table 4.15), comparatively to the empirical findings under direct effect (ß = -.206, p<0.01, M1, Table 4.15). This situation implies that board members in RC are lowering the adverse influence of exchange rate volatility on FS-ZROE when they act as a moderator. Based on such findings, significant evidence is found for the presence of agency relationship as board members/agents of shareholders in commercial banks of Pakistan are found of being lowering the negative effect of CTR for better FS.

From the context of SHT, the interest of all the parties who are directly or indirectly associated to commercial banks could observe in a right direction as RC lowers the negative influence of CTR on FS-ZORE. Figure 4.28 provides a graphical outlook for the moderating effect of RC between CTR-FSZROE relationship. It shows that low RC is negatively increasing the relationship between CTR and FS through ZROE, compared to high RC.

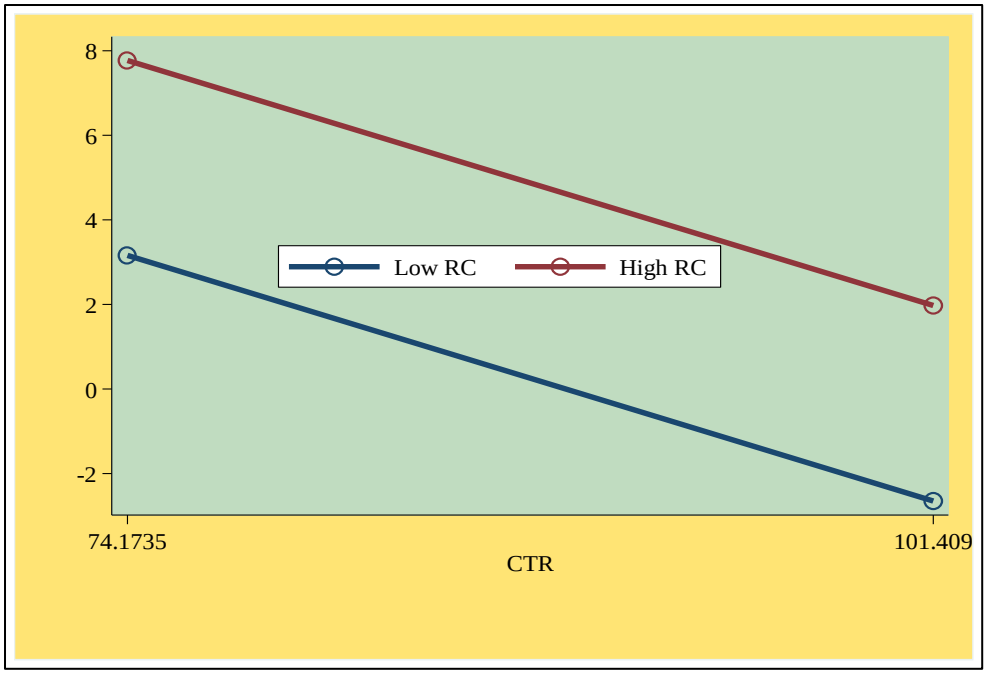

Figure 4.28

Moderating Effect of RC on CTR-FSZROE Relationship

In addition, the direct effect of CAR on FS-ZROE is negatively insignificant, insisting that there is no relationship between them. Similarly, as per the moderating effect of RC through the interaction term (CAR*RC), the effect on FS-ZROE is again negative but insignificant. The reason for the insignificant direct effect of CAR on ZROE may be the excessive capital reserves up to 16 percent in commercial banks, which is above the prescribed limit of 10 percent as settled by SBP. Although the excessive capital reserve can secure a bank from uneven financial shocks, at the same time, it has no relationship with FS-ROE. It implies that there is a need to revise the existing policy for the capital reserves to find its actual impact on stability measures. The insignificant moderating effect of RC further shows that it does not influence CAR-ZROE relationships. Additionally, the interaction effect of AQ and RC demonstrates no significant findings for FS-ZROE. This

insignificant effect implies that there is no moderating role of RC between AQ-FS-ZROE relationship.

Through CLG1, the direct effect under M1 (4.15) shows a negative and highly significant relationship with FS-ZROE. This relationship is further examined with the moderating effect of RC with the interaction term (CLG1*RC). The effect of the interaction term shows a significant and positive effect on FS-ZROE. It specifies that the direct effect of CLG1 on FS-ZROE is significant and negative, but the presence of RC has dampened the negative influence on banking sector stability. It means that RC is significantly lowering the negative relationship between CLG1 and FS-ZROE. This moderating effect further implies that RC is playing a functional role while dealing with the control of corruption and banking sector stability. Therefore, the positive view of AT is reasonably justified.

In recent years, a series of financial frauds and mega corruption scandals have attained significant attention, and most of them are related to commercial banks (Pakistan Today, 2018). Meanwhile, money laundering and fake accounts cases are among the critical reasons of financial deceptions through commercial banks, which represents low control over corruption (The News, 2019). However, with the presence of RC, the moderating effect justifies that involvement of banking sector management like RC can lower the adverse effect of CLG1 over FS-ZROE. Figure 4.29 shows that high RC has a positive

influence on the relationship between CLG1 and FS-ZROE as compared to low RC in commercial banks of Pakistan.

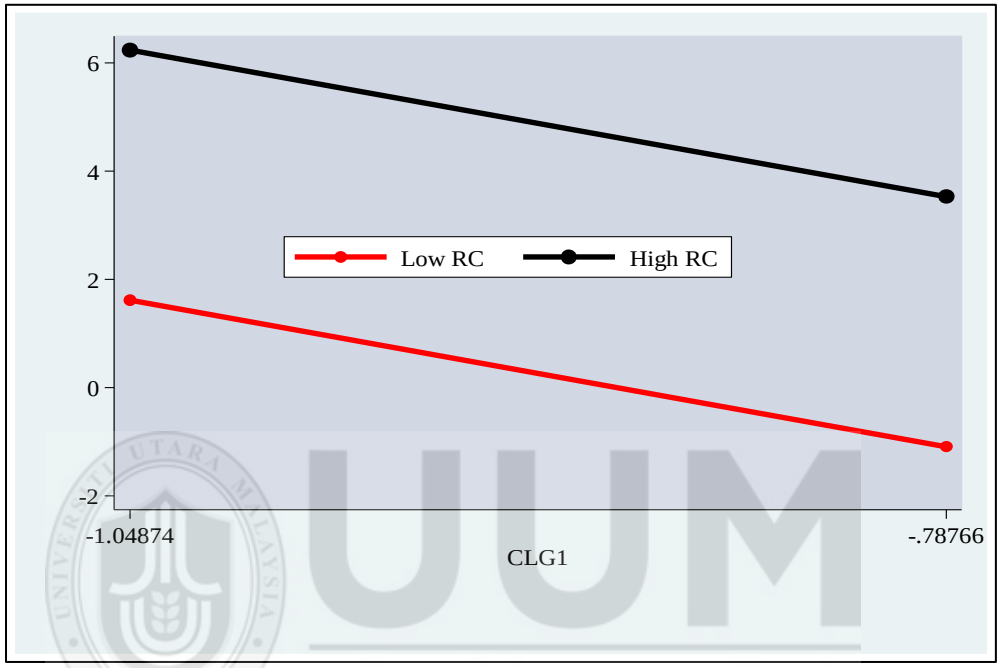

Figure 4.29
Moderating effect of RC on CLG1-FSZROE relationship

Additionally, the effect of RC between CLG2 and FS-ZROE is positively insignificant, implying that there is no moderating effect between them. Although the direct effect of CLG2 is significantly positive (Model 1, Table 4.15), but the coefficient of interaction term would reveal that RC has no role in defining the association between government effectiveness and banking sector stability. One of the many reasons for this insignificant moderating effect might be the nature of CLG2 as macro governance indicator, hence beyond the control of banking sector management, comparatively to CLG1 which is

directly observed to affect the banking sector in recent years. Additionally, the insignificant moderating effect of RC reasonably justifies the argument that banking firms are primarily focusing on bank-related governance measures, whereas CLG2 is purely representing government efficiency to work in the country effectively. Therefore, RC has no control over CLG2 to affect FS-ZROE.

Besides, a similar trend is observed for the interaction effect of CLG3 and CLG4, whose effects are also found to be insignificant. It shows that RC has no concern with macro governance factors like political stability and absence of violence (CLG3) and voice and accountability (CLG4) who are making a direct effect on FS-ZROE under M1 (Table 4.15). In addition, it is observed that the addition of interactive terms under M3 has reduced the value of explained variation (ΔR^2= -0.0069). Besides, both the control variables (SOB, GDP) have shown their positive and significant relationship with FS-ZROE.

Table 4.16 shows the remarks for the research hypotheses for the moderating effect of RC between risk factors, regulation on bank's capital, and governance factors for FS-ZROE.

Table 4.16
Hypotheses Remarks: Moderating effect of RC between RM-FSZROE

Hypotheses	Descriptions	Remarks
H1b	Risk committee moderates the relationship between liquidity risk and financial stability in terms of ZROE	Not supported
H2b	Risk committee moderates the relationship between credit risk and financial stability in terms of ZROE	Supported
H3b	Risk committee moderates the relationship between operational risk and financial stability in terms of ZROE	Not supported
H4b	Risk committee moderates the relationship between market risk and financial stability in terms of ZROE	supported
H5b	Risk committee moderates the relationship between country risk and financial stability in terms of ZROE	supported
H6b	Risk committee moderates the relationship between capital adequacy ratio and financial stability in terms of ZROE	Not supported
H7b	Risk committee moderates the relationship between the quality of audit and financial stability in terms of ZROE	Not supported
H8b	Risk committee moderates the relationship between CLG1 and financial stability in terms of ZROE	supported

Table 4.16 (Continue)

H9b	Risk committee moderates the relationship between CLG2 and financial stability in terms of ZROE	Not supported
H10b	Risk committee moderates the relationship between CLG3 and financial stability in terms of ZROE	Not supported
H11b	Risk committee moderates the relationship between CLG4 and financial stability in terms of ZROE	Not supported

4.6 Summary of Chapter

This chapter provides empirical findings of the relationship between RM, FS, and moderating effect of RC. In the first section, descriptive findings were presented to analyze the trends of data set during 2007-2016 for commercial banks of Pakistan. For regression diagnostic, assumptions like multicollinearity, normality, linearity, and model specification were tested, and discussion was provided under section two. Findings show that there is no bias in the data set for the panel regression analyses. Section three provides the regression findings based on the stated objectives. Application of required panel models specifies that a significant relationship exists between RM and FS in commercial banks of Pakistan.

However, for better understanding, comparison of panel models was applied through HM and B.P LM test, directing the most appropriate model to accept research hypotheses. It was found that random effect is more appropriate among all panel models for both stability measures. After the panel regressions, the moderating effect of RC was observed between

RM and FS through random effect regression techniques. It was observed that RC is significantly moderating the relationship of liquidity, credit, market, country risk factors, capital ratio, audit quality, and third indicators of country-level governance with FS-ROA. For the second measure of FS, RC also moderates the relationship of credit, market and country risk and the first indicator of country-level governance with FS-ZROE. Further discussion on the findings like managerial implications, limitations, and future directions are provided under chapter five.

CHAPTER FIVE

CONCLUSION AND POLICY IMPLICATIONS

5.1 Introduction

Eight sections are presented under this chapter. The present section covers a brief introduction. Section two summarizes the findings as per the research objectives of the study. Section three provides the overall contribution to the research. Section four and five discuss the implications and limitations of research. Section six explains recommendations and some policy implications. Section seven presents directions for future research. The last section concludes the study.

5.2 Summary of Findings

This study has provided empirical evidence in present literature from the context of moderating effect of RC on the relationship between RM and FS in banking sector of Pakistan. For analyzing the relationship between RM and FS, a research framework was developed, covering the independent variables under the title of risk types, regulation on bank's capital, and governance factors. Whereas FS is measured through ROA and ZROE. Furthermore, RC is considered as a moderator between RM-RS relationship.

In local commercial banks of Pakistan, RM is a significant issue in recent years, putting financial measures of stability at a questionable position. This matter is significantly highlighted in the introduction and problem statement of the present research. To provide empirical evidence, research objectives were defined and empirically examined through

hypotheses testing under panel data models. Research objectives (1-3) indicates the relationship between risk types and FS, regulation on the bank's capital and FS, and governance factors for FS in commercial banks of Pakistan. For the direct relationship between RM and FS through ROA, findings are in favor of the random effect through B.P L_M test.

The empirical facts of this study explain that a significant relationship exists between risk factors, capital reserves, governance measures, and FS-ROA. For the second measure of FS, results are again in favor of RE (for the direct relationship), proposing that there is a significant relationship between risk measures, capital regulation, governance indicators, and FS-ROE. These findings reasonably explains that there is an agency issue in commercial banks of Pakistan because of weak RM practices by banking officials which in return affecting the FS.

As per the research framework, fourth objective of the study examines the moderating effect of RC on the relationship between RM and FS in commercial banks of Pakistan. For this purpose, RE regression findings specify that RC moderates the relationship between risk factors (liquidity, credit, market, and country), capital reserves, AQ, CLG3, CLG4 and FS through ROA. Additionally, for the second measure of FS, significant moderation of RC exists between CR-ZROE, between MR-ZROE, between CTR-ZROE, and between CLG1-ZROE.

The stated research framework of the study significantly reflects the key theories like agency theory, stakeholder theory, and modern portfolio theory. More specifically, empirical facts provide reasonable justification for the agency relationship between the shareholders and agents (bank managers) who are supposed to perform their duties by all means to properly manage the risk factors. However, the negative moderating effect of RC on the relationship between RM and FS specifies that there is an agency issue in the banking sector, where risk managers and board members are responsible for increasing instability. This issue significantly defends the presence of agency issue in the framework of RM and FS.

From the context of SHT, it is believed that commercial banks should seriously consider all the stakeholders. In this regard, SHT enhances the managerial implication of better RM and FS for various parties like employees, customers, creditors, and investors as well. As per the fundamental assumption of SHT, better stability in financial terms could lead to more business growth and may regard the interest of stakeholders. Besides, the theoretical background of MPT indicates the link of risk and return through available investment opportunities in the market.

For commercial banks in Pakistan, portfolio analysts are responsible to properly define those investment options which could provide a maximum return with the minimum

amount of risk. However, findings under present study specify that MPT should be reconsidered as some factors like liquidity, credit, and operational, and market risk are not in favor of commercial banks in terms of FS. In this regard, both portfolio experts and risk assessing department are required to deal with such imbalance between risk-return.

5.3 Contribution of the research

The present study has contributed in various ways. At first, it examines the effect of risk measures, regulation on bank's capital, and country governance factors for the FS in commercial banks of Pakistan. Secondly, this study considers two measures of financial stability (ROA, ZROE) which are under limited attention in present literature for commercial banks of Pakistan. Series of studies have been conducted in recent literature, discussing both theoretical and empirical background for the stability of banking firms in developed and emerging economies. However, FS trends for banks in Pakistan were yet to be examined, as addressed in the present research. Thirdly, the foremost contribution of the study is moderating effect of RC between RM and FS, which is observed as a significant gap in literature of finance and banking. Fourthly, panel regression models are applied covering both the direct effect of RM on FS and moderating effect through RC between RM-FS. This empirical investigation also provided significant evidence for a substantial contribution to the literature of RM and FS.

Fifthly, time duration and selected firms of the study could be viewed as a notable addition in the literature of finance. It covers maximum time (2007-2016) and units of observations (28 commercial banks out of 30). Sixthly, this research takes maximum public sector, private sector, local, foreign, conventional, and Islamic banks into account, providing more generalization of the findings for the local financial market. Seventhly, the present work provides theoretical, empirical and practical guidelines for policymakers, chief risk officers, members in the RC, risk management board, audit committee, financial experts, banking officials, country representatives and other stakeholders of the banks.

Finally, conceptual framework of the study has contributed a new insight into the better understanding of underpinning and supporting theories. In this way, it is another contribution to the researchers and for those who are dealing with research philosophies and approaches.

5.4 Implication of the Study

This research has various theoretical, empirical, academic, and managerial implications which are debated in the following subsections:

5.4.1 Theoretical and Empirical Implications

One of the significant implications of the current study is observed as a theoretical addition to the existing literature of RM and FS. The developed framework under current research has reasonably justified the argument that RM is a broader term which could be categorized

into risk factors, capital regulation, and governance measures for banking sector stability. In addition, the moderating effect of RC between RM and FS has specified the study implication for better understanding. It is implicated that RC should broadly view their role between RM and FS to ensure the immediate improvement for any management inefficiencies in risk factors.

In addition, various theories have examined the relationship between RM and FS. However, in current research, three theories (agency theory, stakeholder theory, modern portfolio theory) are applied to hypothesize the relationship between variables. The idea of AT has highlighted the presence of agency problem where conflicts between owners and their agents in commercial banks have created severe financial threats. The negative impact of stated risk factors on FS have demonstrated the agency problem while the positive influence of some risk and governance factors have provided support for the positive view of AT. In this way, AT argument is reasonably justified and implicated in the current study.

Additionally, the argument of SHT supports the fact that commercial banks in Pakistan should extremely consider the interest of all other parties, not just of the shareholders/owners. Finally, the assumption of MPT shows that significant attention is required to control the increasing credit risk, which in return, causes an adverse influence on liquidity reserves, operational cost, and finally, the stability measures. All these theories are very well justified, and their theoretical implication is clear under the present research.

5.4.2 Managerial/Practical and Policy implications

Based on the proposed framework and empirical findings, this research could be suggested to academicians, industry specialists, and chief risk officers in financial markets. The developed framework can help to understand the dynamic relationship between RM-FS and with the presence of RC as a moderator. This research has empirically examined the association between the explanatory and outcome variables through panel modeling, which increases the practicality of the findings. Through panel regression estimation, empirical results could be implicated in the field of financial institutions like banks and similar other role players in financial markets. Findings could enhance the understanding of RM practices for better FS while examining the role of RC. The result provides a clear snapshot for financial experts about the overall trends in commercial banks for defining the future financial and market-related strategies.

Besides, this study has incorporated the AQ and country-level governance factors to provide significant evidence for their impact on FS of commercial banks in Pakistan. In earlier studies, less attention is observed correctly towards these governance factors while examining their impact on FS. It could provide a remarkable idea of how effectively such governance measures should be reevaluated in monitoring and controlling their adverse influence on bank stability. Further, this study provides a clear understanding of two stability measure.

Another practical implication of the study can be observed from the perspective of investors. Both stability measures reflect that risk factors, capital regulations, and governance measures significantly influence commercial banks. This result would imply that local and international investors might use this relationship for retaining or withdrawing their prudent investment in the banking industry. Additionally, with such findings, banking sector regulators like SBP, Securities and Exchange Commission of Pakistan (SECP), and BCBS can define and impose the practical regulations to lessen the harmful effects of risk and inadequate governance measures on FS of commercial banks.

Furthermore, practical implication of the study reveals the role of RC while moderating RM-FS relationship. This contribution under present study provides practical judgment about the board members who are primarily responsible for RM practices. It means that while evaluating the performance of RC in banks, empirical results under this study could be documentary evidence for its performance over two decades.

5.4.3 Academic Implications

The proposed framework and empirical findings of this study could be useful for the researchers in the field of finance, banking, risk-return behaviors, capital regulations, and governance profile. It shows how the risk factors could play a diversified role in explaining the FS. Students in their related fields can cite the study findings for better understanding and implications of all of the above three theories in their research. Besides, one of the significant theoretical contributions of the present study is provided through investigating

the moderating role of RC. Based on the empirical findings of the moderating effect of RC between RM-FS, prospective researchers can use such findings in their area of research.

5.5 Limitations of the Study

Although numerous contributions of this research are presented, however, it is based on some limitations as well. It is observed that the sample period of this research is confined from 2007 to 2016 with a sample size of only 28 commercial banks. It means that this research is ignoring the recent time trends (2017-2018) and other banking firms as working in Pakistan. The missing values under some of the variables have provided the fact that this study is based on the unbalanced panel, which is observed as another limitation of this study. Meanwhile, this research has only added return-based stability measures, while it disregarded the banking regulations, quality of assets, liquidity factors, and macroeconomic stability measures. In line with this, methodological limitations show that study has not implemented the contemporary panel approach like systematic GMM and other advanced panel methods. Further, the regional limitation of the study covers the context of Pakistani banks while missing the overall South Asian perspective. Moreover, in the general context, there are six CLG measures, but current research has considered only four. Addition of all six dimensions of CLG could provide a better generalization of the findings.

5.6 Recommendations of the Study

The present study has provided some practical implications that could be used by policymakers for designing appropriate RM strategies and mechanisms. First, this study

recommends that decision-makers should focus on those risk factors which need special treatment. Since, the moderating effect of RC is found to be significantly negative between RM and FS, this suggests that there should be a strong need for structural improvements for risk appetites by BODs. Second, since, all commercial banks of Pakistan are working through separate risk or audit committee, it is highly recommended that there should be a substantial need for restructuring the risk compliance and governance process. Thirdly, the conceptual framework of this study is highly recommended to the various stakeholders in the field of finance, risk management, and corporate governance for better understanding and conceptualization. Finally, understanding of underpinning and supporting theories could be availed through theoretical and empirical review of the present research.

The present research work also recommends that banking officials and country representatives should also revisit the impact of CLG factors on bank's stability. There is a substantial need to control the corruption, implantation of the proper rule of law, political stability, and other country-level dynamics for better financial results in the overall financial market.

5.7 Direction of Future Research

Although this research has significantly justified its theoretical and empirical contribution in existing literature, yet some future directions for upcoming research also exist. First, this study is limited to 2016 due to non-availability of the dataset for the risk factors, stability

measures, and RC in the research period. The current time durations may be reconsidered in future research with additional evidence from relevant and authentic sources.

Second, stability measures in this study are limited to return based factors. Future research could be expanded to risk-based measures, capital adequacy, monetary aggregates, real interest rates, changes in equity indices, corporate bond spread, and market-liquidity measures of FS. Therefore, further studies could expand their work while adding the bank-based and regional economic indicators of FS. Third, only commercial banks in Pakistan are selected as population of interest where the reasonable gap is yet to be explored for DFIs, MBs, leasing companies, and insurance companies (ICs).

Fourth, although fixed and random models are widely accepted in the field of finance and banking, yet methodological limitations involve non-application of GMM and similar other panel techniques. Future studies could apply such econometric methods. Fifth, moderating effect between RM and FS is observed through RC, which could be expanded to other governance measures like board credit & finance committee and board advisory committee. Besides, the regional application of this study could be extended to South Asian economies, considering the key role players in relevant money and capital market.

5.8 Conclusion of the study

This study concludes that RM practices in the banking sector of Pakistan are significantly associated with the FS. The role of RC as a moderator between RM and FS cannot be ignored because of its governance significance. In addition, this research has provided a conceptual framework for more understanding of AT in the field of finance and banking. The theme of AT emphasizes that business managers should focus more on the business objectives and welfare of the shareholders, compared to their own interest. Whereas, SHT indicates that other parties in the community who are associated with the banking firms should also be considered while dealing with RM and FS.

Additionally, MPT explains the balance between risk-return through diversified investment and strategic decisions by portfolio managers in banks. The excessive liquidity and higher CR are distressing issues for commercial banks of Pakistan. Meanwhile, OR has adversely impacted the stability measures in the form of more operational costs and weak internal control. MR is another indicator in weakening the FS. Additionally, CTR is putting the overall financial system at stake with the constant deprecation of the local currency. Besides, GFC has adversely targeted the stability measures in the banks of Pakistan, putting the banking system under more risk and uncertainty. Furthermore, it is inferenced that significance of CLG factors cannot be ignored as their direct influence on the banking system is distressed.

However, research findings with the presence of RC as a moderator between RM and FS explain that there is an agency issue in commercial banks. Such a committee is primarily responsible for formulating the RM policies and oversight the banking operations.

However, their duties towards risk appetite of the banks seem inefficient and defending the application of AT in the present research. The findings of the study highlight that RC should be restructured by banks as they play an adverse role in the relationship between risk factors and stability. Besides, SHT focuses on securing the benefits of all the parties while MPT assumption predicts the significance of diversification and specialization in banking investment.

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