Determinants of Loan Loss Provisions, Capital Buffers and their Impact on Bank Lending: A Global Perspective

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IN THE NAME OF ALLAH, THE MOST MERCIFUL AND BENEFICENT

DEDICATION

I dedicate this thesis to my father (Mr. Noor Ullah), who is praise worthy for his sustenance of me on right lines. Because what I am today is only due to his efforts.

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TO BE SUBMITTED TO FACULTY OF MANAGEMENT SCIENCES, INTERNATIONAL ISLAMIC UNIVERSITY ISLAMABAD

This thesis Determinants of loan loss provisions, capital buffers and their impact on Bank Lending: A Global Perspective submitted by Ms. Aysha Noor is partial fulfillment of Ph. D degree in Finance has been completed under my guidance and supervision. I am satisfy with the quality of student's research work and allow her to submit this thesis for further process as per IIUI rules and regulations.

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Table of Contents

..... ii

LIST OF TABLES xiv

ABSTRACT xv

CHAPTER # 1 1

INTRODUCTION 1

1.1. Theoretical Foundation for Basel Capital Regulations 4

1.1.1. Systematic Risk and Capital Regulations 4

1.1.2. Modern Banking Theory and Capital Regulations 6

1.1.3. Insurance Premium of Bank Deposits and Regulatory Capital 7

1.1.4. Depositors Representatives Argument and Capital Regulations 8

1.1.5. Formation of Regulatory Capital 8

1.1.6. Summary of Theoretical Foundation of Basel Capital Regulations 10

1.1.7. Implementation of Basel Accord in Pakistan 11

1.1.8. Implementation of Basel III in G20 Members of BCBS 11

1.1.9. Theoretical Foundation for Determinants of Loan Loss Provisions 12

1.1.9.1. Summary of Theoretical Foundation of Loan Loss Provisions 16

1.1.10. Theoretical Foundation for Determinants of Capital Buffers 16

1.1.10.1. Summary of Theoretical Foundation of Determinants of Capital Buffers 18

1.1.11. Theoretical Foundation for Impact of Capital Buffers on Bank Lending 18

1.1.11.1. Summary of Theoretical Foundation of Impact of Capital Buffers on Bank Lending 22

1.1.12. Research Gap Analysis 22

1.1.12.1. Determinants of Loan Loss Provisioning 23

1.1.12.2. Determinants of Capital Buffers 24

1.1.12.3. Impact of the Loan Loss Provisioning and the Capital Buffers on the Bank Lending 26

1.1.13. Summarized (Research Gap Analysis) 26

1.1.14. Rational and Theoretical Framework 27

1.1.14.1. Determinants of Loan loss provisions 27

1.1.14.2. Determinants of Capital Buffers 29

1.1.14.3. Impact of Loan loss Provisions and Capital Buffers on Bank Lending 31

1.1.15. Hypothesis 33

1.2. Problem Statement 34

1.3. Research Questions 35
1.4. Objective of Study 35
1.5. Contribution of Study 35
1.5.1. Theoretical Contribution of Study 36
1.5.2. Practical Contribution of Study 36
1.5. Significance of the Study 37
1.6. Organization of the Study 39
CHAPTER # 2 40
REVIEW OF LITERATURE 40
2.1. Determinants of Loan Loss Provisions 40
2.1.1 Pro-cyclicality of Loan Loss Provisioning 40
2.1.2. Loan loss Provisioning and Capital Management 44
2.1.3. Loan Loss Provisioning and Earnings management 46
2.1.4. Loan Loss Provisioning and Signaling 49
2.2. Determinants of Capital Buffers 50
2.2.1. Cost of Raising New Equity 50
2.2.2. Cost of Failure 51
2.2.3. Speed of Adjustment 52
2.2.4. Bank Size 52
2.2.5. Pro-cyclicality of Capital Buffers 52
2.3. Impact of Capital Buffers on Lending 54
2.3.1. Impact of Interest Rates on Bank Lending 55
2.3.2. Pro-cyclicality of Bank Lending 56
CHAPTER # 3 57
RESEARCH METHODOLOGY 57
3.2. Data Collection 58
3.3. Construction of Variables 58
3.3.1. Dependent Variables 59
3.3.2. Explanatory Variables 60
3.3.3. Controlled Variable 66
3.4. Empirical Models of the Research 68
3.5. Methodological Review 70
3.6. Estimation Technique 70

CHAPTER # 4 73
RESULTS AND DISCUSSION 73
4.1. Descriptive Statistics 74
4.1.1. Banks from USA 74
4.1.2. Banks from Argentina 76
4.1.3. Banks from Australia 77
4.1.4. Banks from Belgium 78
4.1.5. Banks from Brazil 79
4.1.6. Banks from Canada 80
4.1.7. Banks from China 81
4.1.8. Banks from France 83
4.1.9. Banks from Germany 83
4.1.10. Banks from Hong Kong 85
4.1.11. Banks from India 85
4.1.12. Banks from Indonesia 86
4.1.13. Banks from Italy 88
4.1.14. Banks from Japan 88
4.1.15. Banks from Korea 89
4.1.16. Banks from Luxemburg 90
4.1.17. Banks from Mexico 91
4.1.18. Banks from Netherlands 92
4.1.19. Banks from Pakistan 93
4.1.20. Banks from Russia 94
4.1.21. Banks from Saudi Arabia 95
4.1.22. Banks from Singapore 96
4.1.23. Banks from South Africa 97
4.1.24. Banks from Spain 98
4.1.25. Banks from Sweden 99
4.1.26. Banks from Switzerland 100
4.1.27. Banks from Turkey 100
4.1.28. Banks from UK 101
4.1.29. Consolidated Sample Data 102
4.2. Preliminary Data Testing 103

4.3. Other Preliminary Testing 107
4.4. Data Analysis Through Generalized Methods of Moments 109
4.5. Determinants of Loan Loss Provisions 110
4.5.1. Evidence to Determine LLPs through Capital Management 111
4.5.2. Earnings Management and LLPs 111
4.5.3. Signalling and LLPs 112
4.5.4. Credit Quality and LLPs 112
4.5.5. Leverage Ratio and LLPs 112
4.5.6. Output Level and LLPs (pro-cyclicality of LLPs) 113
4.6. Determinants of the Capital Buffers 113
4.6.1. Cost of Raising New Equity and Capital Buffers 114
4.6.2. Cost of Failure and Capital Buffers 115
4.6.3. Operational Risk and Capital Buffers 115
4.6.4. Speed of Adjustment and Capital Buffers 116
4.6.5. Bank Size and Capital Buffers 116
4.6.6. Business Cycles and Capital Buffers (Pro-cyclicality of capital buffers) 117
4.7. Impact of Loan Loss Provisions and Capital Buffers on Bank Lending 117
4.7.1. Loan Loss Provisions and Bank Lending 118
4.7.2. Capital Buffers and Bank Lending 119
4.7.3. Interest Rates and Bank Lending 119
4.7.4. Cash Holdings and Bank Lending 120
4.7.5. Output Level and Bank Lending (Pro-cyclicality of Bank Lending) 120
4.8. Determinants of the Loan Loss Provisions, the Capital Buffers and their Impact on the Bank Lending (over the consolidated sample, Excluding USA banks and BCBS member countries) 121
4.8.1. What determines the LLPs (in the consolidated data, excluding the USA banks and the BCBS members) 122
4.8.2. What Determines the Capital Buffers (in the consolidated data, excluding the USA banks and the BCBS members) 123
4.8.3. Impact of the LLPs and the Capital Buffers on the Bank Lending (in the consolidated data, excluding the USA banks and the BCBS members) 124
4.9. Country Specific Effects on the LLPs, the Capital Buffers and the Bank Lending 125
CHAPTER # 5 128
CONCLUSION 128
5.1. Practical and Theoretical Implications of the Study 131

5.1.1. Practical Implications of the Study 131
5.1.2. Theoretical Implications of the Study 132
5.2. Limitations of the Study 132
5.3. Future Research Directions 133
REFERENCES 134

LIST OF TABLES

Table 3. 1. Risk Weighted Assets 60
Table 3. 2. Construction of Variables 66

Table 4. 1. Descriptive Statistics for the Banks in USA 75
Table 4. 2. Descriptive Statistics for the banks in Argentina 77
Table 4. 3. Descriptive Statistics for the banks in Australia 78
Table 4. 4. Descriptive Statistics for the banks in Belgium 79
Table 4. 5 Descriptive Statistics of the Banks in Brazil 80
Table 4. 6 Descriptive Statistics for the Banks in Canada 81
Table 4. 7 Descriptive Statistics for the Banks in China 82
Table 4. 8 Descriptive Statistics for the Banks in France 83
Table 4. 9 Descriptive Statistics for the Banks in Germany 84
Table 4. 10. Descriptive Statistics for the Banks in Hong Kong 85
Table 4. 11 Descriptive Statistics for the Banks in India 86
Table 4. 12 Descriptive Statistics for the Banks in Indonesia 87
Table 4. 13 Descriptive Statistics for the Banks in Italy 88
Table 4. 14 Descriptive statistics for the banks in Japan 89
Table 4. 15 Descriptive statistics for the Banks in Korea 90
Table 4. 16 Descriptive Statistics for the banks in Luxemburg 91
Table 4. 17 Descriptive Statistics for the Banks in Mexico 92
Table 4. 18 Descriptive Statistics for the Banks in Netherlands 93
Table 4. 19 Descriptive statistics for the banks in Pakistan 94
Table 4. 20 Descriptive Statistics for the Banks in Russia 94
Table 4. 21 Descriptive Statistics for the Banks in Saudi Arabia 95
Table 4. 22 Descriptive Statistics for the Banks in Singapore 96
Table 4. 23 Descriptive Statistics for the Banks in South Africa 97
Table 4. 24 Descriptive Statistics for the Banks in Spain 98
Table 4. 25 Descriptive Statistics for the Banks in Sweden 99
Table 4. 26 Descriptive Statistics for the Banks in Switzerland 100
Table 4. 27 Descriptive Statistics for the Banks in Turkey 101
Table 4. 28 Descriptive Statistics for the Banks in UK 102
Table 4. 29 Descriptive Statistics for the Consolidated Data 103
Table 4. 30 Augmented Dickey Fuller Unit Root Test for the Panel Data (Model-I) 104
Table 4. 31 Augmented Dickey Fuller Unit Root Test for Panel Data (Model-II) 105
Table 4. 32 Augmented Dickey Fuller Unit Root Test for the Panel Data (Model-III) 106
Table 4. 33: Sargan's J statistics (Sargan-Hansen Test) 108
Table 4. 34 Data Analysis through the Generalized Method of Moment (model-I) 110
Table 4. 35 Data Analysis through the Generalized Methods of Moment (model-II) 113
Table 4. 36 Data analysis through the Generalized Method of Moment (model-III) 117
Table 4. 37 Consolidated Results of the Generalized Method of Moment 121
Table 4. 38 Country specific effects 126

ABSTRACT

Bank capital regulations formulation is the outcome of the collapse of the Bretton wood system in 1973, the incentives of risk taking enhances the chances of bank failure especially the undercapitalized bank takes the advantage of limited liability, asymmetry of information between the banks, regulators and agency problems. The implementation of these capital regulations requires the banks to maintain minimum risk weighted assets to continue its operations under the Basel regimes. The literature provides the insight that banks are found to employ two tools to maintain regulatory capital that are the LLPs and the capital buffers to avoid regulator penalty and to maintain market discipline.

The study has been carried out to investigate the determinants of the loan loss provisions, the capital buffers and their impact on the bank lending. The explanatory variables of loan loss provisions model include the capital management, the earnings management, the signaling, the credit quality, the leverage ratio and the output level. The empirical model of determinants of the capital buffers includes the cost of raising new equity, the cost of failure, the operational risk speed of adjustment, the bank size and the output level. The impact of the loan loss provisions and the capital buffers on the bank lending model includes the loan loss provisions, the capital buffers, the interest rates, the cash holdings, the size indicators and the output level as explanatory variables.

To empirically investigate the study objectives the data have been collected from banks in BCBS members (27 countries) and banks in Pakistan and the selected sample comprises of 2251 banks. The data have been tested through the generalized method of moment for each country, as consolidated data, by sample split (BCBS members and Banks excluding USA)

banks. The determinants of the LLPs over the selected samples are the earnings management, the signaling and the leverage ratio. There is no significant evidence found of pro-cyclicality of the LLPs during the study period except in France. The determinants of the capital buffers over the selected sample during the study periods are the cost of raising new equity, the operational risk and the speed of adjustment. The significant co-efficient suggests presence of Pro-cyclicality of the capital buffers. The bank lending has been inversely affected by the capital buffers, the interest rates and the cash holdings and there is empirical evidence of the Pro-cyclicality of the bank lending during the study period.

CHAPTER # 1

INTRODUCTION

To survive in challenging and dynamic financial structure of the world, the banking sector transformed in to its current state from medieval goldsmith. To cater the needs of the customers banking revolutions transformed banks into the present setup. Although transformation equips banks with the state of art technology and contemporary setup but still main banking business is borrowing and lending money. The indispensable banking business makes it vital for the economy due to its crucial role that is divided into two parts. The first one is related to economic planners and monetarist as they considered banking sector to control the supply of money through monetary policy tools. The second role is of an intermediary between the borrower and the lender. Although role of banking sector makes it vital for the economic system but the question is how an institution survives of which main business is to lend borrowed money and ensure its solvent existence while catering the needs of different economic segments. Hence to answer this question that how much bank needs to be capitalized, how much equity it needs to maintain against its risk weighted assets, how much liquidity it must keep and the level of leverage. Basel Committee on Banking Supervision (BCBS) formulate the Basel Capital regulation and this implementation may ensure banks solvency and existence (Dagher et al; 2016).

These capital regulations require the banks to maintain the minimum risk weighted capital (under Basel II & III), the minimum liquidity coverage ratio (under Basel III), the leverage ratio must not exceed the maximum limit (under Basel III) regardless of its size, its selection of portfolio of assets and the risk taking behavior to avoid regulator penalty and to continue

its operations (BCBS, 2010). These regulations lead the banks into two indifferent points which are either to reduce their risk weighted assets or to enhance their capital base (Hamada, 2016). The main source of bank earnings are through lending of borrowed money. The lending of borrowed money is the regular phenomena for the banking sector hence the reduction in risk based assets has been considered as the most chronic situation for the banks (Agenor & da Silva, 2012). This may leads the banks to change their capital ratios regularly as their risk based assets are changings with every new bank lending (Behn et al, 2016). The banks exercise two tools to implement the minimum risk weighted capital regulations (Base II & III). First is through the loan loss provisions which are added in Tier II capital under Basel II regime (Cummings & Durrani, 2016) and second is through the capital buffers which are maintained above the minimum risk based regulatory capital (Adzis et al, 2015).

Therefore the literature provides the insight for the use of only two devices that are the loan loss provisions and the capital buffers. However the loan loss provisions are the cushion maintained in anticipation of future losses on bank lending (Dushku, 2016). The banks are not in a position to maintain as much loan loss provisions as their earnings from interest and other services permits. The loan loss provisions are integral part of Tier II capital therefore what determines them still an unsettled issue due to controversy in literature. On the basis of this controversy the current study is to investigate what determines the loan loss provisions on the basis on which the banks maintain their minimum regulatory capital.

The banks which are implicated in interest income earned through lending of borrowed money do not prefer to reduce their risk weighted assets to maintain regulatory capital. Consequently, they are maintaining the capital buffers to avoid the situation of non-compliance of the

minimum regulatory capital without interrupting their risk weighted assets (Brei and Gambacorta, 2015). Though these capital buffers provide a cushion to alter the banks' risk weighted assets portfolio without falling short of minimum regulatory capital. However there is the cost involved in maintaining excess capital (Dagher et al, 2016). The excess capital maintenance cost leads to the decision whether to maintain excess capital or not. If the banks do not choose to capitalize excess than it leads to the situation of non-compliance of minimum regulatory capital and consequently regulator imposes penalties on such banks and raising new equity becomes costly if the bank fails to comply with regulatory capital (Estrella, 2004). Hence there is still a room to find out the determinants of the capital buffers.

The banks are found to be involved in maintaining their regulatory capital through the loan loss provisions as they are the part of Tier II capital. Therefore any rise in the LLPs bring automatic rise in the Tier II capital (Adzis et al, 2015). Banks use another tool for maintaining their minimum regulatory capital through maintaining a minimum threshold above the regulatory capital that is called the capital buffers (Daher et al, 2015). Though the LLPs are a tool to enhance Tier II capital but they are generating pro-cyclicality (Dushku, 2016) and the capital buffers are also pro-cyclical (Vu & Turnell, 2015). The term pro-cyclicality has been defined as any quantity that tends to enhance during recession and reduces during expansion (Abel and Bernanke, 2001). The empirical investigation on pro-cyclicality has been carried out by Soedarmono et al (2017) on Islamic banks and suggests that LLPs are pro-cyclical as higher economic growth reduced them. However there is still controversy regarding pro-cyclicality of both these tools. Therefore the study also tests the pro-cyclicality of the loan loss provisions and the capital buffers.

The bank lending is the main source of generating interest based revenues but the bank lending has been affected by the tools employed to implement Basel capital regulations (Jonathan, et al., 2014). The same phenomena has been tested under Basel III regime suggests that the effect of model based capital regulations on the pro-cyclicality of the bank lending empirical investigation suggests that the 0.5% increase in charge of bank capital reduces the bank lending by 2.1% to 3.9% (Behn et al; 2016). However the study of Berger et al (2016) provides contradictory arguments that the regulatory interventions have no effect on bank lending while capital support reduces the bank lending. Therefore these contradictory arguments lead to investigate that how the loan loss provisions and the capital buffers impact the bank lending.

The main sources of financing for corporations in Pakistan include issuance of new equity and borrowing from banking sector. As the greatest challenge for the financial markets is to develop bond market in emerging markets especially in case of South Asia (Nazir et al, 2010) and these factors enhance the importance of the research on banking sector in Pakistan.

1.1. Theoretical Foundation for Basel Capital Regulations

The theoretical foundation of Basel capital regulations further divided into four portions that are the systematic risk and capital regulations, the modern banking theory, insurance premium of bank deposits and representatives of depositors' argument.

1.1.1. Systematic Risk and Capital Regulations

The banks utilize their fair priced deposit insurance by taking incentives of enhancement in their risk profile. This enhancement in their risk profile leads them to indifference between

two decisions either to enhance their investment in risky assets or to enhance their leverage. These risk incentives are greater than the flat insurance premiums. These risk shifting incentives along with prospective externalities enhance the risk of bank failures. These types of banking practices lead the banking regulators to justify the imposition of minimum regulatory capital on these banks. The presence of complete market structure, no information asymmetry and appropriate deposit pricing eliminate these risk shifting incentives. The empirical investigation in this context of Kahane (1977) and Sharpe (1978) suggests that how the capital regulations are effective for bank solvency in the presence of complete market structure. The bank depositors as they are fully insured have no incentive to adjust their demanded returns for undertaken risk.

These banking practices to invest in risky assets for incentives by shifting risk lead to the research of Harts and Jaffee (1974). The study concludes that the banks are in the indifferent situation while selecting their portfolio of securities to maximize their profits where the risk and yield of securities are given. While assuming the identical methodology in incomplete market setup captured through risk averse behaviour of bankers Kim and Santomero (1988) determined that flat regulatory requirements leads to the limitations in risk and return frontier of banks and the banks are required to reformulate their portfolio of risky assets as a result of reduction in the bank leverage. The banks in order to cut down the losses arise out of reduction in leverage trying a compensating effort by investing in more risky assets. This phenomena in banking practices enhances the chances of bank failure where regulatory capital is flat instead of risk weighted. The researchers recommend to eliminate these chances of bank failure induced the introduction of the risk based capital regulations.

The Hart-Jaffee models has been criticised by Rochet (1992) on the grounds that undercapitalized banks while taking the advantage of limited liability element may not be kept far away from investing in risky investment though the risk based regulatory capital is imposed upon them. Therefore there is still room for another regulation that is the minimum risk based regulatory capital.

1.1.2. Modern Banking Theory and Capital Regulations

The main part of the modern banking theory says that the information asymmetries arise due to the screening and monitoring of bank loans (Lewis, 1992). The banks take advantage of this information asymmetry and tap those firms that are reluctant to go towards the capital markets by virtue of asymmetry of information. These firms use bank loan as source of funding their projects and banks tap them to make positive NPVs due to their information screening specialization (Gennotte and Pyle, 1991). This asymmetry of information leads to banks to enhance its interest based revenue generation arises from insured deposit by investing in risky assets. Gennotte and Pyle (1991) study leads to the conclusion that the capital standards have ambiguous effect on bank failures as any increase in the risky assets may be offset by the size of the bank and the value of NPV received from such investment.

Santos (1999) carried out the research on the asymmetry of information along with principal agent problem where the banks are subject to capital regulations. In these circumstances the banks while formulating the contract with the firms take into account the bankruptcy cost and higher cost of funding (As equity is expensive than deposits). These adjustments lead the firms to reduce its risk for being in loan contract with the bank and therefore causes reduction in bank chances of insolvency.

The recent debate on pro-cyclicality of capital regulations lead the researchers to overlook the importance of loan loss provisioning while determining the banks minimum regulatory capital. Secondly the agency approach suggests the legal protection provided to external stakeholders does not allow the banks to take advantage of asymmetry of information and can manage their earning through LLPs. The banks are managing their earnings by allocating it to loan loss provisions for expected and unexpected future losses but the protection of outsiders claim may negatively affects the LLPs. Therefore banks exercise provisions less during good times and practise provision more during bad times (Cavallo and Majnoni, 2001).

1.1.3. Insurance Premium of Bank Deposits and Regulatory Capital

The safety and reliability in banking activities can equally be attained either through the risk based capital or risk based insurance premium subject to comprehensive information on the risk of bank with the insurance provider in the absence of any moral hazards (Sharpe, 1978). Hence utilization of both methods are useful to maintain the soundness of banking system where the information provided to the insurance firm on bank risk is subject to errors. Hence in this type of situation both risk based insurance premium or risk based capital cannot be used as the substitute of each other's (Flannery, 1991).

The model of Sharpe (1978) becomes the centre of debate and it leads to the argument that the regulator requirement to pay the insurance premium may not be that feasible as the banks possess the quality of information related to the bank portfolio of loans. Hence due to asymmetry of information about the quality of loan portfolio, for the social welfare of the depositors and sound banking operations regulators are needed to impose minimum risk based regulatory capital on banks (Giammarino et al, 1993). The debate on the issue where the

information about the quality of loan is not complete and subject to errors. Hence in this situation the trade-off between the insurance and regulatory capital has been recommended. The banks with lower quality of loan portfolio are required to pay higher insurance premium and maintain less regulatory capital while the banks with higher quality of loan portfolio need to maintain less insurance premium and higher minimum regulatory capital (Freixas and Gabillon, 1999).

1.1.4. Depositors Representatives Argument and Capital Regulations

Dewatripont and Tirole (1996) suggested that the bank faces the corporate governance issue as the ownership has been separated from the management. Secondly the instance of banking business depends upon the lending of borrowed money to generate interest based income. The banks borrowed money from the depositors and the depositors are different from equity holders. Shareholders are the owners of the banks but they are different from management and depositors. The depositors of the bank are not the part of the management and do not possess the complete information about the quality of bank loan portfolio as the regulators are also not aware of what exactly the quality of loan portfolio is. The main reason behind the existence of banking business is information asymmetry as they borrow from one segment of economy and lend it to another segment of economy. Therefore to safeguard the interest of the bank depositors and it is in welfare of the economic system to impose minimum regulatory capital on the banks.

1.1.5. Formation of Regulatory Capital

In 1973 after collapse of Bretton wood system of managed exchange rate the large number of banks suffered heavy losses in the foreign. The West Germany's supervisory office of

Bankhaus Herstatt withdrew its banking licence on 27th June 1974 on account of undertaking foreign currency exposure which was three times greater than its capital. This dilemma has taken its international dimension due to the bank declares its bankruptcy in its foreign exposure. These interruptions in the international financial markets took the attention of central bank governors of G10 countries to setup a committee on banking regulations and supervisory practices by the end of the 1974 (BIS,2014).

To implement the Basel Accord I till the end of 1992 the capital regulations accord was released to banks on July 1988 after approval from G10 governors. Under this accord the minimum capital ratio fixed against risk weighted assets was 8%. September 1973 declaration of Basel committee on banking supervision (BCBS) suggests that the capital regulations will be implemented in all the G10 countries along with the international active banks. The Basel Accord I was criticised on the grounds of non-association of bank capital to its risk, not applicable on operational risk, liquidity risk and concentration risk (BIS, 2014).

The three pillars that are bases of Basel Accord II (2004) include minimum capital requirement (pillar 1), supervisory review of institution's capital adequacy and internal assessment process (pillar 2) and disclosure requirements (pillar 3).The problems with the Basel Accord II includes that it is a proven to be the failure one while capturing the bank risk especially after financial crisis 2007-2009. Secondly the Basel has not provided guidelines about the liquidity management of the bank. Liquidity risk management needs to be addressed as it arises due to maturity mismatch between the assets and liabilities of the bank. Finally pro-cyclical tendency of Basel II reinforces the financial crises and leads to evaluation of Basel III (BIS, 2014).

The group of governors and head of supervision had announced higher minimum capital requirements for commercial banks in September 2010 after designing of the capital and liquidity reforms package known as Basel Accord III in July. Basel III accord suggests the innovations that are conservative capital buffers, countercyclical capital buffers, leverage ratio, credit conservative buffer and liquidity requirements through four ratios such as leverage ratio, liquidity coverage ratio, long coverage ratio and net stable funding ratio (BIS, 2014).

1.1.6. Summary of Theoretical Foundation of Basel Capital Regulations

To cover up the cost of deposit insurance and to enhance the bank profitability banks are involved in maintaining risky portfolio of assets and enhances its leverage. This phenomena leads to the requirement of risk based capital but the undercapitalized banks was still in a position to invest in risky portfolio of assets due to limited liability phenomena. Both situations contribute to the requirement of formation of minimum risk based regulatory capital. Secondly incomplete market structure, incomplete information with the insurance provider, asymmetry of information with the banks on the quality of loan portfolio, incomplete information with the regulators about the quality of loan portfolio, the bank depositors (main source of financing) are different from their management lead to the formation of Basel capital regulations. Thirdly bank credit exposure is secured by different credit management techniques such as standardized approach and comprehensive approach for credit management risk leads to the development of capital regulations.

1.1.7. Implementation of Basel Accord in Pakistan

The banking companies' ordinance 1962 section (13) addresses the minimum capital requirement for the banking company and its second amendment in 1997. This amendment requires that the banking company can commence its business unless it has a minimum paid up capital as determined by State bank of Pakistan (SBP) and can continue its business if its capital and disclosed general reserves are fulfilling the SBP regulations (SBP, 1997). Basel II was implemented on banks in Pakistan under SBP road map up till 1st January 2008. The implementation requires the banks to implement the standard approach for credit risk, the standard approach for operational risk and internal rating approach (SBP, 2005).

SBP being the regulators of the banking industry in Pakistan has full authority to impose penalty, rescheduling of the bank and cancel the licence to carry on banking business in Pakistan, if the banks operating in Pakistan are failed to comply with minimum capital regulations (SBP, 1997). The phases for implementation of Basel Accord III introduced by SBP include that the minimum capital requirement for banks will be 10% from 2013 out of which 6.5% Tier I capital in 2013, 7% Tier I capital in 2014 and then onwards it will be 7.5%. The credit conservative buffer included in total capital plus credit conservative buffer will be 0.25% for 2014, 0.65% for 2016, 1.275% for 2017, 1.9% for 2018 and in 2019 when Basel III will be fully implemented the ratio of credit conservative buffer will be 2.5% (SBP, 2013).

1.1.8. Implementation of Basel III in G20 Members of BCBS

To monitor the implementation of Basel III in BCBS G20 members group of central bank governors and head of supervision (GHOS) has formulated comprehensive program in January 2012. The program covers the timely implementation of Basel III in G20 member

countries, the minimum capital regulations are consistent in each member to International standards and risk weighted assets of each member countries are consistent and reliable. The report suggests that the domestic regulations which are necessary to implement Basel Accord III was published by India, Japan and Saudi Arabia, European Union completed the process in June 2013. While the Argentina, Hong Kong SAR, Indonesia, Korea, Russia, Turkey and Unites States of America are agreed to meet deadline of 1st January 2013. The remaining G20 countries are facing greater challenges to meet the deadlines (BCBS, 2012).

Basel III for internationally active banks includes Tier I capital was increased from 9.5% to 10% of their risk weighted assets in second half of 2013, leverage ratio was increased from 3.7%(2012) to 4.4%, the weighted average liquidity coverage ratio was increased up to 119% from 114%(2013). The numbers suggests that these internationally active banks has already met the minimum regulatory capital of Basel III (BCBS, 2014). The risk based capital regulations have been implemented by all members of BCBS (BCBS, 2015).

1.1.9. Theoretical Foundation for Determinants of Loan Loss Provisions

The theoretical foundation for loan loss provisions was based on the theoretical model of Cavallo and Majnoni (2001) included the bank profit in relation to business cycles, with relationship to earnings management, taxation and capital ratios. The profit maximizing banks' lending rates comprises of four components. The lending rates are sum total of risk free rate of return, expected loss ratio, risk premium, operating cost and the rate of return per unit of time (Bhattarai, 2015). The expression of lending rate is presented through the following equation:

$$r_L = r_B + E(d) + K + c \qquad (1.1.10.1)$$

[r_B =Risk free rate of return, $E(d)$ = expected loss ratio k = risk premium and c presents operating cost].

The remuneration of the borrowed fund (bank deposits) and the employed capital (bank equity) is presented through risk free rate of return and the risk premium. The study assumed that the per unit operating cost (c) times the volume of outstanding loan (L) is fully covering the sum total of operating cost (OC), So it can be expressed as $c * L = OC$. The expression $E(d)$ represents the yearly amount of provisioning that needs to be matched with the average amount of loss faced by each individual loan during the business cycle. The expression $E(d)$ represents that during upswings in the business cycles the loans default rates are less than $E(d)$ and during downswings the bank loans default rates are higher than the $E(d)$.

The spread of the bank can be found by taking the difference between the bank average lending rate and cost of funding times of total loans (Khawaja & Din, 2007). The net interest income (NII) equation can be represented as follows:

$$Spread = L(r_L - r_D) \qquad (1.1.10.2)$$

(L = total loans, r_L = average lending rate and r_D = cost of funding)

The bank earnings before taxes (π) are the difference between the net interest income (NII) and the value of the loan loss ΔBL. The equation (1.1.10.3 & 1.1.10.4) presents the form pre-tax income takes when the loan loss provisions are kept at zero.

$$\pi = \tilde{L}[(r_B + E(d) + k) - r_D] - \Delta\tilde{B}L \qquad (1.1.10.3)$$

$$= \tilde{L}[r_B + k) - r_D] + [\tilde{L}.E(d) - \Delta B\tilde{L}] \qquad (1.1.10.4)$$

[π = bank earnings before taxes, L = volume of outstanding loan, r_B =Risk free rate of return, $E(d)$ = expected loss ratio k = risk premium, r_D = cost of funding, the value of the loan loss ΔBL and the superscript on the loan loss provisions and bad loans shows they are different from other variables and are stochastic variables with cyclical pattern].

The equation 1.1.10.3 and 1.1.10.4 shows that upswings in the business cycles lead to boost up the interest income due to higher outstanding amount of loans and below average write offs also provides a stimulus effect to the bank profit. It also indicates that during downturn the cumulative effect of the reduction in interest income (due to lower level of outstanding loans) and an increase in bad loan reduces the pre-tax profit. Now the following equation represents the case of partial provisioning. The equation shows the situation when the loan loss provisions are set at the fraction of γ for the expected default ratio of $E(d)$.

$$\pi = \tilde{\tilde{L}}[\{r_B + E(d) + k\} - r_D] - OC - \Delta B_L^{\tilde{\tilde{}}} - [\gamma E(d)\tilde{\tilde{L}} - \Delta B_L^{\tilde{\tilde{}}}] \qquad (1.1.10.5)$$

If the loan loss reserves increases ($LLR > 0$) then the equation 1.1.10.6 is build up.

$$\pi = \tilde{\tilde{L}}[(r_B + k) - r_D] - OC + (1 - \gamma).E(d).\tilde{\tilde{L}} \qquad (1.1.10.6)$$

If the ($LLR = 0$) then the equation 1.1.10.7 is as follows:

$$\pi = \tilde{\tilde{L}}[(r_B + k) - r_D] - OC + E(d).\tilde{\tilde{L}} - \Delta BL \qquad (1.1.10.7)$$

The π in the equation 1.1.10.5 shows the bank's profit, L is the amount of outstanding loans, r_B is risk free rate of return, the expected default ratio in the equation is represented by $E(d)$, K is the risk premium, OC represents operating cost ΔBL represents losses on bank loans. The equation (1.1.10.5) shows net provisions as the difference between the gross provisions $[\gamma E(d)\tilde{\tilde{L}}]$ and write offs $\Delta B_L^{\tilde{\tilde{}}}$. The equation (1.1.10.5) represents the banks willingness to set

aside the net provisioning in excess of the write offs in the period of upswings in the business cycles. The net provisions become negative during the period of contraction and therefore drawn from the loan loss reserves (LLR). These general loan loss provisions are label as the dynamic provisioning by the Spanish banking authorities (Poveda, 2000) to be used as a helpful tool in preventing the cyclical fluctuations in the supply of bank credit to the economy. The equation (1.1.10.6) is reverted to the equation (1.1.10.1) when the loan loss reserves (LLR) presented in equation (1.1.10.6) are fully depleted. The interesting fact is that cyclical impact of write offs ($\Delta B_L^{\approx}$) on profit will only be estimated after complete depletion of loan loss reserves (LLR).

The following equation represents the case when the provisions are set equal to the level of the expected default ratios:

$$\pi = {}^{\approx}_{L}[\{r_B + E(d) + k\} - r_D] - \Delta B_L^{\approx} - [E(d).{}^{\approx}_{L} - \Delta B_L^{\approx}] \qquad (1.1.10.8)$$

$$\pi = {}^{\approx}_{L}[(r_B + k) - r_D] \qquad (1.1.10.9)$$

The equation (1.1.10.8) and (1.1.10.9) shows when the loan provisions are equal to the expected default ratios. In this case, the withdrawals from the loan loss reserves are never greater than the outstanding stock therefore the case identified in equation (1.1.10.7) may never be occurred. The cyclical impact of write offs on bank profits are completely eliminated in equation (1.1.10.6). It is observed in equation (1.1.10.8) and (1.1.10.9) that the term $[(1 - \gamma)E(d)L]$ representing the asymmetric treatment of the expected loan losses and on the cost side of the income statement has been completely washed out. With full provisioning the only source of bank earning variability is the unavoidable oscillation of the demand for loanable funds over the economic cycle.

1.1.9.1. Summary of Theoretical Foundation of Loan Loss Provisions

The bank lending generates revenues and also involves risk of loss of borrowed funds. The banks in anticipation of these losses maintain loan loss provisions which are subject to deduction from its earnings from interest and other incomes. The banks maintain general loan loss provisions in anticipation of the bank losses which leads to pro-cyclicality. But this phenomena can be controlled if banks will go for dynamic provisioning but are not allowed by the regulators of the commercial banks. The banks deduct loan loss provisions from its earnings therefore banks can utilize these loan loss provisions for earnings management. They can set a side much better percentage of its earnings during good times for loan loss provisions and can utilize it during downturns. The loan loss provisions are part of Tier II capital therefore it is utilized for capital management.

1.1.10. Theoretical Foundation for Determinants of Capital Buffers

The determinants of capital buffers and its relationship with business cycles has been explained by the theoretical model of Ayuso et al., (2004). The theoretical equation started with the bank that describes the dynamics of the capital shocks.

$$K_t = K_{t-1} + I_t \qquad (1.1.11.1)$$

The level of capital is represented by K_t at time period t and it depends on K_{t-1} level of capital. The level of capital is the capital at the end of period $(t-1)$. The new stock issues or repurchase (represented by negative value) and retained earnings at time period t is represented by the term I_t. The study of Estrella (2004) indicates the major determinants of capital buffers are cost of holding capital buffer, the direct cost of capital buffer is measured through return on equity, cost of failure (non- performing loans ratio is used as proxy of cost

of failure), cost of adjustment (proxy by lag of dependent variable as suggested by partial adjustment model). These costs are inserted in the following equation.

$$C_t = (\alpha_t - \gamma_t)K_t + \frac{1}{2}\delta_t I_t^2 \qquad (1.1.11.2)$$

The above equation shows cost of equity as α_t, the cost of failure as γ_t and adjustment cost is represented by δ_t. To keep the model simple it is assumed that the return on equity, failure cost and asymmetry in adjustment cost is linear.

The bank minimizes its inter temporal cost by solving the following equation.

$$\underset{\{t+1\}_0}{Min} \quad - E_t \sum_{i=0}^{\infty} \beta^i C_{t+i} \qquad (1.1.11.3)$$

$$S.t \quad C_t = (\alpha_t - \gamma_t)K_t + \frac{1}{2}\delta_t I_t^2 \qquad (1.1.11.4)$$

$$K_t = K_{t-1} + I_t \qquad (1.1.11.5)$$

In the above equation represents expected capital at the given year by E_t and C_{t+i} represents cost of capital. Then cost of capital has been provided by cost of equity as α_t, the cost of failure as γ_t, capital at the given period K_t adjustment cost is represented by δ_t and stock issue and repurchase is I_t. K_t is the sum of previous year capital as K_{t-1} and stock issues or repurchase as I_t. Now first apply the Langragian function and take the first order condition gives the value of I_t.

$$I_t = E_t[\frac{1}{\delta_t}\sum_{i+0}^{\infty}\beta_i\,(\gamma_{t+1} - \alpha_{t+1})] \qquad (1.1.11.6)$$

Now plug in equation (1.1.11.5) and apply expectation

$$(K_t - K^*)_t = (K_t - K^*)_{t-1} + E_t\left[\frac{1}{\delta}\sum_{t=0}^{\infty}\beta^i \gamma_{t+1}\right] - E_t\left[\frac{1}{\delta}\sum_{t=0}^{\infty}\beta^i \alpha_{t+1}\right] + \varepsilon_t \quad (1.1.11.7)$$

The equation (1.1.11.7) represents that capital buffer depends on three types of costs. Then variables are added in the right hand side of the explanatory equation of capital buffer that includes the first lag of dependent variable with positive sign, the return of equity proxy with negative sign, the proxy of expected bank failure cost that is closely linked both the banks attitude towards risk and to bank dimension.

1.1.10.1. Summary of Theoretical Foundation of Determinants of Capital Buffers

The banks to comply with minimum regulatory capital and for continuous growth in its risk based assets maintains capital buffers. The capital buffers are maintained to avoid cost of raising new equity, regulator penalty, it is difficult for small banks to raise new equity than large banks and it is not easy for the banks to speedily adjust to minimum regulatory capital when it falls short of it.

1.1.11. Theoretical Foundation for Impact of Capital Buffers on Bank Lending

The theoretical foundation for impact of capital buffers on bank lending has been based on the theoretical model of Gambacorta and Mistrulli (2003) started with the identities that specify the balance sheet of the banks are as follows:

$$L + S = D + B + R + X \quad (1.1.12.1)$$

The equation represents the loan with symbol L, securities with S. The loan and securities are equal to the deposits(D), bonds(B), capital(R), and capital buffer(X). The capital is defined

at the end of the period $(t-1)$ as given endowment $K = X + R$. The hypothesis has not taken into account the information asymmetries problems for maintaining simplicity as the assumption utilized by many researchers such as Rochet (1992) Kim and Santomero (1988).

The interest rates are given by the following equation:

$$i_l = c_0 L^d + c_1 i_m + c_2 y + c_3 p + \eta \; (c_0 > 0, c_1 > 0, c_2 > 0, c_3 > 0) \qquad (1.1.12.2)$$

The interest rates i_l are given by loan demand (L^d), opportunity cost of financing is measured by the money market interest rates (i_m), real GDP (y) price level (p) and risk premium(η). The equation includes the term GDP as indicated by Kelly et al. (2013) and price level as suggested by many researchers such as (Booth and Liner; 2001, Umoru and Oseme; 2013). The risk premium is added in equation as suggested by Heider and Hoerova (2009). The research carried out by Guo and Stepanyan (2011) also took GDP and price level as determinants of bank credit. The risk premium shown in equation (1.1.12.2) is negatively related to the banks risk aversion and therefore affects the risk profile of the loan portfolio.

The capital buffer is the excess of the minimum regulatory capital therefore it is risk adjusted measure of the bank wealth that is independent of the Basel capital requirement and therefore it is appropriate to study it with respect to risk aversion attitude of the bank. Secondly the large number of literature studied the level of capital does not provide insight for the structure of the loan portfolio and its risk characteristics. The literature provides controversial results regarding the effect of capital buffers on the banks risk attitude. The overarching theory suggests that banks' lending business lead them to implement number of techniques to mitigate the credit risk. Such as the bank credit exposure may be secured through collateral by first priority claim on the whole or in part with cash or securities, or the credit may be

based on the third party guarantee, or bank may buy a credit derivatives to offset its various forms of credit risk (Berger & Udell, 1990). Additionally bank may agree to net off loan owed to them against deposit from the same counterparty. These credit risks and its mitigation techniques lead to the formulation of banking regulations that provide the guidelines to the banking sector for the treatment of credit risk mitigation through standardised approach such as internal rating based approach. The internal rating based approach suggests that how much weight needs to be assigned to each asset group while calculating the risk based weighted assets (Elizalde, 2007).

Secondly banks need for development of comprehensive approach for treatment of collateral, the effect of credit risk may not be double counted, consideration of underlying asset risk, roll off risk, management of concentration risk, margin requirements over the counter derivatives, volatility and liquidity of the securities exchanged as collateral risk, the reuse of the collateral after credit adjustment for another loan and the surrender of rights on collateral from the counterparty lead to the formulation of capital regulations (Win, 2018). Thirdly the minimum legal documentations requirement to be fulfilled by the banks to obtain capital relief on disclosure requirement on any credit risk management technique implied lead to the formulation of capital regulations (BIS, 2006). Therefore the sign (μ) is added in the equation. The positive value of the (μ) indicates that well capitalized banks are more risk averse. The selection of borrower depends upon their ability to repay back the debt and this ability is not affected by GDP shocks. This risk averse attitude leads to less burden of write offs on their profit and loss account and allows the well capitalized banks to smooth the effect of economic downturn on their loan supply. Allen and Gale (1997) describes inter temporal function states that due to well capitalization the banks may preserve credit relationship in bad state of

economy. However if (μ) is negative and banks are risk lover to get higher return from their risky ventures. The higher risk also leads to higher profits or higher bad debts. Therefore due to higher risk taking behaviour the banks credit quality of portfolio reduces. It directly affects increase in bad loans and consequently reduces the banks income.

The liabilities side of the bank's balance sheet shows bank deposit. The unexpected withdrawal of deposits is the normal phenomena in the banking sector therefore to cure with this uncertainty the bank's hold securities. It is assumed that the holding of securities is fixed percentage of outstanding deposits.

$$S = sD \qquad (1.1.12.3)$$

Where $(0 < s < 1)$

The deposits are fully secured and are not remunerated (demand deposits in Pakistan). The demand schedule of these deposits is negatively related to the opportunity cost of deposit that is equal to monetary policy interest rate.

$$D = di_m \qquad (1.1.12.4)$$

Where $(0 < d < 1)$

The equation (1.1.12.4) shows that the deposits are completely monitored by the monetary authorities. This is all because the banks are risky and the bonds are not unsecured. The interest rate of bonds incorporate risk premium. The risk premium depends on the bank capital buffers at the end of period $(t-1)$. The bond holders of the bank demands less interest rate while in keeping of view of last bank balance sheet which presents the bank is well capitalized and risk is appropriately considered in construction of bank loan portfolio. The following

equation includes both the direct influence of capitalization on spread between the interest rates of bonds and money market interest and an interaction term between the two terms.

$$i_b(i_m, X) = i_m + b_0 X_{t-1} + b_1 i_m X_{t-1} \qquad (1.1.12.5)$$

Where $(b_0 < 0, b_1 < 0)$

This assumption leads to state that the bank lending depends upon the bank capital adequacy which determines the degree of substitutability between the unsecure bank deposit and unsecured bank debts. The equation (1.1.12.5) states that in order to maintain the market discipline it is optimal for the bank to hold capital buffer or the excess capital over the regulatory minimum capital.

1.1.11.1. Summary of Theoretical Foundation of Impact of Capital Buffers on Bank Lending

The bank lending has been affected by the interest rates which are determined by the monetary policy developers and by the general output level which generates demand for bank lending. However if the banks are found to be involved in maintaining capital buffers than it affects positively on bank lending.

1.1.12. Research Gap Analysis

The research gap analysis has further divided into three parts first is for the determinants of the loan loss provisions, second for the determinants of the capital buffers and third for the impact of the loan loss provisions and the capital buffers on the bank lending.

1.1.12.1. Determinants of Loan Loss Provisioning

The earlier theoretical foundation of the study stress the importance of imposition of capital regulations such as study of Khane (1977), Sharpe (1978), Harts and Jaffee (1974), Kim and Santomero (1988), Rochet (1992), Gennotte and Pyle (1991), Santos (1999), Flannery (1999), Giammarino et al (1993), Freixas and Gabillon (1999), Dewatripont and Tirole (1996). The theoretical model of Cavallo and Majnoni (2001) suggest that the loan loss provisions are determined by the capital management, the earnings management and the signaling. While the empirical investigation in this context provides controversial arguments. The loan loss provision as part of Tier II capital under Basel II & III regime exerts pro-cyclicality in Albania but are not used for capital management and signaling (Dushku, 2016) while study of Misman and Ahmad (2011) indicates its usage for capital management in aligned with the study of Kim et al (2019). The loan loss provisions are used for earnings management by Australian banks in anticipation of future growth of bank lending (Cummings and Durrani; 2016) and used for signaling (Kanagaretnam et al; 2005). In contrary to this Ozili (2019) suggests that earnings management is reduced among the banks that have larger investment in intangible assets than the banks have the less investment in intangible assets. But the contradictory empirical evidence suggests that the loan loss provisioning has been used by commercial banks for the income smoothing but not for the capital management, signaling and does not exert pro-cyclicality (Adzis et al, 2015). While the contradictory empirical evidence of Promono et al (2019) suggests that the discretionary loan loss provisions are pro-cyclical. These controversies in literature require the further investigation in the area of the determinants of the loan loss provisions.

The study of Cucinelli (2015) was more focused on the effect of credit risk on bank lending while delimiting the study to test the effect of credit quality on loan loss provisioning. In continuation to this, Aristei and Gallo (2019) were more focused on managerial discretion, relationship banking, functional distance and bank risk as determinates of loan loss provisioning while taking credit quality as limitation of study. Therefore the said limitation has been considered as the research gap for our study and was empirically tested in this study as the determinant of the loan loss provision. The leverage ratio as part of Basel Capital regulations were introduced in Basel Accord III and literature indicates a gap how it affects the loan loss provisioning as it is the limitation of the study of researchers, see for example Gupta (2012), Isa et al (2018), Schoenmaker and Wierts (2015). Brei and Gambacorta (2014) have suggested leverage ratio as determinants of LLPs' for future researches. Therefore leverage ratio has been empirically tested in this research as the determinant of the loan loss provision.

1.1.12.2. Determinants of Capital Buffers

The theoretical model of Ayuso et al (2004) suggests how the capital buffers exert pro-cyclicality. While the controversy has been found in this context in empirical investigations. The study of Xu (2016) suggests that the counter cyclicality of the capital buffers has been empirically proven by the decrease in market concentration and fluctuation of capital buffers over the business cycles however the previous study of Brei and Gambacorta (2015) suggests the pro-cyclicality of the bank capital buffers. The study of Vu and Turnell (2015) suggests that the large banks capital buffers exert pro-cyclicality and smaller banks capital buffers are counter cyclical. In continuation to this, the study of Maatong et al (2019) suggests that the

non-performing loans have the positive effect on the pro-cyclicality of the capital buffers for Islamic banks while for conventional banks it shows countercyclical behavior. These controversies suggest that there is still the room for further investigation in this area of research.

The theoretical model of Estrella (2004) on which Ayuso et al (2004) build their model suggests that the capital buffers have been determined by the cost of holding capital, the cost of failure, the cost of adjustment and the size of the bank. While the empirical investigation in this context provides contradictory arguments. The research carried out by Eliskovski (2014) suggests that credit and market risk of failure leads to small banks to maintain large capital buffers while the study of Hamada (2016) suggests that higher risk taking banks maintains lower capital buffers. The small banks are found to maintain higher the capital buffers due to higher issuing cost and lower speed of adjustment (Hamada, 2016) however the study of Berger et al (2008) suggests higher speed for adjustment for smaller banks and higher capital buffers for large banks. While the study of Bakker et al (2019) suggests that the speed of adjustment is slow for larger banks while it is higher for systematic riskier banks. The research carried out by Daher et al (2015) suggest future researchers to investigate empirically how the operational risk affects the bank capital buffers. The operational risk is still an unexplored area of research as determinant of the bank capital buffers. Therefore the literature provides the insight for further exploration in the area of pro-cyclicality and the determinants of the capital buffers.

1.1.12.3. Impact of the Loan Loss Provisioning and the Capital Buffers on the Bank Lending

The bank lending has been affected by the capital buffers (Gambacorta & Mistrulli, 2004) but the effects of the loan loss provisioning on the bank lending was the limitation of the study of Cummings and Durrani (2016). The study of Jin et al (2019) also takes the effect of loan loss provisioning on bank lending as limitation of study. Therefore the novelty of this research is considering the impact of the bank capital buffers along with the loan loss provisioning on the bank lending. Another aspect of the research is that the interest rates being the tool of the monetary policy affects the bank lending and how the cash holding of the bank affects the bank lending. The size of the beta determines the size of the effect on the bank lending.

1.1.13. Summarized (Research Gap Analysis)

The controversy in the literature does not allow to build up the opinion based on previous studies about the determinants of LLPs. Thus it requires further investigation on the matter whether LLPs are determined through capital management, earnings management and signaling. Secondly, the previous studies limitations and direction for future researches suggests that there is still unexplored area for the researchers to investigate whether LLPs are determined through credit quality and leverage ratio. The controversial literature on the determinants of the capital buffers develops a path for further investigation on determination of capital buffers through cost of raising new equity, cost of failure, speed of adjustment, and bank size. The unexplored area of research in this context includes operational risk which requires researcher's attention to fill the research gap. Thirdly, impact of capital buffers and

interest rates on bank lending requires further investigation in the matter due to controversy in the literature. The previous studies controls the effects of cash holdings on bank lending requires attention for the researchers to investigate its impact on bank lending as the banks have to maintain minimum liquidity ratio to comply with Basel III regulations. The research gap suggests that the impact of LLPs on bank lending needs to be investigated. Fourthly the controversy on the pro-cyclicality of LLPs, capital buffers and bank lending allows for further investigation on the matter.

1.1.14. Rational and Theoretical Framework

The rational and theoretical framework has further divided into three parts, first is for the determinants of the loan loss provisions, second for the determinants of the capital buffers and third for the impact of the loan loss provisions and the capital buffers on the bank lending.

1.1.14.1. Determinants of Loan loss provisions

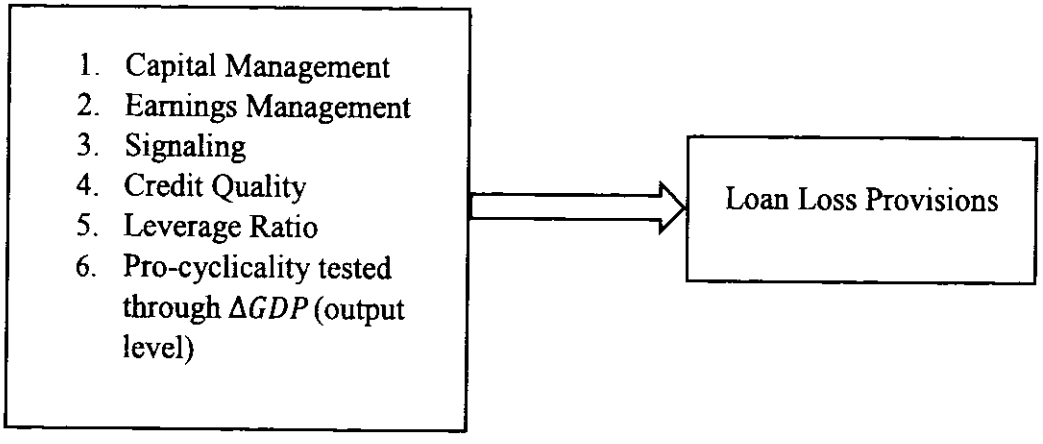
The study investigates the determinants of the loan loss provision through explanatory variables including capital management, earnings management, signalling, credit quality and leverage ratio. The investigation includes whether the capital management is the determinant of loan loss provision found its origin in Basel I (BIS, 2014) where the loan loss provision was included in Tier I capital while it includes in Tier II capital under Basel II & III (BCBS, 2010). Therefore the capital management as the determinant of the loan loss provisions has been tested as the bank capital comprises of Tier I & II capital. Secondly the study extends the theoretical model of Cavallo and Majnoni (2001) which includes the capital management as the determinant of the loan loss provisions. Thirdly literature provides that the capital management determines the loan loss provisions such as study of Abaoub et al (2013).

The theoretical model of Cavallo and majnoni (2001) include the earnings management as the determinant of the loan loss provisions. The model suggests that the banks are maintaining the loan loss provisions out of their yearly profit in anticipation of the future loan losses. The loan loss provisions are deductible as the non-cash expense from the earnings before taxes. Therefore the banks are in the position to maintain higher reserves during the higher earnings period and can deduct loan losses from these provisions during downturn in earnings. The study of Ahmed et al (2014) suggests the earnings management as the determinant of the loan loss provisions therefore the study includes this variable for further investigation. The study of Karimiyan et al (2013) extends Cavallo and Majnoni (2001) model with empirical prove that the loan loss provisions are positively associated with the signalling. The study states that the loan loss provisions signal the market about the management concern about the quality of their portfolio and to safeguard the interest of its equity holders and lenders. Therefore the study includes the signalling for further investigation as the determinant of loan loss provisions.

The study of Cucinelli (2015) states that the credit risk affects the banks' lending but the impact of the credit quality on the loan provisions were taken as the limitation of the study and considered as the research gap. The portfolio of securities varies from banks to banks and their risks also vary (Harts and Jafee, 1974). The banker anticipation of risk depends upon how much of their risky assets are set aside as classified advances and how much are income generating assets. The banks under the internal rating approach are themselves responsible for calculation of the risk associated with their assets (BCBS, 2010). The banks translate the risk of portfolio in to its lending rates (Karimiyan et al, 2013) while the quality of the loans has not yet been discussed. The bank past accumulation of bad loans anticipates the quality

of its portfolio and the management ability to recover the loans. To anticipate the loan loss provisions the quality of loans also matters and therefore the study has taken it as explanatory variable.

The bank loan loss provisions depend upon the bank total loans and advances while these loans and advances depend upon the leverage ratio which is introduced under Basel III (BCBS, 2010). Therefore on this basis of this assumption that banks' lending has been subject to its leverage ratio and the loan loss provisions are anticipated losses of the bank loans the leverage ratio has been added as explanatory variable. The theoretical model of Cavallo and Majnoni (2001) states the pro-cyclicality of loan loss provisions. As the study extends the same model therefore the same pro-cyclicality of loan loss provisions is also part of the study model.



1.1.14.2. Determinants of Capital Buffers

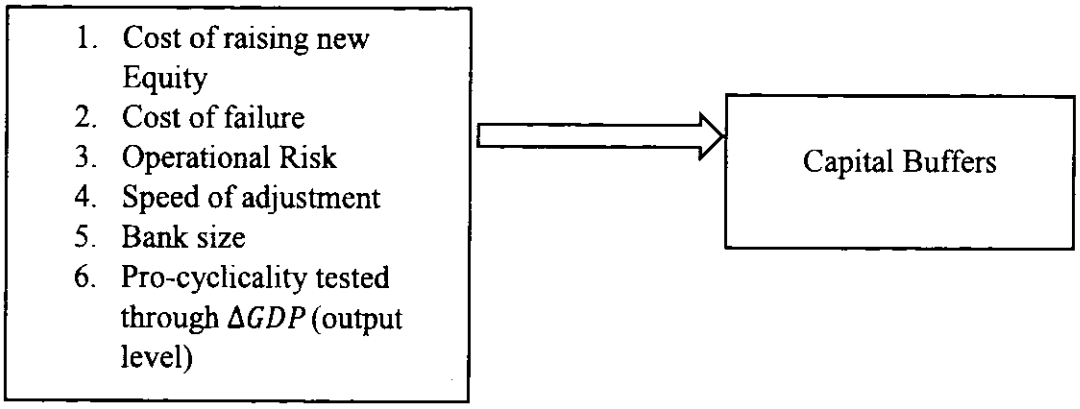
The study of the explanatory variables includes the cost of raising new equity, the cost of failure, the speed of adjustment and the bank size as suggested by theoretical model of Ayuso et al (2004) with an addition of the operational risk. The cost of raising new equity is added in the empirical model as the banks main business is to borrow or lend money. The banks

under the regulatory regime has to comply with minimum regulatory capital. The banks risk weighted assets are subject to change due to its continuous business of lending. The minimum regulatory capital is hard to maintain as it is subject to continuous change in the risk weighted assets. Therefore the banks maintain the capital buffers as it is difficult for the bank to raise the fresh equity when the market knows that the bank is subject to the noncompliance of the minimum regulatory capital attracting regulators' penalty. Therefore the cost of raising the new equity is added in this study model.

The theoretical model of Ayuso et al (2004) includes the cost of failure which has been added in the study model on the grounds that any bad loan occurs during the year when it has been subject to direct deduction from the capital. The banks under regulatory regime has to comply with the minimum regulatory capital which may not be quickly achieved and the banks have to face penalties. Therefore this leads to the addition of the cost of failure and the speed of the adjustment as explanatory variables of the capital buffers. The theoretical model stresses the importance of the size of bank. The smaller the bank the higher the cost of raising new equity while for larger banks the highly complex risk weighted portfolio of the assets leads to stresses the importance of the capital buffers. Therefore the bank size has been added in the study model.

The theoretical model of Ayuso et al (2004) was extended by the addition of the operational risk in the capital buffers model. The operational risk contributes to the losses which are directly deducted from the capital includes the cost that arises out from the failure of the systems such as the penalties from the regulators, the cost of fraud and forgery arise out from the noncompliance of the internal control systems etc. All such losses are the direct deductions

from the bank capital therefore the banks may need to maintain higher the capital than the minimum regulatory to mitigate these uncertain losses that arise out from the operational risk. Therefore the model of this study includes the operational risk explanatory variable for the determinant of the capital buffers.

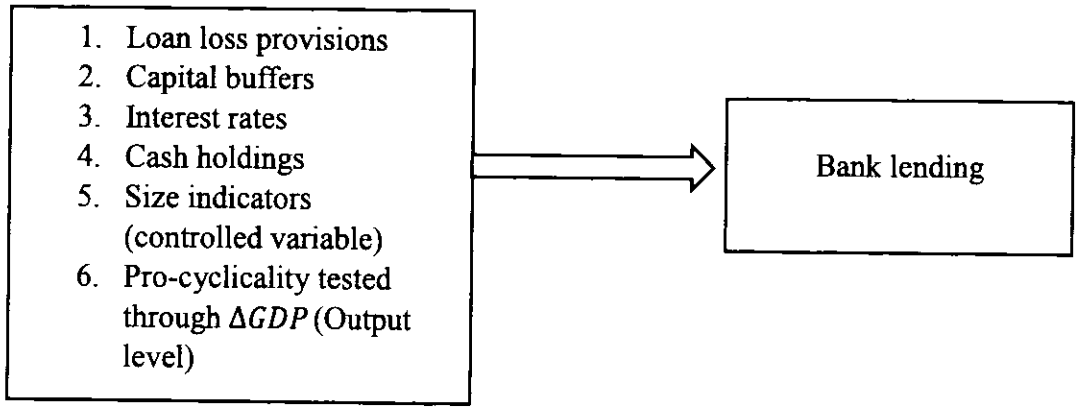


1.1.14.3. Impact of Loan loss Provisions and Capital Buffers on Bank Lending

This research takes all the explanatory variables of theoretical model of Gambacorta and Mistrulli (2004) with an addition of the loan loss provisions and the cash holdings. The theoretical model of Ayuso et al (2004) discussed, has already mentioned, why the banks maintain the capital buffers and what are the determinants. The theoretical model of Gambacorta and Mistrulli (2004) suggests that banks maintain the capital buffers as their risk weighted assets are in continuous change process and the banks need to comply with the regulatory capital in order to avoid penalties. Therefore the banks' capital buffers affect the banks' ability to lend. Due to these empirical findings, the capital buffers have been added in the equation of the bank lending.

The theoretical model of Gambacorta and Mistrulli (2004) suggests that the monetary policy determines the bank lending. The higher rate of the bank lending reduces the bank loans and advances otherwise it enhances. Therefore the interest rates determined through the bank lending rates are added in the model. Cash holdings are added in this model on the basis of the justification that the banks need to maintain the minimum liquidity coverage ratio under Basel III to avoid the penalties imposed by the regulators and it needs to fulfil the liquidity requirements for thirty days during the stress period (BCBS, 2010). Therefore the impact of the bank cash holdings is tested on the bank lending as the fixed liquidity coverage ratio needs to remain operational under Basel III. The output level (change in GDP) represents the performance of the real sector which generates the demand for the bank lending. The pro-cyclicality of the bank lending has been determined through the negative effect of the output level on the bank lending. Hence to investigate the presence of pro-cyclicality of the bank lending, the study takes into account the output level as an explanatory variable. The controlled variables as suggested by the same model that includes the size indicator. The liquidity is no more bank specific under the Basel III regime as the liquidity coverage ratio has been fixed so that the banks can maintain a cash reserve that fulfils the liquidity needs of the banks for thirty days of a stress period, therefore this study has not controlled the effect of the cash holding as suggested by Gambacorta and Mistrulli (2004). Secondly Toh (2019) has taken the impact of the cash holdings on the bank lending as the limitation of the study. Hence the size indicator is bank specific as it is not fixed under Basel III regime. How the bank size affects its ability to lend which has been controlled in this model. The loan loss provisions are added to this model as they are the reserves created by the bank in anticipation of the future bad loans. Thus how these created the loan loss provisions which are part of Tier

II capital (BCBS, 2010) effects. The bank lending has been tested in this study as they absorb the bank bad loans.



1.1.15. Hypothesis

The hypothesis of the determinants of the loan loss provisions are as follows.

H_a: The Capital management has positive effects on the loan loss provisions.

H_b: The Earnings management has positive effects on the loan loss provisions.

H_c: The signalling has been positively affecting the loan loss provisions.

H_d:The credit quality of bank has been negatively affecting the loan loss provisioning.

H_e:The leverage ratio has been negatively affecting the loan loss provisioning

H_f:The business cycles have negative effects on the loan loss provisions.

The following hypothesis are developed for the determinants of the capital buffers.

H_g:The business cycles are negatively associated with the capital buffers maintained.

H_h: The Cost of the raising new equity has positive effects on the capital buffers.

H_i: The Cost of failure has positive effects on the capital buffers.

H_j: The Size of bank has positive effects on the capital buffers.

H_k: The Operational risk has positive effects on the capital buffers.

H_l: The Speed of adjustment has negative effects on the capital buffers.

The following hypothesis are developed for the impact of the loan loss provisions and the capital buffers on the bank lending.

H_m: The loan loss provisions have negative effects on the bank lending.

H_n: The capital buffers have been positively affecting the bank lending.

H_o: The interest rate has been negatively affecting the bank lending.

H_p: The cash holdings has been negatively affecting the bank lending.

H_q: The general output level has negative effects on the bank lending.

1.2. Problem Statement

The banks operating under regulatory regime has to comply with minimum required capital regardless of their size, earnings capabilities, risk taking behaviour and portfolio of assets to avoid penalties from regulators and be effectively operational under regulatory regime. The study investigates the determinants that allows all the banks to maintain uniform level of minimum regulatory capital while maintaining their different level of individuality. The banks

main source of generating revenues is through lending borrowed money. Secondly how the tools are utilized to maintain minimum regulatory capital which affects their bank lending.

1.3. Research Questions

- Are loan loss provisions, capital buffers and bank lending exerts pro-cyclicality?
- What are the determinants of loan loss provisions?
- What are the determinants of capital buffers?
- How LLPs, Capital buffers, interest rates and cash holdings affect bank's lending?

1.4. Objective of Study

- To investigate the presence of pro-cyclicality of loan loss provisions, capital buffers and bank lending in BCBS member countries and Pakistan.
- To investigate, whether capital management, earnings management, signaling, credit quality and leverage ratio are the determinants of loan loss provisioning under Basel capital regulations regime for BCBS member countries and Pakistan.
- To investigate, whether cost of raising new equity, cost of failure, operational risk, speed of adjustment and bank size are the determinants of capital buffers for BCBS member countries and Pakistan.
- To investigate the impact of LLPs, capital buffers, interest rates and cash holdings on bank lending.

1.5. Contribution of Study

The contribution of study has been divided further in to practical and theoretical contribution.

1.5.1. Theoretical Contribution of Study

The study while empirically investigating the determinants of loan loss provisioning extends the Cavallo and Majnoni (2001) model by adding leverage ratio and credit quality into the model. The addition of leverage ratio covers the research gap identified as limitation of study of Gupta (2012), Isa et al (2018) and Schoenmaker and Wierts (2015). Secondly the addition of credit quality covers the research gap identified as limitation of study of Cucinelli (2015), Aristei and Gallo (2019). Secondly, it contributes towards the existing literature that operational risk affects capital buffers and in this extend the model of Ayuso et al (2004). It added towards existing literature through Operational risk identified as indications for future researchers by Daher and et al (2015). Thirdly, the study has added an additional variable of loan loss provisioning and it takes into empirical investigation the effect of cash holdings in the empirical model of Gambacorta and Mistrulli (2004). The study contributes towards existing literature by addressing the effect of LLPs on bank lending as the study of Jin et al (2019) takes LLPs as limitation of study while taking the factors effecting the bank lending.

1.5.2. Practical Contribution of Study

Wayne Byres- secretary general of the Basel Committee on Banking Supervision (2012) suggested that the financial crisis of 2007-2008 highlighted the weakness in the Basel II capital regulations although these reforms and the reforms in pipeline lead to more resilient banking, reduce reliance of commercial banks on central banks and tackle the issue of too big to fail problems. These weakness leads to formation of Basel III on which the G20 Finance Ministers and Central bank Governors are fully committed for timely and consistent implementation of financial regulations agenda. The congress in United States of America is

mandated to Dodd-Frank Wall Street reforms and consumer protection Act 2010 to enhance the regulatory capital (Getter, 2014). Therefore this study has practical contribution as it mainly focuses on the pro-cyclicality of capital regulations under Basel II & III regime.

The specific practical contribution of the study for the banking sector is to provide the insight for what are the determinants of loan loss provisioning. How to maintain a specific amount of capital buffers by managing it determinants and how does the bank lending has been effected by changing in the amount of capital buffers, loan loss provisioning, interest rates, cash holdings and output level.

1.5. Significance of the Study

The study has been significant from the perspective of the regulators that how banks in BCBS member countries and in Pakistan maintains minimum regulatory capital. The banks are managing their Tier II capital ratio through loan loss provisions and avoid violation of minimum capital ratio through capital buffers. This study provides the insight for the determinants of LLPs and capital buffers for each country particularly. Therefore the study is beneficial from the point of view of the regulators who are in process of developing policies and regulations for banks as capital buffers and bank lending are pro-cyclical in BCBS member countries. The pro-cyclicality of capital buffers and bank lending make the economic conditions worse as it creates credit crunch situation. The bank investments are hard to be secured during downturn that leads to the banks to enhance their credit risk weights. The banks need to maintain minimum risk weighted capital under Basel regulations require the banks to enhance their capital base or reduce risky lending. This type of credit crunch situation enforces worst economic conditions during downturn. These findings provide an insight for

the regulators for the formulation of such policy tools that may reduce the pro-cyclicality of these regulations.

Secondly, under Basel III, leverage ratio and liquidity coverage ratio are fixed by BCBS. This study provides the perception to banking regulators that how leverage ratio affects the loan loss provision and cash holdings on bank lending in each BCBS member countries and as a group.

The study has been beneficial from the perspective of the bank management that the banks under study has shock absorbing capability in case of capital regulations is higher than the monetary policy implementation. These findings are beneficial for the bank management by drawing their attention to maturity matching policies. The study provides insight into the bank creditors (depositors) for the determination of LLPs through earnings management. The bank creditors may pursue the implementation of creditors' rights in these countries where LLPs are determined through earnings management.

Pro-cyclicality of capital buffers and bank lending findings are beneficial from the point of view of fiscal policy makers. These findings provide an insight into the formulation of policies and procedures to check the pro-cyclicality of capital regulation in BCBS member countries and Pakistan. Secondly the study has been beneficial from the perspective of the banks owners (equity holders) that are fully aware of the determinants of LLPs and capital buffers.

The study is significant from the perspective of academicians as the study span covers the banks in BCBS member countries and banks in Pakistan for the period of Basel II & III regime. Secondly, its findings are significantly explaining the determinants of the LLPs, capital buffers and their impact on bank lending.

1.6. Organization of the Study

The second chapter of the study comprises of review of literature, third chapter comprises of construction of the variables, empirical model building, methodological review, estimation techniques fourth chapter comprises of data analysis and the last chapter consist of conclusion, practical and theoretical implications, limitation and future research directions.

CHAPTER # 2

REVIEW OF LITERATURE

The review of literature has been further divided into three parts, first part of literature deals with the determinants of loan loss provisions, second portion describes determinants of capital buffers and third explains impact of capital buffers and loan loss provisions on bank lending.

2.1. Determinants of Loan Loss Provisions

The banking practice to uphold loan losses provisions against the expected future loan losses is not novel or subsequently started its implementation after Basel capital regulations. But the researcher focuses on the determinants of loan loss provisions start when it becomes integral part of banks Tier II capital. The research carried out by Curcio & Hassan (2015) in Euro area argued that earnings management leads to enhancement in loan loss provisions and LLPs are reflection of bank management expected quality of loan portfolio. Hence after the implementation of bank creditors' rights in the euro area the banks incentive to smooth their earnings reduces. The study suggests that during the financial crisis period the banks are found to be involved in earnings management through LLPs but are not found to be involved in signalling and capital ratios management through LLP.

2.1.1 Pro-cyclicality of Loan Loss Provisioning

The inverse interaction between the loan loss provisions and business cycles lead to the situation of pro-cyclicality (Bonin & Kosak, 2013). The rise in bank lending during economic expansion leads to rise in bank profits but banks provisions less due to incurred loan loss model and provision higher during recession. These accounting practices lead to deepen the

economic cycle period and consequently lead to the situation of pro-cyclicality (Skala, 2015). Hence though the LLPs are pro-cyclical and are integral part of Tier II capital. But still banks need to implement Basel capital regulation therefore in this situation the appropriate recognition of loan loss provisioning leads to less likely the situation of Pro-cyclicality (Beatty & Liao, 2009). The empirical investigation suggests that incurred loan loss model has been implemented on the US banks during and before the financial crisis. The incurred loan loss model allows banks to provision against the loan losses when it actually occurs and there is significant documentary evidence to provision against such loan. Therefore due to implementation of incurred loan loss model the situation of Pro-cyclicality may not be tackled by the amount of the provisioning but may be tackled by the timing of the pro-cyclicality. This type of provisioning is known as dynamic provisioning (Balla & Mckenna, 2009). On contrary to this the study of Valverdoe and Fernandaz (2018) suggests that after implementation of the dynamic provisioning. There is reduction in Pro- cyclicality of the loan loss provisioning as the banks on the game to adopt the ex-ante riskier behavior.

Banks in US provisions against their loans loss under the Statement of Financial Accounting Standards (SFAS) No. 5 and 114, Accounting for Contingencies (1975) and Accounting by creditors for impairment of loans (1993). Under these regulations banks can provision against the loan loss when it is actually incurred and when it can be rationally estimated and cannot be properly recognized before they are actually incurred. However G20 members summit in 2009 suggests that to smooth the functioning of the banks and to avoid the situation like financial crisis accounting standard setters and banking regulations setters need to work together to improve the loan loss provisioning standards for banks. These accounting standards lead to the situation of pro-cyclicality (Sood, 2012).

On the basis of the suggestions of G20 member summit in 2009 the Financial Accounting Standard Board (FASB) and the International Accounting Standard Board (IASB) submitted the changes to credit risk modelling that leads to conventional banks to implement Expected Loan Loss Model (ELLM) instead of incurred loan loss model in 2011. However the implementation was delayed till 2018 but Islamic Banks are involved in the practice of expected loan loss model since 2010 particularly the countries which adopted the AAOIFI (Accounting and Auditing Organization for Islamic Financial Institution) standards. But the expected loan loss model is criticized on the grounds that although the Islamic Banks have already implemented them but still their LLPs are pro-cyclical (Soedarmono et al, 2017).

On the contrary to the situation in US due to incurred loan loss model the banks in Hong Kong has adopted the International Financial Reporting Standards (IFRS) generally and International Accounting Standards (IAS) No. 39 that require the banks to fully disclose the provisions made against their bad loans. That is situation of incurred loan losses where provisions may not be made against bad loans unless they are actually realized and banks are not in the position to establish any hidden loan loss reserves. By establishing these standards banks in Hong Kong are not in the position to create provision for expected and unexpected future losses without their occurrence. Though in the presence of such accounting practices there is no evidence found of pro-cyclicality of loan loss provision in Hong Kong (Adzis et al, 2016). However the contradictory evidence of Kruger et al (2018) suggests that the provisioning rules such as International Financial Reporting Standards (IFRS) and US Generally Accepted Accounting Principles (GAAP) further increase the pro-cyclicality of bank capital regulations.

Another approach for LLPs are the loan loss reserving approach that suggests how the losses are anticipated instead of when they are actually incurred. This practice does allow to reduce bank capital and lending ability during downturn as loan losses reserves are created during upturn of business and loan losses deducted from reserves during downturn. The loan losses reserves reflects the bank management anticipation capability and quality of its loan portfolio (Dugan, 2009). In continuation to this, Haan and Oordat (2018) carried out the research on twenty five Dutch Banks in the post 2008 crisis period and indicated that there are substantial differences in the timing of loan loss provisioning for bad loan losses.

However accounting standards suggest two types of provisioning specific and general. The specific provision is related to the loss assessed against individual loans and general provisions are accounted far against the loan portfolio. The loan loss provisioning through specific and general provisioning present the recent event occur before the date of balance sheet but not the event that not yet been occurred (Li, 2009). Due to this provisioning it becomes difficult to provision against individual loan due to agency problem. The bank manager to show more earnings usually reluctant to provision against individual loans. The rationale behind implementation of general provisioning in most of the countries is to limit the bank management from manipulating the bank accounts. The general provisioning increases during downturn in the business cycles and therefore contributes towards pro-cyclicality (Flora, 2010).

The growing literature about the pro-cyclicality of loan loss provisions leads the researchers to find out the way to mitigate pro-cyclicality. The advocates of dynamic provisioning suggest that it can mitigate pro-cyclicality as it is countercyclical. In this system of provisioning banks

provisions higher during favorable economic conditions and reduce provisioning during economic downturn. Banks loan loss provisioning comprises of discretionary and non-discretionary components. Only the nondiscretionary components lead to credit fluctuations as it causes reduction in provisioning during economic expansion and enhancement in loan loss provisioning during recession (Bouvatier and Lepetit, 2007). In contrary to this research the Italian Banks loan loss provisions are countercyclical due to non-discretionary provisioning (Caporale et al; 2018). In contrary to the above empirical evidence the study of Pramono et al (2019) suggests that the non-discretionary provisions are pro-cyclical particularly for the banks with lower capitalization and lending activities as they are not found to be involved in income smoothing. The banks are found to be involved in this type of provisioning to enhance the safety and stability of banks in bad times as the provisioning stocks are buildup during economic upturn (Balla & Mckenna, 2009).

However Fillat and Garriga (2010) suggest that the dynamic provisioning hypothetical model adopted by Spanish Banking Regulatory System could not effectively cope with US Banking System. The study suggests that the cyclical buffer for the aggregate US Banking System depleted during first quarter of 2009, which leads to conclusion that this type of provisioning is not feasible for the severe conditions as faced by US Banking System during financial crisis. To cope with Pro-cyclicality debate is not yet end and leads to study of Olszak et al (2018) that suggests the contributors that lead to the reduction in Pro-cyclicality of LLPs are borrowers' restrictions policies, dynamic provisioning, limit on large exposure concentration and taxation on specific assets.

2.1.2. Loan loss Provisioning and Capital Management

The banking regulators have formed Basel capital regulations to safeguard the interest of large number of depositors that are different from the bank management, to enhance the safety, soundness and reliability of the banking corporations. Banks need to maintain minimum capital threshold to absorb the shock of expected and unexpected losses arise due to inherit risk of default in the core banking business of lending of borrowed money (Greenbaum et al; 2015). Bank equity comprises of Tier I and II capital and loan loss provisions which become part of Tier II capital. Before 1988 loan loss provisions are not part of Tier II in fact they were substantial part of the primary banks' capital. But after implementation of Basel II the loan loss provisions as discussed earlier become an integral part of Tier II capital with upper limit of 1.25% of risk weighted assets. Hence from therefore Tier I capital includes only the equity capital of the bank and published earnings reserves that are created through post tax earnings (Yunxia, 2007). The bank capital composition facilitates the banks to do capital management through loan loss provisioning as bank itself determines the risk associated with its each assets under Basel II and LLPs are integral part of Tier II capital with upper limit of 1.25% of risk weighted assets. Therefore the study suggests that there is significant empirical evidence of capital management through loan loss provisioning for Asian Islamic banks (Abdullah et al, 2014). The study on the capital management through loan loss provisioning undertaken by Moyer (1990) suggests that when banks minimum capital ratios violate the minimum risk weighted regulatory capital they are found to be in managing this capital through LLPs.

Hence the literature has not yet provides the presence of capital management through LLPs without any contradictions. The controversy in the literature suggests that banks are not involved in any capital management through LLPs as suggested by Abaoub et al (2013). The literature which support the argument suggests that the banks are subject to implementation

of International Financial Reporting Standards (IFRS) that requires the banks to provisions against those losses that are incurred and are rationally be quantified. Hence in the presence of these regulations banks are not in the position to be involved in capital management through loan loss provisioning. On contrary to this argument the deposit money banks in Nigeria are found to manage their capital through loan loss provisioning after implementation of International Financial Reporting Standards (Ajekwe et al, 2017). In align with these findings, the study of Elnahass et al (2018) suggests the significant evidence of capital and earnings management via loan loss provisions in conventional banks.

Yunxia (2007) suggests that the loan loss provisions are non-cash expenses and they are set aside as allowance for all bad loans. The rationale behind the use of loan loss provisioning as capital management tool is that higher cost is associated with generating new equity, shareholders are reluctant to participate in the undercapitalized bank, secondly LLPs treatment is different under Basel II but is still a part of Tier II capital and LLPs are easily manageable. Kim et al (2019) has carried out an empirical investigation to find out the effect of capital purchase program under the Troubled Asset Relief Program (TARP) on the transparency of participating banks by examining changes in their loan loss provisions. The investigation suggests that in large TARP banks and banks with low Tier I capital or high earnings, small TARP banks and banks with low earnings significantly increased their discretionary provisioning.

2.1.3. Loan Loss Provisioning and Earnings management

The loan loss provisioning is the non-cash expense subject to deduction of income before taxation and therefore it is a source of earnings management. In this way they are positively

related to each other (Ahmed et al, 2014). That part of loan loss provisions is considered as the part of Tier II capital against which losses are not yet identified and they are kept as loan loss reserves against expected and unexpected losses in future. Bad loan ones are identified then these provisions are never be the part of Tier II capital but are subject to deduction of these bad loans. The calculation of capital does not include any identified deterioration in the value of the assets or group of subsets of assets such as part of portfolio (BCBS, 2006). Abaoub et al. (2013) suggests banks use these loan loss provisions as a tool to earnings management. In continuation to this, the study of Pinto & Picoto (2018) indicates that bank managers use LLPs to manage earnings and regulatory capital. Hence in contrary to this argument, Ozili (2019) suggests that the income smoothing is considerably reduced among the banks that have larger investment in intangible assets than the banks have lesser investment in intangible assets. Secondly this income smoothing behavior has been reduced among the banks that located in the areas with more minority shareholders rights.

Annandarajan (2006) has carried out empirical investigation in Australia on earnings management through LLPs and it utilizes the sample split technique by dividing the sample into commercial banks and other types of banks. It has been significantly argued that commercial banks in Australia are aggressively involved in earnings management through LLPs than other types of banks. The study finds no evidence of capital management after implementation of Basel capital regulations on Australian banks. Another empirical investigation has been carried out by Lar and Stoian (2014) on Dutch banks where earnings are subject to tax deduction before the loan loss provisioning and LLPs addition into Tier II capital is prohibited. The study concluded with the arguments that banks are found to be involved in discretionary LLPs when earnings are high while it reduces its LLPs when risk

weighted assets are increased. Secondly the rolling window analysis of this research suggests that the banks are found to be involved in reducing volatility of their earnings though LLPs. Thirdly if the banks current earnings are higher than the earnings are expected to be paid as dividend to the shareholders then banks keep the difference of current earning and expected earnings as loan loss provision.

The banks are subject to implementation of international financial reporting standard (IFRS) and these standards allows the banks to create LLPs against the incurred loan loss approach. Therefore the banks can provision only when their incurred losses can rationally be quantified and implementation of these regulations prohibit the banks from earnings management through LLPs (Onala et al, 2014). The same results have been found in 91 European banks by Leventis et al (2010). In continuation to this the study of Aristei and Gallo (2019) suggest that banks facing increasing level of risk are not only characterized by higher loan loss provisions, but also have a higher tendency to engage in earnings management practices to stabilize their income flow overtime.

The research carried out by Chang et al. (2008) suggest that the banks are engaged in the earnings management through discretionary loan loss provisioning when the earnings before the discretionary loan loss provisioning and nonperforming loans are high. After financial crisis the US banks are engaged in two types of loan loss provisioning discretionary and non-discretionary loan loss provisions. The discretionary loan loss provision depends on the banks management discretion for setting a side bank earnings as LLPs in anticipation of future losses. While non-discretionary element of the LLPs is based on the incurred loss approach. These non-discretionary LLPs are created when the losses can rationally be quantified. This

discretionary part of LLPs allows the US banks to do earnings management through discretionary loan loss provisions (Tran et al; 2018). Another research carried out in the same context of earnings management through discretionary and non-discretionary LLPs in Brazil. It indicates that the banks with higher earnings are involved in earnings management through discretionary loan loss provisioning in comparative to banks with lower earnings in Brazil (Schectman & Takeda, 2018).

2.1.4. Loan Loss Provisioning and Signaling

The banks future earnings and stability have been affected by creation of loan loss provisioning reserves. If the loan loss provisions reserves are enough to cope with future expected and unexpected loan losses than it affects bank stability and future earnings positively. On the other hand if the loan loss provisions reserves are not high enough to cope with future needs of expected and unexpected loan loss then it affects negatively the future stability and earnings. Therefore creation of loan loss provisions signals the market positively about the future bank stability and future earnings stability. The banks in Jordan uses the same tool to signal the future positive changes in earnings (Abu-Serdaneh, 2018). Another research carried out by Karimiyan et al (2013) has suggested the same results that any enhancement in LLPs gives positive signals to the market and in the same way market returns increases positively. On contrary to these studies the study of Annandarajan (2006) suggests earnings management through LLPs but provides no evidence of LLPs gives positive signal to the capital markets. The market signal of loan loss provisioning depends upon the size of the banks and their renegotiable loans. If the bank size is large and loans are renegotiable then LLPs signals positively to the market otherwise it signals negatively (Liu and Ryan, 1995).

The asymmetry of information between the buyer and the seller leads to adverse selection problem and the cure to this problem is signaling (Spence, 1973). The bank financial statements are the disclosure of the financial standings of the banks during the particular financial year. If the bank financial statements disclose the non-performing loans and loan loss reserves as the supplements to their financial position leads to affect bank market value positively (Beaver et al, 1989).

2.2. Determinants of Capital Buffers

Any amount that has been kept by the bank in excess of minimum risk weighted regulatory capital is considered as capital buffers (Barth et al; 2004). The study carried out by Zheng et al (2012) suggests that as the amount of capital buffers reaches to minimum risk weighted regulatory capital then its relationship becomes negative with bank risk taking. While for well capitalized banks the relationship between the capital buffers and the bank risk taking is positive as the capital buffers rises the bank risk taking also rises. Another important contribution towards literature is of Danarsari (2018) suggests that any enhancement in capital buffers enhances bank stability. Hence the review of literature has been carried out to find out the theoretical support for what are the factors that contribute towards accumulation of these capital buffers though banks are fully aware that cost is associated with keeping excess equity?

2.2.1. Cost of Raising New Equity

The banks' capital ratios are subject to changes as its risk weighted assets change though the regulators under Basel capital regulations require the banks to maintain minimum risk weighted regulatory capital. This regular phenomena of banks for changing their risk

weighted assets require the banks to maintain capital buffers to avoid the situation of violating minimum capital ratio (Ayuso et, al; 2004). Secondly the asymmetry of information and agency problems leads to enhancement in the cost of raising new equity (Myers, 1984). In this context it leads to the argument that the news of new issuance will give negative signals to the market that is the fair value of equity is less than the face value of equity. Secondly outside equity investors take new equity as that the bank is undercapitalized and therefore to avoid regulators' penalties banks are going for new issuance. The investors due to asymmetry of information take new equity issuance negatively and it becomes costly for the banks (Korajczyk et al. 1990).

2.2.2. Cost of Failure

The bank losses that are left behind after absorbing the loan loss provision reserves are subject to deduction from banks' capital. Therefore during the period of distress and unexpected shocks to banks these capital buffers are useful to absorb these losses in case of turmoil (Durrani & Cummings, 2014). On the contrary, banks are not maintaining capital buffers to absorb any unexpected turmoil or to be use in period of distress due to heavy losses. The study of Lindquist (2003) suggests that banks are maintaining the capital buffers to maintain the market discipline by avoiding penalties from the regulators, to give signal to the market about the financial soundness of the bank, to exploit the risky investment with heavy expected earnings and to avoid in reduction of risk weighted assets to comply with regulatory capital. In align with these results the study of Bui et al (2017) have find out that a moderate increase in bank capital buffer is sufficient to maintain financial system resilience even after taking economic downturn into consideration.

2.2.3. Speed of Adjustment

The banks are usually keeping the amount in the form of capital buffers in excess of the regulatory minimum capital as it is difficult for them to quickly adjust their capital ratios as a result of change in risk weighted assets (Eliskovski, 2014). The comparative analysis among the banks that are maintaining higher and lower amount of capital buffers. It has been argued that the banks maintaining lower amount of capital buffers and their speed of adjustment is quicker than the banks maintain higher capital buffers. The banks maintaining low capital buffer adjust to capital requirement both by raising capital and reducing risk (Jokipii and Milne, 2009).

The speed of adjustment of capital buffers has also been tested among the countries and it has been argued that the speed of adjustment of capital is higher for banks in China and India than for banks in Brazil, Russia and South Africa (Haq, 2018). In align with these findings, the study of Bakker et al (2019) has suggested that speed of adjustment for larger is slow while speed of adjustment for systematic riskier banks is high.

2.2.4. Bank Size

The factor contributes towards the capital buffers includes the bank adjustment cost, the bank size, the profitability and the risk (Carvallo et al; 2015) and larger banks are found to keep more capital buffers than smaller banks (Bouchina, 2008). On the contrary to this Atici and Gursoy (2013) indicate negative relationship between the bank size and the capital buffers.

2.2.5. Pro-cyclicality of Capital Buffers

The banks are maintaining excess of minimum regulatory capital and this maintenance of capital rises during economic contraction and reduces during expansion and this situation leads to the pro-cyclicality of the capital buffers (Jokipii and Milne, 2006). On contrary to the study, the empirical findings of Fonseca et al. (2010) between the period of implementation of Basel I and II suggest no significant presence of pro-cyclicality of capital buffers. But after the implementation of Basel II in Pakistan the study carried out by Noreen et al (2016) suggests presence of pro-cyclicality of capital buffers from 2007 to 2012. To investigate empirically, the capital buffers are more pro-cyclical for larger banks or smaller banks. It has been found out that the capital buffers of the larger banks that has better access to equity markets and external sources of financing found to be more pro-cyclical than smaller banks (Montagnoli et, al; 2018). The maintenance of higher capital buffers are the outcome of higher market power, higher funding cost and higher generation of revenue through diversification and suggest pro-cyclical behavior (Adesina & Mwamba, 2018). Maatong et al (2019) has carried out to investigate the countercyclical capital buffers for conventional and Islamic banks. The study indicates that the non-performing loans have the positive effect on the pro-cyclicality of the capital buffers for Islamic banks while for conventional bank it shows countercyclical behavior.

The literature not only suggests contradictory results about the pro-cyclicality of capital buffers but also provides mix results. Such as study of Valencia and Bolanos (2018) suggest on average pro-cyclical behavior over the study period for 25 developed and 54 developing countries. The study argued that the pro-cyclicality of capital buffers are greater for developing countries than for developed ones. The study also investigated that whether the banks are involved in competition for maintaining capital buffers. The empirical investigation

suggests that the competition to maintain higher capital buffers are more profound for developed countries than for developing countries.

2.3. Impact of Capital Buffers on Lending

The sound capitalization of banks act as a shield for their lending against monetary shocks and their reaction to GDP shocks. The well capitalized banks are in the better position to maintain long term lending relationship as they are in better position to absorb the temporary difficulties of the borrowers. However the highly risky banks' lending has been reduce up to twenty percent as they are required to maintain high solvency ratio above the minimum capital ratio. Therefore the results are consistent with the hypothesis it is less costly to cut the cost to adjust lending than to capital (Gambacorta and Mistrulli, 2004). The study of Jiang et al (2019) provides contradictory evidence that the bank capital buffers have the robust U shaped association with bank risk taking. This effect of risk is more significant for the banks that are at the upper tail of risk taking. The findings have more policy implications than the continuously increase in bank regulatory capital which does not continuously reduce the bank risk taking behavior.

The Study of Mausin and Toivanen (2012) suggest that the banks' in order to achieve the desired level of capital significantly affects the bank assets but this effect is more sizeable in case of security than on lending. The study carried out by Drehmann and Gambacorta (2011) indicates that although the countercyclical capital buffers cause reduction in credit supply during upswing and reduction in credit contraction once the buffer is realized. In contrary to this, the study of Hesson and Lai (2018) finds out that both the risk based capital buffers and leverage buffers are positively associated to the loan and loan growth.

2.3.1. Impact of Interest Rates on Bank Lending

The determinants of interest rates are subject to controversy in theoretical and empirical literature. Real interest rates determined by the marginal productivity of the physical capital while Fisher contributes it as the outcome of the inflation. The empirical investigation of Olokoyo (2011) suggests that banks are adopting different borrowing and lending rates due to the contributing factors such as macro-economic factors, bank specific factors and factors specific to the banking industry itself. Hence the adoption of different borrowing and lending rates have been contributed by the cost of operations, the loan loss provisioning, the higher rate of inflation and the corporate taxation.

The literature provides the insight for macro-economic factor that contributed towards interest rates includes monetary policy of the central bank and interest rate spread has been the contribution of the real sector. The study suggests that the main contributor towards interest rate is the monetary policy as the interest rates are the main tools to implement monetary policy (Estrella and Mishkin, 1995). Coelho et al (2001) suggests that fiscal policy tool to enhance taxation base through debit transaction tax contributes towards the enhancement in borrowing rate and due to which bank lending rates are automatically enhanced. In contrary to this Noor & Ali (2018) suggest that when the fiscal tool of enhancing tax base through bank withdrawal taxation it leads to enhancement in disintermediation, cash holding and inflation while reduction in borrowing rates and lending interest rates have been reported. The above all the discussion leads to the conclusion that the interest rates are the major tool for the implementation of the monetary policy although there is a controversy among its determinants.

In continuation to above discussion that Gambacorta and Mistrulli (2004) have tested the impact of monetary policy through interest rates on bank lending and suggests decrease in bank lending due to increase in interest rates in align with the study of Kamber and Mohanty (2018). The size of bank also matters while transmission of monetary policy through interest rates, the empirical findings suggest that small banks show the greater degree of credit contraction than the larger banks because larger banks are in the better position to fund its lending through debt issuance (Mahathanaseth and Tauser, 2019).

2.3.2. Pro-cyclicality of Bank Lending

The literature is not limited to the empirical investigation of the pro-cyclicality of loan loss provisions and capital buffers but also provides insight about the Pro-cyclicality of bank lending. Akinboade & Makina (2009) carried out the empirical investigation on the impact of business cycles on bank lending. This study concludes that the real borrowings of the government is counter-cyclical and bank lending is pro-cyclical for loans granted to households firms. The study of Sakti and Zulkhibri (2018) provides the supporting and contradictory argument to pro-cyclicality of bank lending. The study suggests on average bank lending is pro-cyclical but after sampling split technique is applied on the research sample data. It has been observed that the bank lending of conventional banks is pro-cyclical while bank lending of Islamic banks is counter-cyclical.

CHAPTER # 3

RESEARCH METHODOLOGY

The research questions and the theoretical framework of the study clearly explain that the research has been carried to identify what are the determinants of the loan loss provisions, the determinants of the capital buffers and their impact on the bank lending. Therefore this research has been the empirical investigation where the effect on each explanatory variable has been tested on the dependent variable for each empirical equation. The study population and the selected sample, the data and the data collection techniques, the empirical models of the research, the construction of variables and the relevant estimation technique have been formulated while keeping in view of the global perspective of the study.

3.1. Research Population and Sample Selection

The population sample of this study includes the banks in the BCBS member countries having international presence (Argentina, Australia, Belgium, Brazil, Canada, China, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, United States of America, United Kingdom). Basel I, II & III are required to be implemented on the internationally active banks such as Pakistan has also implemented the Basel Accord II & III on its banking industry therefore Pakistani banks are included in the study sample. The selected sample for this study includes all the banks from the population sample which meets the requirements such as the financial statements are available in English language from 2008 to 2016 and the total assets are not less than 500 million in any currency

as suggested by Yunxia (2007). The additional data for the year 2007 have been collected due to the lag values utilized in the measurement of some variables. However the European banks along with the mentioned criteria needs to be scheduled as the commercial bank of the European Central Bank. As the European Central Bank is the only responsible for the implementation of Basel III on its schedule commercial banks. The banks which meet the above criteria include 700 banks in USA, 44 banks in Argentina, 32 Australian banks, 13 banks in Belgium, 72 banks in Brazil, 21 banks in Canada, 202 banks in China, 7 banks in France, 250 banks in Germany, 16 banks in Hong Kong, 60 banks in India, 68 banks in Indonesia, 77 banks in Italy, 91 banks in Japan, 16 banks in Korea, 10 banks in Luxemburg, 20 banks in Mexico, 26 banks in the Netherlands, 27 banks in Pakistan, 129 banks in Russia, 13 banks in Saudi Arabia, 4 banks in Singapore, 19 banks in South Africa, 34 banks in Spain, 10 banks in Sweden, 76 banks in Switzerland, 36 banks in Turkey and 178 banks in United Kingdom.

3.2. Data Collection

The quantitative research has been carried out through data collection on the study variables for the selected sample from the financial statements and bankers' database for the period of 2008 to 2016 and 2007 data have been taken lag values. The financial statements are available on the web sites of each banks and banks data have also been available on Bankers database. The data on bank lending rates and GDP have been collected from the World Bank economic indicators, IMF database and Federal Reserve Bank of St. Louis economic research.

3.3. Construction of Variables

3.3.1. Dependent Variables

3.3.1.1. Loan loss provision

The loan loss provision is constructed as suggested by Ghosh (2007) under stated equation. Loan loss provisions are constructed by taking the ratio of change in LLPs to change in total assets on the basis of justification that how much LLPs are created against the bank total assets to safe guard the banks' interest during the period of chronic situation. The difference of current year from previous year value has been taken to address the endogeneity.

Loan loss provision = $\Delta in\ loan\ loss\ provisions / \Delta\ in\ total\ assets$ (3.3.1.1)

3.3.1.2. Capital buffer

The capital buffer is calculated as suggested by Ayuso et al (2004) as under stated equation. Capital buffers are the cushion maintained by the banks in excess of the regulatory capital therefore capital buffers are calculated by considering the difference between the banks total capital (comprises of Tier I & II capital) and MCR.

Capital buffer = Sum of bank Tier I & II capital- MCR (3.3.1.2)

Minimum regulatory capital requirement (MCR) under Basel Accord II is 8% from the Tier I capital of bank up till 2012 while in 2013 and onwards it increases to 10% (SBP, 2013).

3.3.1.3. Tier I capital

The Tier I capital ratio has been calculated as suggested by SBP (2006). The banks under study are subject to implement Basel capital regulations therefore the Tier I capital is calculated in the same manners as suggested by the capital regulations.

$$\text{Tier I capital} = \frac{Tier\ I\ capital_t}{Risk\ Weighted\ Assets} \quad (3.3.1.3.1)$$

$Tier\ I\ capital_t$ = (Fully Paid up capital + general reserves + special reserve for issue of bonus shares + balance of share premium account + unappropriated profits) (3.3.1.3.2)

The Basel accord II provides insight into the calculation of risk weighted assets along with its weights as suggested by SBP (2006). Basel III has adapted the same calculation mechanism for risk weighted assets thus therefore this study measured risk weighted assets under the same manners as suggested by Basel II.

Table 3. 1. Risk Weighted Assets

Assets	Weights
Cash and cash equivalents	0%
Investment & Advances	35%
Balance/Lending to Financial institutions	75%
Commercial & real estate	100%
Other assets	100%

3.3.1.4. Bank lending

The bank lending has been constructed by taking the change in bank lending as suggested by Gambacorat and Mistrulli (2004) to address the issue of endogeneity, the natural logarithm of the bank lending has been taken. Bank lending includes gross advances and sum of lending to financial institutions on the basis of justification that the asset's side of the balance sheet comprises of only these components as bank lending.

Bank lending = log (Δ *in* lending) (3.3.1.4)

3.3.2. Explanatory Variables

3.3.2.1. Capital Management

Tier I & II capital has been used as the proxy for the capital management as suggested by Perez et al (2006) as the bank capital comprises of both Tier I & II capital. After the implementation of Basel Accord II, the loan loss provisions are added in the Tier II capital. The Tier II capital ratio has been calculated as suggested by SBP (2006).

Tier II capital = $Tier\ II\ capital_t / Risk\ weighted\ assets_t$ (3.3.2.1.1)

Tier II capital = (undisclosed reserves + revaluation of assets reserves + hybrid debt instruments + subordinated term debt + loan loss reserves) (3.3.2.1.2)

Capital management = Tier I capital + Tier II capital (3.3.2.1.3)

3.3.2.2. Earnings Management

The research carried out by Ghosh (2007) suggests the earnings ratio as proxy for the earnings management as the earnings before interest and taxes are subject to deduction of the loan loss provisions.

Earnings management = $Earnings\ before\ tax\ and\ provision_t / Total\ assets_t$ (3.3.2.2)

3.3.2.3. Signalling

The research carried out by Ghosh (2007) had used the ratio of change in earnings before taxes and provisions to total assets ratio as a proxy to test the signalling hypothesis as the positive change in the earnings signals the growth earnings from the previous year and the negative change suggests deduction in earning.

Signalling = $\Delta\ in\ Earnings\ befores\ taxes\ \&\ provisions / \Delta\ in\ total\ assets$ (3.3.2.3)

3.3.2.4. Credit Quality

The change in non-performing loans ratio as proxy of the credit quality. The increase in non-performing loan from previous year represents the deterioration in the credit quality and the reduction represents the better recovery policy. The credit quality is measured as under:

Credit Quality = $\Delta\ in\ Non-performing\ loans_t / Non-performing\ loans_{t-1}$ (3.3.2.4)

3.3.2.5. Leverage Ratio

The leverage ratio calculation is provided in Basel III. The following measurement criterion is utilized in this on the basis of the justification that the banks under study are subject to implement Basel III capital regulations and needs to comply with minimum leverage ratio to avoid penalties from the banking regulators. Basel III includes contingencies and commitments in total exposure and leverage ratio must not exceeds four times of its capital (SBP, 2013). This research has not taken non-fund based exposure (contingencies and commitments) while calculating leverage ratio on the basis of the justification that bank can create loan loss provisions against fund based exposure only while no provisions are allowed under regulatory regime to provision against non-fund based exposure. This study empirically investigates leverage ratio as determinant of LLPs therefore non-fund based exposure has not been added while calculating total exposure.

Leverage ratio = Tier I capital / total exposure (3.3.2.5.1)

Total exposure = (Total Assets – Total capital) (3.3.2.5.2)

3.3.2.6. Pro-cyclicality

Pro-cyclicality of LLPs is measured by the negative effect of GDP on the loan loss provisioning as indicated by Floro (2010) while taking the ratio of one year lag value and then divided by the previous year GDP amount. The change in the economic activity of the business cycles are measured by the GDP. The Pro-cyclicality of capital buffers has been determined as suggested by the Ayuso et al (2004) by the negative impact of GDP on capital buffers (output level). Thirdly, the Pro-cyclicality of bank lending is measured by the negative impact of output level on bank lending as suggested by Gambacorta and Mistrulli (2004).

3.3.2.7. Cost of Raising New Equity

The opportunity cost of holding capital is measured by return on equity as the profit after taxes and provisions have been subject to deduction of interest paid to bank depositors and other lenders. Therefore the profit after tax and provisions either used for payment of dividend or retained as retained earnings. The retained earnings have become a part of Tier I capital of the bank therefore the sum of the bank equity includes Tier I & II capital. Therefore Ayuso et al (2004) used this proxy that the direct cost for remunerating excess equity are approximated by each institution's ROE.

Cost of raising new equity = Return on equity (3.3.2.7.1)

Return on equity = Profit after taxes and provisions / Total bank equity (3.3.2.7.2)

3.3.2.8. Cost of Failure

The credit risk has been taken as the proxy for the cost of failure. Ayuso et al (2004) states that the cost of the failure increases with the credit risk and reduces with the reduction in the credit risk. The credit risk has been measured through the nonperforming the loans ratio.

Cost of failure = Non-performing loans/Total loans and credit (3.3.2.8)

3.3.2.9. Operational risk

The study has been carried out under the regulatory regime therefore the operational risk has been measured by the basic indicator approach as suggested by Basel Accord II.

$$KBIA = [\sum(GI_{1n} \times \propto)]/n \quad (3.3.2.9)$$

$KBIA$ under the basic indicator approach is capital charge, GI is the positive gross income for the previous three years while the negative gross income is deducted. The sign of $\propto$ indicates 15% and n is the number of years for which the gross income was positive.

3.3.2.10. Speed of Adjustment

The speed of the adjustment is measured as suggested by Saadaoui (2015). The speed of adjustment in this form represents that the change in capital buffers from the previous year capital buffer maintained by the bank.

$$SOA = (Capital\ buffers_t - Capital\ buffers_{t-1})/Capital\ buffers_{t-1} \quad (3.3.2.10.1)$$

SOA = speed of adjustment (3.3.2.10.2)

3.3.2.11. Bank size

Gambacorta & Mistrulli (2004) measurement technique for bank size is utilized on the basis of the justification that the bank balance sheet determines the size of the bank. Thus natural log of the bank total assets determines bank size of this study.

Bank size = Natural Log (Bank total assets) (3.3.2.11)

3.3.2.12. Interest rates

Monetary policy is to control or expand the supply of the money through interest rates therefore the study takes the bank lending rate as the proxy for the interest rates as suggested by Gambacorta and Mistrulli (2004). The study measures interest rates through bank lending rates on the basis of the justification that the bank borrowers have to pay interest rates on its lending from banks on the bank lending rates.

Interest rates = bank lending rates (3.3.2.12)

3.3.2.13. Cash Holdings

The Cash holdings of the bank are the liquid form of the assets which are easily converted into cash. Therefore the measurement, as suggested by Gambacorta and Mistrulli (2004), is utilized. The change in cash and securities and total assets has been taken to address the issue of endogeneity. Though the study of Gambacorta & Mistrulli (2004) has not taken change in the ratio as their study data comprises of quarterly data while this research has been carried out on the annual data and to deal with the issue of endogeneity.

Cash holdings = Δ *in Sum of cash and securities*$_t$/Δ*Total Assets*$_t$ (3.3.3.13)

3.3.2.14. Output level

The output level represents the performance of the real sector and determines in the same way as suggested by Gambacorta and Mistrulli (2004).

Out Put level = $(GDP_t - GDP_{t-1})/GDP_{t-1}$ (3.3.2.14)

3.3.3. Controlled Variable

The controlled variable includes the size indicator.

3.3.3.1. Size Indicator

The size indicator measurement has already discussed under the bank size and has been utilized in the same manners for the controlled variable.

Table 3. 2. Construction of Variables

S#	Variables	Construction technique
1	Loan loss provision	$\Delta in\ loan\ loss\ provisions / \Delta\ in\ total\ assets$
2	Capital buffer	MCR – Sum of bank Tier I & II capital
3	MCR	Minimum regulatory capital requirement (MCR) under Basel Accord II is 8% from the Tier I capital of bank up till 2012 while in 2013 and onwards it increases to 10%.
4	Tier I capital	$\frac{\text{Tier I capital}_t}{\text{Risk Weighted Assets}}$
5	Risk weighted assets	Cash and cash equivalents 0% Investment & Advances 35% Balance/Lending to Financial institutions 75% Commercial & real estate 100% Other assets 100%
6	Tier II capital	$\text{Tier II capital}_t / \text{Risk weighted assets}_t$
7	Bank lending	log (Δ *in* lending)

8	Capital management	Tier I capital + Tier II capital
9	Earnings management	$Earnings\ before\ tax\ and\ provision_t/Total\ assets_t$
10	Signaling	$\Delta\ in\ Earnings\ befores\ taxes\ \&\ provisions/\Delta\ in\ total\ assets$
11	Credit Quality	$\Delta\ in\ Non-performing\ loans_t/\ Non-performing\ loans_{t-1}$
12	Leverage ratio	Tier I capital / total exposure
13	Pro-cyclicality of LLP's	Negative effect of GDP on LLP's
14	Pro-cyclicality of capital buffers	Negative effect of GDP on capital buffers
15	Pro-cyclicality of bank lending	Negative effect of GDP on bank lending
16	GDP/output level	$(GDP_t - GDP_{t-1})/GDP_{t-1}$

17	Cost of raising new equity	Return on equity Return on equity = Profit after taxes and provisions / Total bank equity
18	Cost of failure	Cost of failure = Non-performing loans/Total loans and credits
19	Operational risk	KBIA = $[\sum(GI_{1n} \times \propto)]/n$ (Basic indicator approach-Basel II)
20	speed of adjustment	$(\text{Capital buffers}_t - \text{Capital buffers}_{t-1})/\text{Capital buffers}_{t-1}$
21	Bank size	Natural Log (Bank total assets)
22	Interest rates	Bank lending rates
23	Cash holdings	$\Delta\ in\ Sum\ of\ cash\ and\ securities_t/\Delta Total\ Assets_t$
24	Size indicators	Natural Log (Bank total assets)

3.4. Empirical Models of the Research

To test how the loan loss provisions are affected by the capital management, the earnings management, the signalling and with a new addition how the leverage ratio affects the loan loss provisioning and the credit quality the empirical research methodology of Cavallo and Majnoni (2001) is observed. Therefore the following equation is developed to test the null hypothesis of determinants of the LLPs from a to f.

$$Y_3 = \beta_0 + \beta_1 X_{13} + \beta_2 X_{14} + \beta_3 X_{15} + \beta_4 X_{16} + \Phi_{it} + \varepsilon_{3it} \quad (3.4.3)$$

The above equation includes the following variables.

Y_3	Bank lending
X_{13}	Loan loss provisions
X_{14}	Capital buffers
X_{15}	Interest rates
X_{16}	Cash holdings
Φ	Controlled variable (Size indicator)
ε	Error term

3.5. Methodological Review

The empirical models of the research has been tested through the estimation techniques while keeping in view the methodological review of the previous researches. Fonseca et al (2010) while taking the data of seventy countries to resolve the issue of the endogeneity and banks located in different countries lead to country specific effects (heterogeneity) empirically investigated the data through generalized method of moment. However the study of Flora (2010) tested his empirical models through GMM on the data of Philippines from 2001 to 2009 to resolve the issue of the bank specific effects. The same technique is employed by Annandarajan et al (2006) on Australian Banks. The panel data have been utilized by many researchers such as Fonseca (2010), Flora (2010), Annandarajan et al (2006), Abaoub et al (2013), Ayuso et al (2004) to enhance the size of the sample.

3.6. Estimation Technique

The panel data have been used in this research where N is cross section that are 28 (BCBS member countries and Pakistan) and the time period is T that is 9 years from 2008 to 2016

and 2007 is used for the lag values. There are number of advantages associated with the use of panel data as it increases the size of sample, the degree of freedom and reduces the issue of multi co-linearity especially in distributed lag model and give better estimates. The data included in this study is the balanced panel. The lag dependent variables are utilized in this research as the panel data in which the lag dependent variables are included among the regressors are known as the dynamic panel. The most important feature associated with the dynamic panel is the partial adjustment approach. In this case the coefficient of the lag dependent variables represents the speed of adjustment. The problem of auto correlation may also be addressed through the lag dependent variables.

The stationary of the data have been tested through the augmented dickey fuller panel unit root test. The estimation technique becomes more complex while dealing with the panel data as the individual added in the panel may not have the same characteristics that lead to the issue of heterogeneity. The data is further tested for autocorrelation and the most common test used for this purpose is the Durbin Watson test but it does not take into account the higher order autocorrelation. In this study the data is tested for the serial correlation with Durbin Watson test as all the autocorrelation tests inherited some sorts of problems. Therefore this test has been used for the autocorrelation test in our model. The J test (Sargan test) is used to test that the model is not over identified and instruments (determinants) are valid.

The two approaches that are widely used for testing the panel data are the Arellano-Bond and the Arellano-Bovver approach. The Arellano-Bovver approach is suitable for the small sample while the Arellano-Bond is for the large sample. The study of Gambacorta & Mistrulli (2004) suggests the use of the generalized method of moments, the first difference estimator

developed for the panel data model by Arellano-Bond (1991) approach. The problem of the unobserved bank specific effects (heterogeneity) or of any econometric endogeneity can be addressed through GMM. The equations are simultaneous equations where OLS is not appropriate because of the biased and inconsistent results. However Gujarati (2003) indicates that in case of recursive models (as the case of this study) if the disturbance terms are uncorrelated then OLS may be used to test these models. While the OLS used for estimation leads to generate biased results as it will not cover the issue of endogeneity and heterogeneity related to the unobserved bank specific effects. The GMM models deal with the issue of endogeneity by taking the first difference of the explained variable on both sides as well as the first difference of the error term. It resolves the issue of heterogeneity by dividing the parameters with defined weights. So this study has utilized the GMM model for estimation. The data split technique as suggested by Yunxia (2007) has been used for comparative analysis between the consolidated data, banks excluding USA banks and BCBS member countries banks. Secondly each countries data has been split to test each explanatory variable effects on the dependent variable for that specific country. Then results are compared to find out how variables behave in different countries.

CHAPTER # 4

RESULTS AND DISCUSSION

The data have been collected for the sample countries that are members of BCBS and Pakistani banks. Therefore this study uses panel data as it contains more degree of freedom, more sample variability than cross sectional data, hence improving the efficiency of econometric estimates and greater capability for capturing the complexity of human behavior than a single cross section as suggested by Hsiao (2007). The panel data techniques are further divided into balanced panel and unbalanced panel data. In unbalanced panel data set, there is an additional error term in "u" therefore u = Mu+v+e. Where "u" is the additional disturbance from the unbalanced random effect term. The unbalanced panel data begins to have a problem when the value of "e" exerts significant effect on the system.

The balanced panel data is preferred over unbalanced panel because it allows an observation of the same unit in every time period, which reduces the noise introduced by unit heterogeneity. This study uses balanced panel data and therefore include only those banks in the study sample which are in banking business during the period from 2007 to 2016. The selected sample period includes year 2007 on the grounds to take lag values. The collected data for each country has been presented in the form of descriptive statistics for each model. Secondly the data goes through preliminary testing to affirm that the data fulfills all the assumptions to be tested through the generalized method of moment. The stationarity of data have been tested through the Augmented Dickey fuller unit root test for panel data. In preliminary testing, serial correlation has been tested through Durbin Watson test. The

validity of the instruments and the model are not over identified. It has been tested through Sargan's J statistics which is commonly known as Sargan-Hanson test.

After preliminary data testing the data have been analyzed for each study model through generalized methods of moment for each country and consolidated sample. Secondly the study employs the sampling split technique by dividing the consolidated data into banks other than USA and BCBS member countries banks. Each country dummy has been tested against the dependent variables of each model to empirically investigate the country specific effect. Therefore this section covers the descriptive statistics, preliminary data testing and data analysis through generalized methods of moment.

4.1. Descriptive Statistics

The sample data have been presented through descriptive statistics that covers the member countries of Basel Committee on Banking Supervision and Pakistan (that are internationally active banks and are subject to implementation of Basel capital regulations). Descriptive statistics is calculated as a group statistics in e-views for each model separately. The results are reported separately for each country and then consolidated data results are reported.

4.1.1. Banks from USA

Table 4.1 indicates the descriptive statistics for 700 banks of USA that fulfill the study assumptions that the banks are in operations during study period and must have not less than 500 million of total assets. The descriptive statistics presents data for three models of the study that are, model (I) determinants of the loan loss provisions, model (II) determinants of the capital buffers and model (III) impact of the loan loss provisions and the capital buffers

on the bank lending. The descriptive statistics indicates that the mean value of the dependent variable (loan loss provisions) of model (I) for the American banks is -0.009 which indicates that on average loan loss provisions are negative during the study period. While the maximum value indicates that the American banks are involved in the loan loss provisioning up to value of 0.195 and minimum value is (0.283) while the standard deviation indicates the risk of change in the loan loss provisions is 1.392. The average value of the capital management is higher than the average value of other explanatory variables. Though the minimum value of the explanatory variables is the signaling with -2.279 and at the same time the standard deviation is the highest for credit quality in model (I). This negative minimum value of the credit quality suggests that up to how much low level the credit quality may enhanced for the banks in USA. In model (II) the dependent variable capital buffers indicates the average value of 0.063 with 0.117 risk of change (standard deviation). This indicates that during the study period on average capital buffers are enhanced for the banks in USA is 6.3 percent. Whereas the explanatory variables includes the operational risk having the highest average value 10.466 relative to the other explanatory variables of the model. The operational risk for banks in USA is on average 146 percent but the deviation from the mean is also the highest. That indicates the value far from the mean is 585 percent. Whereas the speed of adjustment on average is 0.001 percent that is the minimum mean among the explanatory variables. In model III the dependent variable bank lending indicates 0.009 mean value with risk of deviation from mean is 0.033. In this model the explanatory variables with the highest mean value is the capital buffers while the highest risk of the deviation from the mean has been indicated by the loan loss provisions.

Table 4. 1. Descriptive Statistics for the Banks in USA

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.009	0.008	0.195	-0.283	1.392
Capital management	0.228	0.298	0.385	0.129	0.117
Earnings management	0.020	0.021	0.079	-0.173	0.008
Signaling	0.068	0.010	-2.279	-2.279	0.352
Credit Quality	0.104	0.015	0.180	-0.347	0.537
Leverage ratio	0.118	0.111	0.377	0.008	0.022
Output level	0.029	0.037	0.044	-0.020	0.019
Capital Buffers	0.063	0.061	0.080	0.009	0.117
Cost of raising new equity	0.019	0.019	0.080	0.004	0.007
Cost of failure	0.009	0.009	0.305	-0.009	0.005
Operational risk	10.466	9.317	60.299	-14.297	5.852
Speed of adjustment	0.001	0.011	0.594	-2.608	0.065
Bank size	9.180	9.228	10.294	7.426	0.403
Bank Lending	0.009	0.014	0.043	-0.672	0.033
Interest rates	0.035	0.033	0.051	0.033	0.006
Cash holdings	0.005	0.005	0.009	-0.001	0.002

4.1.2. Banks from Argentina

Table 4.2 indicates the descriptive statistics of the data sample of 44 banks in Argentina and for three models of the study. The dependent variable of loan loss provisions (model-I) shows an average value (0.102) during the study period along with the maximum amount LLPs are 0.980 with the standard deviation of 1.268. The explanatory variables of the data sample shows the bank size with the highest average value 8.719 but the capital buffers has highest deviation from the mean is of 3.224. The average value of the capital buffers (dependent variable of Model II) is 0.089 with the standard deviation of 3.224. The highest average value among the explanatory variables belong to the bank size. The maximum deviation from the average value among the explanatory variables belong to the operational risk. The standard

deviation indicates the values in the samples far away from the mean. The descriptive statistics of model III presents the bank lending (dependent variable of the model) on the average across the sample data is 0.389 with the deviation from mean is 7.246. On average the highest value among explanatory variables of model III belongs to the interest rates.

Table 4. 2. Descriptive Statistics for the banks in Argentina

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.102	0.004	0.980	-0.290	1.268
Capital management	0.158	0.157	0.214	0.101	3.225
Earnings management	0.009	0.010	0.020	0.000	0.003
Signaling	0.038	0.002	0.044	-0.064	1.900
Credit Quality	0.591	0.004	0.722	-0.097	2.902
Leverage ratio	0.041	0.047	0.0583	0.009	0.676
Output level	0.029	0.037	0.044	-0.020	0.019
Capital Buffers	0.089	0.062	0.313	0.046	3.224
Cost of raising new equity	0.008	0.010	0.020	0.000	0.004
Cost of failure	0.004	0.004	0.010	0.000	0.001
Operational risk	3.141	2.374	25.739	0.168	3.047
Speed of adjustment	0.017	0.015	0.0493	-0.079	2.538
Bank size	8.719	8.713	10.784	7.710	0.532
Bank Lending	0.389	0.010	0.144	-0.199	7.247
Interest rates	0.035	0.033	0.051	0.033	0.006
Cash holdings	0.004	0.000	0.008	0.000	0.002

4.1.3. Banks from Australia

Table 4.3 shows descriptive statistics of 32 banks operating in Australia during the study period. The average value of LLPs during study period is 0.130 that is higher relatively to the average values of the banks in USA and Argentina. Although the mean shows a better situation of LLPs in Australia with the deviation from the mean is 2.008. The table presents

the explanatory variables of the model, the bank size, has on average the highest value and on average the lowest value belongs to the signaling. The average value of the capital buffers is 0.095 and standard deviation is 8.259. The highest mean of the explanatory variables belong to the bank size but the deviation from the mean is the highest for the speed of adjustment. In model III the average value across the sample data of the explained variable (bank lending) is 0.395 with standard deviation of 6.432. Among the explanatory variables (Model III) the cash holdings has the highest mean value and standard deviation and comparatively, the interest rates indicates the lowest mean value.

Table 4. 3. Descriptive Statistics for the banks in Australia

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	0.130	0.004	0.135	-6.200	2.008
Capital management	0.239	0.236	0.275	0.231	8.273
Earnings management	0.009	0.009	0.019	0.001	0.003
Signaling	0.275	0.001	0.974	-0.591	1.081
Credit Quality	0.419	0.002	0.879	-0.901	1.650
Leverage ratio	0.212	0.244	0.246	0.147	0.686
Output level	0.049	0.020	0.235	-0.120	0.144
Capital Buffers	0.095	0.043	0.195	0.014	8.259
Cost of raising new equity	0.008	0.009	0.021	0.003	0.004
Cost of failure	0.003	0.004	0.008	0.000	0.001
Operational risk	3.188	3.131	15.030	0.206	1.896
Speed of adjustment	0.362	0.015	0.798	-0.153	4.867
Bank size	8.872	8.872	10.245	8.331	0.265
Bank Lending	0.395	0.009	0.7976	-0.058	6.432
Interest rates	0.067	0.062	0.089	0.054	0.011
Cash holdings	0.447	0.181	0.307	0.000	191.973

4.1.4. Banks from Belgium

Table 4.4 shows the descriptive statistics of 13 banks operating in Belgium during the study period. The average value of the LLPs is -0.166, of the capital buffers is 0.030 and of the bank lending is 0.031. The average value of the capital buffers is lower than the banks in USA though the deviation from the mean is highest. The table shows the explanatory variables of each models of which the highest mean value in the model I is of credit quality, in model II is of the bank size and in model III is of the cash holdings.

Table 4. 4. Descriptive Statistics for the banks in Belgium

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.166	0.003	0.322	-7.766	1.150
Capital management	0.203	0.158	0.232	0.066	45.786
Earnings management	0.008	0.009	0.014	0.000	0.003
Signaling	0.180	0.008	0.141	-0.646	13.434
Credit Quality	0.295	0.012	0.238	-0.986	22.515
Leverage ratio	0.126	0.043	0.208	0.004	1.162
Output level	0.002	0.019	0.099	-0.143	0.074
Capital Buffers	0.030	0.075	0.085	0.016	45.786
Cost of raising new equity	0.006	0.007	0.015	0.000	0.001
Cost of failure	0.003	0.004	0.005	0.001	0.001
Operational risk	3.361	2.402	11.705	0.011	2.828
Speed of adjustment	0.129	0.011	0.146	-0.555	13.549
Bank size	8.839	8.820	10.024	7.540	0.750
Bank Lending	0.031	0.009	0.263	-0.091	0.143
Interest rates	0.041	0.039	0.092	0.017	0.020
Cash holdings	0.215	0.205	0.162	0.017	50.671

4.1.5. Banks from Brazil

Table 4.5 shows the descriptive statistics of 72 banks carry on their operations in Brazil for the explained and the explanatory variables. On average LLPs is -0.093, the capital buffers is

0.077 and the bank lending is 0.034. The average value of LLPs, the capital buffers and the bank lending is higher than the banks in Belgium and lower than the average value of the banks in Australia. The highest mean value for model I is of the credit quality, in model II is of the bank size and in model III is of the interest rates while the greatest deviation from the mean is of the credit quality (model I), of the operational risk (model II) and of the loan loss provisions (model III).

Table 4. 5 Descriptive Statistics of the Banks in Brazil

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.094	0.002	4.450	-31.570	1.490
Capital management	0.268	0.267	0.357	0.162	0.046
Earnings management	0.008	0.009	0.015	0.000	0.003
Signaling	0.553	0.002	0.633	-0.639	3.233
Credit Quality	0.842	0.002	0.958	-0.975	4.911
Leverage ratio	0.059	0.058	0.061	0.056	0.008
Output level	0.042	-0.005	0.325	-0.266	0.165
Capital Buffers	0.077	0.077	0.087	0.037	0.047
Cost of raising new equity	0.007	0.008	0.013	0.000	0.003
Cost of failure	0.032	0.004	0.009	0.000	0.001
Operational risk	3.691	2.630	44.942	0.012	4.262
Speed of adjustment	-0.002	0.019	0.396	-0.151	0.054
Bank size	8.830	8.927	11.409	6.995	0.794
Bank Lending	0.034	0.011	2.188	-0.188	0.158
Interest rates	0.409	0.439	0.521	0.274	0.073
Cash holdings	0.004	0.004	0.013	0.000	0.002

4.1.6. Banks from Canada

Table 4.6 shows the descriptive statistics of 21 banks in Canada for the explained and the explanatory variables. It presents the explained variables such as the loan loss provisions, the

capital buffers and the bank lending with their respective mean, median, minimum, maximum and standard deviation. The average value of the capital buffers is lower than the banks in USA, Argentina, Australia, Belgium and Brazil and the average value of the bank lending is lower than the banks in USA. The highest mean value among the explanatory variables of model I includes that of the credit quality, of the operational risk for model II and the interest rates for model III. The highest deviation from the mean is of the credit quality (model I), of the operational risk (model II) and of the loan loss provisions (model III).

Table 4. 6 Descriptive Statistics for the Banks in Canada

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.014	0.004	2.490	-2.655	0.538
Capital management	0.219	0.212	0.224	0.141	0.069
Earnings management	0.009	0.010	0.013	0.001	0.003
Signaling	0.356	0.005	11.082	-0.615	1.416
Credit Quality	0.543	0.008	16.873	-0.938	2.163
Leverage ratio	0.044	0.043	0.094	0.042	0.074
Output level	0.009	0.010	0.177	-0.133	0.093
Capital Buffers	0.028	0.061	0.082	0.005	0.068
Cost of raising new equity	0.009	0.011	0.014	0.001	0.003
Cost of failure	0.004	0.004	0.005	0.000	0.001
Operational risk	3.750	2.810	10.688	0.093	2.695
Speed of adjustment	0.001	0.010	0.275	-0.145	0.054
Bank size	8.861	8.934	9.905	7.514	0.674
Bank Lending	0.029	0.012	1.084	-0.189	0.112
Interest rates	0.030	0.030	0.047	0.024	0.006
Cash holdings	0.004	0.004	0.008	0.000	0.002

4.1.7. Banks from China

Table 4.7 shows the descriptive statistics for 202 banks operating in China. The sample size is higher than the Argentina, Australia, Belgium, Brazil and Canada as 202 banks fulfil the assumptions, were added into the research sample. The average value of LLPs is -0.002 with standard deviation of 1.940. The maximum value of LLPs 0.205 indicates that there is a relative increase in LLPs from previous years but the negative value of the mean indicates that there is an average reduction in LLPs relative to previous years. The highest value of mean 1.120 among the explanatory variables belongs to the credit quality. The mean value of the explained variable of model II is 0.088 with standard deviation of 0.101 that is better than the average of the capital buffers during the study period in USA, Belgium and Canada. The highest mean value of the explanatory variables of model II is of the Bank size 8.469 and of the capital buffers 0.088 for model III.

Table 4. 7 Descriptive Statistics for the Banks in China

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.002	0.003	0.205	-21.417	1.940
Capital management	0.284	0.283	0.341	0.234	0.100
Earnings management	0.008	0.009	0.360	-0.012	0.009
Signaling	0.737	0.001	0.215	-42.379	8.315
Credit Quality	1.121	0.001	0.331	-63.914	12.427
Leverage ratio	0.060	0.058	0.068	0.043	0.096
Output level	0.139	0.122	0.294	0.011	0.085
Capital Buffers	0.088	0.089	0.139	0.031	0.102
Cost of raising new equity	0.007	0.008	0.264	0.001	0.007
Cost of failure	0.003	0.004	0.237	-0.004	0.006
Operational risk	2.228	1.914	47.628	-2.054	1.948
Speed of adjustment	0.002	0.019	0.828	-0.441	0.063
Bank size	8.470	8.441	10.052	7.426	0.481
Bank Lending	0.021	0.010	2.007	-0.639	0.114
Interest rates	0.055	0.056	0.066	0.044	0.007

Cash holdings	0.004	0.004	0.031	0.000	0.002

4.1.8. Banks from France

Table 4.8 indicates the descriptive statistics of 7 banks selected as sample of the study that fulfils the assumptions for the selection and were in operation during the study period. This is the smallest sample of the data due to non-availability of their annual reports and due to mergers and acquisitions during the study period. The table shows the average value of LLPs that is -0.011, the average value of the capital buffers is 0.071 the average value of the bank lending is 7.969. The average bank lending is higher than the previous mentioned countries.

Table 4. 8 Descriptive Statistics for the Banks in France

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.011	-0.209	2.149	-2.143	0.824
Capital management	0.262	0.242	0.285	0.159	0.055
Earnings management	0.017	0.016	0.031	0.003	0.008
Signaling	0.202	-0.153	4.345	-0.706	0.953
Credit Quality	0.202	-0.153	4.347	-0.706	0.953
Leverage ratio	0.047	0.044	0.066	0.042	0.056
Output level	0.016	0.015	0.032	-0.028	0.017
Capital Buffers	0.071	0.052	0.082	0.049	0.056
Cost of raising new equity	0.025	0.022	0.049	0.005	0.012
Cost of failure	0.012	0.011	0.023	0.002	0.006
Operational risk	6.967	6.423	16.131	1.097	3.598
Speed of adjustment	-0.001	0.009	0.105	-0.056	0.032
Bank size	8.621	8.507	9.334	8.092	0.372
Bank Lending	7.969	0.020	501.402	-0.070	63.169
Interest rates	0.084	0.817	0.106	0.632	1.583
Cash holdings	0.004	0.004	0.007	0.001	0.002

4.1.9. Banks from Germany

Table 4.9 presents the descriptive statistics of 250 banks operating in Germany that fulfill the research assumptions. The positive mean value of the loan loss provisioning indicates that there is on average enhancement in LLPs relative to previous years. The average positive value of LLPs during the study period is of the banks in Australia and Germany while the other countries present on average reduction in LLPs relative to previous year. Credit quality indicates the highest positive mean value among the explanatory variables and it also indicates that on average there is a reduction in the credit quality during the study period. The capital buffers and the bank lending also indicate on average a positive rise. The highest mean value among the model II explanatory variables belongs to the operational risk and for model III belongs to the interest rates.

Table 4. 9 Descriptive Statistics for the Banks in Germany

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	0.013	0.000	22.410	-6.880	0.936
Capital management	0.204	0.282	0.267	0.191	0.997
Earnings management	0.016	0.013	0.070	-0.016	0.012
Signaling	0.235	-0.011	0.497	-0.146	2.160
Credit Quality	0.362	-0.017	0.751	-0.230	3.316
Leverage ratio	0.057	0.086	0.092	0.021	0.479
Output level	0.004	0.030	0.100	-0.132	0.076
Capital Buffers	0.012	0.019	0.032	0.001	0.995
Cost of raising new equity	0.010	0.007	0.095	0.001	0.009
Cost of failure	0.008	0.006	0.041	-0.006	0.007
Operational risk	1.350	0.732	17.606	-0.632	2.118
Speed of adjustment	0.011	0.006	6.817	-0.817	0.178
Bank size	7.062	6.998	9.038	5.852	0.550
Bank Lending	0.024	0.015	1.459	-0.450	0.111
Interest rates	0.409	0.439	0.521	0.274	0.073
Cash holdings	0.004	0.004	0.014	0.000	0.002

4.1.10. Banks from Hong Kong

Table 4.10 presents the descriptive statistics of 16 banks being functional in Hong Kong during the research period. It shows on average LLPs is -0.0578 indicates that is 5.788 percent reduction in LLPs relative to previous year for the banks in Hong Kong. The statistics presents on the average capital buffers is 0.046 across the sample data and the bank lending on average is 0.042. The deviation from the mean for explained variables are greatest for LLPs relative to the capital buffers and the bank lending. The highest mean among the explanatory variable belongs to the credit quality (model I), the operational risk (model II) and the size indicators.

Table 4. 10. Descriptive Statistics for the Banks in Hong Kong

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.058	0.003	4.615	-7.977	1.447
Capital management	0.241	0.242	0.294	0.208	0.041
Earnings management	0.019	0.013	0.066	0.000	0.015
Signaling	0.491	0.027	15.546	-0.610	2.083
Credit Quality	0.749	0.040	23.794	-0.930	3.184
Leverage ratio	0.049	0.059	0.091	0.048	0.024
Output level	0.048	0.057	0.087	-0.024	0.029
Capital Buffers	0.046	0.049	0.049	0.002	0.042
Cost of raising new equity	0.020	0.014	0.063	0.000	0.016
Cost of failure	0.009	0.006	0.038	0.000	0.008
Operational risk	4.077	2.220	23.865	0.101	4.878
Speed of adjustment	-0.001	-0.010	0.125	-0.182	0.047
Bank size	8.248	8.286	9.663	6.579	0.939
Bank Lending	0.041	0.018	0.178	-0.210	0.180
Interest rates	0.051	0.050	0.060	0.050	0.003
Cash holdings	0.004	0.003	0.013	0.000	0.003

4.1.11. Banks from India

The Indian 60 banks sample data during the study period indicates on average negative LLPs with deviation from the mean is 7.098110. Indian banks (model I) explanatory variables indicate the highest mean value of the credit quality as the banks in Hong Kong present the highest average value of the credit quality. It indicates on average there is reduction in credit quality. The data indicates the highest deviation from the mean is of the credit quality (model I) as the sample of the American and German banks shows. The capital buffers on average during the study period is 0.071 (model II) with standard deviation of 0.287 and the banking lending is 0.773 (model III).

Table 4. 11 Descriptive Statistics for the Banks in India

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.180	-0.159	64.520	-31.380	7.098
Capital management	0.264	0.210	0.248	0.200	0.292
Earnings management	0.025	0.025	0.061	0.000	0.014
Signaling	0.529	-0.127	34.210	-0.646	2.278
Credit Quality	0.807	-0.194	2.328	-0.986	3.479
Leverage ratio	0.072	0.068	0.319	0.050	0.613
Output level	0.077	0.082	0.251	-0.012	0.076
Capital Buffers	0.071	0.116	0.189	0.007	0.288
Cost of raising new equity	0.020	0.018	0.054	0.000	0.012
Cost of failure	0.012	0.012	0.033	0.000	0.008
Operational risk	3.910	3.315	16.526	0.032	2.793
Speed of adjustment	0.008	0.012	0.973	-0.166	0.073
Bank size	8.002	7.990	8.829	7.395	0.316
Bank Lending	0.291	0.020	0.789	-0.318	46.928
Interest rates	0.107	0.103	0.133	0.097	0.011
Cash holdings	0.005	0.005	0.010	0.000	0.002

4.1.12. Banks from Indonesia

Table 4.12 present descriptive statistics of 68 banks operating in Indonesia. The average value of LLPs is -0.212 which presents reduction in LLPs from previous year during the study period. The average value of LLP is negative in align with the data banks in USA, Argentina, Hong Kong and India. The data highest mean value of credit quality among the explanatory variables is aligned with the data of banks in Hong Kong and India. The highest mean value among the explanatory variables of the model III belongs to the operational risk as the data of banks in USA and Germany. The bank lending presents an average value across the sample data that is 0.643 with the deviation from the mean equal to 0.125. The highest mean value among the independent variables is of the bank lending (model III).

Table 4. 12 Descriptive Statistics for the Banks in Indonesia

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.212	-0.094	32.780	-48.030	4.692
Capital management	0.234	0.279	0.282	0.132	0.281
Earnings management	0.030	0.030	0.072	0.001	0.015
Signaling	0.305	-0.083	0.336	-0.608	1.908
Credit Quality	0.465	-0.126	0.513	-0.928	2.905
Leverage ratio	0.042	0.055	0.052	0.059	0.444
Output level	0.096	0.058	0.399	-0.034	0.130
Capital Buffers	0.044	0.088	0.092	0.032	0.279
Cost of raising new equity	0.028	0.027	0.077	0.001	0.015
Cost of failure	0.015	0.015	0.041	0.001	0.009
Operational risk	7.586	5.860	42.923	0.276	6.058
Speed of adjustment	0.003	0.008	0.939	-0.137	0.062
Bank size	8.391	8.364	9.503	7.505	0.477
Bank Lending	0.025	0.021	1.582	-0.478	0.125
Interest rates	0.127	0.126	0.145	0.117	0.009
Cash holdings	0.006	0.006	0.012	0.000	0.003

4.1.13. Banks from Italy

Table 4.13 presents the descriptive statistics for 77 banks working in Italy from 2008 to 2016. The data descriptive statistics indicates that on average LLPs is positive with standard deviation of 1.028. The average value of LLPs for the banks in Italy is inconsistent with the mean value of the banks in USA, Argentina and India. On average the highest value among the explanatory variables is of the credit quality as the banks in India. The capital buffers and the bank lending have a positive mean value similar to the other country research samples.

Table 4. 13 Descriptive Statistics for the Banks in Italy

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	0.056	0.004	0.090	-0.062	1.028
Capital management	0.234	0.219	0.237	0.185	0.401
Earnings management	0.009	0.010	0.016	0.000	0.003
Signaling	0.473	0.002	57.519	-0.638	2.942
Credit Quality	0.722	0.003	88.444	-0.973	4.507
Leverage ratio	0.054	0.043	0.058	0.041	3.380
Output level	-0.016	0.010	0.085	-0.148	0.074
Capital Buffers	0.021	0.023	0.114	0.001	0.409
Cost of raising new equity	0.008	0.009	0.019	0.000	0.004
Cost of failure	0.003	0.004	0.006	0.000	0.001
Operational risk	2.811	1.920	11.396	0.014	2.311
Speed of adjustment	0.005	0.015	0.936	-0.234	0.084
Bank size	8.543	8.451	10.008	7.268	0.678
Bank Lending	0.269	0.010	0.697	-0.240	27.247
Interest rates	0.048	0.048	0.068	0.035	0.009
Cash holdings	0.004	0.004	0.010	0.000	0.002

4.1.14. Banks from Japan

Table 4.14 presents the descriptive statistics for 91 banks being functional in Japan from 2008 to 2016 and on average the value of LLPs is negative as for the other banks in USA, Argentina and Belgium. The highest average value among the explanatory variables is also of the capital management as for the other banks in USA, Hong Kong and India. The capital buffers show a positive mean value like the rest of sample data. The bank lending gets a positive mean indicates on average rise in bank lending. The higher mean value among the explanatory variables of model II is of the operational risk and for model III is of the capital buffers.

Table 4. 14 Descriptive statistics for the banks in Japan

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.017	0.004	0.375	-1.675	1.173
Capital management	0.286	0.274	0.293	0.219	0.196
Earnings management	0.009	0.010	0.016	-0.218	0.003
Signaling	0.341	0.003	30.788	-6.624	2.023
Credit Quality	0.520	0.004	47.364	-10.122	3.096
Leverage ratio	0.065	0.033	0.052	0.028	0.302
Output level	0.015	0.038	0.126	-0.169	0.097
Capital Buffers	0.093	0.083	0.098	0.019	0.196
Cost of raising new equity	0.012	0.012	0.038	0.003	0.007
Cost of failure	0.003	0.004	0.006	-0.008	0.001
Operational risk	3.173	2.582	13.719	-2.189	2.506
Speed of adjustment	0.012	0.013	1.040	-0.202	0.086
Bank size	8.666	8.629	10.216	7.293	0.733
Bank Lending	0.104	0.011	1.316	-0.543	47.191
Interest rates	0.014	0.014	0.019	0.010	0.003
Cash holdings	0.004	0.004	0.009	0.000	0.002

4.1.15. Banks from Korea

Table 4.15 indicates the descriptive statistics of 16 banks in Korea during the study period. The average value of LLPs shows positive value of 0.002 is like the average LLPs in

Australia, Germany and Italy. The capital buffers on average across the selected sample is 0.207 with standard deviation of 0.745. The bank lending on average during the study period is 3.063 with standard deviation 3.639 which is relatively much higher as the maximum amount in the sample data is 4.367 and the minimum amount is -0.262. The highest mean among the explanatory variables for model I is of the capital management, for model II belongs to the operational risk and for model III belongs to the interest rates.

Table 4. 15 Descriptive statistics for the Banks in Korea

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	0.002	0.003	0.005	-0.010	0.003
Capital management	0.299	0.368	0.445	0.176	0.746
Earnings management	0.008	0.007	0.012	0.002	0.003
Signaling	0.032	0.005	1.142	-0.181	0.126
Credit Quality	0.049	0.008	1.733	-0.276	0.193
Leverage ratio	0.195	0.177	0.207	0.039	44.849
Output level	0.030	0.023	0.214	-0.107	0.095
Capital Buffers	0.007	0.075	0.365	0.006	0.746
Cost of raising new equity	0.004	0.004	0.009	0.001	0.002
Cost of failure	0.003	0.003	0.005	0.001	0.001
Operational risk	1.073	0.660	5.634	0.038	1.144
Speed of adjustment	0.003	-0.001	0.708	-0.303	0.077
Bank size	7.335	7.389	9.280	5.659	0.961
Bank Lending	3.064	0.007	4.367	-0.262	3.639
Interest rates	0.050	0.054	0.007	0.034	0.011
Cash holdings	0.001	0.001	0.001	0.000	0.000

4.1.16. Banks from Luxemburg

Table 4.16 shows the descriptive statistics of 10 banks in Luxemburg of which the average LLPs is -0.007 with standard deviation 0.072 and the maximum value across the sample data

is 0.252. The banks in Luxemburg sample data shows on average the capital buffers is 0.099 with standard deviation of 0.578 for model II and on average the bank lending is 1.017. The average lending during the study period shows quite heavy rise but the deviation from the mean is 96.317 that is also on the high side. The stand deviation shows the sample value far away from the mean such as the maximum amount in the sample is 9.137 and the minimum is -0.049. The highest means among the explanatory variables for model I is of the credit quality, for model II is of the bank size and model III is of the interest rates.

Table 4. 16 Descriptive Statistics for the banks in Luxemburg

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.007	0.007	0.252	-0.224	0.072
Capital management	0.197	0.208	0.246	0.058	0.578
Earnings management	0.007	0.007	0.011	0.000	0.003
Signaling	0.224	0.002	11.106	-0.616	1.282
Credit Quality	0.353	0.000	17.866	-0.942	2.044
Leverage ratio	0.089	0.052	0.163	0.008	11.163
Output level	0.019	0.035	0.127	-0.128	0.084
Capital Buffers	0.099	0.072	0.166	0.005	0.578
Cost of raising new equity	0.006	0.006	0.012	0.000	0.003
Cost of failure	0.002	0.003	0.004	0.000	0.001
Operational risk	0.559	0.540	1.650	0.022	0.356
Speed of adjustment	0.016	0.020	1.197	-0.173	0.142
Bank size	7.273	7.160	7.992	6.684	0.349
Bank Lending	1.017	0.021	9.13	-0.049	96.317
Interest rates	0.493	0.029	4.230	0.013	1.328
Cash holdings	0.003	0.004	0.007	0.000	0.001

4.1.17. Banks from Mexico

Table 4.17 shows the descriptive statistics for 20 banks in Mexico for three models of the research. The table shows LLPs is on average -0.099 with standard deviation of 0.769, the capital buffers on average is 0.093 and the bank lending on average is 4.595. The standard deviation of the bank lending is 43.519 that suggests the how far the sample values are from the average value of 4.595.

Table 4. 17 Descriptive Statistics for the Banks in Mexico

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.099	0.003	1.602	-7.943	0.770
Capital management	0.188	0.251	0.400	0.156	0.599
Earnings management	0.007	0.008	0.011	0.000	0.003
Signaling	0.532	0.006	24.416	-0.640	2.526
Credit Quality	0.815	0.009	37.804	-0.977	3.884
Leverage ratio	0.052	0.045	0.125	0.016	13.497
Output level	0.009	0.031	0.175	-0.189	0.109
Capital Buffers	0.093	0.065	0.390	0.048	0.599
Cost of raising new equity	0.007	0.007	0.013	0.000	0.004
Cost of failure	0.003	0.003	0.004	0.000	0.001
Operational risk	2.010	1.243	7.635	0.009	2.084
Speed of adjustment	0.002	0.002	1.007	-0.403	0.105
Bank size	8.120	8.219	9.665	6.142	1.079
Bank Lending	4.596	0.016	4.641	-0.239	43.519
Interest rates	0.052	0.047	0.087	0.034	0.016
Cash holdings	0.004	0.004	0.010	0.000	0.002

4.1.18. Banks from Netherlands

Table 4.18 presents 26 banks in Netherlands, on average LLPs is 0.233, the capital buffers is 0.065 and the bank lending is 0.009 across the sample period. The minimum amount in the sample of LLPs shows a negative value of 22.610 and a maximum of 48.290 with standard

deviation of 7.065710 relatively higher among the sample countries. The higher mean value among the explanatory variables' for model I is of the capital management, for model II is of the operational risk and for model III is of the LLPs.

Table 4. 18 Descriptive Statistics for the Banks in Netherlands

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	0.234	0.009	48.290	-22.610	7.066
Capital management	0.256	0.233	0.356	0.150	0.095
Earnings management	0.028	0.028	0.047	0.010	0.009
Signaling	0.037	-0.053	0.954	-0.255	0.231
Credit Quality	0.077	-0.110	1.957	-0.523	0.474
Leverage ratio	0.052	0.046	0.158	0.037	0.164
Output level	-0.004	0.015	0.115	-0.138	0.077
Capital Buffers	0.065	0.054	0.087	0.041	0.094
Cost of raising new equity	0.040	0.039	0.077	0.009	0.014
Cost of failure	0.021	0.021	0.039	0.007	0.008
Operational risk	8.779	8.534	21.752	1.890	3.666
Speed of adjustment	0.003	0.002	0.356	-0.078	0.040
Bank size	8.334	8.391	8.797	7.882	0.209
Bank Lending	0.009	0.019	0.244	-0.108	0.047
Interest rates	0.025	0.020	0.046	0.015	0.011
Cash holdings	0.007	0.007	0.011	0.003	0.002

4.1.19. Banks from Pakistan

Table 4.19 shows descriptive statistics for 27 banks in Pakistan from 2008 to 2016. The explained variables includes LLPs, the capital buffers and the bank lending that, on average, are -0.027, 0.300 and 0.134, respectively. The highest mean value among the explanatory variables includes the capital management for model I, the bank size for model II and the interest rates for model III.

Table 4. 19 Descriptive statistics for the banks in Pakistan

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.027	0.001	3.479	-6.993	0.565
Capital management	0.392	0.285	2.833	0.147	0.381
Earnings management	0.057	0.025	0.918	-0.024	0.132
Signaling	-0.110	0.056	15.494	-44.610	4.468
Credit Quality	0.844	0.056	88.680	-1.000	5.967
Leverage ratio	0.064	0.087	0.171	0.051	1.754
Output level	0.071	0.055	0.204	-0.011	0.060
Capital Buffers	0.300	0.194	0.373	0.147	0.381
Cost of raising new equity	0.057	0.067	1.809	0.008	0.178
Cost of failure	0.193	0.124	1.981	0.000	0.297
Operational risk	0.718	0.268	5.321	0.001	1.048
Speed of adjustment	-0.092	-0.048	2.341	-10.667	0.861
Bank size	18.920	19.054	21.596	15.561	1.402
Bank Lending	0.135	0.087	1.602	-0.763	0.264
Interest rates	0.125	0.129	0.145	0.088	0.019
Cash holdings	0.065	0.065	0.148	0.007	0.022

4.1.20. Banks from Russia

Table 4.20 shows the descriptive statistics of 129 banks in Russia on average LLPs is 0.127, the capital buffers is 0.045 and the bank lending is 0.0103 with the standard deviation of 6.046, 0.279 and 0.077, respectively. The higher average value in the sample data among the explanatory variables includes the credit quality for model I, the operational risk for model II and the LLPs for model III.

Table 4. 20 Descriptive Statistics for the Banks in Russia

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	0.127	0.005	52.260	-65.400	6.064
Capital management	0.237	0.268	0.295	0.156	0.253

Earnings management	0.058	0.058	0.137	0.001	0.016
Signaling	0.178	0.000	78.681	-0.648	3.006
Credit Quality	0.272	-0.001	119.463	-0.988	4.573
Leverage ratio	0.041	0.031	0.078	0.004	1.973
Output level	0.024	0.039	0.345	-0.337	0.225
Capital Buffers	0.045	0.037	0.141	0.005	0.279
Cost of raising new equity	0.075	0.073	0.408	0.001	0.036
Cost of failure	0.031	0.031	0.083	0.000	0.010
Operational risk	12.044	10.730	34.146	0.083	6.816
Speed of adjustment	0.026	0.000	2.219	-0.660	0.215
Bank size	8.222	8.239	9.325	7.426	0.443
Bank Lending	0.010	0.013	1.544	-0.448	0.078
Interest rates	0.106	0.109	0.157	0.080	0.024
Cash holdings	0.007	0.007	0.012	0.001	0.002

4.1.21. Banks from Saudi Arabia

Table 4.21 presents the descriptive statistics of 13 banks in Saudi Arabia during the study period. The table indicates on average LLPs is 0.127, the capital buffers is 0.056 and the bank lending is 0.004 with the standard deviation of 1.792, 0.051 and 0.031, respectively. The highest average value in the sample data among the explanatory variables is of the capital management for model I, of the operational risk for model II and of the LLPs for model III.

Table 4. 21 Descriptive Statistics for the Banks in Saudi Arabia

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	0.128	0.011	8.856	-9.639	1.792
Capital management	0.248	0.232	0.285	0.184	0.051
Earnings management	0.048	0.042	0.091	0.015	0.022
Signaling	0.032	0.002	1.862	-0.317	0.234
Credit Quality	0.049	0.002	2.840	-0.483	0.357
Leverage ratio	0.094	0.088	0.160	0.034	0.045

Output level	0.061	0.015	0.271	-0.174	0.155
Capital Buffers	0.056	0.035	0.085	0.038	0.051
Cost of raising new equity	0.053	0.051	0.099	0.016	0.024
Cost of failure	0.026	0.022	0.056	0.007	0.014
Operational risk	32.452	31.653	77.868	5.048	19.648
Speed of adjustment	-0.001	0.000	0.197	-0.080	0.029
Bank size	9.435	9.507	10.064	8.752	0.346
Bank Lending	0.004	0.004	0.070	-0.168	0.031
Interest rates	0.005	0.003	0.022	0.003	0.006
Cash holdings	0.008	0.007	0.014	0.003	0.003

4.1.22. Banks from Singapore

Table 4.22 is presenting the descriptive statistics of 4 banks operating in Singapore during the study period. It indicates that the mean value of the dependent variable (loan loss provisions) of model (I) is -0.059. It leads to argument that on average the loan loss provisions are negative across the sample data although the banks are involved in loss provisioning up to the maximum value of 0.640. The mean value of the credit quality is higher than any other explanatory variables in the model. The capital buffers on average is 0.085 with 0.090 risk of change (standard deviation) and the bank lending on average is 0.007 with deviation from the mean equal to 0.089. The bank size having the highest mean value relative to the other explanatory variables of the model (II) and the capital buffers for model III.

Table 4. 22 Descriptive Statistics for the Banks in Singapore

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.060	-0.007	0.640	-1.140	0.334
Capital management	0.276	0.250	0.213	0.162	0.089
Earnings management	0.008	0.010	0.011	0.000	0.004
Signaling	0.846	-0.025	19.509	-0.647	3.750

Credit Quality	1.288	-0.038	29.644	-0.986	5.705
Leverage ratio	0.041	0.039	0.059	0.036	0.066
Output level	0.065	0.047	0.229	-0.024	0.078
Capital Buffers	0.058	0.055	0.081	0.047	0.090
Cost of raising new equity	0.009	0.010	0.014	0.000	0.004
Cost of failure	0.003	0.004	0.005	0.000	0.001
Operational risk	3.226	3.380	6.407	0.084	1.668
Speed of adjustment	0.001	0.020	0.115	-0.118	0.055
Bank size	9.031	8.912	9.390	8.738	0.251
Bank Lending	0.007	0.011	0.046	-0.037	0.020
Interest rates	0.054	0.054	0.054	0.053	0.000
Cash holdings	0.003	0.004	0.007	0.000	0.002

4.1.23. Banks from South Africa

Table 4.23 presents the data collected on the study of 19 banks from 2008 to 2016. It presents that on average LLPs is -0.059 that is negative although the maximum LLPs in the sample is 19.000. The capital buffers on average is 0.073 and the bank lending on average is 0.003 across the sample. Hence the explanatory variables with the highest mean for each model includes the credit quality, the bank size and the interest rates.

Table 4. 23 Descriptive Statistics for the Banks in South Africa

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.366	0.003	19.000	-17.060	3.065
Capital management	0.219	0.229	0.255	0.209	0.162
Earnings management	0.007	0.007	0.014	0.000	0.003
Signaling	1.346	0.003	75.739	-0.652	7.207
Credit Quality	2.132	0.005	127.571	-0.995	11.787
Leverage ratio	0.063	0.0540	0.401	0.043	0.233
Output level	0.001	-0.043	0.263	-0.095	0.105
Capital Buffers	0.073	0.067	0.175	0.051	0.166

Cost of raising new equity	0.006	0.006	0.014	0.000	0.003
Cost of failure	0.003	0.003	0.007	0.000	0.001
Operational risk	1.852	1.647	5.352	0.011	1.216
Speed of adjustment	0.004	0.006	0.521	-0.132	0.061
Bank size	8.513	8.488	9.279	7.415	0.483
Bank Lending	0.003	0.007	0.135	-0.138	0.025
Interest rates	0.103	0.094	0.151	0.085	0.020
Cash holdings	0.002	0.001	0.005	0.000	0.001

4.1.24. Banks from Spain

Table 4.24 shows the descriptive statistics of 34 banks located in Spain from 2008 to 2016 with on average -0.149 LLPs, on average the capital buffers is 0.051 and the bank lending is 0.016. The highest average value among the explanatory variables is of the capital management (model-I), of the operational risk (model II) and of the capital buffers (model III).

Table 4. 24 Descriptive Statistics for the Banks in Spain

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.150	0.010	5.032	-18.975	1.589
Capital management	0.207	0.256	0.260	0.195	0.010
Earnings management	0.028	0.029	0.042	0.020	0.003
Signaling	0.017	0.007	0.454	-0.232	0.102
Credit Quality	0.026	0.011	0.692	-0.354	0.156
Leverage ratio	0.042	0.037	0.141	0.033	0.117
Output level	-0.017	0.011	0.105	-0.130	0.073
Capital Buffers	0.051	0.047	0.098	0.039	0.100
Cost of raising new equity	0.031	0.032	0.050	0.016	0.005
Cost of failure	0.013	0.013	0.018	0.010	0.001
Operational risk	11.723	12.406	32.070	4.061	4.326
Speed of adjustment	0.001	0.015	0.370	-0.277	0.059

Bank size	9.001	9.130	10.034	8.145	0.380
Bank Lending	0.016	0.013	0.336	-0.318	0.054
Interest rates	0.038	0.043	0.059	0.014	0.015
Cash holdings	0.006	0.006	0.010	0.003	0.002

4.1.25. Banks from Sweden

Table 4.25 presents the data of 10 banks on average LLPs is 0.402, the capital buffers is 0.063 and the bank lending is 0.010 with the standard deviation 4.088, 0.045 and 0.039 respectively. The higher mean value among the explanatory variables' for model I belongs to the LLPs, for model II belongs to the operational risk and for model III belongs to the capital buffers.

Table 4. 25 Descriptive Statistics for the Banks in Sweden

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	0.402	0.008	38.580	-2.076	4.088
Capital management	0.254	0.250	0.265	0.247	0.044
Earnings management	0.018	0.021	0.023	0.003	0.006
Signaling	0.085	0.029	1.970	-0.557	0.454
Credit Quality	0.130	0.044	3.005	-0.850	0.692
Leverage ratio	0.036	0.035	0.042	0.032	0.031
Output level	0.011	0.033	0.153	-0.164	0.103
Capital Buffers	0.063	0.055	0.156	0.037	0.045
Cost of raising new equity	0.021	0.024	0.029	0.004	0.007
Cost of failure	0.008	0.009	0.010	0.002	0.003
Operational risk	11.799	12.333	19.658	1.944	4.938
Speed of adjustment	-0.001	0.020	0.207	-0.122	0.057
Bank size	9.491	9.547	9.804	9.031	0.216
Bank Lending	0.010	0.008	0.169	-0.084	0.039
Interest rates	0.022	0.021	0.039	0.005	0.011
Cash holdings	0.004	0.004	0.007	0.000	0.002

4.1.26. Banks from Switzerland

Table 4.26 indicates the descriptive statistics of 76 banks from 2008 to 2016 for the research models. The table presents on average LLPs is 0.002, on average the capital buffers is 0.058 and the bank lending is 0.009. The highest mean among the explanatory variables for model I belongs to the capital management, for model II belongs to the bank size and for model III belongs to the capital buffers.

Table 4. 26 Descriptive Statistics for the Banks in Switzerland

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	0.002	0.006	0.447	-0.576	0.051
Capital management	0.275	0.257	0.315	0.246	0.088
Earnings management	0.015	0.016	0.026	0.003	0.004
Signaling	0.061	-0.002	3.180	-0.541	0.342
Credit Quality	0.093	-0.003	4.850	-0.826	0.521
Leverage ratio	0.044	0.041	0.150	0.036	0.102
Output level	0.041	0.030	0.198	-0.045	0.082
Capital Buffers	0.084	0.066	0.121	0.044	0.088
Cost of raising new equity	0.016	0.016	0.031	0.002	0.005
Cost of failure	0.006	0.007	0.011	0.001	0.002
Operational risk	8.002	7.453	19.071	0.686	3.770
Speed of adjustment	0.002	0.021	0.352	-0.180	0.065
Bank size	9.241	9.260	10.097	7.979	0.426
Bank Lending	0.009	-0.014	0.838	-0.722	0.097
Interest rates	0.028	0.027	0.033	0.026	0.002
Cash holdings	0.005	0.005	0.011	0.001	0.002

4.1.27. Banks from Turkey

Table 4.27 presents sample data of 36 banks located in Turkey during the study period and indicates on average LLPs is 0.034, the capital buffers is 0.059 and the bank lending is 0.002.

Hence the table presents the highest mean among the explanatory variables is of capital management for model I, of the operational risk for model II and of the interest rates for model III.

Table 4. 27 Descriptive Statistics for the Banks in Turkey

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	0.034	0.006	16.850	-18.938	2.203
Capital management	0.283	0.275	0.337	0.258	0.057
Earnings management	0.015	0.016	0.025	0.005	0.003
Signaling	0.059	0.000	1.596	-0.458	0.342
Credit Quality	0.089	0.000	2.434	-0.699	0.522
Leverage ratio	0.044	0.043	0.087	0.039	0.055
Output level	0.033	0.050	0.197	-0.157	0.102
Capital Buffers	0.059	0.058	0.093	0.048	0.057
Cost of raising new equity	0.015	0.017	0.027	0.005	0.004
Cost of failure	0.006	0.007	0.010	0.002	0.001
Operational risk	21.241	23.228	48.255	2.283	8.852
Speed of adjustment	0.000	0.007	0.218	-0.131	0.048
Bank size	10.215	10.389	10.724	9.006	0.432
Bank Lending	0.002	0.008	0.173	-0.526	0.036
Interest rates	0.144	0.143	0.250	0.090	0.051
Cash holdings	0.005	0.005	0.009	0.001	0.002

4.1.28. Banks from UK

Table 4.28 presents the descriptive statistics of 178 banks in UK during the study period. The study research models includes the dependent variable of model I (loan loss provisions with mean value of -0.023), the explained variable of model II (the capital buffers with 0.062 mean value) and the dependent variable of model III (the bank lending with mean value of 7.279). The table shows the explanatory variables of each models of with the highest mean value for

model I is of the credit quality, model II is of the operational risk and model III is of the capital buffers.

Table 4. 28 Descriptive Statistics for the Banks in UK

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	-0.023	0.006	11.800	-17.004	1.325
Capital management	0.215	0.272	0.298	0.148	0.170
Earnings management	0.017	0.017	0.626	0.000	0.017
Signaling	0.253	0.002	99.890	-0.628	2.888
Credit Quality	0.385	0.003	152.531	-0.958	4.408
Leverage ratio	0.052	0.043	0.087	0.036	0.346
Output level	-0.013	0.016	0.103	-0.176	0.081
Capital Buffers	0.062	0.058	0.081	0.038	0.169
Cost of raising new equity	0.017	0.017	0.418	0.000	0.012
Cost of failure	0.008	0.007	0.982	0.000	0.025
Operational risk	7.318	6.826	184.842	0.020	5.740
Speed of adjustment	0.004	0.013	1.024	-0.373	0.067
Bank size	9.024	9.054	9.770	8.280	0.351
Bank Lending	7.279	7.052	14.316	2.748	24.865
Interest rates	0.010	0.005	0.047	0.005	0.013
Cash holdings	0.006	0.006	0.036	0.000	0.003

4.1.29. Consolidated Sample Data

After presentation of the data through the descriptive statistics for each country, table 4.29 presents the consolidated data of the sample countries. It indicates the value of the loan loss provisions on average over the data period is 0.006 with standard deviation 2.516 and the capital buffers on average is 0.087 with standard deviation 4.041. While the consolidated data presents that the bank lending on average during the study period is 58.297 with deviation from the mean 20.968. The mean value of credit quality among the explanatory variables are

higher relative to other explanatory variables for model I, the bank size for model II and the cash holdings for model III.

Table 4. 29 Descriptive Statistics for the Consolidated Data

Variables	Mean	Median	Maximum	Minimum	Std. Dev.
Loan Loss Provisions	0.006	0.004	64.520	-65.400	2.516
Capital management	0.285	0.223	0.338	0.131	4.059
Earnings management	0.019	0.016	0.918	-0.173	0.021
Signaling	0.262	0.002	215.700	-44.610	3.290
Credit Quality	0.415	0.002	331.700	-63.914	5.065
Leverage ratio	0.078	0.109	0.120	0.037	160.377
Output level	0.033	0.037	0.399	-0.337	0.100
Capital Buffers	0.078	0.062	0.258	0.011	4.041
Cost of raising new equity	0.019	0.015	1.809	-0.883	0.028
Cost of failure	0.011	0.007	1.981	-0.009	0.040
Operational risk	6.949	5.258	184.842	-14.297	6.820
Speed of adjustment	0.020	0.008	146.486	-10.667	1.244
Bank size	57.803	0.015	143.160	-4.470	208.923
Bank Lending	58.297	0.015	143.160	-4.470	209.678
Interest rates	0.102	0.035	4.230	-0.006	0.163
Cash holdings	12.655	0.005	16.208	-0.882	41.944

4.2. Preliminary Data Testing

Before the balance panel data tested through the generalized methods of moment the data have been tested through the augmented dickey fuller test to find out the presence of unit root for all three models of the research.

Table 4.30 shows the determinants of the loan loss provision (model-I) explained and explanatory variables that are tested through the augmented dickey fuller test for the balanced panel data at the first difference for each country and for the consolidated data. The unit root

test has the null hypothesis that there is the presence of unit root in the data and the alternative hypothesis suggests non-presence of unit root in the data. All the variables show that the null hypothesis is rejected as the t-statistics value is less than the critical value. Therefore the data fulfils the assumption to further test through the generalized method of moment.

Table 4. 30 Augmented Dickey Fuller Unit Root Test for the Panel Data (Model-I)

Country	Loan loss provisions	Capital management	Earnings management	Signaling	Credit quality	Leverage ratio	Output level
USA	-45.865*	-9.639*	-6.707*	-9.623*	-9.622*	-10.289*	-4..949*
Argentina	-12.699*	-19.215*	-13.262*	-14.692*	-14.696*	-13.909*	-28.880*
Australia	-13.630*	-8.500*	-11.639*	-15.021*	-15.018*	-9.712*	-18.140*
Belgium	-13.469*	-14.437*	-9.906*	-14.187*	-14.225*	-8.023*	-28.009*
Brazil	-15.897*	-18.674*	-17.978*	-16.654*	-16.658*	-27.658*	-12.171*
Canada	-10.595*	-8.3620*	-12.295*	-11.730*	-11.741*	-8.506*	-54.969*
China	-21.005*	-18.905*	-20.721*	-19.529*	-19.530*	-11.749*	-46.271*
France	-6.981*	-10.396*	-7.790*	-6.077*	-6.077*	-9.786*	-1.2E+8
Germany	-21.041*	-15.131*	-14.809*	-23.591*	-23.730*	-20.923*	-77.200*
Hong Kong	-11.051*	-9.348*	-9.663*	-27.434*	-27.447*	-11.296*	-73.402*
India	-18.244*	-12.883*	-14.021*	-14.678*	-14.680*	-12.202*	-99.410*
Indonesia	-13.608*	-14.063*	-13.282*	-17.803*	-17.806*	-12.982*	-3.E+9*
Italy	-23.454*	-6.534*	-5.585*	-27.593*	-22.585*	-22.990*	-40.710*
Japan	-16.332*	-6.954*	-8.543*	-30.492*	-30.485*	-7.162*	-59.124*
Korea	-6.305*	-3.437*	-2.173*	-11.993*	-12.099*	-16.630*	-22.657*
Luxemburg	-7.706*	-12.324*	-5.993*	-8.124*	-8.100*	-25.618*	-80.703*
Mexico	-11.212*	-16.278*	-11.697*	-9.641*	-9.632*	-6.215*	-95.574*
Netherlands	-11.390*	-19.120*	-12.536*	-12.842*	-12.842*	-17.674*	-22.916*
Pakistan	-11.730*	-19.185*	-6.084*	-11.820*	-11.397*	-11.104*	-21.351*
Russia	-14.950*	-10.250*	-17.471*	-18.760*	-18.761*	-20.035*	-38.719*
Saudi Arabia	-8.971*	-12.379*	-10.188*	-11.895*	-11.895*	-13.883*	-33.651*
Singapore	-5.266*	-7.500*	-6.166*	-1.951**	-1.952**	-11.290*	-59.140*
S. Africa	-6.560*	-14.688*	-9.461*	-10.500*	-10.476*	-13.700*	-2.6E+8*
Spain	-19.362*	-18.731*	-12.246*	-11.750*	-11.751*	-16.859*	-27.432*
Sweden	-9.022*	-8.951*	-7.348*	-8.684*	-8.683*	-12.066*	-14.798*
Switzerland	-17.686*	-21.992*	-17.617*	-17.573*	-17.573*	-14.183*	-2.4E+8*
Turkey	-11.182*	-10.803*	-14.586*	-14.242*	-14.242*	-10.626*	-27.313*

UK	-18.384*	-12.491*	-37.239*	-40.920*	-40.919*	-4.588*	-61.049*
Consolidated	-53.694*	-13.678*	-8.597*	-17.705*	-17.786*	-48.372*	-3.305*

Model (I): Determinants of Loan loss Provisions

*0.01, **0.05 level of significance

Table 4.31 shows the determinants of the capital buffers (Model II) explained and the explanatory variables for each country and the consolidated data that are tested through the augmented dickey fuller test for the panel data at the first difference. The results suggest that the t statistics value is less than the critical value and there is no presence of the unit root in the data. Hence the data fulfils the assumption to be analysed through the generalized method of moments.

Table 4. 31 Augmented Dickey Fuller Unit Root Test for Panel Data (Model-II)

Country	Capital buffers	Cost of raising new equity	Cost of failure	Operational risk	Speed of adjustment	Bank size	Output level
USA	-27.600*	-28.972*	-27.036*	-27.705*	-25.662*	-29.850*	-4.949*
Argentina	-19.217*	-15.673*	-13.783*	-23.657*	-12.576*	-20.818*	-28.880*
Australia	-8.501*	-15.711*	-11.771*	-22.732*	-11.721*	-17.107*	-18.141*
Belgium	-14.437*	-14.260*	-9.951*	-9.091*	-10.430*	-11.006*	-28.009*
Brazil	-19.051*	-17.951*	-18.209*	-28.620*	-11.319*	-12.468*	-12.171*
Canada	-14.639*	-12.149*	-9.283*	-10.698*	-10.856*	-14.322*	-54.969*
China	-18.907*	-20.419*	-20.017*	-17.174*	-17.866*	-11.708*	-46.271*
France	-10.316*	-7.807*	-5.848*	-7.647*	-6.798*	-6.077*	-1.252*
Germany	-15.158*	-21.939*	-14.857*	-11.807*	-19.697*	-12.736*	-77.200*
Hong Kong	-11.903*	-9.861*	-9.657*	-9.995*	-10.772*	-12.848*	-73.402*
India	-12.801*	-12.936*	-14.205*	-15.191*	-13.781*	-24.318*	-99.410*
Indonesia	-14.001*	-14.326*	-13.390*	-20.532*	-15.181*	-27.100*	-3.069*
Italy	-6.510*	-5.654*	-5.591*	-6.580*	-26.326*	-3.518*	-40.710*
Japan	-6.875*	-5.729*	-8.481*	-7.204*	-30.078*	-4.388*	-59.124*
Korea	-3.440*	-2.038*	-2.117*	-8.364*	-13.137*	-2.483*	-22.657*
Luxemburg	-12.324*	-10.225*	-9.133*	-7.674*	-6.570*	9.559*	-80.703*
Mexico	-16.241*	-10.783*	-11.641*	-17.756*	-11.008*	-8.604*	-95.574*
Netherlands	-18.763*	-11.601*	-12.654*	-6.891*	-11.581*	-8.336*	-22.916*
Pakistan	-19.163*	-19.065*	-20.982*	-4.564*	-11.452*	-4.773*	-21.351*

Russia	-10.319*	-15.432*	-17.488*	-17.339*	-15.574*	-19.402*	-38.719*
Saudi Arabia	-12.023*	-12.592*	-10.513*	-11.601*	-8.113*	-9.797*	-33.651*
Singapore	-7.358*	-5.182*	-5.469*	-5.728*	-4.623*	-19.989*	-59.140*
S. Africa	-14.516*	-11.377*	-9.384*	-16.393*	-9.253*	-7.9213*	-2.608*
Spain	-18.384*	-14.373*	-12.393*	-20.231*	-11.029*	-16.779*	-27.432*
Sweden	-8.739*	-7.301*	-7.689*	-8.841*	-8.000*	-7.797*	-14.798*
Switzerland	-21.909*	-18.450*	-18.084*	-12.826*	-13.999*	-14.842*	-2.438*
Turkey	-10.765*	-14.146*	-13.001*	-15.088*	-15.564*	-17.920*	-27.313*
UK	-12.570*	-11.611*	-39.745*	-17.934*	-28.045*	-16.335*	-61.049*
Consolidated	-13.660*	-8.419*	-11.872*	-7.992*	-142.282*	-7.206*	-3.305*

Model (II): Determinants of Capital Buffers

*0.01 level of significance

Table 4.32 shows the impact of the loan loss provisions and the capital buffers on the bank lending (model-III) explained and the explanatory variables tested through the augmented dickey fuller test for the panel data at the first difference. The data of all variables for each country and in the consolidated not found the unit root. The value of t statistics is less than the critical value so there is no evidence of the unit root in the data.

Table 4. 32 Augmented Dickey Fuller Unit Root Test for the Panel Data (Model-III)

Country	Bank lending	Loan loss provisions	Capital buffers	Interest rates	Cash holdings	Size Indicators	Output level
USA	-26.233*	-45.865*	-27.601*	-79.742*	-34.607*	-29.850*	-4.949*
Argentina	-13.824*	-12.699*	-19.217*	-20.292*	-13.909*	-20.818*	-28.880*
Australia	-12.870*	-13.630*	-8.502*	-19.071*	-13.841*	-17.107*	-18.141*
Belgium	-9.033*	-13.469*	-14.437*	-28.806*	-10.951*	-11.006*	-28.009*
Brazil	-15.422*	-15.897*	-19.051*	-89.190*	-19.819*	-12.468*	-12.171*
Canada	-9.433*	-10.595*	-14.639*	-20.045*	-10.312*	-14.322*	-54.969*
China	-22.874*	-21.005*	-18.907*	-55.769*	-20.213*	-11.708*	-46.271*
France	-8451.693*	-6.980*	-10.316*	-7.694*	-7.8125*	-6.077*	-1.258*
Germany	-19.576*	-21.041*	-15.158*	-100.505*	-13.166*	-12.736*	-77.200*
Hong Kong	-11.707*	-11.051*	-11.903*	-14.027*	-9.726*	-12.848*	-73.402*
India	-13.989*	-18.245*	-12.801*	-44.897*	-13.878*	-24.319*	-99.410*

Indonesia	-16.422*	-13.608*	-14.001*	-15.490*	-13.159*	-27.101*	-3.069*
Italy	-26.325*	-23.454*	-6.510*	-11.695*	-6.425*	-3.518*	-40.710*
Japan	-28.621*	-16.332*	-6.875*	-46.414*	-5.964*	-4.388*	-59.124*
Korea	-11.959*	-6.305*	-3.440*	-11.823*	-7.034*	-2.483*	-22.657*
Luxemburg	-9.433*	-7.706*	-12.324*	-1.058*	-6.853*	-9.558*	-80.703*
Mexico	-11.289*	-11.212*	-16.241*	-93.603*	-9.823*	-8.603*	-95.574*
Netherlands	-13.040	-11.390*	-18.763*	-62.897*	-12.588*	-8.336*	-22.916*
Pakistan	-13.718*	-11.730*	-19.163*	-50.302*	-11.987*	-4.773*	-21.351*
Russia	-18.002*	-14.950*	-10.319*	-18.903*	-17.144*	-19.402*	-3872*
Saudi Arabia	-8.260*	-8.972*	-12.023*	-12.235*	-10.041*	-9.797*	-33.651*
Singapore	-5.310*	-5.266*	-7.358*	5.963*	-6.770*	-19.689*	59.140*
S. Africa	-12.202*	-6.560*	-14.516*	-29.705*	-9.787*	-7.921*	-2.608*
Spain	-12.984*	-19.362*	-18.384*	-23.967*	-15.186*	-16.779*	-27.433*
Sweden	-8.983*	-9.022*	-8.739*	-18.983*	-7.458*	-7.797*	-14.798*
Switzerland	-19.809*	-17.686*	-21.909*	-29.492*	-10.558*	-14.842*	-2.438*
Turkey	-13.796*	-11.182*	-10.765*	-2.358*	-15.119*	-17.920*	-27.314*
UK	-16.294*	-18.384*	-12.571*	-44.152*	-5.635*	-16.335*	-61.049*
Consolidated	-38.060*	-53.694*	-13.661*	-3.688*	-18.099*	-6.559*	-3.305*

Model (III): Impact of bank lending on loan loss provisions and capital buffers

*0.01 level of significance

4.3. Other Preliminary Testing

The data have been tested through Durbin Watson test that indicates approximate value of 2 for each model carried on each country separately and in the consolidated data. The value of the Durbin Watson test suggests that there is no negative or positive serial correlation is present in the data. Then the validity of the determinants and the models are not over identified. It has been tested through Sargan's J statistics commonly known Sargan-Hansen test and the value of computed chi-square is 0.000 for each model in each country and for the consolidated data. This indicates that the computed chi-square is less than the critical chi-

square value and the null hypothesis is accepted. The study determinants are valid and none of the determinants are correlated with the error term. Secondly models are not over identified.

Table 4. 33: Sargan's J statistics (Sargan-Hansen Test)

Country	Model I	Model II	Model III
USA	0.000	0.000	0.000
Argentina	0.000	0.000	0.000
Australia	0.000	0.000	0.000
Belgium	0.000	0.000	0.000
Brazil	0.000	0.000	0.000
Canada	0.000	0.000	0.000
China	0.000	0.000	0.000
France	0.000	0.000	0.000
Germany	0.000	0.000	0.000
Hong Kong	0.000	0.000	0.000
India	0.000	0.000	0.000
Indonesia	0.000	0.000	0.000
Italy	0.000	0.000	0.000
Japan	0.000	0.000	0.000
Korea	0.000	0.000	0.000
Luxemburg	0.000	0.000	0.000
Mexico	0.000	0.000	0.000
Netherlands	0.000	0.000	0.000
Pakistan	0.000	0.000	0.000
Russia	0.000	0.000	0.000
Saudi Arabia	0.000	0.000	0.000
Singapore	0.000	0.000	0.000
S. Africa	0.000	0.000	0.000
Spain	0.000	0.000	0.000
Sweden	0.000	0.000	0.000
Switzerland	0.000	0.000	0.000
Turkey	0.000	0.000	0.000
UK	0.000	0.000	0.000
Consolidated	0.000	0.000	0.000

4.4. Data Analysis through Generalized Methods of Moments

The models of the study has been tested through the generalized methods of moment estimators suggested by Arellano and Bond (1991) for all the large sample under study while Arellano Bovver has been utilized for small sample such as for sample data from Belgium, France, Luxemburg, Saudi Arabia, Singapore and Sweden. The test ensures consistency and efficiency while fulfilling the assumptions that includes no serial correlation and determinants are valid (Gambacorta & Mistrulli, 2004). The study of Gambacorta & Mistrulli (2004) suggests the use of the generalized method of moments, the first difference estimator developed for the panel data model by Arellano-Bond (1991) approach. The problem of the unobserved bank specific effects (heterogeneity) or of any econometric endogeneity can be addressed through GMM. The study balanced panel data have fulfil the assumptions of the GMM and therefore data have been tested through GMM. In particularly, the instruments chosen for the explanatory variables are one period lag of the same variable. These lags have been chosen to avoid correlation with the error term while minimizing, at the same time, the number of observations lost as suggested by Ayuso et al (2004). To investigate the study objective empirically the data have been tested in two ways. In the first round data have been tested for each individual country for the study models. Then consolidated data have been analysed for each research model. Secondly the data split technique has been employed and divided the consolidated data into two sub samples to empirically investigate the research models for the banks excluding USA and for the banks of BCBS member countries. The data split is the cross validation technique belongs to conventional approach used to ensure good generalization while seeking for optimal model parameters.

4.5. Determinants of Loan Loss Provisions

The study has been carried out to empirically investigate what are the determinants of the loan loss provisions in the BCBS member countries and in Pakistan for the period under study. To achieve the study objectives the data for the period from 2008 to 2016 have been analysed through the GMM for each sample country separately. Table 4.34 presents the results of model I where the dependent variable is the loan loss provision and the explanatory variables include the capital management, the earnings management, the signaling, the credit quality, the leverage ratio and the output level.

Table 4. 34 Data Analysis through the Generalized Method of Moment (model-I)

Variables	Capital Management	Earnings Management	Signaling	Credit Quality	Leverage Ratio	Output level
Countries	Coefficients	Coefficients	Coefficients	Coefficients	Coefficients	Coefficients
U.S.A	0.869	26.080*	279.521	-182.455	-4.918	-0.159
Argentina	0.051***	86.735*	25.451	-16.642	0.767**	-3.864
Australia	-0.023	119.946*	308.406*	-201.620*	-0.055	0.923
Belgium	0.002	77.797**	0.635***	-0.376***	-0.064	2.897**
Brazil	-2.061**	87.970*	3.131	-2.070	13.784*	0.609**
Canada	-3.747**	84.883*	6.434	-4.164	2.863**	0.249
China	-2.628**	-30.374	0.407**	-0.256**	2.631**	0.829***
France	35.532*	101.436*	-66.512	67.069	-31.396**	-9.378**
Germany	0.021***	12.901*	0.312***	-0.140	-3.355**	0.111
Hong Kong	1.196	19.925***	103.136***	-67.417***	0.233	0.898
India	-0.036	126.614*	442.030**	-288.902**	-0.003	-3.321
Indonesia	-1.111***	49.210*	-317.734*	208.932*	-1.149**	0.385
Italy	0.083	99.264*	7.629***	-4.943***	-0.014	-0.361
Japan	-0.083	130.861*	1.133	-0.645	0.013	0.607***
Korea	0.001	0.824*	0.022	-0.013	-8.400	0.001
Luxemburg	0.013**	5.408*	1.733*	-1.072*	-0.000	0.108***
Mexico	-0.0244	9.384	1.014	-0.646	-0.002	0.061
Netherlands	3.089	6.753	1723.176	-831.925	-1.148	-5.593
Pakistan	0.026	-0.037	0.002	0.002	0.000	0.377
Russia	0.435	97.475*	-59.202	39.010	-0.006	-0.809

Saudi Arabia	67.296**	69.077**	12937.300	-8480.489	-63.283**	-0.600
Singapore	-0.086	49.844*	-5.309***	3.519**	-0.206	1.102**
South Africa	13.345***	318.808*	0.788***	-0.451***	-9.007***	-1.613
Spain	0.786	117.384**	1044.831	-684.621	-0.342	1.385
Sweden	4.532	-133.419	18014.010	-11808.800	-3.397	4.065
Switzerland	0.359*	-8.699	-15.397	10.084	-0.258*	0.019
Turkey	-5.314***	43.291	-155.734	103.144	4.799	-0.488
UK	-0.026	-19.149***	40.672***	-26.618***	0.315**	-0.056

*0.01, **0.05 and ***0.10 level of significance

4.5.1. Evidence to Determine LLPs through Capital Management

The above table presents the empirical evidence for the study hypothesis that capital management exerts positive effects on the loan loss provisions. The capital management coefficient suggests positive effects on the LLPs in align with the study of Moyer (1990) for the banks in Argentina, France, Germany, Luxemburg, Saudi Arabia, South Africa and Switzerland. In this case it may be argued that the banks in these countries in order to enhance their Tier II capital enhance their LLPs through enhancement in capital management. The above table also presents negative significant coefficient of the capital management for the banks in Brazil, Canada, China, Indonesia, and UK. This negative coefficient leads to the conclusion that any increase in the capital management reduces the LLPs in contradictory to the study of Ajekwe et al (2017).

4.5.2. Earnings Management and LLPs

The earnings management has been found to be positively significant for the banks in USA, Argentina, Australia, Belgium, Brazil, Canada, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, Korea, Luxemburg, Russia, Saudi Arabia, Singapore, South Africa and Spain. These coefficients reported in table 4.34 lead to the argument that any increase in

the earnings management brings positive effects on the LLPs in align with the study of Ahmed et al (2014). Hence the negative coefficient of the earnings management for the banks in UK suggests any enhancement in the earnings management reduces the LLPs in contrary to the research hypothesis and the study of Abaoub et al (2013).

4.5.3. Signalling and LLPs

The positive coefficients of the signaling reported in table 4.34 for the banks in Australia, Belgium, China, Germany, Hong Kong, India, Italy, Luxemburg, South Africa and UK suggest that signaling exerts positive effects on the LLPs in align with the study of Abu-Serdaneh (2018). The study hypothesis has been rejected in case of Indonesia and Singapore as the negative coefficient of the signaling suggested the reduction in the LLPs due to enhancement in the signaling in contrary to the study of Karimiyan et al (2013).

4.5.4. Credit Quality and LLPs

The significant negative coefficient of the credit quality for the banks Australia, Belgium, China, Hong Kong, India, Italy, Luxemburg, South Africa and UK supports the study hypothesis that the credit quality exerts the negative effects on the LLPs. The credit quality is the novelty of this study and its coefficients are significant positive for the banks in Indonesia and Singapore. These positive coefficients are contrary to the study hypothesis as they suggests that the credit quality of the banks enhances their LLPs.

4.5.5. Leverage Ratio and LLPs

The study hypothesis that the leverage ratio exerts negative effects on the LLPs has been accepted in case of the banks in France, Germany, Indonesia, Saudi Arabia, South Africa and

Switzerland. As the negative coefficient of the leverage ratio in these countries suggests that any increase in the bank leverage reduces the LLPs. In contrary to the study hypothesis the positive coefficient of the leverage ratio for the banks in Argentina, Brazil, Canada, China and UK suggests that any increase in the leverage ratio enhances the LLPs.

4.5.6. Output Level and LLPs (pro-cyclicality of LLPs)

The study hypothesis suggests that business cycles exerts negative effect on the LLPs have been accepted in case of France. The negative coefficient of the output level suggests the presence of pro-cyclicality of the LLPs in France in align with the study of Skala (2015). In contrary to the study hypothesis the positive coefficient of the output level in Belgium, Brazil, China, Japan, Luxemburg and Singapore suggests that the output level exerts positive effects on the LLPs. These findings leads to the argument that the LLPs are countercyclical in these countries in align with the study of Caporale et al (2018).

4.6. Determinants of the Capital Buffers

The study second model has been build up to empirically investigate the determinants of the capital buffers for the banks in the BCBS member countries and in Pakistan. Table 4.35 presents the results of the data analysis through the generalized method of moment for model II. Model II comprises of the capital buffers as the dependent variable and the explanatory variables include the cost of raising new equity, the cost of failure, the operational risk, the speed of adjustment, the bank size and the output level.

Table 4. 35 Data Analysis through the Generalized Methods of Moment (model-II)

Variables	Cost of Raising New Equity	Cost of Failure	Operational risk	Speed of Adjustment	Bank Size	Output level

Countries	Coefficients	Coefficients	Coefficients	Coefficients	Coefficients	Coefficients
U.S.A	-18.422*	4.005	0.023*	0.469*	-0.293*	0.0289
Argentina	-831.492*	1764.842*	-0.015	0.416*	-0.012	-3.765
Australia	-1113.047	2505.912	0.111	0.559*	-2.779	-0.502
Belgium	-7601.622*	18778.590*	-7.068***	0.024	22.993**	0.676
Brazil	63.558*	-141.417*	0.001**	0.227*	-0.025*	0.0419*
Canada	-60.307*	153.507*	0.011*	0.381*	-0.054*	0.063**
China	-17.176*	17.512*	0.007**	0.408*	0.104*	0.0861*
France	-3.315***	0.037	0.004	0.239	-0.059	0.010
Germany	-168.427*	167.627*	0.112*	0.117	-0.424*	-0.111
Hong Kong	-3.991**	5.292**	-0.000	0.241*	0.016***	-0.043
India	-48.952*	63.206*	0.027***	0.648*	-0.176**	0.042
Indonesia	-38.579*	53.077*	0.019**	0.615*	-0.151*	-0.032
Italy	-118.343*	171.110**	0.134*	0.744*	-0.465*	0.007
Japan	-36.511*	153.264*	-0.006	0.227*	-0.016	0.040
Korea	-639.464*	632.125*	0.564*	0.921	-0.445*	0.093
Luxemburg	-197.675*	165.257	1.165**	0.729*	-1.271*	0.439***
Mexico	-147.073*	168.683*	0.203*	0.732***	-0.472*	0.187
Netherlands	-14.519*	16.436*	0.016	0.068	-0.086	0.058**
Pakistan	0.113	0.606*	0.118*	0.052	-0.173*	0.197
Russia	-7.003*	17.814*	-0.022*	0.035	0.226*	0.007
Saudi Arabia	-7.875*	12.626*	-0.001	0.265*	0.017	0.033*
Singapore	-72.247*	135.663**	0.066**	0.610*	-0.232	0.187
South Africa	-101.892*	143.805*	0.114*	0.354*	-0.283*	0.076
Spain	-18.129*	31.139*	0.016*	0.304*	-0.213*	0.001
Sweden	-18.967*	37.962*	0.015	0.106**	-0.184*	0.028
Switzerland	-38.345*	83.901*	0.015*	0.365*	-0.145*	0.055*
Turkey	-34.239*	68.813**	0.005*	0.438*	-0.099*	0.046*
UK	-33.536*	1.420***	0.067*	0.461*	-0.508*	0.032

*0.01, **0.05 and ***0.10 level of significance

4.6.1. Cost of Raising New Equity and Capital Buffers

The study hypothesis that the cost of raising new equity have positive effects on the capital buffers have been significantly explained by the Brazilian banks. Hence the significant evidence suggests that the cost of raising new equity reduces the capital buffers for the banks

in USA, Argentina, Belgium, Canada, China, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, Korea, Luxemburg, Mexico, Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey and UK in contrary to the study of Estrella (2004).

4.6.2. Cost of Failure and Capital Buffers

The empirical results suggests that the cost of failure leads to the creation of the capital buffers in align with the study of Lindquist (2003) for the banks in Argentina, Belgium, Canada, China, Germany, Hong Kong, India, Indonesia, Italy, Japan, Korea, Mexico, Netherlands, Pakistan, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey and UK. Hence in contrary to these significant results of Brazilian banks suggest negative effects of the cost of failure on the capital buffers. It may be argued that in case of Brazil increase in the cost of failure reduces the capital buffers and any reduction in the cost of failure enhances the capital buffers in contrary to the study hypothesis. It may be argued that the banks in Brazil are willing to pay regulators penalties instead of raising the capital buffers as a result of rise in the cost of failure.

4.6.3. Operational Risk and Capital Buffers

The novelty of this research is to empirically investigate the study hypothesis that the operational risk exerts positive effect on the capital buffers. The findings of the study suggests that the operational risks are positively effecting the capital buffers for the bank in USA, Brazil, Canada, China, Germany, India, Indonesia, Italy, Korea, Luxemburg, Mexico, Pakistan, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey and UK. These

findings lead to argument that increase in the operational risk enhances the creation of the capital buffers during the study period. In contrary to these finding the empirical evidence for the banks in Belgium and Russia suggests that the operational risk has been negatively effecting the capital buffers. So these findings may lead to argument that in case of the banks in Belgium and Russia any enhancement in the operational risk reduces the capital buffers. The reduction in capital buffers indicates that any increase the operational risk has not been offset by the increase in capital buffers.

4.6.4. Speed of Adjustment and Capital Buffers

The study hypothesis that the speed of adjustment exerts negative effects on the capital buffers have been rejected by the positive coefficient of the speed of adjustment for the banks in USA, Argentina, Australia, Brazil, Canada, China, Hong Kong, India, Indonesia, Italy, Japan, Luxemburg, Mexico, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey and UK. These findings of the study are contradictory with research of Eliskovski (2014) as empirical evidence suggests that any enhancement in the speed of adjustment enhances the capital buffers.

4.6.5. Bank Size and Capital Buffers

The study hypothesis that the bank size exerts positive effects on the capital buffers have been accepted for the banks in Belgium, China, Hong Kong and Russia in aligned with the findings of Carvallo et al (2015). These findings lead to argument that as the size of bank enhances capital buffers also enhances. The study hypothesis has been rejected by the significant negative coefficients of the bank size for banks in USA, Brazil, Canada, Germany, India,

Indonesia, Italy, Korea, Luxemburg, Pakistan, South Africa, Spain, Sweden, Switzerland, Turkey and UK. These findings leads to argument in align with the study of Atici and Gursoy (2013) that bank size has negative effects on capital buffers. In continuation to this argument it may be concluded that larger bank size leads to reduction in capital buffers and small size banks kept large amount of capital buffers.

4.6.6. Business Cycles and Capital Buffers (Pro-cyclicality of capital buffers)

The study hypothesis that business cycles exert negative effects on capital buffers has been rejected in all countries under the study period. The findings are contrary to the study of Jokipii and Milne (2006) as there is no empirical significant evidence of pro-cyclicality of capital buffers has been found. Hence the significant coefficients of output level suggests that capital buffers are countercyclical for Brazil, Canada, China, Luxemburg, Netherlands, Saudi Arabia, Switzerland and Turkey. These findings suggest that as output level has positive effects on capital buffers therefore it may be concluded that the capital buffers are countercyclical in contrary to the study of Shim (2013).

4.7. Impact of Loan Loss Provisions and Capital Buffers on Bank Lending

To empirically investigates the impact of the LLPs and capital buffers on the bank lending, the study variables of model III has been tested through the generalized method of moment. The results of the data analysis have been presented in table 4.36 where the dependent variable bank lending has been tested against the explanatory variables including the loan loss provisions, the capital buffers, the interest rates, the cash holdings, the output level and the size indicators (controlled variable).

Table 4. 36 Data analysis through the Generalized Method of Moment (model-III)

Variables	Loan Loss Provisions	Capital Buffers	Interest Rates	Cash holdings	Size Indicators	Output level
Countries	Coefficients	Coefficients	Coefficients	Coefficients	Coefficients	Coefficients
U.S.A	-0.007*	0.032*	0.067	-0.375***	0.004*	0.050**
Argentina	0.002	0.036	7.456	73.917	1.200	-2.765
Australia	-0.003	-0.017	-38.992	0.000	-0.211	-0.229
Belgium	0.006	0.000	0.024	-1.447	0.027	-0.092
Brazil	0.002*	0.509**	0.003	-6.661	0.042*	-0.0388
Canada	0.002	-0.124**	-0.523	9.941**	0.035*	-0.173***
China	-0.000	0.163***	0.372	-1.910	0.021	-0.074*
France	2.832	71.031	-7.171	-3178.083	-16.368	-102.919
Germany	-0.015*	0.002	0.033	-1.128	0.041*	-0.102*
Hong Kong	-0.015*	0.207	-5.507	-4.086	0.019	-1.360
India	0.001	-1.870	-225.500	-1462.874	-0.208	-7.525
Indonesia	-0.003*	0.001	3.227*	-5.591*	0.055*	-0.144*
Italy	0.094	-0.605	-267.974	2.442	-1.078	19.100
Japan	-7.612	-10.056	-1778.953	942.125	-2.344	46.575
Korea	-65.505	-1.451	-399.303	15219.600	4.011	-12.746
Luxemburg	30.262	-0.013	-2.735	1475.015	39.045	-22.347
Mexico	1.186	-2.496	-92.632	453.962	1.496	34.776
Netherlands	-0.002*	-0.009	-0.150	-7.378*	0.0305	-0.011
Pakistan	0.0180	-0.217*	-0.539	1.543	-0.053**	0.101
Russia	-0.002*	0.009	-0.279***	-7.568*	0.026*	-0.051**
Saudi Arabia	-0.011*	-0.063	0.333	-2.142*	0.004	-0.003
Singapore	0.029*	-0.038	1.291	6.044*	-0.003	-0.082***
South Africa	0.000	0.019	-0.018	8.105*	0.007	-0.013
Spain	0.001	7.140	-0.234	5.284*	0.014	-0.019
Sweden	0.001*	0.062	-0.020	5.796*	0.015	-0.024
Switzerland	0.179**	0.008	-2.360	-15.481*	0.018	0.024
Turkey	0.000	0.048	-0.083	4.825*	0.001	4.746
UK	1.556	551.322*	5.402	-9406.634	6989.715*	36.359

*0.01, **0.05 and ***0.10 level of significance

4.7.1. Loan Loss Provisions and Bank Lending

The study hypothesis that the LLPs exerts negative effect on the bank lending has been accepted for the banks in USA, Germany, Hong Kong, Indonesia, Netherlands, Russia and Saudi Arabia. It may be argued that as the LLPs rises as a cushion against bad loans as a result

the bank lending reduces. On contrary to these findings the positive significant coefficients of the LLPs for the banks in Brazil, Singapore, Sweden and Switzerland suggest that any increase in the LLPs lead to enhancement in the bank lending.

4.7.2. Capital Buffers and Bank Lending

The empirical findings are in align with the previous research of Gambacorta and Mistrulli (2004) that it is less costly to cut the cost to adjust the lending than to the capital in case of the banks in Canada and Pakistan. These results suggest that as the capital buffers rise the bank lending reduces and lead to argument that for the Canadian and Pakistani banks it is less costly to reduce the lending than to enhance the minimum risk weighted regulatory capital. Secondly another hypothesis suggests that as the capital buffers enhance the banks' ability to lend in the risky ventures rises (Atici & Gursoy, 2013). The study hypothesis that the capital buffers exert positive effect on the bank lending have been accepted in case of the banks in USA, Brazil, China and UK in align with Atici and Gursoy's hypothesis (2013).

4.7.3. Interest Rates and Bank Lending

The study hypothesis that the interest rates exert negative effects on the bank lending has been accepted in Russia. The finding are align with the Kamber & Mohanty (2018) as the interest rates play a major role in monetary policy transmission in the economic system significantly explained for the banks in Russia. In contrary to this the significant results indicate that the bank lending is positively affected by the interest rates in Indonesia. The banks lend more in Indonesia as the lending rates rise and reduce the lending as the lending rates reduce.

4.7.4. Cash Holdings and Bank Lending

The effects of the cash holdings has been controlled by Gambacorta and Mistrulli (2004) model as it is bank specific. But it is no more bank specific as Basel III has implemented the minimum liquidity coverage ratio with the objective that the banks must keep this minimum amount to fulfil the funding needs for 30 days of stress period. The significant results accept the study hypothesis that the cash holdings exerts negative impact on the bank lending for the banks in USA and Indonesia. The study hypothesis has been rejected in case of the banks in Canada as the cash holdings rises the bank lending also rises. For instance the banks maintains enough cushion against the stress period to carry on the bank operation that's may lead to increase in the bank lending. Secondly in the risk weighted assets calculation, zero percent risk weight have been assigned to the cash holdings (BCBS, 2010).

4.7.5. Output Level and Bank Lending (Pro-cyclicality of Bank Lending)

The study hypothesis that the output level exerts negative effects on the bank lending has been accepted for the banks in Canada, China, Germany, Indonesia, Russia and Singapore. The results are in aligned with the study of Behn et al (2016) that the bank lending is pro-cyclical as the bank lending enhances during recession and reduces during expansion. In contrary to this the output level in USA has significant positive effects on the bank lending. It may leads to argument that the bank lending enhances during expansion and reduces otherwise. Thus the bank lending in case of the banks in USA is countercyclical.

4.8. Determinants of the Loan Loss Provisions, the Capital Buffers and their Impact on the Bank Lending (over the consolidated sample, Excluding USA banks and BCBS member countries)

The data have already been tested for the determinants of the LLP, the capital buffer and their impact on the bank lending separately for each country in the selected sample. Table 4.37 presents the consolidated data analysis results for each model tested through the generalized method of moment. Then data split technique has been employed to empirically investigate each model. The table presents the results of the consolidated data of the selected sample, excluding the USA banks and the BCBS member countries banks. The consolidated data comprises 2251 banks from the study sample countries and then the data have been split into two categories (Excluding the USA banks and the BCBS member countries banks). The consolidated data comprises of 700 American banks which is almost 31.1 percent of the total banks in sample and the remaining banks are of the rest of the sample countries. Therefore the sample split technique is employed to empirically investigate the research models on excluding the USA banks as suggested by Valencia and Bolanos (2018). By excluding the USA banks the sub sample is of 1551 banks that includes all the sample countries banks except the USA. The Basel Committee of Banking Supervisions (BCBS) includes all the countries of research sample except Pakistan. Pakistan is not member of the member of the BCBS but as the Pakistani banks have the international presence and are subject to implementation of Basel III (SBP, 2013). Hence it is not permanent member of the BCBS it is not included in the sub sample of the BCBS member countries.

Table 4. 37 Consolidated Results of the Generalized Method of Moment

Models	Variables	Consolidated	Excluding USA banks	BCBC Members
	Capital Management	-0.000	-0.001	0.002
	Earnings Management	8.626**	1.781**	17.119*
	Signaling	0.029***	0.027***	0.269
	Credit Quality	0.015	0.014	-1.407
	Leverage Ratio	-3.E-05*	-3.E-05*	-3.3E-0*
Model I	Output level	-0.259	-0.276	-0.192
	Cost of Raising New Equity	-6.115**	-2.191**	-19.816*
	Cost of Failure	-0.087	-1.609	16.657***
	Operational risk	-0.018*	-0.024*	-0.0124*
	Speed of Adjustment	-0.582*	-0.521*	0.583*
	Bank Size	-0.023	0.051	-0.021
Model II	Output level	-0.494***	-0.554***	-0.493***
	Loan Loss Provisions	-1.081	-0.926	0.550
	Capital Buffers	-9.832*	-14.628*	-10.718*
	Interest Rates	-274.565*	-388.265*	-258.979*
	Cash holdings	-0.005*	-0.007*	-0.005*
	Size Indicators	89.299*	141.113*	165.785*
Model III	Output level	-2831.244*	-3105.947	-2834.230*

*0.01, **0.05 and ***0.10 level of significance

4.8.1. What determines the LLPs (in the consolidated data, excluding the USA banks and the BCBS members)

The overall significant determinants of the LLPs in the consolidated sample data and in the banks excluding USA banks are the earnings management, the signaling and the leverage ratio. Any increase in the earnings management and the signaling brings significant increase in the LLPs in align with the research of Ahmed et al (2014) and Abu-Serdaneh (2018). The novelty of this study leverage ratio brings significant negative effects on the LLPs in align with the study hypothesis as indicated by the consolidated results, excluding the USA banks and the BCBS member countries banks. It may leads to argument as the bank leverage rises

it leads to reduction in the LLPs. The hypothesis of the signaling brings positive effect on the LLPs is rejected in case of the BCBS member countries banks but the results of the earnings management are aligned with the study of Abaoub et al (2013). Therefore it may be argued that the consolidated sample banks during the study period are involved in the earnings management and the signaling to enhance the LLPs and BCBS members countries are involved in the earnings management to enhance the LLPs. Secondly the bank leverage rises its LLPs reduce and any reduction in the bank leverage suggests positive impact on the LLPs. There is no significant evidence found in all three cases the presence of pro-cyclicality of the loan loss provisions.

4.8.2. What Determines the Capital Buffers (in the consolidated data, excluding the USA banks and the BCBS members)

Table 4.36 suggests that the significant determinants of the capital buffers during the study period includes the cost of raising new equity, the operational risk, the speed of adjustment and the general output level. The study hypothesis that the cost of raising new equity exerts positive effects on the capital buffers has been rejected and significant negative coefficient in all three cases suggest reduction in the capital buffers due to the increase in the cost of raising new equity. The study hypothesis that the operational risk exerts positive effects on the capital buffers has been significantly rejected as the operational risk brings significant negative effects on the capital buffers in all three cases mentioned in the above table. The negative coefficient of the speed of adjustment supports the study hypothesis that increase in speed of adjustment reduces the capital buffers in case of the consolidated data and excluding the USA banks. On the contrary to the study hypothesis the banks in BCBS member countries suggests

that the speed of adjustment exerts positive effects on the capital buffers. Hence the BCBS member countries banks reports another determinants of the capital buffers that is the cost of failure. The results support the study hypothesis that any increase in the cost of failure exerts positive effects on the capital buffers. But the consolidated data and sub sample excluding the USA banks do not support the hypothesis. The significant negative coefficients of the output level suggest adverse effects of the output level on the capital buffers. Therefore it leads to argument that the capital buffers are pro-cyclical as just 1 unit increases in the output level reduces the capital buffers by 0.493793 units for the consolidated sample countries banks in align with the study of Ayuso et al (2004).

4.8.3. Impact of the LLPs and the Capital Buffers on the Bank Lending (in the consolidated data, excluding the USA banks and the BCBS members)

The negative significant coefficient of the capital buffers rejects the study hypothesis in all three samples and leads to argument that the interaction between the capital buffers and the bank lending is negative. The banks during the study period increases its capital buffers that leads to reduction in the bank lending. This phenomena supports the hypothesis that it's better to cut the costly lending than to increase the cost of capitalization (Gambacorta and Mistrulli, 2004). This negative interaction is higher for the banks excluding the USA banks than for the BCBS member countries banks and for the consolidated sample data. The coefficient of the interest rates support the study hypothesis that the interest rates exert negative effects on the bank lending in align with the study of Beutler et al (2017). The interest rate effects on the bank lending is higher for the banks excluding the banks in USA than for the consolidated

data. However the interest rate effect on the banks in the BCBS member countries as whole is lower than the consolidated data.

Basel III introduces the liquidity coverage ratio so that the minimum regulatory cash may be utilized and fulfils the liquidity requirement for thirty days of stress period (BCBS, 2010). Therefore the cash holdings impact on the bank lending has been tested and empirical results suggests 1 unit increase in the cash holdings reduces the bank lending by 0.004880 units for the consolidated data, 0.007297 units for the banks excluding USA banks and 0.004956 units for the BCBS member countries banks in align with the study hypothesis. This explanatory variable has higher impact on the banks excluding the USA banks than on the consolidated data. The empirical investigation while testing the effects of the output level on the bank lending suggests the significantly negative effect in contradictory with the study of Braslins et al (2014) and aligned with the study of Behn et al (2016). The negative significant coefficients of the general output level leads to acceptance of study hypothesis that the output level exerts negative effects on the bank lending. The study suggests the presence of pro-cyclicality of the bank lending in align with the study of Sakti and Zulkhibri (2018). The banks (excluding USA banks) reduction in the bank lending is greater than the consolidated data due to rise in the general output level. It may be argued that any expansion in the general output level reduces the bank lending and the bank lending is pro-cyclical across the sample countries.

4.9. Country Specific Effects on the LLPs, the Capital Buffers and the Bank Lending

To empirically investigate the qualitative aspect of the research each country dummy is used against the dependent variables of the study models to test the country specific effect. The Dummy has been created in this way that one is for the USA banks and zero for the other banks and this pattern is followed across the empirical investigation for each country. Table 4.38 shows the country specific effect on the LLPs, the capital buffers and the bank lending.

Table 4. 38 Country specific effects

Country	Loan loss provisions	Capital Buffers	Bank lending
USA	-0.0212	-0.349*	-840.267*
Argentina	-0.034	-0.624**	-589.197*
Australia	0.063	1.438*	-585.995*
Belgium	-0.173	22.257*	-581.367*
Brazil	-0.103	-0.103	-597.163*
Canada	-0.020	-0.252	-583.462*
China	-0.009	0.324	-635.209*
France	-0.017	-0.306	-570.060**
Germany	0.007	0.489*	-650.502*
Hong Kong	-0.065	-0.330	-582.141*
India	-0.192***	-0.109	-591.010*
Indonesia	-0.225**	-0.240	-596.073*
Italy	0.573*	-0.516*	-598.304*
Japan	-0.024	-0.400*	-600.305*
Korea	-0.005	0.634***	-597.096*
Luxemburg	-0.014	0.116	-570.401*
Mexico	-0.106	0.060	-578.592*
Netherlands	0.229	-0.315	-584.799*
Pakistan	-0.032	-0.58*	-584.935*
Russia	0.127***	-0.444*	-613.287*
Saudi Arabia	0.122	-0.423	-581.394*
Singapore	-0.066	-0.292	-579.054***
S. Africa	-0.375	-0.147	-582.964*
Spain	-0.158	-0.368	-586.909*
Sweden	0.397	-0.416	-580.608*
Switzerland	-0.005	-0.304***	-598.290*
Turkey	0.028	-0.289	-587.455*
UK	-0.031	-0.275*	-7280.489*

*0.01, **0.05 and ***0.10 level of significance

The data analysis of the consolidated data of the LLPs, the capital buffers and the bank lending while taking country specific effect as explanatory variable. The results reported in the above table suggests that on the consolidated data of the LLPs the positive country specific effect is

significantly explained by Russia and negative effect is significantly explained by India and Indonesia. It may be argued that due to country specific effect the LLPs are rising in Russia and due to the country specific effect it reduces in India and Indonesia.

The country specific effect is also empirically investigated on the capital buffers. The qualitative aspect of study suggests that the country specific effect for the capital buffers is significantly negative in USA, Argentina, Hong Kong, Italy, Japan, Pakistan, Switzerland and UK while it is significantly positive for Australia, Belgium, Germany and Korea and there is no significant country specific effect found in the rest of the data. Hence the country specific effect on the bank lending has also been tested and it is significantly negatively explained by all the countries in the sample data for the bank lending.

CHAPTER # 5

CONCLUSION

This study has been carried out to investigate pro-cyclicality of the loan loss provisions, the capital buffers and the bank lending along with the objective to investigate the determinants of loan loss provisioning, the capital buffers and their impact on the bank lending. To investigate the research objectives, the data have been collected from the BCBS member countries and Pakistan.

The empirical investigation leads to the conclusion that the LLPs are determined through capital management, earnings management, signaling, credit quality, leverage ratio and there is the evidence of the presence of Pro-cyclicality of LLPs in France. These findings may leads to argument that banks under study are complied with minimum capital regulations through increase in their LLP's (Moyer, 1990). These LLP's are subject to deduction of bad debts and an inadequacy in the LLPs leads to capital shortages during downturn with undesirable pro-cyclical effects on the level of economic activity (Cavallo & Majnoni, 2001). This phenomena may leads to the banks that they may enhances their LLPs during downturn to comply with minimum capital regulations and as cushion against bad debts. This tendency may reduce the bank ability for further lending (Abdullah et al, 2014). The earnings management determines the LLPs leads to the argument that the banks manage their higher earnings through provisioning in good times (LLPs are integral part of Tier II capital under Basel II & III) in align with the study of Ahmed et al (2014). Thus the implementation of creditors (depositors) rights may lead to shortage of regulatory capital as LLPs are determined through earnings

management (Adzis et al, 2016). It may be argued that the determination of LLPs through earnings management leads to the shortage of capital during downturn (Abu-Serdaneh, 2018).

The determination of LLPs through signalling indicates that any increase in bank LLPs sends positive signal to the market about the bank soundness that the bank bad debts are secured through LLPs (Karimiyan et al, 2013). The banks outside investors takes increase in LLPs as positive signal on the basis of the sound provisioning hypothesis (Annandarajan et al, 2006). While signaling as determinant of LLPs negates the sound provisioning hypothesis as the banks facing financial distress appears to engage in signaling relative to financially healthy banks (Leventis et al, 2010). The study findings suggests mixed results on the determination of LLPs through credit quality. The negative effects of the credit quality on LLPs suggests that the banks LLPs fairly reflects the quality of their loan portfolio. While the positive determination of LLPs through credit quality suggests that the LLPs are not fairly reflecting the quality of their loan portfolio. It may lead to the argument that the bank may faces the shortage of capital during the crisis period. The study findings indicates both reduction and enhancement in LLPs due to increase in leverage ratio for the banks under study. It may lead to argument that the reduction in LLPs are not fairly reflecting the banks anticipation of future losses due to enhancement in leverage ratio. It may indulge the bank in capital crisis situation if bad debts are more than the anticipated LLPs.

The study findings indicates that the determinants of capital buffers includes cost of raising new equity, cost of failure, operational risk, speed of adjustment, bank size and capital buffers shows pro-cyclical and countercyclical behaviour. The findings that are related to cost of failure and speed of adjustment are aligned with previous studies (Adesina & Mwamba; 2018,

Bouchina; 2018, Eliskovski; 2014, Vu & Turnell; 2015) and provide support for the study hypothesis that banks capital buffers are also determined through operational risk. The findings indicates that the banks to comply with minimum regulatory capital maintains capital buffers (Haq, 2018). The operational risk determines capital buffers positively shows that the banks create a cushion in capital buffers against any loss arises due to failure of systems. However the study results related to cost of raising new equity contradicts with Estrella (2004) as rise in cost of raising new equity leads to reduction in capital buffers. It indicates that after implementation of Basel capital regulations banks are found to build up capital buffers by raising new equity. Pro-cyclicality of capital buffers may offer some support to the view that the banks may not properly take into account the cyclical nature of output and therefore tend to underestimate risk during economic upturn. This may lead to capital shortages during economic downturn (Ayuso et al, 2004).

The empirical findings indicates that the bank lending is affected by the loan loss provisions, capital buffers, interest rates, cash holdings and there is the evidence of the presence of pro-cyclicality of bank lending. The findings are aligned with the study of Gambacorta & Mistrulli (2004) for effects of capital buffers and interest rates. The study results support the research hypothesis that any enhancement in LLPs reduces bank lending. Thus it may be argued that as the LLPs increases in anticipation of future loan losses lead to upward shifting of assets weights and consequently contributes towards reduction in bank lending. Secondly, the findings support the study hypothesis that after implementation of minimum liquidity coverage ratio (Cash holdings) under Basel III, it may reduce bank lending. The pro-cyclical behaviour of bank lending suggests that banks are not taking into account the business cycle while enhancing their bank lending. This under estimation of risk may enhances the chances

of bad debts on the enhancement of loan portfolio during the recession. This tendency not only enhances the period of business cycle but may lead to capital shortage due to heavy losses on the loans granted during recession (Akinboade & Makina, 2009).

5.1. Practical and Theoretical Implications of the Study

The implications of the study are further divided in to practical and theoretical implications.

5.1.1. Practical Implications of the Study

The study provides insight to the banking regulators that LLPs are determined through capital management, earnings management, signaling, credit quality and leverage ratio. Banking regulators are in the positions to formulate and implement with the help of International Accounting Standard Board such accounting practices for LLPs that fairly reflects the anticipated future losses and the losses that can be rationally quantified to avoid the situation of capital shortage during the period of stress. The determination of LLPs through earnings management findings are beneficial for bank creditors to pursue the proper implementation of creditors' rights. The study findings on signaling as determinant of LLPs have practical implications for the banks investors (shareholders) point of view, as it uses to reflect the financial soundness of the bank to the financial markets.

The study findings has practical implication for the bank creditors (depositors) and equity holders about the soundness of the bank as the capital buffers comprises of cost of failure, speed of adjustment and operational risk.

The ineffectiveness of the interest rates as monetary policy tool in Indonesia has the practical implications for the central bank of Indonesia to devise such policies and practices to ensure its effectiveness. Secondly, the banks have to comply with minimum liquidity coverage ratio

under Basel III and therefore the management may devise such policies and practices that their lending business may not be affected by increase in cash holdings while considering policies and procedures implemented in the Canadian banks.

The research findings on the countercyclical capital buffers are beneficial for the policy makers and regulators that they may study the policies and procedures adopted in the sample countries and may implement them where the capital buffers are pro-cyclical. The study has practical implications for the fiscal policy holders to devise such policies and procedures to address the issue of pro-cyclicality of bank lending, which contributes towards enhancing the period of economic cycle especially during recession

5.1.2. Theoretical Implications of the Study

The study also has theoretical implication as it extends Cavallo & Majnoni (2001) model with addition of credit quality and leverage ratio. Secondly, the extended models of the study are tested through the data from banks in Basel Committee on Banking Supervision member countries and Pakistan. Thirdly, the data collected for period from 2008 to 2016 that covers the period of Basel II & III regime. Fourthly, it extends the model of Ayuso et al (2004) with addition of operational risk and the study also extends the model of Gambacorta and Mistrulli (2004) model with addition of loan loss provisions.

5.2. Limitations of the Study

The undesirable noise has affected the study results as the data of the study has been collected for the period from 2008 to 2016. The study has no control over the possible changes of the bank's behaviour due to financial crisis for period from 2007-2008, Lehman Brothers bankruptcy in 2008 and the great recession hits from 2007 to 2012. The most affected

countries from the great recession are Argentina, Ukraine and Jamaica. Some severely affected countries are Ireland, Russia, Mexico, Hungry, the Baltic State, United States and UK while relatively less affected countries are China, Japan, Brazil, India, Iran, Peru and Australia (Ali et al, 2009).

Secondly, the risk weighted assets are calculated under the Basel II & III framework but the supplement to Basel III was introduced by the BCBS in December 2017 to be implemented till 2022 as the risk weighted assets are criticized on the grounds of excessive variability (BCBS, 2017). Thirdly, the data collection period includes the Basel III implementation period. Fourthly, the calculation of the LLPs are different across the countries, so the data may pick up the noise from the national regulatory policy for calculation of the LLPs.

Another noise in the data is that the data set comprises of unequal distribution of the banks from each country as the consolidated data comprises of 31.097% of the banks from USA, 8.973 percent banks from China and 11.106 percent banks from Germany.

5.3. Future Research Directions

The future researchers are recommended to calculate the risk weighted assets formulated under the policy supplement of Basel III issued on December 2017 by the BCBS implementation framework is up till 2022. Secondly, analyse the Pro-cyclicality of the LLPs by bifurcating into specific and general LLPs. Thirdly the minimum capital required to maintain against the operational risk (which will be implemented up till 2022) may be taken while calculating the minimum capital ratio (MCR). Fourthly, to carry out the empirical investigation to find out the causes behind the pro-cyclicality of the bank lending.

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