Impact of Bank and Economic Determinants on Capital Buffer in Pakistan Banking Sector

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Abstract

This paper aims to explore the influence of bank-specific determinants as well as economy specific variable gross domestic product (GDP) on the capital buffer in Pakistan. To investigate this relationship 30 banks sample is selected working in the Pakistan economy in the period from 2007 to 2014. Regression and Generalized Method of Moment (GMM) models were used to investigate relationships. The result suggested that I) GDP impact on buffer capital is positive. II) Total Liabilities over Total Assets, liquidity bank size and lag of buffer capital put a positive and significant effect on buffer capital. III) Non-Performing loan and loan growth impact also positive but insignificant. IV) Return on Equity and Net Profit put negatively insignificantly impact on buffer capital.

1 Introduction

Banks are the key player in the financial system of any country. In this present era of globalization banking sector dealing not limited to one single country. Banks face greater risk as compared to any other sector in global financial crises, in global financial crises banks appeal and face significant interest. Dealings of banking sector usually have the most risky environment as compared to other sector, so researcher always motivate to address the different issue on the banking sector to overcome and find out the problem of the banking sector.

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Capital requirement of banks is very critical, especially in financial crises. Capital requirement and business cycle relationship is a very much essential and addressable issue in the literature. Capital structure decision in every sector is most important topic since 1970, same as in banking sector capital structure decisions also have great importance and very much the growing question. Researcher concludes numeral technique and method for the optimal capital structure technique for the baking sector.

In literature, the capital buffer is defined as the specified proportion amount of capital, that's banks must maintain to overcome any immediate risk. This mentioned amount helps banks to save their operations in risky and in a financial crisis environment. This specified amount also protect banks against insolvency crisis. Banks also hold this capital buffer for variety of motivation and justification like 1) for growth and opportunities 2) for the reflection of soundness towards customer and competitor having well manage capital amount 3) to ensure themselves to full fill capital buffer amount 4) internal capital assessment model determine by their own risk and uncertain situations.

Capital buffering bring both advantage and disadvantage for the banking sector. Restricting banks operations within the capital amount that banks hold is margin requirement. Capital buffering decrease the development of banks. Advantage of the capital buffer is that it's a parameter for the regulator to determine the vital risk management task for banks. Buffer capital amount also a testing technique for the regulator to continually testing banks stress that they face. Basel committee continually publishes a numeral report of capital standard and capital measurement for the worldwide banking sector, knows as Basel I, II and III. In Basel II regulation, provide a complete report on the importance of banking capital requirement and instruct all central bank adopt very restrict rule of 8% of risk weight assets as a solvency coefficient. This new polices two significant effects on the banking sector one is put dilemma on the banking sector to maintain capital adequacy ratio, and another one is given a lot of healthiness and abilities to the banking sector to handle the uncertain situation and also provide the ability to absorb future losses. At the end, these new regulations also bring a lot of public confidence in general people use as banking sector to settle financial matters.

In Basel III, capital buffer framework obliges all nations to ensure their respective banks appropriate capital buffer rate for bank's credit and third world dealings. This new framework gives an idea to focus only on third country exposure that, firstly bring stability in the domestic framework on the banking sector and secondly ensure the fallow the banking rules and regulation to overcome the instability.

In this study, we try to evaluate the issue for the banking sector of Pakistan. All the listed bank form both industry public and private are include to find out the determinants impact on the banking sector in Pakistan. In this regard, we arrange panel data from to analyze the result and taken 2009-2015 data period. Generalized Method of Moment (GMM) estimator has been employed to reviewing the literature.

1.1 Problem Statement

Banking sector plays a very aggressive role in the financial matter of any country. Dynamic nature of the banking sector, motivate researcher to provide a most suitable method and technique for adoption to overcome risks. A lot of work done on this topic in a developed nation, rather than emerging and developing nations. This study conduct on Pakistan banking sector, to investigate the determinants put the impact of capital buffer on banking sector of Pakistan. This study will be done to investigate the working capacity of the banking sector of Pakistan under

capital buffer requirement and give an answer to the investor, customer and banking supervision about capital buffer importance.

1.2 Literature Gap

From Pakistan point of view a lot of work done banking sectors like banking profitability and capital structure under consideration, but from capital buffering technique, no work initially be done. So this study provides initial step to the researcher for future capital buffering topic emerging topic awareness and set initial step for the future study on the capital buffer.

1.3 Research Question

- How lag of buffer capital affect buffer capital?
- How GDP affect the capital buffer amount?
- Is there any relationship between bank size and capital buffer?
- Is Return on Equity (ROE) affected by capital buffer amount?
- How Non-Performing loan affected by buffer capital?
- Is there any relationship among buffer capital and liquidity?
- Is the bank's margin requirement affect the loan growth of the banks?
- Is there any relation between banks profit and capital buffer amount?
- How loan over total assets affect by bank's capital buffering?

1.4 Objectivity of the Study

Objectivity of the study addresses the following points:

- Find out the relationship among lag of buffer capital with buffer capital.
- Find out the relationship between GDP and capital buffer amount.
- Investigate the relationship between bank size and bank margin requirement.
- To verify the relationship between ROE and bank's margin requirement
- To investigate the relationship among Liquidity and Buffer capital
- To investigate the relation between Non-Performing loan and capital buffer requirement
- To verify loan growth and the bank's margin requirement relationship
- Find out profit and capital buffer relationship
- Investigate loan over total assets in relation with the regulatory minimum capital requirement.

1.5 Importance of the study

This study tries to build a perfect model for the determinants from both points of view using bank-specific factor (Return on equity, bank size, loan growth profit and liquidity) and macroeconomic factor (GDP) impact on the buffer capital amount in the banking sector. This study build model either this specific variable impact positive and negative and provide an ability for taking some future decisions. From this model, banking sector take the initiative in their operational activities in the form assets and liabilities increment or not.

2 Literature Review

(Stolz and Wedow 2010), investigate the relationship between supervisory buffer and business cycle taken as Germany under study. Twelve-year data taken as understudy from 1993 to 2003. Data are categorized in two way large and small banks. The result indicates that small banks face the greater problem as compared to bigger banks. Small banks do not maintain their risk weight assets due to low capital for operation. The result indicate that's low capitalization does not force a retreat from lending.

(Atici and Gursoy, 2013), conducted a study on the Turkish banking sector to investigate the impact of the capital buffer on bank performance form the period (1988-2009) taken 87 banks understudy including both commercial banks and savings deposit and insurance funds. Two-step generalized method of moments model uses to investigate the impact. Purpose of this study is to investigate the impact of economic growth, bank size, and return on equity and Non-performing loans on capital buffers. Data was investigated in two way firstly all 87 banks are analyzed and secondly saving deposit and insurance funds are excluded from the overall data. The result of the study same as Basel III that there is procyclical relation between banks capital requirement and business cycle of the Turkish banking sector, and the countercyclical relationship between banks when SDIF are excluded from the overall data.

(Rosa Fonseca and Gonzalez, 2009), analyzes the determinant of capital buffer on the banking sector, 1337 banks form 70 countries using as a sample to investigate the determinant effect on the capital buffer. The result of the study indicates that cost of deposit and market power of the bank put a positive impact on the capital buffer, although this result varies across the countries due to supervisory regulation and institutions own working behaviour. The result of the study indicate two situations, one is institution quality like better disclosure of accounting matter put a clearly positive impact on the capital buffer and also strengthen the market discipline and market value making. Secondly, restriction on banking working but on the other way reduce the incentive to hold capital buffer, reducing market discipline and market value making.

(Ayuso et al, 2003), conducted a study to investigate the relationship between Spanish business cycle and banking buffer capital, taken 15-year data from (1986-2000). The result of the study showed a significantly negative relationship between the business cycle and banking capital buffer. The result of the study showed that 1% increase in GDP reduces 17% capital buffer. Moreover, the result suggested that, this relationship asymmetric, and closer during the upturn.

(Jokipii and Milne, 2007) investigate the relationship between the capital buffer and the business cycle. European countries data was collected including all type (saving commercial and large banks) from 1997 to 2004. Results suggested that capital buffer in EU15 shows negative co-movement between cycle and buffer capital. Banks working in accession countries showed a significant positive relationship between cycle and buffer capital. Smaller banks also showed significant positive co-movement between cycle and buffer. These all relationship between when analyze only negative co-movement will exacerbate the procyclical impact of BASEL II.

(Lindquist, 2004) conducted study on a sample of 127 Norwegian banks to find determinants of the capital buffer using 25 quarterly base observation from 1995q4 to 2001q4. Risk economic growth, competitor effect, supervisory assurance and buffer determinants of a capital buffer. The result indicates that the non-significant effect of risk on buffer capital, suggesting that more risk

likely affect capital as per as BASEL II. Result also suggested that buffer capital used as insurance against failure to meet capital buffer.

(Miguel Boucinha, 2008), examined determinants of the capital buffer of Portuguese banks taken as an understudy. 17 Portuguese banks data were collected from the data period 1994 to 2004. Non-performing loans, loan growth, return on assets and return on equity used as a determinant of buffer capital. Dynamic panel data was used to find out the result. Ordinary least square (OLS) model was used to estimate the result. Result is suggesting that larger banks maintain less minimum capital requirement due to negative business cycle effect. Result also suggesting that, capital ratio of banks in Portuguese must be increase as per BASEL II requirement. Buffer capital positive influence on bank risk that why capital ratio must be increases to overcome future losses.

(Jean-Charles Rochet, 1992), conducted a study to investigate the relationship between bank margin requirement and commercial bank working behaviour. He analyzes this relationship using two different approaches, firstly study result finds out when banks focus on profit-maximizing and future market growth, in this scenario capital requirement not prevent banks for choosing the very risky or specified technique. Secondly, he finds out the result, when banks think like a portfolio manager, in this situation capital requirement put a significant effect on banking working. At the end, he suggested that banks must maintain capital requirement amount as per instruction of regulatory authority maintain liquidity and overcome future defaults.

(Craig Furfine, 2001), developed a structural, dynamic and economic model how bank manage their loan portfolio under regulatory capital, using United State banks data working in the era of (1989-1997). This paper also investigates three major aspects of U.S banking sector an proposed a model, three aspects are, 1) past and future regulatory capital requirement 2) changes in regulatory monitoring and inspection criteria 3) economic ups down for U.S banking environment. The result suggested that the decrease in loan growth but a significant impact on capital ratio enhancement in future. Secondly, model purpose that there should be time to time changes to renew regulatory capital restriction. All the regulatory capital maintains decision purely base upon economic down and upturns.

(Nier and Baumann, 2006), conducted a study to examine the hypothesis, what's the relationship between banks provided an incentive like to overcome default risk by hold their capital margin. To examine this hypothesis 729 individually banks data were collected from 32 different countries; data period was used from (1993 to 2000) for estimation of the result. Using panel data technique result are find, the result suggested that government provide a lot of safety in low capital margin requirement, in larger capital requirement strong market discipline and banks own accounting disclosure both are equal. Result also indicate that in government support era banks uninsured liabilities and accounting disclosure is decrease and the government provide a high degree of support.

(Chiara Pederzoli and Costanza Torriceli), developed a forward-looking model for the capital requirement changing due to economy downturns. This model was the relationship between buffer capital rates and the business cycle: (two phase's boom and recession). Quarterly base data of United States banks from the period (1971-2002) was used to forecast this capital requirement and the business cycle. The model indicates that capital requirement reduces the risk of sensitivity and defaults, and buffer capital also reduces the procyclicality.

(Skander J. Van den Heuvel, 2008), conducted a study to find out welfare cot of banking capital requirement. United State banks data was used to developed find out welfare cost of capital. The result showed that buffer capital reduced the bank's liquidity for operation. Result also indicate that return on assets gives strength to the liquidity of the banks. The welfare cost of capital is equivalent to capital adequacy regulation permanent loss in consumption up to 0.1% to 1%.

(Arturo Estrella, 2004), developed a dynamic model for cyclical behaviour of optimal capital. For the development of model U.S banks data was collected from the period (1984 to 2003). The result of the study predicts that value at risk (loans) is positively correlated with optimal flows of external capital flows. On the other way, VAR is negatively correlated with net changes in capital flows within the banking sector of the U.S. Finally result suggested that a minimum regulatory capital based upon the value at risk. This model also suggests a number of valuable techniques to manage banks capital risk.

Regulatory authority continuously changes banks margin requirement, for the better economy and flow of finance. In running an economy lot of factor that's put some effect on banks margin requirement either positive and negative. U.S banks data was used to investigate the relationship between, increases in assets can put significantly effect on the capital building. In this research, we find no evidence between the capital building and assets growth. U.s Banks data from the period the early 1990s, the result showed that, long cross-sectional relationship between assets risks and banks capitalizations, Mark J. Flannery and Kasturi P. Rangan (2008).

Alan D. Morrison and Lucy White (2005), conducted a study to develop a model generalize equilibrium model to investigate adverse selection and moral hazard in the banking sector. This model suggests that supervisory authority should develop a proper screening method for both banks, existing one and newly enter banks. The study indicated that regulatory authority should have skill person's team for conducted post-ex-audit and also have in-depth information about the market to analyze possible return of new projects. Regulatory authority should impose capital adequacy requirements on banks. The capital requirement is a very much important tool for regulatory authority for screening. The capital requirement also reduces moral hazard and adverse selection in the banking sector. Tight capital requirement policy reduces default of the banking sector and also provide strong strength to economic growth.

The financial sector (Banking sector) is a back bone of any economy. Banking sector acts as a leading sector of any economy. Pakistan economy face a lot of distress, downturns from last two decays, there is a number of causes of this distress like terrorist attack, political instability and lack of planning for future events. Purpose to select this topic is very critical, the banking sector of Pakistan face a lot of trouble from last three decays, nationalization and denationalization put a lot of pressure on banking working and profitability. Regulatory authority (SBP) also implement a number of rule and regulation for the constant operation of the banking sector. Comparatively to other sector banking sector face more pressure and restriction from the regulatory authority in working. All the banks operate in the entire world must deposit mentioned amount of proportion at regulatory account. Same as other countries rule and regulation Pakistan banking regulatory also adopt this measure (Buffer capital) for the smooth working of the bank sector. Aim to select this topic is to investigate what's the factor should banks adopt to support this buffer capital decision from regulatory authority (SBP).

3 Methodology

The methodology of the paper is arranged in the following manner.

3.1 Population and Sampling

All are currently working banks in Pakistan economy including (Public sector, Private sector, Specialized Banks and all Development Financial Intuitions) considered as a population of study. Thirty banks from three sectors (Public, Private and Specialized sector) selected as a sample to find out determinants capital buffer of Pakistan. Appendix 1 showed complete detail of selected banks like bank name, belonging category and official website.

3.2 Data period, Data source and Collection

For investigating capital buffer determinants, 8-year data is collected from (2007 to 2014). Data is collected from the official website of respective banks, the annual report of all selected banks and the state bank of Pakistan financial statement analysis also used for the collection of the data.

3.3 Variables
3.3.1 Dependent variable

Buffer Capital (minimum regulatory amount, held by State bank of Pakistan) of respective year and the respective selected bank used as dependent variable. Capital buffering is calculating by the difference of regulatory capital and maintained capital and divided by total assets.

3.3.2 Independent variable

Gross Domestic Product (GDP), Return on Equity (ROE), Bank Size (BS), Non-Performing Loan (NPL), Net Profit (NP), Liquidity (LIQ), Loan Growth (LONGR) and Net Loan / Total Assets (TLTA) are used as independent variables (as determinant of capital buffer).

3.4 Model

Following equation is used to find the determinant effect on the capital buffer.

$$BUFFCAP_{it} = \beta 0 + \beta 1\, BUFFCAP_{i,t-1} + \beta 2\, GDP_t + \beta 3\, ROE_{it} + \beta 4\, BS_{it} + \beta 5\, LIQ_{it} + \beta 6\, NPL_{it} + \beta 7\, NP_{it} + \beta 8\, LONGR_{it} + \beta 9 TLTA_{it} + \pounds_{it} \qquad (1)$$

In equation 1, BUFFCAP is capital buffer of bank i in year t. We measure capital buffer by the given instructions of the regulatory authority (SBP) in its publication. GDP is an annual growth of gross domestic product in year t. ROE is the proxy of net profit after tax over total equity of bank i in year t. BS represent bank size and calculated by the natural logarithm of total assets of bank i in period t. NPL represent Non-performing loan of bank i in period t. NP is the net profit after tax of bank i in period t. LONGR is the indicator of the growth of loan of bank i in year t. We assume TLTA is proxy of the total loan over total assets of bank i in year t. £ represent error term in year t of bank i.

Variable in above equation $BUFFCAP_{i\,t-1}$ used as lagged of dependent variable intended to capture the persistence of capital buffer, argue by Ayuso et al. (2004), Fonseca and Gonzalez

(2010) and Atici and Gursoy (2013), used as adjustment cost and also put positively and significant effect on buffer capital, so we also expected positive sign from result.

GDP used as the macroeconomic indicator in this study and the positive sign is expected due to the impact of the business cycle on buffer capital as arguing by Ayuso et al. (2004) and Atici and Gursoy (2013).

BS in equation (1) used as a proxy of bank size and calculated by taken natural logarithm of net assets, Stolz and Wedow (2004), Alfon and Argimon (2005) and Atici and Gursoy (2013) showed a negative relationship between buffer capital and Bank size. We also assume negative sign by consider the following reason; large bank has great capabilities and opportunities for easily approaching the capital market and also have a strong reputation for capturing investment, so that way large bank bear unexpected rise in margin requirement.

Return on Equity (ROE) bank-specific control variable also include in equation 1, to investigate the impact on Buffer capital. ROE is the proxy of net income after tax divided by total equity of respective bank in a respective year. In a previous study negative relation is find out between the capital buffer and ROE. Alfon et al. (2005) and Ayuso et al. (2004) and Boucinha (2008) find out the negative impact of ROE on Buffer capital, negative sign suggests that higher the cost of capital showed negative sign. Some study contradicts from this result like Berger (1995), Flannery and Rangan (2008) and Nier and Boucinha (2006) found a positive relationship between buffer capital and ROE. The positive sign indicates that, asymmetry information in banking sector a large proportion of banks earning kept in retained earnings that hidden retained earnings increase the capital ratio of the banks.

In equation 1, Non-Performing Loan (NPL) used as third bank-specific control variable. Ayuso et al. used as independent variable in his study as a determinant of a capital buffer. Same as ROE, two contradict result of NPL find out in the previous research, positive and negative. The positive sign showed that, if bank managers and sets its risk portfolio according to regulatory set rule and regulation, then the positive sign will be expected. A negative sign indicates that, if banks make their portfolio riskier, risk lower the capital ratio results, so negative sign will be accepted.

Next variable in equation 1 us Net Profit, profit result also dynamic in nature, some studies like Lindquist (2004) and Atici and Gursoy (2013) positive and negative relationship respectively, among capital buffer and profit, positive sign indicate that high profit mean high retained earnings, increase in retained earnings increases the capital ratio of the banks. Jokipii and Milne (2008), find out the negative relationship among variables, indicate that the increase in profit, increases in retained earnings, this incensement leads to increase the capital buffer proportion at regulatory authority.

Loan growth is the next variable in equation 1, Atici and Gursoy (2013), the study showed negative and significant of loan growth on the capital buffer. Both results can be expected from this variable on buffer capital; positive result suggested that banks perfectly manage their loan to overcome the risk and earning from the loan is stable and increase the capital ratio. On the other side same as NPL result, Boucinha (2008), loan growth enables banks to capture changes in

credit demand, if banks not properly manage the increase in credit demand, this will lead to a reduction in buffer capital.

TLTA is the proxy of the total loan over total assets, used as a measurement of risk; this ratio indicates how much banks have total assets against the full filament of total liabilities. Loan over total assets also point out banks potential risk. So due to the measurement of potential risk positive sign is expected from this variable. Some studies showed negative relation among TLTA and buffered capital, Fonseca and Gonzales (2010) showed the negative relationship of TLTA with buffer capital, negative sign indicate that banks that have a high loan as compared to their total assets put a negative impact on their buffer capital holdings.

3.5 Hypothesis

H1: There is a significant positive relationship between lag of the dependent variable.

H2: There is a significant positive relationship between GDP and buffer capital.

H3: There is a significant negative relationship between ROE and buffer capital.

H4: There is a significant positive relationship between Bank Size and buffer capital.

H5: There is a significant positive relationship between Liquidity and Buffer Capital

H6: There is a significant negative relationship between Non-Performing Loan and buffer capital.

H7: There is a significant positive relationship between Net Profit and buffer capital.

H8: There is a significant negative relationship between Loan Growth and buffer capital.

H9: There is a significant positive relationship between Total Loan over Total Assets and buffer capital.

3.6 Variable Calculation and Expected Sign

Variables	Calculation	Proxy	Expected Sign
Dependent Variable			
Buffer Capital$_{it}$	Req Reserve – Maintained Equity / Total assets	BUFFCAP	
Independent Variable			
Buffer Capital$_{i\,t-1}$	Req Reserve $_{t-1}$ – Maintained Equity $_{t-1}$ / Total assets $_{t-1}$	BUFFCAP$_{t-1}$	+
Gross Domestic Product	GDP	GDP	+
Return on Equity	Net Profit after Tax / Total Equity	ROE	+
Bank Size	Natural Logarithm of Total Assets	BS	-
Liquidity	Cash and Cash Equivalent / Total Assets	LIQ	+

Non-Performing Loan	Natural Logarithm of Non-Performing Loan	NPL	-
Net Profit	Natural Logarithm of Net Profit	NPROFT	+
Loan Growth	Current year loan / previous year loan	LNGR	-
TLTA	Total Liabilities/ Total Assets	TLTA	+

3.7 Theoretical Frame Work:

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┌─────────────────┐
│ Gross Domestic  │───────┐
│    Product      │       │
└─────────────────┘       │
┌─────────────────┐       │
│ Return on Equity│───────┤
└─────────────────┘       │
┌─────────────────┐       │
│   Bank Size     │───────┤
└─────────────────┘       │       ┌──────────────────┐
┌─────────────────┐       ├──────▶│  Buffer Capital  │
│Non-Performing   │───────┤       └──────────────────┘
│     Loan        │       │
└─────────────────┘       │
┌─────────────────┐       │
│   Net Profit    │───────┤
└─────────────────┘       │
┌─────────────────┐       │
│  Loan Growth    │───────┤
└─────────────────┘       │
┌─────────────────┐       │
│Total Loan over  │───────┘
│  Total Assets   │
└─────────────────┘
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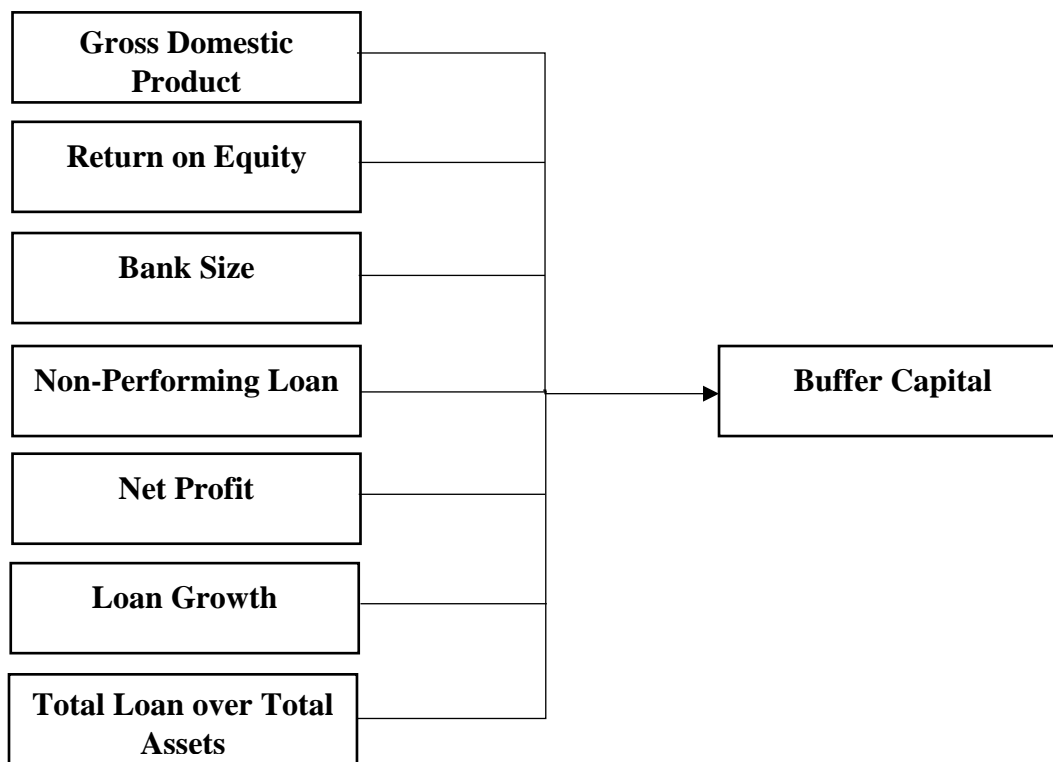
4 Empirical Result

4.1 Descriptive Statistics

Table 1 shows descriptive statistics of all variables (Buffer capital, lag capital buffer, bank size, return on equity, liquidity loan growth, non-performing loan, net profit and total loan over total assets. From the selected data period (2007-2014) buffer Capital Mean (Median) -0.015% (7.8%). Buffer capital means result indicates that in the data period chosen all banks averagely maintain (-0.015%) buffer capital. Lag behind buffer capital result Man (Median) 4.9% (7.8%). Mean (Median) of bank size proxy of the Natural logarithm of Total Assets Result, mean 18.29 thousand rupees and median 18.59 thousand rupees.

Table 1: Descriptive Statistics

	BUFFCAP	BUFFCAP$_{t-1}$	BS	ROE	LIQ	GDP	LNGR	NPL	NPROFT	TLTA
Mean	-0.00519	0.049497	18.2957	-0.0973	0.09484	3.296886	0.222736	14811535	3101773	0.6432
Median	0.07802	0.078373	18.5901	0.07176	0.08211	3.169351	0.110407	6189845	649159.5	0.520208
Maximum	8.87326	8.873256	21.3476	2.34715	0.3569	4.832817	4.2139	122000000	31819590	13.47568
Minimum	-6.48863	-6.488626	8.51494	-14.743	0.01272	1.606681	-0.92027	0.0000	0.0007	0.248523
Std. Dev.	1.22121	1.311189	2.00766	1.25747	0.04608	1.208591	0.503227	19980194	6504223	1.046416
Skewness	0.90771	2.18649	-2.0147	-9.5693	1.64409	-0.08218	4.421974	2.509437	1.785186	10.54727
Kurtosis	33.4113	32.04289	10.3394	103.126	7.83021	1.547298	27.92934	10.6035	6.201407	119.6154
Observations	240	240	240	240	240	240	240	240	240	240

The average return on equity that's given by selected banks in the data period -9.73%. Mean result of return on equity indicted that in the selected data period Pakistan banking sector faces stress in their operational working due to a lot of regulation restriction and as well economic pressure, comparatively less return from another sector. Liquidity result mean (Median) in table 1, 9.484% (8.211%). The average result of liquidity proxy of Cash and Cash equivalent divided by total assets shows in the selected data period from 2007-2014 liquidity of Pakistani banks 9.484%, so Pakistani banks highly liquid and perform their operation very effectively. Mean result of Gross domestic product in the selected data period 3.29. Loan growth of the banking sector is very much important proxy, increase in loan growth predict that banks working in the economy easily manage their loan portfolio for earning. In the selected data period from 2007 to 2014 Pakistani banks loan growth 22.2%, loan growth average result shows banks working in the Pakistan economy continuously manage their loan portfolio for earning a profit. Mean (Median)

results of Non-Performing loan 14811535 (6189845) thousand rupees, mean result indicates that in the selected data period of eight years from 2007-2014 non-performing loan of Pakistani banks 1.4 billion. Mean result of Net profit 3101773. The ratio of the total loan over total assets means (median) results in 64.32% (52.02%). The result of the total loan over liabilities shows in the selected data period banks have 64% burden of liabilities on their 100% total assets.

4.2 Correlation Result

Table 2 shows correlation result among selected variables; result shows lag behind buffer capital liquidity, loan growth and total loan over total assets have significantly correlated with buffer capital. Previous year observation of buffer capital positively significantly correlates with buffer capital, indicate that banks must increase their buffer amount for any sudden disaster in operational working. Buffer capital basically the extra amount that banks maintain to overcome any sudden operational disaster so the result of correlation also suggest that banks must maintain this extra proportional amount for any operational working risk reduction. Bank size also shows positive correlation with buffer capital.

Table 2: Correlation Result

	BCAP	BUFF	BS	ROE	LIQ	GDP	LNGR	NPL	NPROFT	TLTA
BUFFCAP	1									
BUFCAP$_{t-1}$	0.8976**	1								
BS	0.0083	-0.0355	1							
ROE	-0.0024	-0.0014	0.09211	1						
LIQ	0.1375*	0.1139	0.07324	0.0116	1					
GDP	-0.0075	-0.0242	0.07775	0.0629	-0.0708	1				
LNGR	0.1802**	0.1554*	-0.1324*	0.0352	0.10225	0.0603	1			
NPL	0.0123	-0.0167	0.3939**	0.0564	-0.0135	0.0722	-0.1**	1		
NPROFT	0.0346	0.01	0.4379**	0.199**	0.11527	0.1221	-0.18	0.47	1	
TLTA	0.5565**	0.5144**	-0.298**	-0.0084	-0.0971	-0.040	0.11	-0.1	-0.0906	1

*. Correlation is significant at the 0.05 level.
**. Correlation is significant at the 0.01 level.

Banks have highly operational assets for earning provide the ability to banks to maintain a high amount of buffer capital. Assets size up to 0.83% increases banks buffer capital amount easily be maintained 100% for any sudden operational breakout.

The relationship among return on equity and buffer capital is positively correlated. Banks have high proportional amount buffer capital also have a high return on equity, buffer capital increment support the working of banks and banks easily got up high desire return on equity goal for the attraction of investor, deposited and creditor.

Liquidity result also positive but significant sign up to 5% confidence level also observed among this relationship. So correlation result among liquidity and buffer capital indicate that highly liquid banks high amount of buffer capital to full sudden of operations. The effect of liquidity shows highly liquid banks have highly buffer amount for the full filling any sudden operational

breakage. Banks that have 13.5% liquidity, banks working in the Pakistan economy easily achieve buffer capital maintaining level.

The downfall in the economy of country banking operation also faces a lot of trouble in case of deposit and loan portfolio. In table 1 Gross domestic product shows a negative correlation with buffer capital. Mean decrease in the economy of a Pakistan bank buffer capital also faces trouble, in economy downturn bank also focus on saving from any operational downturn they more focus on the working instead on maintain extra amount for future. This result also predicts Economy downturn also put an impact on the bank working, so banks buffer capital also decreases for wellbeing, when the economy in recession face. Macroeconomic factors like (GDP, Inflation) too very much crucial for bank working, these factors also put an impact on the working banking sector.

Non-performing Loans also shows a positive correlation with buffer capital. Banks loan that has not in the strong performance for the generation of profit, banks must think about that loans, how those loan risk can be reduced, so banks increase their buffer capital to overcome risk.

Loan growth and total loan over total assets also show positively significant correlation with buffer capital; mean banks must maintain extra amount for the advancement in loan growth and also overcome the debt burden for both financial and non-financial liabilities. Net profit also indicates that banks in case high profit and also for the high achievement profit earning must maintain buffer capital.

4.3 Regression Analysis and GMM Analysis

Table 3 shows the regression result of the study.

$$1 = -1.329518 + 0.7450541 \, BUFFCAPi \, t - 1 + 0.051481 \, BSit - 0.005766 \, ROEit + 1.436121 \, LIQit + 0.013342 \, GDPt + 0.104973 \, LONGRit + 9.98E - 10 \, NPLit - 7.53E - 10 \, NPit + 0.200553 TLTAit$$

Above equation clearly define the regression result of the study. The result shows intercept of the equation -1.329. Impact of the previous year buffer capital maintains amount is positive and significantly. Previous year buffer capital positive relationship indicates that banks must maintain some extra amount to full fill its operational risk aversion. Highly banks buffer capital amount highly banks stable working. So banks must maintain a buffer amount. This result also explains the previous study of Ayuso et al. (2004), Fonseca and Gonzalez (2010) and Atici and Gursoy (2013) positive and significant relation among lagged buffer capital amount.

Table 3: Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.329518	0.383263	-3.468949	0.0006
BUFFCAP$_{t-1}$	0.745054	0.030601	24.34769	0.0000
BS	0.051481	0.019988	2.575567	0.0106
ROE	-0.005766	0.027068	-0.213033	0.8315
LIQ	1.436121	0.751826	1.910178	0.0574
GDP	0.013342	0.027986	0.476743	0.634

LNGR	0.104973	0.069003	1.521291	0.1296
NPL	9.98E-10	1.97E-09	0.506034	0.6133
NPROFT	-7.53E-10	6.30E-09	-0.119517	0.905
TLTA	0.200553	0.03987	5.030142	0.000
R-squared	0.829569	**Mean dependent var**		-0.00519
Adjusted R-squared	0.8229	**S.D. dependent var**		1.221211
S.E. of regression	0.513925	**Akaike info criterion**		1.547294
Sum squared resid	60.74729	**Schwarz criterion**		1.692321
Log-likelihood	-175.6753	**Hannan-Quinn criteria.**		1.605729
F-statistic	124.3914	**Durbin-Watson stat**		1.518517
Prob(F-statistic)	0			

Bank size also put positive infusion on bank maintain buffer capital, increase in 51% bank total assets put positively and significant impact on bank buffer capital. This result contradicts from some previous studies, Stolz and Wedow (2004), Alfon and Argimon (2005) and Atici and Gursoy (2013), they argue banks size put the negative impact of bank buffer capital. The result of bank size shows an increase in bank working assets (size) bank should increase its buffer capital amount.

Return on equity (ROE), the relationship among Buffer ratio and ROE negative but insignificant, banks have high-level buffer ratio decrease return on equity. Banks more focus on buffer ratio decrease in return on equity put the negative worth of amount in a market and investor and creditor and depositor feel hesitation in investment. This positive relation same as previous studies of Berger (1995), Flannery and Rangan (2008) and Nier and Boucinha (2006) found a positive relationship between buffer capital and ROE. On the other way, this result also contradicts from some past studies that found a negative association in their finding like Alfon et al. (2005) and Ayuso et al. (2004) and Boucinha (2008) find out the negative impact of ROE on Buffer capital. From this positive relationship, we conclude that this positive relationship between ROE and buffer capital ratio shows the cost of capital is very much low in Pakistan economy, and banks efficiently manage capital for operations.

Liquidity ratio cash and cash equivalent, in the selected data period also shows positively and significantly impact on Buffer capital. Banks have a highly liquid asset such as cash and cash equivalent securities like Receivable and T-bills, have better buffer capital comparatively to less liquid banks. The economic downturn also has a significant relationship with bank working, because banks directly involved in economic activities. Result suggests that an economic boom period banks also have better and well maintain buffer capital comparatively in an economic recession.

Banks earn profit from two significant ways, one issuing loans and secondly providing financial services. Basic earnings (Interest) of banks from loans issuing, so banks have a high amount of loan publishing from other have a high amount of buffer capital. The non-performing loan also has a positive impact on buffer capital but the too much little impact and even insignificant. So banks non-performing loan not put some substantial impact on buffer capital.

A result of the model shows that, Net profit put a native impact on buffer capital, this result support some previous studies of Jokipii and Milne (2008), find out the negative relationship among variables, this negative relationship suggests that banks profit increases the retained earnings, this cause increases the regulatory proportional, so banks buffer capital decreases.

Total loan over total assets used as a measurement of risk, the high result of this ration shows top risky banks; this ration also put a positive and significant impact on bank buffer capital. Positive sign predicts that banks have high risk-taking environment and banks have risk-taking management for high profit, must have high buffer capital. This positive relationship is contradicting from some previous studies of Fonseca and Gonzales (2010). They find a negative relationship between TLTA and buffer capital.

5 Conclusion

This current study tries to investigate the relationship among bank buffer capital and two major factors that put an impact on this amount, banks specific and country macroeconomic factor. For investigating this relationship banks, specific factors include Bank size, Return on Equity, loan growth, non-performing loans, total loans over total assets ratio and net profit and liquidity. Macroeconomic factor consists of the gross domestic product (GDP).

Same as some previous studies mix of a positive and negative result is obtains. Some variable put positively and significantly influence and some as negatively significantly impact on buffer capital that's banks maintain for their operational distress. The primary purpose of this study tries to evaluate some critical measure from both banks factor and country-specific factor for the maintaining of capital buffer amount.

Try to evaluate this relationship Pakistan 30 banks from all sector except internal banks and micro financial institution used as a sample. 2007 to 2014 seven-year data period is used to investigate relationships among bank buffer capital and bank-specific factor and macroeconomic factor. Result suggests that banks must maintain their buffer capital amount according to the economic condition of the country. Pakistan like a country that have more volatile economic due to the internal disability of efficient control on political uncertainty and planning adequacy for future and also too much unpredictable due to a lot of terrorist attack and energy failure, banks must move and make their financial strategies according to economic downturns. The result indicates that banks in the boom economy increase their buffer amount and in rescission decrease their buffer capital amount.

Bank specific capital Bank size, liquidity, loan growth, non-performing loan and total liabilities over total assets put a positive impact on buffer capital, so banks working in the Pakistan economy increase these ratios for improvement of buffer capital amount. Further results of the return on equity and net profit put a negative impact on the buffer capital. Banks in high profit, increase in retained earnings, so regulatory restriction compel banks for the to maintain of the reserve requirement, so banks most involved in financial services instead involve in too much profit activities and risk-taking activities. So, this study suggests that banks more focus on the asset's growth, loan growth and liquidity for the achievement of optimal level buffer capital.

This study also provides initial framework to researcher and student to investigate the relationship among buffer capital and banks specific factor and economic factor with categories

of banking sector like Islamic and conventional sector. The researcher also conducts comparative studies with some other growing economies just like Pakistan economy.

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Appendix 1 Bank and their official website

Public Sector Banks

1) Bank of Punjab   https://www.bop.com.pk/
2) National Bank of Pakistan   https://www.nbp.com.pk/
3) The bank of Khyber   http://www.bok.com.pk/

Specialized Sector

1) Zari Taraqiati Bank Limited   http://www.ztbl.com.pk/
2) Small Medium Enterprises Bank limited   http://smebank.org/
3) Industrial Development Bank Limited   http://www.idbl.com.pk/
4) The Punjab provisional corporation bank limited   http://www.ppcbl.com.pk/

Private sector

1) Allied bank limited   https://www.abl.com/
2) Askri bank limited   http://akbl.com.pk/
3) Bank al falha limited   http://www.bankalfalah.com/
4) Bank al habib limited   https://www.bankalhabib.com/
5) Bank islami pakistan limited   http://www.bankislami.com.pk/
6) Faisl bank limited   http://www.faysalbank.com/
7) Habib bank limited   http://www.hbl.com/
8) Habib metro bank limited   http://habibmetro.com/
9) Js bank limited   http://www.jsbl.com/
10) Mcb bank limited   http:// www.mcb.com.pk
11) Meezan bank limited   http://meezanbank.com/
12) Nib bank limited   http://nibpk.com/
13) Samba bank limited   http://pak.samba.com/
14) Silk bank limited   http://www.silkbank.com.pk/
15) Sonari bank limited   http://www.soneribank.com
16) Standard chartered bank limited   https://www.sc.com/pk/
17) Summit bank limited   http://www.summitbank.com.pk/
18) United bank limited   http://www.ubldirect.com/