

Taming Financial Capital:
*The Role and Limitation of Basel
Capital Regulation in Pakistan*

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Abstract

The study investigates the role of International Basel Capital Regulation in taming the financial capital via improving risk management in banking. The study examines if capital adequacy ratios of commercial banks calculated under Basel Capital Accord reflect credit risk, market risk, operational risk, liquidity risk, and economic impact in Pakistan. The study employed dual methodology utilising both primary and secondary data. A Likert-scale questionnaire was administered in addition to deploying panel data approach.

The empirical outcome of the study states that economic predictors: GDP growth and Industrial Production growth do not significantly impact the Capital requirements of the commercial banks of Pakistan. In addition, the study also found market risk had no impact on Capital Adequacy Ratio of the commercial banks of Pakistan despite being major risk determinant of Basel Capital regulation methodology. The results of the study also show Non-performing loans had no impact on the capital requirements of the commercial banks of Pakistan. The results of the study evidenced that capital requirements of the commercial banks did not reflect impact of the economic activity in Pakistan. The empirical results also show that Credit risk and operational risk along with the size of bank and bank profitability show significant impact on capital requirements of the commercial banks of Pakistan. Credit risk being the only bank risk variable showing significant negative relationship with the capital adequacy ratio of the commercial banks of Pakistan.

The study reveals that commercial banks of Pakistan are solvent and operate with adequate capital that is above the target set by the regulatory authorities to meet an episode of financial crises. However, the results also suggest that capital requirements of the commercial banks of Pakistan did not reflect impact of economic activity. Furthermore, results also evidenced that capital requirements of the commercial banks of Pakistan did not factor in full scale banking risks as market risk had no impact on capital requirements of the commercial banks of Pakistan.

Keywords: Capital requirements, Basel Capital Accord, Pakistan, NPL, Credit Risk, Market Risk, Operational Risk.

Declaration

I declare that the research undertaken and work contained in this thesis is my own effort except where referenced appropriately.

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Abbreviations

AAOIFI	Accounting and Auditing Organization of Islamic Financial Institutions
ABCP	Asset-backed commercial paper
OTT	Office of Thrift Supervision
FDIC	Federal Deposit Insurance Corporation
SEC	Securities and Exchange Commission
ABS	Asset-backed securities
CFP	Consumer and Financial Protection Bureau
PCAOB	Public Company Accounting Oversight Boards
ADB	Asian Development Bank Institute
ADI	Authorised Deposit taking Institute
AIG	American International Group
AIRB	Advanced Internal Ratings Based approach
AMA	Advanced measurement approach
AML	Anti-Money Laundering
ANCOVA	Analysis of Covariance
ANOVA	Analysis of Variance
APGML	Asia Pacific Group on Money Laundering
APRA	Australian Prudential Regulation Authority
AR	Autoregressive
ARM	Active Risk Management
ATM	Automated Teller Machine
AVC	Asset value correlations
BCBS	Basel Committee on Banking Supervision
BIA	Basic Indicator Approach – operational risk
BID	Banking Inspection Department
BIS	Bank of International Settlements

BLP	Branch Licensing Policy
BOP	Balance of Payment
BPR	Banking Policy and Regulations
BS	Banking Supervision
BSV	Banks Specific Variables
CAD	Capital Adequacy Directive
CAMELS	Capital Adequacy-Asset Quality-Management-Earnings-Liquidity-Sensitivity to Market
CAR	Capital Adequacy Ratio
CC	Counter-cyclical
CCF	Credit conversion factors
CCyB	Counter-cyclical Capital Buffers
CDO	Collateral Debt Obligations
CDS	Credit default swaps
CGAP	Consultative Group to Assist Poor
CGFS	Committee on Global Financial System
CI	Confidence Interval
CIB	Credit Investigation Bureau
CII	Council of Islamic Ideology
CNIC	Computerized National Identity Card
CPD	Consumer Protection Department
CPEC	China Pakistan Economic Corridor
CPP	Capital Purchase Program
CRD	Capital Requirements Directive
CRF	Corporate Registers Forum
CRM	Credit risk mitigation
CRR	Ratio of credit risk weighted assets to total assets
CRT	Credit Risk Transfer Instruments
DFS	Data File Structure

EAD	Exposure at default
ECAI	External Credit Assessment Institutions
EGLS	Estimated Generalized Least Squares
EL	Expected loss
EME	Emerging Market Economies
EMRC	Effective Minimum required risk-based Capital
EU	European Union
EV	Economic Variables
E-Views	Econometric Views
FBU	Federal Bureau of Statistics
FDI	Foreign Direct Investment
FED	Federal Reserve Board of the United States of America
FIRB	Foundation Internal Ratings Based Approach
FPT	Fit and Proper Test
FSI	Financial Stability Institute
FSV	Forced Sale Value
FWBL	First Woman Bank Limited
GAAP	Generally Accepted Accounting Principles
GAB	General Arrangement of Borrowing
GAO	Government Accountability Office of United States of America
GDP	Gross Domestic Product
GDPGR	GDP growth rates
GMM	Generalized Method of Moments
HBFCCL	House Building Finance Corporation Limited
HBL	Habib Bank Limited
HBOS	Halifax Bank of Scotland
IAA	Internal Assessment approach
IAIS	International Association of Insurance Supervisors
IAS	International Accounting Standards

IBI	Islamic Banking Institutions
ICAAP	Internal Capital Adequacy Assessment Process
ICFR	Internal Controls over Financial Reporting
IDB	Industrial Development Bank
IFI	Islamic Financial Institutions
IFRS	International Financial Reporting Standards
IFSB	Islamic Financial Services Board
IIFM	International Islamic Financial Markets
IIP	Industrial Production of Pakistan
IIPGR	Industrial Production of Pakistan growth rates
ILSA	International Lending and Supervisory Act
IMF	International Monetary Fund
IOPS	International Association of Insurance Supervisors
IOSCO	International Organization of Securities and Commission
IRAF	Institutional Risk Assessment Framework
IRB	Internal ratings based approach
IRBA	Internal ratings based-advanced approach
IRBF	Internal ratings based-foundation approach
IS	Information Systems
ISD	Insurance services directive
K-W ANOVA	Kologorov-Smirnov analysis of variance
LGD	Loss given default
LGTA	Natural logarithm of total assets
LOLR	Lender of last resort
LSDV	Least Squares Dummy Variable
M	Maturity
MBS	Mortgage-backed securities
MDA	Multiple Discriminant Analysis
MDB	Multilateral Development Bank

MFB	Micro Finance Bank
MIX	Microfinance Information Exchange
MOF	Ministry of Finance
MOU	Memorandum of Understanding
MPR	Monetary Policy Research
MRC	Minimum required risk-based Capital
MRR	Ratio of market risk weighted assets to total assets
MVA	Multivariate Analysis
NDA	National Domestic Assets
NHFC	National Housebuilding Finance Corporation
NIT	National Investment Trust
NPL	Nonperforming loans
NPLR	Ratio of nonperforming loans to total loans
OCC	Office of Comptroller of Currency
OECD	Organisation of Economic Co-operation and Development
OFSI	Office of the Superintendent of Financial Institutions
OLS	Ordinary Least Squares
ORR	Ratio of operational risk weighted assets to total assets
PAIRS	Probability and Impact Rating System
PBC	Pakistan Banking Council
PBS	Pakistan Bureau of Statistics
PD	Probability of default
PICIC	Pakistan Institute of Credit and Investment Corporation
PIFCO	Pakistan Industrial Finance Corporation
PLS	Partial Least Squares
PLS	Profit and loss sharing
PSE	Public sector entities
QIS	Quantitative impact studies
RAROC	Risk Adjusted Return on Capital

RBA	Ratings based approach
RCOA	Reporting Chart of Accounts
ROA	Return on Assets
ROE	Return on Equity
RWA	Risk-weighted assets
SA	Standardized Approach – operational risk
SBP	State Bank of Pakistan
SCAP	Supervisory Capital Assessment Program
SDR	Special Drawing Rights
SECP	Securities and Exchange Commission of Pakistan
SF	Supervisory formula
SL	Specialized lending
SME	Small and Medium-sized enterprise
SOARS	Supervisory Oversight and Response System
SPSS	Statistical Package of Social Sciences
SPV	Special purpose vehicle
SRP	Supervisory review process
UBL	United Bank Limited
UNDP	United Nations Development Program
US	United States of America
VAR	Value at risk

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Dedication

To Laraib.

I can still hear you calling me “*mera pyara bhai*” (my sweet brother).

Tears or a smile, your memories are the best moments of my day, every day.

Part 1: Financial Capital beyond bounds: Assessing the role of Bank risks and Basel Capitals in Pakistan

Chapter 1: Introduction

1.1 Introduction

The rise in globalization and in particular financialization¹ where sharper rise in trade amongst financial intermediaries across borders has made economies inseparable, international banks systemically² important and economic collapse of contagion nature highly probable (Aglietta 2016). Amidst such foray of economic activity, Financial Capital, the lifeblood of business managed to advance at a tremendous pace through the veins of the world economy, from one jurisdiction to another creating corporate giants in its path. Rise in borderless financial intermediation allowed variety of financial institutions³ get involved in the act of creating financial capital through development of complex financial derivatives to cater for all tastes, thus giving rise to financial capitalism beyond bounds. Financial institutions therefore, due to adoption of heightened speculative approach in their operations justly took the blame and brunt during the financial crisis of 2007-8. The study aims to investigate the role and limitations of banking regulations in improving the risk management in banking in light of global financial crisis. The study furthermore proposes to test the efficiency of bank capital regulations empirically and investigate that capital requirements of the banking institutions reflect banking risks and bank vulnerability to economic shocks.

¹ Financialization, defined as growing influence of financial intermediaries in contemporary economic and political outlook. See Pike, A., & Pollard, J. (2010) for detailed synopsis of impact and role of financialization leading up to the global financial crises. Notes on the roots of financialization and contending theories is discussed in critical manner by Fouskas and Gokay (2012); Magdoff and Sweezy (1987); Arrighi and Moore (2001); Lapavitsas (2013); Aglietta (2000).

² Systemically importance banks (SIB) have been identified and studied intensively on backdrop of financial crises across literature to assess interconnectivity of SIBs and impact on global economic function see Drehmann and Tarashev (2013); Tabak et al (2013)

³For instance Commercial banks, Investment Banks and Insurance companies

1.1.1 Financial Capitalism

Episodes of economic crises starting as early as 18th, 19th and 20th centuries were rooted in financial capitalism (Rockoff 2010; Lapavistas 2013). The role of banking in instigating financial crises peaked debate since 1772 collapse of Ayr bank, the case of British credit crises that originated in London. The economic slump caused by the financial crisis of 1772, was similar to a number of crises fresh in memories including crash of 1929 (Black Tuesday) and global financial crisis of 2007-8. Aforementioned crises, and more cited in literature frequently marked the end of periods of credit boom. For instance, economic crises of 1772 followed Great Britain's industrial expansion since mid1760's, an era of growth attributed to availability of cheaper capital to merchants, facilitated through banks. The growth was down to easy availability of credit, therefore once availability of credit stopped the crises erupted (Sheridan 1960). The importance of debate on the role of money and banking was recognized as early as Adam Smith, although a blanket proponent of *laissez-faire*, however, reading into the financial crises of 1772 agreed with requiring a government regulation of some sort on regulating banking, later on endorsed by Friedman following his assessment of the crash of 1929⁴. Not only that, through the history of modern financial crises intellects continued attempts to understand and explain the geneses of economic growth and decay emerged with pioneering theories of free market⁵; money supply⁶; and capital accumulation⁷.

Financial literature⁸ debates in abundance Marx's explanation that the rise of financial capitalism unavoidably charms economic downtrend. Therefore financial crises will always act as an innate predator of growth that feeds on over-accumulated capital during an era of global economic progress, in other words any form of regulation is pretty much

⁴See Rockoff (2010). Parallel journeys: Adam Smith and Milton Friedman on the regulation of banking. *Rutgers University Department of Economics Working Papers*, (201004).

⁵ Adam Smith (1723-1790): *The wealth of nations* [1776].

⁶ David Hume (1711-1776)

⁷ Karl Marx (1818-1823)

⁸See Fouskas and Dimoulas (2013)

helpless in taming the growth of Finance and subsequent financial crises (Lapavistas, 2008). For instance argument posited by John Kay⁹ that 97 percent of the loan extended by the banks in England funded loan portfolios of banks and that evidenced activities related to financial derivatives involving financial innovation for the purpose of profit making only with no contribution to real economic growth, and that mystifies the entire convention of financial intermediation facilitated by the banking sector in potential economic development, tormenting the role of banking regulations. Nevertheless, banking regulations exist, the practice of following a crises with a set of regulations has gone on for ages and perhaps a new regulation will occur following sighting of next episode of crises. For instance, Zingales (2015) argues that more government regulation does not improve stability of financial district due to the fact that formation of regulatory bodies followed episodes of crises¹⁰, and further lists in fines paid by the Banking institutions¹¹ of their alleged exploitation of gaps in regulations despite presence of strict regulatory consequences.

1.1.2 Role of Banking: *Globalization, Financialization and Global Financial Crises*

Banking institutions no doubt form an integral part of economic and political engineering due to systemic nature of their operations, for instance banks' inherent ability to facilitate credit creation and providing liquidity, once in a state of crises can threaten the stability of entire financial system (Santos 2001). The banking institutions, during the decades preceding the global financial crises seemed to have made the most of financial growth opportunities, engaged themselves in open market trading as traders, gatherer of fees and

⁹ Kay, J. (2015). *Other People's Money: Masters of the Universe Or Servants of the People?* Profile Books.

¹⁰ for instance: Federal Reserve in 1913 to address the liquidity panic of 1907; Federal Deposit Insurance Corporation (FDIC) created in 1933 after the bank runs instances of 1930s, Securities and Exchange Commission (SEC) in 1934 to address stock market crash of 1929; Office of Thrift Supervision (OTT) in response to saving-and-loan crises of 1980s; Public Company Accounting Oversight Boards (PCAOB) after Enron scandal, and Consumer Financial Protection Bureau (CFPB) after the global financial crises

¹¹ Notable Banks in the list include Barclays, Royal Bank of Scotland, HSBC, Bank of America, BNP Paribas and Credit Suisse

commissions and as mediators in investing savers money (Fouskas and Dimoulas 2013). Susan Strange in her book ‘Casino Capitalism’¹² published in 1986 stresses the need for regulating banks due to innovation in financial market instruments, growth in size of financial markets, commercial banks offering investment banking, and a shift to self-regulations by banks. Banking institutions, given the rise in Casino Capitalism developed extraordinary reach, capturing individual, Corporations and Governments alike, deployed resources in conducting lending, handling savings and financial instruments, thus transformed into giant organizations the world cannot do without¹³. For example, despite international corporations’ measly attempts to distancing themselves from banks, still failed to escape the web of financial innovation casted by the banks because only commercial option open for raising larger sums of cash apart from banks for corporations would be the financial markets. Where banks again dominate in facilitating financial instruments as intermediaries, or underwriters and/or traders (Lapavitsas 2008).

Thus, systemic importance of globally active banks as significantly influential on financial markets crucially highlighted during instant spread of the global financial crises originated by the credit crunch, consequently brings the role of central banks and regulatory framework developers in limelight as most burdened, emphasizing that the role of Bank Capital Regulations and Supervision in predicting financial health of the entire banking segment carries immense importance¹⁴. The empirical literature witnesses a number of heated debates on the subject of understanding underlying characteristics of risk management in banks, in particular under Bank Capital regulations and supervision in dictating bank profitability and its impact on soundness of the whole financial system. For instance, stricter bank capital regulations have positive impact on the bank performance through improved risk management (Chortareas et al 2012; Lee and Hsieh 2013). On the

¹² The term ‘Casino Capitalism’ took its criticism later on and argued to be misleading in the title as players on financial markets can influence the price of securities they lay on, unlike a casino where the amount of stake on one number does not influence the outcome see Ribnikar (2011).

¹³ Lapavitsas, C. (2013) The financialization of capitalism: ‘Profiting without producing’, *City*, 17:6, 792-805

¹⁴ Credit crunch is defined as credit squeeze faced by lending institutions including SIB’s. Collapse of SIB’s due to credit default was at the heart of the global economic meltdown during 2007-8.

contrary, financial literature sights plentiful research in conclusion that tighter control on bank capital has negative relationship with banks profitability (Barth et al 2010). In essence, debate in financial literature attempting to gauge economic impact of banks only reveals the impact of banking regulations and supervision based on empirical measures of samples selected for the studies so far, and there still remain territories where appropriation of the Basel Capital Accord post crises lacks empirical research, for example emerging economies (Frait and Tomsík 2014). It justifies to contribute to the existing financial literature and further research activity in jurisdictions where the literature remains inadequate in understanding underlying characteristics of risk management of systemically important banks under the rules of internationally active Basel Bank Capital Regulations and Supervision.

1.1.3 Basel Committee on Banking Supervision (BCBS)

The modern banking regulation within the broader economic framework does exist, origins of which can easily be traced back to post financial crises of 1929-33, an era of Keynesian economics on rise arguing use of monetary and fiscal policies to offset economic downturns. Furthermore, post-World War II activities in this direction included international collaborations on economic and financial stability¹⁵, the introduction of Bretton woods system (1944-1971) of fixed exchange rates, formation of the International Monetary Fund (IMF), and the World Bank. International Monetary Fund credibly tasked to facilitate global trade with global monetary cooperation towards economic growth and find monetary solutions for member countries experiencing balance of payment issues. World Bank on the other hand was chartered to loan money to the world of developing countries for reconstruction and development projects. Bretton Woods arrangement in wake of the World War II promised improved economic outlook at the time. Nevertheless, effectiveness of such measures remain questionable as following the zenith of the Bretton woods system, pillars of fixed exchange rate arrangements started to fumble (Nixon

¹⁵ Keynes (1883-1946) argued policy intervention necessary in striking balance between savings and investments as a way of curtailing financial crises see Keynes (1930)

shock)¹⁶ most notable episode being pound sterling crises of 1964¹⁷. Against the backdrop of cracks appearing in the Bretton Woods system, during 1960s well before the actual termination of the Bretton Woods, International Monetary Fund had already initiated informal consultations amongst financial regulatory bodies of major Western countries (G-10 countries)¹⁸ focusing on liquidity related issues, for instance the General Arrangement of Borrowing (GAB) and Special Drawing Rights (SDR) (Rueff and Hirsch 1965). Following collapse of the Bretton Woods system of fixed exchange rates, 1970s embarked upon a global floating exchange rate regime in an era of globalization¹⁹ rendering banks exposed to excessive exchange rate risk. For instance exchange rate risk based insolvencies that occurred in Herstatt Bank (Germany), the American Franklin National Bank (United States) and Israeli-British Bank (United Kingdom) simultaneously in 1974, were deemed interrelated but non-systemic (Norton 2010). In response to aforementioned events Basel Committee on Banking Supervision (BCBS), a subcommittee informally formed by the Central Bank Governors of the G-10 countries, was tasked to develop an international bank supervisory standard focusing on institutional liquidity, addressing cross-border supervision and capital adequacy requirements of banks.

1.1.4 Capital Adequacy: *Basel Capital Accords*

Regulators at Basel Committee on Banking Supervision (BCBS) viewed bank capital as significant indicator of the financial stability of the bank and a cushion against unexpected

¹⁶ President of United States Richard Nixon shook the world on 15 August 1971 closing the gold window imposing 10% surcharge on imported goods to prevent run on US gold reserves following negative BOP see Irwin (2013). The Nixon shock after forty years: the import surcharge revisited. *World Trade Review*, 12(01), pp.29-56.

¹⁷ See Mundell (1971). Monetary theory; and Triffin, R. (1978). *Gold and the Dollar Crisis: Yesterday and Tomorrow*. International Finance Section, Department of Economics, Princeton University for detailed critique on mechanism and collapse of Bretton Woods

¹⁸ G-10 refers to group of 10 countries established in 1962 member countries: United States, United Kingdom, Belgium, Canada, France, Germany, Italy, Japan, Netherlands, and Sweden. Switzerland joined in 1964

¹⁹ After Bretton Woods, financial capitalism gripped the world where banks peaked lending irrelevant of the purpose of why money is required that promoted consumption of money as opposed to investment, got involved in speculative profit making operations i.e. shadow banking, trading in stocks and bonds, the list can be exhaustive See Fouskas and Dimoulas (2013).

losses based on first consultative document called ‘Basel I Capital Accord’ released in 1988. Basel I won the backing of Governors of the central banks of the G-10 countries and opened the gate for further industry consultations under the BCBS umbrella to achieve a prudential risk management framework across board banking institutions to mitigate systemic default probabilities. Basel Capital Accords²⁰ recommend approaches to calculating capital adequacy ratios (CAR)²¹ for international banks in determining minimum capital requirements and managing important banking risks.

Basel II in particular, the second in the string of Basel Capital consultations, proved hugely popular and received recognition of banking regulations pundits globally. Basel II, developed in 2004 prior to global financial crisis, improved on Basel I proposals to make bank capital more sensitive to risk by adopting either *external credit ratings* issued by external rating agencies or more advanced *internal credit ratings* based on the bank’s own developed risk models. Furthermore, Basel II promised more risk sensitive paradigm with increased number of risk categories, proposition of a mix of statistical models and expert opinion to help track a bank’s exposure to insolvency risk over a period. Basel II in essence, promoted enhanced market transparency with added focus on capital regulation and supervision in order to achieve set objective of improved risk management in banking. On the contrary, the investment bill for the banks to upgrade to Basel II was significant yet the incentive for these banks to make such investments in the new data management technologies was even greater, for instance reduction in the amount of regulatory capital²² required and an increased return on equity. Despite improvements over Basel I, Basel II, the globally hailed spearhead international bank capital regulation framework misjudged the scale of interdependence amongst cross-border banking institutions and therefore, during the global financial crises it became clear that Basel II lacked that all important macro approach in risk management amongst banking institutions. Basel II, post global

²⁰ Basel I released 1988, followed by amended releases in 1991 and 1995. Basel II consultation began in 1999 and Basel II released in 2004, Most recent current format: Basel III; implementation initiated 2012

²¹ CAR is ratio of Bank’s tier1 and tier 2 capital (off and on-balance sheet) to risk weighted assets, discussed in more detail in chapter 2 of the thesis.

²² Regulatory capital is defined as the amount of bank capital required by regulatory authorities

financial crises paved the way in for serious consultations amongst industry operatives and BCBS, resulting in more prudent Basel III²³ that improves on Basel II with inclusion of liquidity foresights and enhanced capital buffers. The journey of Basel Capital Accords continues in form of consultations, perhaps beyond Basel III, but is Banking Regulations on right track in taming the financial capital?

The global financial crises, unveiled plenty of complex global financial structure interrogations within the field of risk management in banking under Basel Capital Regulations, for instance their role in over accumulation of debt²⁴ and in particular securitization defined as transformation of non-liquid assets on balance sheets of banks into tradable securities to revive liquidity²⁵. Development in complex financial structures of banking institutions such as securitization, starved Basel Capital regulations in timely signalling risk of default and as to how the bank's portfolio of assets might vary in value when exposed to unexpected risk for instance global economic crises. Basel II Capital Regulations failed to tame such speculative arbitrage by the banks at any stage of securitization process. In addition, Basel II like Basel I, continued to be inflexible on 4 and 8 percent minimum ratios of capital to risk-weighted assets, and therefore explicitly failed to accomplish its objective of providing buffer through capital during global financial crises. Standardized approach under Basel II relied on ratings provided by External ratings agencies. External credit rating agencies on the other hand, due to revenue based incentives relaxed ratings requirements causing potential ratings inflation. During the global financial crises, credibility of these ratings was seriously dented by frequent and large downgrades. In addition, credit ratings by the external credit rating agencies did not aid in setting capital requirements as they seemed only useful in establishing loss reserves for particular assets²⁶.

²³ Basel III requires banks to add extra 2.5% capital conversations buffer, liquidity control ratios see Caruana, J. (2010). Systemic risk: how to deal with it. *Basel: Bank for International Settlements*.

²⁴ See Minsky (1992) "*The financial instability hypothesis*" for detailed discussion of the accumulation of debt and borrowers defined as Hedge, Speculative and Ponzi borrowers

²⁵ See Pagano, M., & Volpin, P. (2012). Securitization, transparency, and liquidity. *Review of Financial Studies*, 25(8), 2417-2453

²⁶ Behavior of bank loan-loss reserves see Treacy, W. F., & Carey, M. (2000). Credit risk rating systems at large US banks. *Journal of Banking & Finance*, 24(1), 167-201.

Internal Rating Based²⁷ approaches also failed to show resilience to the crises as Basel II held accountable for allowing big banks to develop their own models for assessing risk and determining the amount of regulatory capital, which conveniently led to banks being overoptimistic about their risk exposures. Massive losses reported by some of the world's largest banks of developed economies compliant with Basel II framework²⁸ quickly rolled over to causing a global financial distress. Despite the launch of Basel III on cards for the banks within advanced economies, the banks in the developing countries are trailing well behind the Basel III mark, and at best remain limited to Basel II standardized approaches. The role of capital regulations and supervision: Basel II Capital Accord in preventing the collapse of banking institutions during the global financial turmoil of 2007-08 is considered of great significance and well debated in literature. The research aims to take its place in contributing to taking a closer look the role and limitation of Basel Capital Regulation with an emerging economy perspective.

1.2 Aim and Objectives of the study

The study endeavours to determine if capital adequacy ratios calculated under Basel Capital Accord reflect credit risk, market risk, operational risk, liquidity risk, and risk of procyclicality in commercial banking structure of Pakistan. In broader context the study aims to contribute to understanding the role of banking regulations and supervisory in prudential risk management towards solvency of the commercial banks of Pakistan.

1.2.1 Discussion of the Research Question

Can banking regulation improve risk management practices in banking institutions and plays a significant role in putting a check on risky credit extension by the banks? The rise of banking institutions in an environment of extended credit lending activity and risks associated with spread of financial capital came to surface in a grand manner during the

²⁷ Internal ratings based see Gordy, M. B. (2003). A risk-factor model foundation for ratings-based bank capital rules. *Journal of financial intermediation*, 12(3), 199-232.

²⁸ See Wellink, N. (2008). The importance of banking supervision in financial stability. *BIS website, Basilea.*; Benink, H., & Kaufman, G. (2008). Turmoil reveals the inadequacy of Basel II. *Financial times*, 28.

period of Global financial crisis of 2007-8 questions the question above. In discussion of role and limitations of banking regulations, Basel Capital Accord for instance, financial literature captures a number of empirical efforts extended in understanding the role of bank regulation through analysing capital adequacy ratio and correlated factors by testing a number of combinations of banks specific variables and economic indicators through econometric modelling in particular, using panel data methodologies. Amongst these efforts a number of key issues capturing role and limitations of Basel Capital Accord in developing countries also have come to surface by researchers and industry operatives in varied contextual paradigms, making pertinent literature knowledge rich. Risk management in banking and the role of banking regulation has featured in a number of previous researches. Losses suffered by the commercial banks due to loan defaults significantly impact the performance of the commercial banks highlighting importance for enhanced risk management in commercial banks. This is because loan defaults could severely affect the liquidity positions of commercial banks in addition to adversely impacting profitability and cause bank failures. There is empirical evidence of variation in losses suffered by different banks operating in same market with similarly diversified loan portfolios. Based on data gathered from nearly 2500 banks, Keeton and Morris (1987) concluded such variation in loss suffered by the banks due to loan defaults could be attributed to varied credit risk management approaches by the commercial banks directly related to the level of risk taking by that individual bank. Level of risk taking is discussed to be an important factor in managements' failure of judgement in predicting bank vulnerability to economic shocks (Keeton and Morris 1987). The determinants of credit risk have been researched in a variety of jurisdictions with a mix of economic and bank specific factors tested for significance. For instance, empirical evidence based on panel data study for the period between 1985-1997 from Spain suggested both macroeconomic and bank specific variables for instance GDP growth, bank size and capital ratios constitute important determinants that explain variation in credit risk (Salas and Saurina 2002). In addition, an annual panel data between the periods from 1986 to 2000 was used to analyse relationship between economic activity and capital adequacy in Spanish commercial and saving banks. The results of the study supported a negative significant relationship between capital buffers and GDP growth rates (Ayuso et al 2002). The literature furthermore, suggests that rise in nonperforming loans in Sub-Saharan Africa during economic and

banking crises was due adverse economic climate. Macroeconomic volatility promote higher cost of capital and lower interest margins causing banks to write off loans and incur financial losses. There existed strong association between macroeconomic and microeconomic indicators and nonperforming loans in Sub-Saharan Africa. Empirical evidence of 1990s of Sub-Saharan Africa using panel data set suggested that undiversified loan portfolios of African economies explicitly remained exposed to external shock and therefore declining nonperforming loans would be associated with positive economic growth (Fofack 2005). Panel data modelling using both macroeconomic indicators and bank specific variables was employed to examine sensitivity of nonperforming loans to economic activity in Guyana. Economic indicators and bank variable were tested for significance and the results remained consistent with existing evidence in literature. Findings of the study showed positive relationship between nonperforming loans and real effective exchange rate, GDP growth inversely related to nonperforming loans however, there was no significant relationship detected between bank size and level of nonperforming loans it reports (Khemraj and Pasha 2009). Polat and Al-Khalaf (2014) conducted panel data study of capital requirements of listed banks in Saudi Arabia Stock Exchange covering the period from 2002 to 2012. The results of the study showed loan to assets ratio has negative significant impact on capital requirements however, leverage and size of banks have positive relationship with capital requirements of sampled banks in Saudi Arabia. Econometric analysis of 10 Mauritian banks using panel data for 12 year period between 2000 and 2012 showed that exchange rate, lagged loans and the size of banking institutions have positive impact on nonperforming loans (Poloodo et al 2015). Buyuksalcarci and Abdioglu (2011) analyzed relationship of bank specific variables and Capital adequacy ratio of Turkish banks for the period 2006- 2010 and indicated that loans, profitability and leverage have a negative significant impact on capital adequacy ratio, loan loss reserve and return on assets positively related with capital adequacy ratio in Turkish banks. Chiuri et al (2001) found that imposing of Basel regulation capital requirements exert a negative impact on credit supply of banks, in particular less capitalized banks causing aggregate slowdown amongst emerging countries. In Pakistan, analysis of Islamic Banks reveal capital adequacy ratio exert a negative impact on financing behavior (Ayub and Javeed 2016) However, the results of the empirical analysis of listed commercial banks of Pakistan investigating impact of risk based capital requirements on the bank risk taking

behavior suggest that introduction of strict capital based regulation reduced asset portfolio risk of commercial banks of Pakistan (Ashraf et al 2016).

Key questions considered by the researches above revolve around assessment of the role played by international bank capital regulations in making commercial banks resilient. In doing so the existing studies considered it vital to test that the capital adequacy ratios calculated under International Basel Capital Regulation reflect the important banking risks. The research takes its motivation from aforementioned studies and identifies a gap in testing the relationship of banking regulation in improving risk management practices in commercial banks of Pakistan. Furthermore it would be important to note that the commercial bank sensitivity to economic activity in Pakistan can be predicted through monitoring capital adequacy ratios. These and more, financial regulatory issues remained focal point of the research and the research views that such issues must be discussed by the researchers and banking professionals in emerging and developing economies parallel to the developed countries for instance Pakistan. Global financial crisis of 2008 sheds light on importance of investigating riskiness of banking assets in attempts to curtail expansion of credit extension, or in other words onslaught of financial capital beyond the bounds of control, putting at risk the solvency of systemically important commercial banks.

Table 1. Panel Data Studies

Authors	Year	Data Group	Period of study	Variables	Methodology	Result
Keeton and Morris	1987	US	1979-1985	Bank size, ROE, Credit concentration	Panel Data – OLS	Risk inverse to NPL
Salas and Saurina	2002	Spain	1985-1997	CAR, Size, Ownership,	Panel Data – GMM	CAR inverse to NPL
Polodoo et al	2015	Mauritius	2000-2012	Size, GDP growth rate	Panel Data – GMM	Post crises BSV significant
Fofack	2005	Sub-Saharan Africa	1990s	Size, GDP, CAR	Panel Data	Macroeconomic factors impact NPL

Khemraj and Pasha	2009	Guyana	1994-2004	GDP growth, NPL, Bank size	Panel Data-PLS	GDP growth inversely related to NPLs
Polat and Al-Khalaf	2014	Saudi Arabia	2008-2012	NPL, Size, CAR, ROA	Panel Data – EGLS	ROA positive CAR
Cai and Huang	2014	China	2008-2010	NPL, Size, CAR, GDP	Panel Data – EGLS	NPL negative impact CAR

Motivated by the cause of mitigating factors instigating insolvencies in the banks during episodes of economic crisis, the study aims to investigate the role and limitations of Basel Capital Accord in commercial banks of Pakistan and record comments on performance of International Basel Capital Regulation in curbing financial crises in emerging and developing economies. In light of the discussion above, the study remains in line with existing efforts in fields of bank regulations and supervision (Table 1). This research aims to contribute to devising and testing a unique model to measure the economic impact on minimum capital requirements of commercial banks in Pakistan through combination of bank specific variables and economic indicators in a panel data setting. In addition panel data analysis, the research proposes questionnaire-based methodology that is novel and rarely used previously in studies of Basel Capital banking regulations and risk management in Pakistan.

1.2.2 Objectives of the study

The study aims to put to test the claims that Capital Adequacy Ratio acts as significant predictor of the financial stability of the banking sector. The study aims to test further if Basel Capital regulation plays an active role in effective risk management in commercial banks of Pakistan towards taming the spread of the financial capital:

- Analyse role and limitation of Basel Capital Regulations in taming the financial capital in Pakistan.
- Conduct empirical research to investigate Basel Capital Regulation reflect banking risks for prudential bank regulation and supervision in Pakistan.
- Assess the economic impact of capital adequacy of commercial banks of Pakistan.

1.3 Rationale of research

Amongst the broader economic framework of the journey from industrial capitalism to financial capitalism as basis for justifying economic crises²⁹, the research simply aims to take place amongst focused empirical studies extending efforts in understanding the influence of Basel Capital bank regulations and supervision on risk management of the commercial banks within the context of developing countries. Can Bank Capital Regulations tame the financial capital? Banking regulations and supervision guidelines contained in Basel Capital Accords demonstrated sound theoretical base and route to benefit for the banks within developed countries showing eventual benefiting of the economy³⁰. Following compliance, success stories and extended limelight in developed economies prior to the global financial crises, Basel Capital Accord attracted obvious attention from the developing countries. Basel Capital Accords, the on-going consultations have been partially integrated globally including a number of emerging economies where global market turbulence had raised major concerns to strengthen overall risk management framework of their banking institutions. Yet, because of a less sophisticated or restricted bank credit setup in developing countries with market operations in volatile political and economic conditions, it only proved challenging for banks in developing countries to implicate exact same methodology used in highly resourceful globally active banks. Note despite presence of advanced Basel II Capital Regulations, Banks in Europe and United States failed to cast away the clouds of financial loss and hit hard by the Global Financial

²⁹ See Fouskas, V. K., & Gokay, B. (2012). *Fall of the Us Empire: Global Fault-lines and the Shifting Imperial Order*. Pluto Press
Lapavitsas, C. (2009). Financialised capitalism: Crisis and financial expropriation. *Historical Materialism*, 17(2), 114-148.

³⁰ See analysis of varied empirical literature from 2001 to 2013 through comparison of main findings of the studies include proactive portfolio management, forward thinking, improved operational efficiency by Kaur, M., & Kapoor, S. (2015). Adoption of Basel norms: a review of empirical evidences. *Journal of Financial Regulation and Compliance*, 23(3), 271-284.

Crises of 2008. Thus, in comparison with developed countries of Europe and United States, commercial banks in developing countries stumble in their efforts to integrate advanced approaches under Basel II Capital Regulations in their commercial banking structures. Perhaps contrary to the developed world with comparatively better structured bank supervisory setup and research focused culture, the process of bank supervision in many developing countries remains inadequate, lacks domestic research lead consultation amongst banking industry technicians and therefore had failed to keep up with the rapid pace of exacerbated financial system fragility making them prone to crises.

1.3.1 Need for Capital Adequacy: *Developing Banking in Developing Countries*

Similar to developed countries, some of the major turning points in the emerging markets credit cycle during the past few decades have been associated with a string of crises³¹. Massive macroeconomic disruption, sharp fluctuations in interest rates, substantial currency depreciation and dramatic deflation of domestic demand followed episodes of crises. It can be argued that the Tequila Crises of 1994-95 and Asian crises of 1997 had given such concerns some urgency and the need for promoting research culture in emerging economies gained momentum. Tequila crises caused by Mexican peso devaluation against US dollar, had dramatic consequences domestically and caused major upheaval internationally. The demand for credit fell because of recession and prompted greater reluctance of borrowers to become indebted. Simultaneously the supply of bank credit declined, banks became more risk averse and a major stiffening of supervisory oversight reinforced the effect in many countries. Asian crisis similarly caused havoc in East Asia triggered by bankruptcy of Thailand during 1997 until IMF intervened to curtail the contagion nature of the Asian crises. Thailand witnessed almost four decades of continued economic growth before struck by economic downturn of 1997 caused by currency crises.

³¹ See Goldstein, M., & Turner, P. (1996). Banking crises in emerging economies: origins and policy options. In *BIS Economic Paper 46. Bank for International Settlements, Monetary and Economic Department, Basle*.

Thailand baht suffered significant devaluation as consequence and further sparked a banking crisis translated into Southeast Asian economic crisis (Wade 1998).³²

The importance of more work on capital regulations and banking supervision within emerging economies had gained recognition amongst regulators at the Bank of International Settlements (BIS)³³. Notably, Bank of International Settlements meeting in February 1995 started the ball rolling where consultations focused on the challenges faced by financial regulatory authorities of developing countries begun as they introduced financial reforms, liberalizing their banking system towards global financial integration and becoming ever more systemically important (Turner 2006). Developing countries lack resources coupled with limited creditworthiness to borrow in international financial markets, makes it challenging for developing countries to cope with any global financial calamity. In addition, due to developing countries constantly increasing level of financial integration with the rest of the world, changes in the developed world's financial architecture following global financial crises have direct consequences for the developing countries. There exist a need for capital regulatory framework incorporating developing countries circumstances. Basel Capital Regulation despite its positive aspects, struggled to tame the financial capital in developed world, therefore the validity of Basel Capital Accord in an emerging economy setup remains dubious. It perhaps justifies international Bank Capital Regulation consultations to explicitly incorporate circumstances the developing world operates in. The research therefore, aims to test the Basel Capital Accord effectiveness with an emerging economy set up and extend research in fields of banking regulations and supervision on financial stability of the banking structures in developing countries.

³²Literature sights discussions in detail the implications of capital changing hands freely without a regulatory framework See Wade, R. (1998). The Asian debt-and-development crisis of 1997-? Causes and consequences. *World development*, 26(8), 1535-1553 for a detailed critique

³³ Bank of International Settlements established in 1930 in Basel, Switzerland to promote monetary and financial stability through cooperation amongst the central banks see Toniolo, G., & Clement, P. (2005). *Central bank cooperation at the Bank for International Settlements, 1930-1973*. Cambridge University Press.

1.3.2 Islamic Republic of Pakistan

Pakistan³⁴ gained independence from British rule in 1947 as an Islamic Republic, the second largest developing economy in South Asia with her economic climate easily comparable with the most developing economies of the world. Independence was theoretically aimed at converting Pakistan into a welfare state for the Muslims of the subcontinent. However, the focus switched towards state building instead of stimulating common people welfare. Primary needs of the people for example health, education and shelter suffered in hands of incompetent power and rising corruption, in addition security situation also deteriorated. Pakistan inherited weak industrial and agricultural structures as India occupied more developed regions at the time of partition³⁵. Despite that, economic activity witnessed high rates of investment growth achieved during 1950s with the industrial development initiatives in Pakistan with the cooperation of the World Bank pioneering development finance institutions in Pakistan for instance Pakistan Industrial Credit and Investment Corporation (PICIC) and Pakistan Industrial Finance Corporation (PIFCO) later on replaced by Industrial Development Bank (IDB) in 1961³⁶. The banking sector of Pakistan grew during economic growth for instance in 1969 exports of Pakistan alone were higher than Indonesia, Malaysia, Philippines and Thailand (Rammal 2008). During 1970s Pakistan politically switched towards a socialist economy from prevailing liberal capitalist approach under her first democratically elected government evidenced by the intervention of government through initiating nationalization³⁷ of banks, insurance, educational institutions and industries. This discouraged private investment in Pakistan causing increase in public expenditure and widened budget deficit followed by reduced subsidies and indirect taxes. Late 1979s witnessed toppling of elective democracy in

³⁴Pakistan, out of a total of 9 nuclear capable countries (United States, Russia, United Kingdom, France, China, India, Pakistan, North Korea and Israel) only Muslim country in the world to develop Nuclear reactors started in 1972, completed successful underground nuclear tests: code name 'Chagai-I' in 1998.

³⁵ Papanek, G. F. (1967). *Pakistan's development, social goals and private incentives*. Harvard University Press.

³⁶ GDP growth rates of 5% on average during early to mid1950s see Isran, M. A., & Isran, S. (2013). Introduction of Structural Adjustment Programme (SAP) in Pakistan: Transition towards Market Economy. *Journal of Business Strategies*, 7(2), 73.

³⁷ Transfer from private to state ownership.

Pakistan with another military rule with capitalist approaches for instance privatization³⁸ and western aid³⁹ that helped GDP growth to increase to 6.6% during 1980s from 5% during 1970s. In addition, in 1989 Pakistan signed a \$2.1 billion, structural reform program with IMF (Isran and Isran 2013).

Pakistan during the past couple of decades witnessed average Gross Domestic Product (GDP) growth rate above the high income countries since 2005 see Figure 1. Note that Pakistan remained resilient through the period of global financial crises as opposed to the rest of the comparable upper middle and lower middle income economies. Pakistan shares her borders and trades with China, and in particular India despite some political and geographical friction. Both India and China are G-20⁴⁰ member countries and the region has accelerated economic development during past few decades with China and India leading the way. China and Pakistan in particular, boast close economic and political ties. Pakistan and China recently announced China Pakistan Economic Corridor (CPEC). CPEC project proposes China's investment circa \$46 billion in Pakistan in a variety of energy and infrastructure projects including network of roads and railways in Pakistan. The CPEC draws in systemically important Chinese banking institutions including Exim Bank of China, China Development Bank and Industrial Commercial Bank of China making Pakistan systemically important.

Figure 1: World Development Indicators

³⁸ Industrialized units nationalized during 1970 were returned to original owners during 1980s.

³⁹ In particular from US, total of \$3.2 billion after Soviet interference in Afghanistan in 1979 increased remittances from \$0.5 to \$3.2 billion in 1980s see Rammal (2008).

⁴⁰ G20 refer to Australia, Austria, Belgium, Canada, Chile (joined later in 2010), Czech Republic, Denmark, Estonia (joined later in 2010), Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel (joined later in 2010), Italy, Japan, Korea, Luxembourg, Latvia (joined later in 2016), Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States



Series : GDP growth (annual %)
Source: World Development Indicators
Created on: 09/07/2016

1.4 Research problem

In Pakistan similar to many developing economies, prior to the structural reforms regime announced by the government, banks were strictly instructed on the allocation of credit to specific sectors, in particular to finance the General Government and a plethora of administrative interests were set for various purposes. Fees were also regulated in detail. Prudential regulation, particularly capitalization and provisioning requirements, were weak. Pakistan had nationalized its domestic banks in the mid1970s. Since then, state-owned credit and saving institutions have held a dominant role in the financial sector. In Pakistan, the presence of institutional instruments, including the National Saving Scheme remain significantly influential on gross domestic savings. In this environment, banks had

little incentive and negligible means to assemble additional savings, reduce operating costs, or make lending decisions based on creditworthiness. Aforementioned discussion shed light that government of Pakistan aimed to make structural remedy to the financial infrastructure starting from banks, in a bid to making the financial industry more competitive and transparent. The suggested reforms included re-privatizing formerly nationalized banks, liberalizing interest rates and credit ceilings, strengthening the central bank's supervisory capacity and imposing standardized accounting and auditing systems, scheduled to be initiated under broader macroeconomic structural adjustment program during late 1980s (UI-Haque 1997). Pakistan, as discussed above starting in 1988, very substantially de-regulated the allocation of credit, interest rate; liberalized entry into the financial sector; privatized major state-owned banks; introduced modern prudential regulation and supervision. Pakistani authorities also pursued to liberalize exchange controls, and permitting the opening of foreign currency deposits (Haque and Kardar 1995).

On the basis of keeping in view the global response with regards to banking regulation and supervision towards Basel Capital Accord and to bring bank regulatory and supervisory standards to international bench mark of Basel compliance, the State Bank of Pakistan decided to adopt Basel Capital Accord in Pakistan. Based on Basel 1 guidelines from the end of 1997, banks were required to maintain an 8% minimum risk-weighted assets⁴¹ to capital ratio⁴², and disclosure of loan classification (Hardy and Patti 2005). Basel II implementation, believed to further strengthen existing risk management framework of the commercial banking sector of Pakistan. However Basel II, costly to implement, complex to understand and prescriptive in its numerous recommendations, favored active risk management and in preparation for its adoption, commercial banks in Pakistan would need to improve their core risk management models tremendously⁴³. In particular, costs of compliance with the Internal Ratings Based approaches are significant, ranging from

⁴¹ Risk weighted assets refer to assets after risk weightings applied under Basel Capital Regulations.

⁴² Refers to Capital under Basel II: Tier 1 (core capital) and Tier 2 (supplementary capital)

⁴³ Lastra, R. M. (2004). Risk-based capital requirements and their impact upon the banking industry: Basel II and CAD III. *Journal of Financial Regulation and Compliance*, 12(3), 225-239.

investments in data collection and IT systems to training and recruiting specialist staff (Bischofberger and Rybach 2003). Regardless of challenges in integrating Basel II, State Bank of Pakistan initiated Basel II implementation in 2006 (SBP 2005). Following the State Bank of Pakistan directive, the standardized approach under Basel II Capital Accord has become business as usual since 2007 and the commercial banks of Pakistan are reporting their capital adequacy accordingly⁴⁴. Compliance in Pakistan, with a developing economy set up presents unique opportunity to test the suitability of Basel Capital Accord, a regulatory tool originally meant for developed economies.

1.4.1 Need for Banking regulations and Supervision in Pakistan

In Pakistan GDP growth rate in the past decades averaged 4.3% since 1990s, in comparison with GDP growth rate of 6% prior to commencement of structural reforms⁴⁵, evidencing that a weak financial system in developing countries tend to undermine the effectiveness of monetary policy where financial development can be deciding factor for economic growth at macro-level, promoting increase in national income and wealth that permits people to make more deposits and encourage monetary sophistication. For instance amongst the discussions on role of financial integration, Krugman (1993) argues that international financial integration is unimportant and there is lack of evidence that capital flows⁴⁶ impact growth positively within developing economies. This was argued by Keynesian economists⁴⁷ concluding that regulatory intervention is unavoidable seeing into post-World War II era termed as “Golden age of Capitalism”, when economic focus of the governments included introduction of regulations and publication of economic indicators on the backdrop of growth rates of 1950s and 1960s amongst industrialized nations.

⁴⁴ State Bank of Pakistan Circular No.1, 2008

⁴⁵ See McCartney, M. (2015). The Missing Economic Magic: The Failure of Trade Liberalization and Exchange Rate Devaluation in Pakistan, 1980-2012. *The Lahore Journal of Economics*, 20, 59.

⁴⁶ Capital flows include capital investments, portfolio investments (debt and equity), FDI (including start-ups), from Industrial countries to less developed countries (LDCs).

⁴⁷ See Marglin, S. A. (1990). Lessons of the golden age: an overview. *The Golden Age of Capitalism*, Oxford: Clarendon, 1-38.

Nevertheless, advanced financial intermediation enables firms to raise and manage large amounts of funds more effectively, resulting in comparatively rapid economic development (Levine, 2002). A number of empirical studies surfaced utilizing a combination of economic and financial indicators attempting to evidence the link between financial system and economic activity. For instance some empirical evidence suggest, during 1970s and 1980s positive causal relationship between financial development measured by liquid assets of the financial system as share of GDP caused reduction in moderate poverty, however same relationship could not be achieved during 1980s to 1990s sample when financial development measured through proxy of credit extended by the financial institutions⁴⁸. Amongst debaters, Asghar and Hussain (2014) use panel data and evidence strong relationship between financial development and economic growth amongst developing countries. Rashti et al (2014)⁴⁹ discusses that capital markets had a positive impact on economic growth of developing countries during 1990-2010, using GMM methodologies in light of global financial crises. Al Samman and Azmeh (2016)⁵⁰ differentiating between financial liberalization and financial development, showed that financial development had positive impact on economic growth in a sample of 47 countries. Banking sector development is argued to be particularly important for developing economies since a bank-based system has a greater impact on growth at the early stage than a market-oriented financial system (Fase & Abma, 2003; Tadesse, 2002). However, in the context of developing economies, financial liberalization needs to be initiated carefully through extensive research and consultations, as a too rapid and uniform liberalization strategy of the banking industry may not bring optimal outcomes. Empirical evidence suggests that countries which hurried liberalizing their banking systems are significantly more likely to face a financial crisis see Demirguc-Kunt, et al (2013). Thus, need for continued contribution in knowledge of banking regulations and supervision in emerging economies is justified. Islamic Republic of Pakistan likewise comparable developing

⁴⁸ Perez-Moreno, S. (2011). Financial development and poverty in developing countries: a causal analysis. *Empirical Economics*, 41(1), 57-80

⁴⁹ Financial development measured by banking system credit to GDP, ratio of services provided by the banks to private sector to GDP

⁵⁰ See Al Samman, and Azmeh, C. (2016) for discussion on effect of financial liberalization

countries, to prosper economically, must strengthen her financial system and work towards eliminating deep rooted issues including poverty⁵¹, terrorism⁵² and political unrest⁵³ in the country. Furthermore, Pakistan since independence, faced a number of events of misfortunes including three of the history's biggest refugee crises⁵⁴, three major wars with neighboring India⁵⁵, and a number of natural calamities⁵⁶. Nevertheless, Pakistan seemingly took daring steps towards financial system stabilization at least, in shape of comprehensive and far-reaching restructuring policy. There is little empirical evidence that identifies the underlying characteristics of the capital regulations and risk management in Pakistani banking sector (Akhtar 2006). Earlier, Hardy and Patti (2003) found that the revenue performance of all banks, particularly privatized banks, improved significantly after as compared to before banking reforms in Pakistan. Mushtaq et al (2015) finds that credit risk was negatively associated to the profitability of banks in Pakistan under capital adequacy paradigm. Numerous issues regarding risk management and capital adequacy in

⁵¹ See Karim and Iraqi (2015), a detailed discussion on the issue of poverty alleviation and role of public policy in Pakistan

⁵² Pakistan reputed as to be home of the world's most notorious terrorist groups including Al-Qaeda. Pakistan remains in league of countries hit the hardest by terrorism with over 5,500 fatalities between 2007-2009 see Nasir, M., & Shahbaz, M. (2015).

⁵³ Three eras of military rule by way of military coups: General Iskander Mirza 13 years (1958 – 1971); General Zia-ul-Haq 11 years (1977-1988) and General Pervez Musharaf 9 years (1999-2008); spanning over 33 years out of a total of 69 year history of Pakistan.

⁵⁴ 1947 the independence of Pakistan led an estimated 14 million people to move: Hindus to India and Muslims to Pakistan; 1971 civil unrest of Pakistan led to creation of divided Pakistan (formerly West Pakistan) and Bangladesh (formerly East Pakistan), the event witnessed around 10 million refugees most of whom later settled in now Bangladesh; 1980 Pakistan initially took estimated 3.3 million Afghan refugees resulting from Soviet war, 1.5 million of whom later moved to Iran leaving Pakistan with over 2 million Afghan refugees.

⁵⁵ All wars stem from the territory conflict of 'Kashmir' with neighbouring India. War of 1947; War of 1965; War of 1971. Followed by a number of border skirmishes and stand offs including Kargil 1999 and Siachen 2003.

⁵⁶ Earthquakes and floods discussed in detail see Houze et al (2011) Anomalous atmospheric events leading to the summer 2010 floods in Pakistan. *Bulletin of the American Meteorological Society*, 92(3), p.291; Warraich et al (2011). Floods in Pakistan: a public health crisis. *Bulletin of the World Health Organization*, 89(3), pp.236-237.

Pakistan banking have been debated in literature⁵⁷. However, research on Basel compliance in Pakistan remains brief and literature fails to spot studies explicitly focus to quantify the steps taken by Pakistani government to prevent banking crises including Basel Capital convergence.

1.4.2 Basel Capital Regulations Compliance in Pakistan

The study, in broader context proposes to the investigate role of Basel capital regulation in calculating and monitoring capital adequacy ratios towards better risk management in commercial banks of Pakistan. Basel implementation appeared well regarded amongst financial industry operatives of Pakistan as an effective tool for improved international financial stability, nevertheless compliance limitations in Pakistan revolve around lack of technical expertise (Masood and Fry 2012). There is no study to date analyzing explicitly the implementation of Basel II in Pakistan in context of testing the role of Basel Capital framework in enhancing resilience of commercial banks of Pakistan. This represents an opportunity to extend research in operational complexity in integrating Basel II in Pakistan. Basel Capital Regulation was developed in the developed world with the developed world in mind, therefore it would be interesting to note how Basel Capital Regulation benefits Pakistan in improving loan quality and taming financial capital. Basel Capital Regulation Study aims to answer the question, is Basel Capital Regulation appropriate for Pakistan with a developing economy perspective. The study aims to accomplish this in Pakistan through gathering empirical evidence and test if important banking risks as well as procyclicality are reflected in capital adequacy ratios of the commercial banks of Pakistan.

Commercial banks of Pakistan even though operating in a developing economy, were compliant with Basel II Capital Accord standardized approach during the period of global financial crisis and signaled early recovery as opposed to the banks of developed world

⁵⁷ Afzal and Mirza (2012) found no relationship between risk diversification and nonperforming loans in Pakistan; Shar et al (2010) found that performance of Pakistani banking industry improved with increase in capital base; Ahmed and Malik (2015) used questionnaires to extract determinants of loan performances in Pakistan and found credit terms have significant impact on loan performance

who failed to sustain the crises⁵⁸. This may simply be attributed to the complexity of operations in International versus Pakistani commercial banks, nevertheless offers a unique opportunity to extend research in role played by Basel Capital Accord in the resilience of commercial banking sector of Pakistan. The research therefore, concentrates on developing economies perspective, and remains aligned with contributing to existing literature on effectiveness of banking regulations and supervision see Barth et al (2010).

1.5 Methodology

1.5.1 Conceptual Framework

Research fundamentally benefits when simplified by defining concepts and by succeeding in creating an efficient conceptual framework. Consistency must be achieved in the structure of the project from the onset to remain aligned with the cause. In addition to providing guidance in the framing of the research question, there opens an opportunity to trial the research conceptual framework against the research findings (Fisher 2007). Thus, conceptual framework effectively work towards theories that explain the patterns contained within the research theme and broadly help depict the relationship between such concepts. It is considered suitable to discuss important approaches widely campaigned in literature.

Grounded approach was carefully considered as the starting point, that theory or the concept should emerge out of the material analysed rather than pre imposing a framework. Due to an implicit characteristic of the theory developed under grounded approach (i.e. to be emerged out of the research material) this approach in practice may exceed time constraints. In addition, grounded approach like all other, not only depends upon accuracy of the research material gathered, but also requires researcher to negotiate effective coding and comparison of the research material. Nevertheless, every time grounded approach is adopted masterfully the researches resulted in useful theories developed (Glaser and Strauss 1967). On the contrary, a ‘Structured approach’ based on a preliminary theory, concept or hypothesis is applied at the commencement of the study, the applied framework

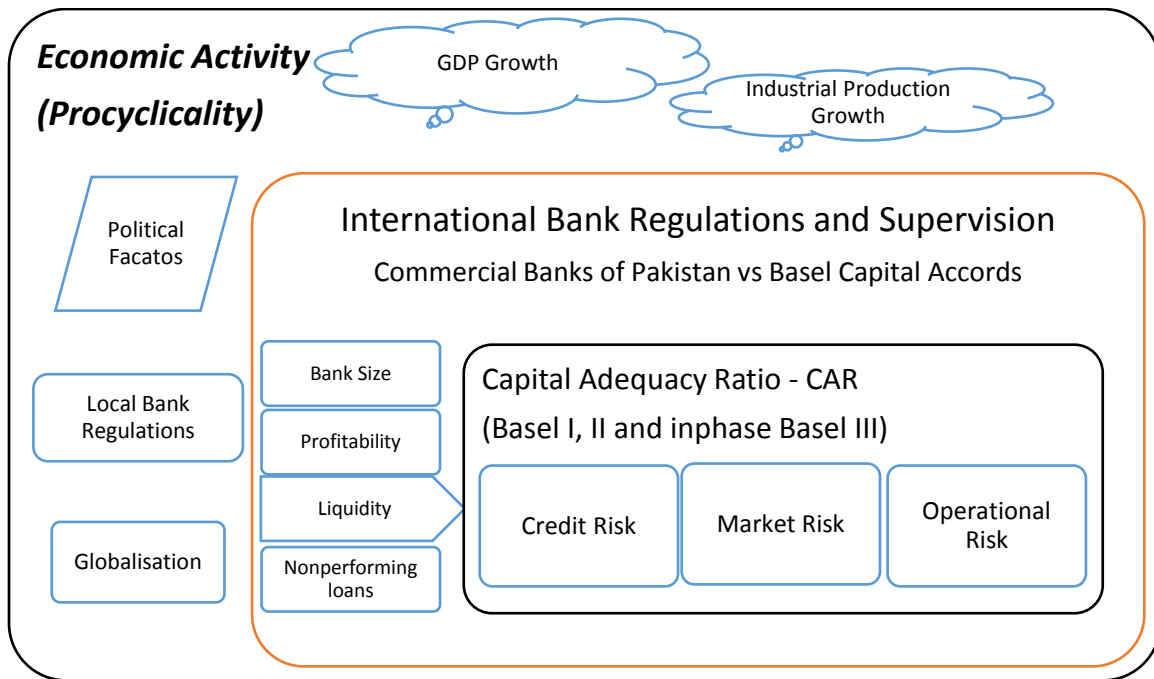
⁵⁸See chapter 6 secondary data analysis of the study

then directs the data collection themes and ultimately steers the research through that initially set path. The study follows a structured approach based on the framework developed at the beginning.

The conceptual framework adopted by the study while acknowledging importance of risk management in banking assesses the role of international banking regulations under Basel Capital Accords. The conceptual framework of the study further recognizes prominence of possible economic implications of internationally active global banks' capital adequacy variations. Economic fluctuations inflicting variations in banks' capital base thence may simply be termed as Procyclicality. Traditionally important financial risks faced by the big banks have been identified and calculated under Pillar 1 of the Basel Capital Accord to keep at bay any possibilities of a systemic financial turmoil. The theory may be further defined simply as that banks in times of economic stability and boom enjoyed relaxed regulations allowing banks to take riskier more profitable positions. However, following an economic shock stringent regulatory requirements may be imposed on banks resulting in possible halt on banks' growth that eventually translates back in the economy exacerbating procyclicality. Aforementioned, episodes of global financial crises demand testing the durability and the impact of at the time implemented risk management practices and question effectiveness of bank regulations in taming financial capital. The conceptual framework remains the foundation of the study proposing daringly to test Basel Capital Regulations claims of financial sector durability through Capital Adequacy Ratio in commercial banking sector of Pakistan. In order to test if Basel Capital Regulation remains truly reflective of most important banking risks in Pakistan and other combinational economic and environmental factors including most importantly, presence of Procyclicality of banks' capital requirements, the conceptual framework of the study thenceforth supports to categorizing important banking risks and economic forces tackled by the commercial banks in Pakistan. Best suited strategy to testing the concept further, would be to evaluating the combinational impact of aforementioned bank specific variables, economic indicators and important bank risks on minimum capital requirements of the commercial banks of Pakistan. Following Figure 2 displays within the economic climate, currently applied Capital Adequacy Ratio constituents with liquidity moving in. The diagram also lists additional factors under the clouds of economic unpredictability

around the International Banking Regulations, all to be tested for their impact on capital requirements of the commercial banks in Pakistan in order to determine the creditworthiness of commercial banking sector of Pakistan.

Figure 2: Conceptual Framework



1.5.2 Research Methodology

The research project proposes to adopt dual methodology based on collection of both secondary and primary data. Questionnaire based methodology is applied to gather views of key risk managers of the commercial banks of Pakistan on the topic. In banking, the views of the key risk managers of the sampled institutions have effectively been obtained through structured questionnaires in order to analyze political risk and determinants of non-performing loans (Masood and Bruno 2008; Wahlström 2009; Masood and Stewart 2008, Al-Tamimi and Al-Mazrooei 2007).

The questionnaire circulated by the study contained a demographical profiling questions section along with questions enquiring Basel II implementation, Active Risk Management (ARM) under Basel Capital Accord and the impact of procyclicality on the capital

requirements of the sampled Commercial Banks. The respondents of the study included senior level risk managers of the commercial banks of Pakistan responsible for supervising, the implementation; and day to day running of the business in accordance with Basel Capital Adequacy framework. This information extracted from the questionnaires exploring Basel Capital Regulations in commercial banks of Pakistan is expected to be reality rich, based on respondents' decision making authority and weighing key factors see Saunders and Allen (2002). In addition to descriptive statistical analysis, cross-tabulations and hypothesis testing applied to analyze collected primary data, where chi-squared test considered most appropriate that is applied frequently see Masood and Sergi (2008). The study managed to gather 104 completed observations within population sample size of twenty five commercial banks of Pakistan.

For the purpose of secondary data analysis the entire Commercial Banking of Pakistan is considered as population, reduced to 25 banks due to data availability and consistency. Therefore the data compiled in a panel setting encompassed time from 2007 to 2014 across 25 banks. Data has also been acquired through World Bank and IMF data bases, audited accounts/ annual reports of commercial banks of Pakistan as well as mandatory reports submitted to State Bank of Pakistan (SBP), the principal regulator. Data is also obtained from Securities and Exchange Commission of Pakistan (SECP), Federal Bureau of Statistics (FBU), Pakistan Bureau of Statistics (PBS) and accredited international financial and banking journals.

The study adopts Panel Data methodology taking motivation from earlier studies⁵⁹ in fields of banking regulations and economic activity. The study deploys panel dataset and fixed effects modelling by developing unique mix of fitting economic indicators and banks specific variables justified for the cause⁶⁰. Panel Data offers greater identification and measurement of effects because of its inherent analysis ability of variables across entities and over time. Panel data methodology best serves as balanced however it deals with

⁵⁹ See Salas and Saurina (2002); Rajan and Dhal (2003); Fofack (2005); Khemraj and Pasha (2009); Boudriga et al (2009); Mogboyin et al (2012); Polat and Al-Khalaf (2014); Cai (2014); Polodoo et al (2015); and Apergis et al (2016);

⁶⁰ See section 3 for more detailed discussion on methodology

missing information far more effectively than mere time series or cross sectional methodologies (Hsiao and Shen 2003). Panel data are suggested to be heterogeneous and allow that crucial control for individual heterogeneity, not inherent in time series or cross section data designs (Beck and Katz 1995). In contrast where multicollinearity remains strongest contender in afflicting time series and cross section studies with biased results is dealt with, adequately within panel datasets (Moulton 1987; Batlagi and Levin 1992). Other advantages of panel data over time series or cross section include superior study of adjustment dynamics enabling to construct complicated behavioral modelling i.e. fewer restrictions applied in panel on distributed lags than time series ((Deaton 1995; Koop and Steel 2001; Hsiao and Shen 2003); appropriately deals with issues of heteroscedasticity (Kaufman 2013); and reduced biased resulting from including similar variables in comparison with time series dataset (Klevmarken 1989). Panel data methodologies widely applied in studies of bank specific variables (BSV's) and economic factors (EV's) and suggest significant association between BSV's and EV's⁶¹. Following econometric model developed and tested by the study.

$$CAR_{it} = \beta_0 + \beta_1 CRR_{it} + \beta_2 MRR_{it} + \beta_3 ORR_{it} + \beta_4 ROA_{it} + \beta_5 ROE_{it} + \beta_6 NPLR_{it} + \beta_7 LGTA_{it} + \beta_8 GDPGR_t + \beta_9 IIPGR_t + u_{it}$$

β_0 is constant and $\beta_{(1,2,3 \dots)}$ represent coefficients of predictor variables and u_{it} is error term. CAR_{it} represent Capital Adequacy Ratio of bank i in year t ; CRR_{it} represent Credit risk weighted assets to total assets of bank i in year t ; MRR_{it} represent Market risk weighted assets to total assets of bank i in year t ; ORR_{it} represent Operational risk weighted assets to total assets of bank i in year t ; ROA_{it} represent Return of Assets of bank i in year t ; ROE_{it} represent Return on Equity of bank i in year t ; $NPLR_{it}$ represent Ratio of non-performing loan to total loans of bank i in year t ; $LGTA_{it}$ represent Natural logarithm of total assets of bank i in year t ; $GDPGR_t$ represent GDP growth rates in year t ; and $IIPGR_t$ represent Industrial production index of Pakistan growth rates in year t .

⁶¹ See Keeton and Morris (1987); Salas and Saurina (2002); Jiang et al (2013); Zhang et al (2015). Panel data OLS and GMM methods applied to study economic indicators and bank specific variable in US, Spain, Europe, China and Taiwan

1.6 Contribution

Literature so far regarding Basel Capital regulation implementation and risk management in commercial banks of Pakistan is scarce (Masood and Fry 2012). Thus, the literature remains adolescent in analysing role and limitations of Basel Capital regulation in Pakistan as basis for taming financial capital, for instance there is no study to date capturing the role of Basel Capital regulation in taming the financial capital in Pakistan. This research therefore identified an opportunity to investigating the role and limitation of Basel Capital regulation in Pakistan. Thus, this study contributes to pioneer research in Pakistan in directions of **1. Role of Basel Capital regulation in taming the financial capital; 2. Capital required by the banks of Pakistan reflective of the risks they face and 3. Assessing economic impact on capital requirements of commercial banks in Pakistan.**

The research, to gauge the risk faced by the banks developed unique model for commercial banks of Pakistan, introducing use of risk weighted assets to total assets as proxy to capture the captured riskiness of bank assets by the commercial banks of Pakistan in addition to bank specific variables and economic indicators to conclude if capital requirements of commercial banks of Pakistan reflect risk. Therefore this particular study could prove a mile stone. The model adopted by the study has not previously been tested in Pakistan and therefore the concept embarks upon new grounds of research in Basel Capital Bank regulation in Pakistan. In addition, comprehensive empirical analysis of implementation of Basel Capital regulation in commercial banks of Pakistan is unique. Furthermore, the questionnaire-based methodology is novel and rarely used previously in studies of Basel Capital banking regulations in Pakistan. Therefore this research has the potential to become the cornerstone of further academic research, contributing towards investigating role and limitation of Basel capital regulation in Pakistan in context of comparable emerging economies that are in-phase banking regulatory reforms.

In order to answer the research question and to meet its objectives, an in-depth qualitative study that focuses on a sample selected purposively was undertaken. This provided the researcher with an information-rich case study in which the research question could be

explored (Saunders, Lewis, Thornhill 2000). Senior bank managers' lending attributes have been analysed using questionnaire-based methodology (Masood 2010). Questionnaire based methodology has been used to analyse the efficiency of financial managers as well as borrowers (Masood et al 2009). In addition, questionnaire methodology has also been used with loan officers in relation to their commercial lending (Royal and Altauser 2002). Therefore the risk managers who are actually responsible for the Basel Capital regulation compliance in commercial banks constitute the sample of the study⁶².

The research thus aims to contribute to identifying if bank capital is reflective of bank risks towards taming the financial capital. The study aims to achieve this by developing a model with unique proxies to capture the riskiness of banking assets and carry out questionnaire for deeper insights on the topic. Findings of the empirical research will contribute towards identifying role and limitation of International Basel Capital regulation in Pakistan with developing economies perspective and potentially point out further research directions in taming financial capital through International Banking Regulations and prudential risk management in Banks.

1.7 Layout of the thesis

The research thesis constitutes three parts. Part 1 constitutes introduction and review of relevant literature and the “Banking Sector of Pakistan”, Part 2 contains research methodology, empirical findings and discussion. Part 3 summarizes the research findings, conclusion and recommendations.

Part 1: Financial Capital beyond bounds: Assessing Bank risks and Basel Capitals in Pakistan

Part 1 of the thesis contains chapters 1, 2 and 3 as detailed below:

⁶² See Neuman and Roskos (1997) for significance of research question focusing on a sample where the respondents are selected because they are particularly informative.

Chapter 1: Introduction

Chapter 1 contains the introduction to the study. The chapter encompasses rationale of research, statement of research problem, conceptual framework, contribution to existing literature, aim and objectives of the study accompanying brief introduction to methodology.

Chapter 2: Basel Capital Regulation

Chapter 2 reviews the literature debating the evolution and role of banking regulations, Basel Committee on Banking Supervision and the journey of Basel Capital regulation from the very first Basel Capital Accord Basel I to the most recent Basel III. The chapter then takes a critical viewpoint of the role and limitations of the Basel Capital regulation in taming the financial capital as witnessed in global financial crises. The chapter continues on to discussing Basel Capital regulation, its technical charter (the computation of risk under three pillar approach) and the implementation progress across the globe. The chapter also includes discussion on the role of Basel Capital regulations in exacerbating procyclicality and suitability for emerging market economies.

Chapter 3: Banking Sector of Pakistan

Chapter 3 contains the introduction to Banking sector of Pakistan systematically discussing evolution of banking regulations in Pakistan, the principal regulatory authority ‘The State Bank of Pakistan’ and its regulatory achievements. The chapter also incorporates brief introduction to the evolution of dual banking system in Pakistan where both traditional interest-based banks operate parallel to Islamic banks offering no interest; and profit and loss sharing services. The chapter furthermore highlights the Basel Capital regulations compliance in Pakistan, the regulatory take on importance of Basel Capital compliance in Pakistan and the role and limitations of Basel Capital regulations in Pakistan.

Part 2: Research Methodology, Empirical findings and Discussion

Part 2 encompasses a detailed methodology in chapter 4, followed by empirical findings and discussion in chapters 5 and 6.

Chapter 4: Methodology

Chapter 4 details the research methods, data collection and analysis approaches, data presentation, software for the analysis, limitations and ethical considerations of the research.

Chapter 5: Primary Data Analysis

Chapter 5 discusses the findings of the primary data analysis

Chapter 6: Secondary Data Analysis

Chapter 6 discusses in detail the finding of the secondary data analysis.

Part 3: Conclusion

Part 3 sums up the thesis with concluding protocol in chapter 7.

Chapter 7: Findings, conclusion and recommendations

Chapter 7 contains summary of findings, conclusion, recommendations, limitations of the research and future research directions.

Chapter 2: Basel Capital Regulation

2.1 Introduction

This chapter is divided into eight subsections: First takes critical view point of the evolution and importance of the banking regulations; second is critical evaluation of Basel Capital Accord's technical charter as basis to critically analyse its role and limitations; third takes a look at the implementation challenges across the globe and transition progress, in particular impact on capital requirements of the banks, concluding with critique of Basel II capital regulation; fourth discusses the economic impact (procyclicality)⁶³ of the variation in capital requirements of the under Basel Capital regulation guidelines; fifth section discusses the limitations of Basel Capital regulation surfaced during global financial crises; sixth discusses the Basel Capital regulatory modifications in response to the global financial crises: Basel III. Seventh section of the chapter discuss the suitability and transition hurdles of the Basel capital regulation in emerging economies followed by conclusion.

2.1.1 International Banking Regulation and Supervisory

The evolution of banking regulations and supervision of the developed economies is highlighted following or during periods of crises⁶⁴. In times it is evident that solvency ratios alone do not act as comprehensive early warning signs. It has been argued that each episode of banking crisis followed its own unique circumstances however, deregulation and asset price boom remain noted similarities (Basanko and Kanatas 1996; Barth et al 2013a). Developed economies of United States and Europe faced devastating banking crises in past, owing to financialization of capitalism (Lapavitsas, 2013). Whenever erupted bankruptcy was suspected to be a risk of a systemic nature, central banks historically intervened as

⁶³ See Barajas et al (2004)

⁶⁴ For example: US regulatory authorities to cope with 1907's liquidity panic banking failures caused introduction of US Federal Reserve (established 1913) as the lender of last resort (LOLR); The crash of Dow Jones 1929 inflicting the famous *Glass-Steagall* Act, the introduction and termination of *Bretton Woods* system and Herstatt crises in 1970s, instigated creation of IMF and World Bank depict the actions of regulators at the time see Kroszner and Rajan (1994).

saviors confirming the fact that these banking empires are considered too large to be allowed to fail (Demirgüç-Kunt, and Huizinga 2013).

Nevertheless along with US, the financial scene of the rest of the world records bank failures leaving overwhelming impact, even most stable economies of world tumbled, questioning the effectiveness of the role of regulators see Reinhart and Rogoff (2008). Evidently, average yearly world inflation during late 70s and early 80s rose significantly higher than world economic growth (Trumbore 2002). The need for synchronization of international regulations kept ever growing. Regulatory authorities across the globe at the end of 1970s took steps to liberalize their banking sectors to allow financial institutions to reorganize and face the threats of volatile economic environment. In particular actions of American regulatory authorities, for instance introduction and promotion of domestic and global capital markets in attempts to reinstate American economic authority following collapse of Bretton Woods.⁶⁵

Deregulation of financial sector, gave birth to a number of crises see Lindgren et al (1996). In Europe banking regulators issued directive establishing that the supervision of banks operating in several countries to be transformed from the host country to the home country. Analysis of crises dating from 14th century through to global financial crises showed evidence that such transformation was difficult to achieve. A number of countries struggle to transform from developing economies into developed economies. In addition neither regulators nor banks' top Managers of host countries occupied skills to see off any planned transformation process successfully⁶⁶. Reinhart and Rogoff (2009) discuss some core features of crises through quantitative evidence that crises frequently stem from interest rate shock, and commodity price crashes frequently accompanied by banking crises.

It has been recognized for some time now that the banking system comprises a set of vulnerable processes, in particular capital calculation and treatment remains complex

⁶⁵ See Panitch, L., & Gindin, S. (2009). Global capitalism and American empire. *Socialist register*, 40(40) for detailed synopsis of 'Volcker Shock' of 1979 and acceleration in capital accumulation; momentum in neo-liberal policies towards globalization discussed in detail see Gowan, P. (1999). *The global gamble: Washington's Faustian bid for world dominance*. Verso.

⁶⁶ Reinhart, C.M., & Rogoff, K.S. (2008). *This time is different: A panoramic view of eight centuries of financial crises* (No. w13882). National Bureau of Economic Research.

affair⁶⁷. The most frequently discussed weaknesses have been non-existent covenants, liberal payments terms, inadequate financial analysis, insufficient collateral support, elevated leverage ratio, and repayments dependent on highly optimistic cash flows (Moshirian and Wu 2009). Regardless the cause, financial fragility can provoke a loss of confidence and prevent banks from offering important product and service liquidity within banks and thus become prime cause for a potential bank run. At a time when banking system is vulnerable, the lack of confidence associated with one bank can heavily impact other banks sequentially see Kroszner, Laeven and Klingebiel (2007). Banks dealing with such situation are only left with the option to absorb their losses through capital. On instances where bank capital, or retained earnings of the commercial bank are not enough to absorb the losses then governments may need to intervene with taxpayers' money causing the government to sacrifice their popularity amongst the taxpayers. Note, once the entire financial system collapses, there is no mechanism for money transmission. Rochet (2004) discusses that the issue of micro prudential regulation shifts to macro prudential regulation if banks in one or more countries are collectively exposed to the same risks imposing large costs on the economies. Hoggarth, Reis, and Saporta (2002); Claessens, Demirguc-Kunt and Moshirian (2009) further investigate the reasons and impact of the crises. Hoggarth, Reis, and Saporta (2002) concluded that the costs of banking crises resolution are greater in emerging economies. Developing countries experienced greater macroeconomic volatility, and greater volatility of external flows fearing greater susceptibility to external shocks. Not to mention that institutions in developing economies are weak, bankers and bureaucrats may exploit an unfair advantage of gathering private benefits at public cost within an environment where technical expertise is scarce (Foot 2006). Banks with their potential to impact world economy on such huge scale therefore should rightly be subject to stringent regulations and supervisory rules. Bank failures in developing countries had threatened the financial health of banks in other countries as well raising apprehension about cross-border contagion risk (Tonzer 2015). Regulators have been firmly convinced of the need for better coordination in regulation across the globe.

⁶⁷ See Cihak, M., Demirgüç-Kunt, A., Peria, M. S. M., & Mohseni-Cheraghloo, A. (2013) found that crises countries had complex but less strict definition of capital, however exhibited lower actual capital ratios

2.1.2 Basel Committee on Banking Supervision (BCBS)

A forerunner to the Basel committee was the standing committee to the group of ten (G-10 countries)⁶⁸ central banks, which was established in 1971 due to growing regulatory concerns⁶⁹ including the emergence of the Eurocurrency markets. Its secretariat was agreed to be provided by the Bank of International Settlement (BIS), and each member government sent representatives. The impetus to create such a committee to focus on capital adequacy came from the progressive globalization of financial markets and an ongoing process of financial derivatives innovation (Huang et al. 2008). The Basel committee act as a forum for discussion on the handling of specific supervisory problems, coordinates the sharing of supervisory responsibilities among national authorities in respect of banks foreign establishments, and seeks to enhance standards of supervision among its member countries. “International convergence of capital measurement and capital standards” issued by the G-10 central bankers’ working group was a brief set of simple rules intended to ensure financial stability and level playing field among international banks (BCBS 1988). During 90s in Europe, the Capital Adequacy Directive (CAD)⁷⁰ took the limelight for incorporating market risk. CAD was based on proposals to equip banks and non-banks with adequate capital to cope with unexpected credit default. In 1996 the European Commission released an updated Capital Adequacy Directive “CAD II” proposing advance VAR⁷¹ model, followed by CAD III to incorporate proposed Basel Capital Regulation into European legislation (Strug 2008; Holton 2008). Standardized approach and Internal Models Approach whereby banks are allowed to use their own VAR models was covered comprehensively by the Basel Committee (BCBS 2001a). Basel Committee continued consultation with the sector and published a string of working papers. Final version published, then widely known as Basel II (BCBS 2006a) replaced the 1988 framework. The set of recommendations contained in Basel II expected to reach as many

⁶⁸ G-10 refers to group of 10 countries established in 1962 member countries: United States, United Kingdom, Belgium, Canada, France, Germany, Italy, Japan, Netherlands, and Sweden. Switzerland joined in 1964

⁶⁹ Suspected termination of then prevailing Bretton Wood fixed exchange rate paradigm

⁷⁰ European initiative of 1993, to establish uniform capital requirements for both banks and non-banks

⁷¹ VAR short for value at risk, developed to encompass a firm exposures to market risk see Linsmeier, T.J. and Pearson, N.D. (2000). Value at risk. *Financial Analysts Journal*, 56(2), pp.47-67.

as 100 countries and translated into laws in Europe, North America and Japan as was in case of Basel 1988 (Balthazar 2006). Furthermore Basel II, just like its predecessor aimed to maintain quality and stability of the international banking system along with creation of level playing field for international banks. But also adds as most important goal, the promotion of adoption of stricter rules regarding risk management framework of banking (BCBS 2006b). The Basel committee in a bid to significantly organize dealing with international bank supervisory issues operates with a list of sub-expert committees see (Appendix 1).

2.1.3 Basel I: The Basel Capital Accord

The first consultative Basel Capital Regulation document published by BCBS was called Basel I (BCBS 1988). The objective was to strengthen not only the soundness and stability of the international banking system but also, to diminish existing sources of competitive advantage⁷² enjoyed large international banks. The Accord focused primarily on credit risk and consisted of recommendations for minimum capital requirements of the bank, fully backed by the central bankers of G10⁷³ countries initially proposed for implementation in G-10. To describe briefly, the initial Basel accords suggested both on-balance sheet and off-balance sheet item should be assigned a weight based on their estimated risk (BCBS 1998). Basel effectively aimed to differentiate assets by function of their assumed risk and incorporated off balance sheet items that grew significantly. It was designed for banks to hold minimum capital level of 8 percent of those risk weighted assets with provisions for national regulators to implement stricter conditions if deemed necessary. The capital thus categorized as Tier 1 and Tier 2. Tier 1 capital included paid up capital and disclosed reserves and Tier 2 capital included undisclosed reserves, general provisions, subordinated debt (max. 50% of Tier 1), asset valuation reserves and other unsecured fully paid up

⁷² Competitive advantage (inequality) in banking refers to lower reserve required by large banks as compared to small banks. Large banks with advanced risk management structure manage to convince the regulator of their better ability to diverse risk. As a result of lower reserve requirements the large banks have more money available to do business and therefore enjoy a competitive edge over smaller banks.

⁷³ G-10 refers to group of 10 countries established in 1962 member countries: United States, United Kingdom, Belgium, Canada, France, Germany, Italy, Japan, Netherlands, and Sweden. Switzerland joined in 1964

instruments. Goodwill because of its subjective valuation nature was deducted from Tier 1. Un-consolidated investment in subsidiaries was also proposed to be deducted from the total capital base (Balthazar 2006). Once the capital was defined, the risk weight of assets was divided into categories ranging from 0 to 100 percent depending upon their assumed risk level. Off balance sheet items were divided in two broad categories and a number of Credit Conversion Factors (CCFs) were applied to transform these off-balance items into their on-balance sheet equivalents (BCBS 2000a). Collaterals and guarantees were only considered if issued by OECD⁷⁴ central government or cash.

2.1.4 Limitations of Basel Capital Accord

A number of economic factors contribute to dictate proceedings in each era of crises⁷⁵ including fixed versus flexible exchange rates, financial capitalism, speculation and liquidity, fiscal and monetary policies, regulation and competition, therefore it is unfair to establish credit risk as the only cause for the bank failures (Lindgren et al. 1996, Rochet 2004, Claessens, Demirguc-Kunt and Moshirian 2009, Lapavitsas 2013). Nevertheless it has been highlighted that Basel I by default, one size fits all approach, was relaxed during the times of boom, but in times of recessions it got strict (Dewatripoint and Tirole 1994). The research suggested that where increase in capital requirements resulted in decrease in quality of banks assets and amplified the business cycle fluctuations, it also most importantly for banks increased the value of their future profits (Boot and Greenbaum 1993, Blum and Hellwig 1995, Besanko and Kanatas 1996, Blum 1999, John 2000).

Despite number of draw backs and criticism, Basel Accord laid down foundations for the greater focus and a better understanding of the risks associated with the banking activities. Designed primarily for the international banks of the G10 countries, it effectively is now

⁷⁴ Australia, Austria, Belgium, Canada, Chile (joined later in 2010), Czech Republic, Denmark, Estonia (joined later in 2010), Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel (joined later in 2010), Italy, Japan, Korea, Luxembourg, Latvia (joined later in 2016), Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States

⁷⁵See Summers, L. H. (2000). "International financial crises: causes, prevention, and cures". The American Economic Review, 90(2), 1-16.

basis for more than 100 countries and has often been imposed at the national level. This may not achieve in exact a uniform playing field due to different circumstances prevailing in each compliance jurisdiction nonetheless, majority of international banks are facing similar set of uniform rules regarding capital requirements and risk management. It is also an improvement on previously utilized equity ratios. Although Basel Accord achieving a safer banking practice environment remains dubious (Jackson, 1999) indeed it has played its part and pushed banks with minimum capital requirements under 8 percent to reconsider their risk management strategies.

2.2 Basel II Capital Regulation: The Three Pillars

The Basel II Capital Accord introduced three pillar approach in a bid to enhance banks' risk management capabilities. Capital allocation under Basel II Capital regulation were dubbed more risk sensitive, progressive and comprehensive. Nevertheless, its implementation remained difficult, in particular in countries where risk management in banks was newly born. The three pillars of Basel II capital regulation are 1. Minimum capital requirement, 2. Supervisory review of capital adequacy, and 3. Public disclosure. Pillar 1, initially dealt with two major types of risk in the definition of risk weighted assets: Credit and Market risk, Operational risk was introduced in calculations later. Credit Risk consists of Standardised Approach, Foundation IRB Approach and Advanced IRB Approach. Market risk captured through VAR methodologies and operational risk computed using Basic Indicator Approach, Standardised Approach and Advanced Measurement Approached (AMA). Pillar 2, Supervisory Review process and Pillar 3, Market Discipline documented in the Basel II capital regulation were drafted to aid Pillar 1 in calculating remaining risks not covered under Pillar 1 and keeping a comprehensive check on the riskiness of banks' asset portfolio.

Judgements of risk and capital adequacy must be based on more than an assessment of whether a bank complies with minimum capital requirements, furthermore, it provide banks with some insight into supervisory expectations for specific securitisation exposures.

In empirical banking literature despite an enormous number of existing studies, there is still no general consensus about the function and role of the banking sector⁷⁶.

Basel I Capital Accord only focused on credit risk and one size fits all approach that made no discrimination between a well Risk managed bank and one that is not. In response to the criticism of the 1988 Basel Capital regulation a number of changes were made, culminating in the 2001 proposals. The original plan was for the proposal to be discussed among banker and the member of the Basel committee agreed on by January 2002, and adopted by 2004. However, comments from banks, together with the committee's three impact studies⁷⁷, prompted BCBS to make substantial changes to the original document. In June 2004, final proposal was published in full by the Bank of International Settlements on behalf of Basel Committee called Basel II Capital regulation introducing a three pillar approach discussed below (BCBS 2004d). In transition towards Basel II initial plan was to introduce standardized approach to the G-10 member countries by the end of 2006 and then "advanced" approaches would take effect from the end of 2007 (BCBS 2004d). During the first year of implementation, banks and national regulators were expected to run parallel computations, calculating capital charges based on Basel 1 and II. Following the implementation in G-10 it will be interesting to find, how emerging economies react to implementing Basel II especially in conditions carrying economic recession. Basel II is structured in three pillars, a comprehensive step up from Basel I, lacked guidelines for calculating the exact minimum capital requirements threshold as a warning sign for the regulators (Decamps et al. 2004; Gordon 2004). However, following continued consultation and effective dialogue with the sector, the comprehensive version⁷⁸ contained updated guidelines on implementation of the three pillars discussed below.

⁷⁶ Berger, A., Leusner, J., & Mingo, J. (1997). The efficiency of bank branches. *Journal of Monetary Economics* **40**, pp. 141–162

⁷⁷ Impact studies refer to three quantitative impact studies done by the BCBS before Basel II, QIS III being the last one initiated in 2003 across 43 countries to gauge impact of Basel II on minimum capital requirements before final version of Basel II in 2004.

⁷⁸ (BCBS 2006a)

2.2.1 Pillar 1 Minimum Capital Requirements: A Technical Charter

Pillar 1 of the comprehensive version of Basel II contains the comprehensive guidelines on assessment as well as computations of Credit, Operational and Market risk discussed individually (BCBS 2006a). The risk management approaches under Basel II have been designed for banks to achieve lower minimum capital requirements when moving from adopting simpler approaches towards adopting more complex approaches (BCBS 2009a). Importance of Capital can be defined simply as the only buffer available to Banks against unexpected losses and to maintain their operations in an effective manner. According to Basel Capital Regulation, minimum capital requirements of the bank must be calculated individually for each of its asset portfolio. This should act as an incentive for the banks to conduct secure lending. For instance secure loans would enable banks to keep their minimum required capital at its lowest against that asset, freeing up excess funds to conduct more business and so forth. This incentive urged banks to raise their risk management standards and comply with Internal Ratings Based (IRB) approach under Basel Capital Regulation. Under the IRB approach, banks can develop their own risk assessment model and demonstrate to regulatory authorities that their assets carry low risk (Blum and Hellwig 1995; Blum 1999; Lastra 2004; Caruana and Narain 2008; and Marrison 2009). Such progress and innovations in quantification techniques have allowed large banks to make precise estimates of their internal economic capital requirements. Such expertise developed by the banks did not necessarily proved useful as banks got involved in riskier activities in order to align their economic capital⁷⁹ with the regulatory capital⁸⁰ requirements for instance Capital arbitrage. In fact, practice of Capital arbitrage (substituting high-risk for low-risk assets) theoretically should help banks correcting capital requirements constructively (John 2000). Instead it became a speculative practice into growth of financial capital and increased profits. The desire for increased return on equity urged banks to consider transacting their assets in counterparty arrangements for reduction in total risk of the original lender and get involved in trading markets. Markets hosting the hedging of such credit assets initially considered inefficient and illiquid. However continued growth in credit-derivative and guarantees is somehow spectacular and points

⁷⁹ Capital requirements according to banks own estimates

⁸⁰ Capital requirements according to regulatory body banks must comply with

out to the improvement achieved in credit market's liquidity and efficiency (Altman 2002). Commercial and investment banking due to their fundamental difference in operations are exposed to different risks and intense competition encouraged banks to pursue in both operations. To top that, financialization of the industry played its part in deregulation and pushed banks to invest in even riskier markets e.g. investment banking. The extent of growth in investment banking and hedge funds at an abnormal pace should have sparked concerns amongst regulators. For instance during mid90s US housing market witnessed extensive growth accompanied by high injection of cash inflow into US economy from other economies (BCBS 2004a). The regulators cut interest rates in regular intervals and credit became easy to obtain encouraging exceptional growth in lending activity therefore greatly increasing Mortgage-backed securities (MBS)⁸¹. In this particularly obvious era of volatile exchange and interest rates this time market risk emerged as a definitive force in causing bank failures (Moshirian and Wu 2009).

Growing importance of all forms of risk management driven by the rise in volatility within many principal financial markets have led banks to become developers, users and above all providers of risk management instruments. In fact risk management has witnessed an era of evolution, from a mere limit setting risk valuation technique to extremely complex performance measures encouraging risk based pricing, portfolio management and economic capital allocation. Basel II arguably developed extremely sophisticated breakdown of capital standards for the management of Market, Operational and Credit risk techniques starting from the basic standardized approach towards more complex ones such as securitization, use of credit derivatives or guarantees and credit insurance products (Altman 2002).

2.2.1.1 Credit Risk

Basel II capital regulation propose credit risk to be calculated broadly using two approaches: standardized approach for all banks and internal ratings based approaches for

⁸¹ Pagano, M., & Volpin, P. (2012). Securitization, transparency, and liquidity. *Review of Financial Studies*, 25(8), 2417-2453.

banks qualifying to develop their own internal risk management models discussed in more detail following.

2.2.1.1.1 Credit Risk – Standardized Approach: The Standardized Approach is somewhat similar to the 1988 capital accord, indeed there is sufficient up grading of the risk weights by integrating their estimated risk levels through use of external ratings. Banks lacking sophisticated models against the bench mark requirement by the Basel Capital Accord for assessing risk would be required to adopt the standardized approach under Basel II (BCBS 2004c). The major modification in Risk-weighted assets (RWA) involves the use of a wider band of risk weightings, ranging from 0% for very low risk to 150% for high risk loans even if lending bank has a claim through a short term issue bearing an external risk rating (BCBS 2000a). Loans due for over 90 days are risk weighted and do not fall below 50 percent under any given provision. The credit risk weights for loans to countries, banks, corporate and securitized assets vary according to the banks (BCBS 2003a). There is no distinction between OECD and other sovereigns where a sovereign risk weighting will be determined by external rating agencies or a qualified export credit agency (BCBS 2000a). External Credit Assessment Institutions (ECAIs) have been recognized only if they meet the standard criteria of transparency and credibility. Released ratings are then converted into risk weights. If more than one ratings available, banks should retain lower of the top two (BCBS 2005). Public sector entities that are non-central government can be weighted by regulators as banks or as sovereign. Multilateral Development Banks and Securities firms are also risk weighted as banks unless they fall under certain category to advantage from 0 percent Risk Weighted Assets. Banks are weighted under two options. Under option 1 risk weight is higher than that of given to claims on the country of origin. Under option 2 risk weight is a function of the bank rating (Balthazar 2006). In Retail, the claims allowed are strictly based on individual person or business entity. In case of Residential property and Commercial property credit must be fully secured and the borrower must be the one to occupy or to rent the property. Recommended risk weight for retail as well as property is not less than 100 percent unless specific exception is recognized by regulator. For any other Assets 100 percent risk weights recommended (BCBS 2009a). There is no modification to recommended use of Credit Conversion Factors (CCFs) to convert off-balance sheet into their equivalent credit exposures as in 1988 framework (BCBS 1988). Nevertheless, the

probability of default of counterparty and increased deterioration of quality of borrowers resulted in increased regulatory capital requirements consistently. This in turn forced sophisticated financial institutions to develop Credit Risk Mitigation arrangements (Altman 2002; James and Allegra 2009). Credit Risk Mitigation (CRM) mainly to help banks manage credit risk by effectively managing collateral dramatically evolved over the years. To integrate use of CRM into RWA computations under Basel II Standardized approach, covered exposures receive the risk-weight of the collateral with a minimum of 20% otherwise risk-weight can be treated as unsecured by reducing exposure by the value of the collateral. Current value of exposures and collateral is subject to change following market fluctuations or, in case of default of counterparty the change in the current value from the time bank decides to liquidate collateral till the point position is closed (BCBS 2004d). Exchange rate has to be taken into account in case of collateral and exposure in different currencies (BCBS 2004b). Banks develop their own or adopt supervisory procedures in order to adjust the value of collateral in case of sensitive to market parameters. Reference values are available under a ten day holding period (the time between decision to sell the collateral and the effective time of the recovery) in Standardized and IRBF approaches. Banks may alter regulatory guidelines to adjust the value of the collateral taking into account transaction holding period due to the fact that various types of collaterals on different markets can have different liquidation period. Banks that are allowed to renovate supervisory guidelines or use their own developed processes in order to adjust the values of collateral, banks must comply with requirements set by the regulators. Regulators may allow exemption from adjusting the value of collateral only in the cases where exposures and collaterals are in cash or same currency with maximum liquidation period of four days where the market participants can be sovereigns, central banks and banks (BCBS 2004d). Legal requirements must be considered at all times as well as banks' ability to execute the collateral, and arrange funds on request in time see James and Allegra (2009). Although CRM is significantly useful for reducing credit risk but at times is guilty of increasing operational, liquidity and legal risks (Wang 2008).

2.2.1.1.2. Credit Risk-IRB approaches

In IRB approaches (Foundation and Advanced) capital requirements are calculated by the function of risk parameters (Table 2) derived from advanced credit risk models estimated by the banks (BCBS 2004c).

Table 2. Risk Parameters

Probability of default (PD)	The probability of counterparty failing to meet the requirements of the financial arrangement.
Loss given default (LGD)	Expected loss on an exposure in case the counterparty defaults.
Exposure at default (EAD)	The expected value of exposure at the time when counterparty defaults.
Maturity (M)	Average maturity of the exposure

Source: Bank of International Settlements www.bis.org

For exposures including Corporate, sovereigns and banks, in IRB-Foundation the regulator's data consists of LGD, EAD and M where the banks only have to estimate the PD (BCBS 2001a). In IRB-Advanced banks internally have to estimate all risk parameters (see Table 2) conventionally based on historical data for most exposure types (BCBS 2001e). Maturity in majority cases is computed internally by the Banks as a function of cash flows and time of the cash flows in years (Balthazar 2006). CI (Confidence Interval) and ρ (Asset Correlation) are provided by the regulators in all cases (BCBS 2004d). Exposures are essentially classified into six categories for risk weightings (Table 3).

Table 3. Exposure Categories

Corporate	This includes both large corporate and small and medium-sized enterprises (SMEs). In addition it covers comprehensively Specialized Lending (SL) exposures through Special Purpose Vehicles (SPVs). For risk weighting Banks are inclined to use standardized approach to band SL exposure to classify their operations. Only ratings classified as strong would be greater than BB+.
Sovereign	Exposures treated as sovereign risk-weighted according to Standardized approach i.e. sovereigns, assimilated Public Sector Entities (PSEs) and Multilateral Development Banks (MDBs) at zero percent.
Bank	Exposure to banks and sovereigns that are not zero percent in Standardized approach. The risk weighting is same as corporate.
Retail	Exposures loans given to SMEs amounting less than 1 million EUR along with their counterparties that are managed as retail exposures. Exposure on

	individuals and residential mortgages are without size limit. The risk weighting is the same as corporate.
Equity	Exposure that execute claim on borrowers assets in case of default where there may be no other debt to clear. In simple form of proceedings they receive between 300 to 400 percent risk weightings but in PD/LGD situations risk weighting is calculated same as corporate. Internal approach carries risk weighting as a percentage of 99 percent of VAR estimated quarterly.
Purchased Variables	Retail or corporate exposures not directly raised but purchased by banks. Banks apply respective risk weighting function.

Box 2.2.2 - Exposure Categories (BCBS 2004d)

In IRBF, in addition to collateral determined in standard approach, Commercial and residential real estate, receivable as well as other physical collateral can be recognized and used to offset a part of the exposure before calculations of RWA. Guarantees and credit derivatives are treated almost as same as standard approach where PD of the guarantor is swapped with PD of the exposure if it is lower (BCBS 2004c).

In IRBA approach, banks calculate (%) and apply internal collateral adjustment processes and set minimum collateral acceptance indicator (%) for receivables; commercial and residential estate; and other physical collateral. If the value of covered exposure is less than internally calculated minimum collateral indicator, it is not recognized. In case the value of covered exposure is more, it is recognized. Final LGD for that part of exposure is calculated by dividing the value of collateral by the collateral (Internally adjusted) of the exposure (BCBS 2001d). Under IRBA, a bank (with minimum past seven year data on average recovery value of collateral) can recognize a range of collateral and deduct from exposure to identify capital requirements (BCBS 2004d). Evidently by validating their internal credit rating system banks start benefiting straight away (Ozdemir 2009). Only after complying with this complex and strict criteria set out by the regulatory authorities, the institution is considered eligible to switch to IRB approaches. Research suggests that only larger more sophisticated banks show the strength and technical knowhow to implementing IRB approaches and as a result extend even further their competitive advantage over the banks using Standardized approach (Lastra 2004). QIS3 published by Basel II discovered that there is a large variance in capital across different banks and evidenced that Banks enjoyed hefty cut down in capital when moving towards adopting

IRB approaches (Tschemernjak 2004). In doing so, there is possibility that banks underestimate their expertise in encountering problems, in particular rules concerning commercial lending. Under IRB approaches risk weightings can drop significantly offering banks an incentive to advance further into retail activities e.g. mortgage lending etc. There is evidence that even banks complying with Basel II did not have sufficient capital to buffer against unexpected losses arisen from mortgage related assets and feared sudden pressure to deleverage, that reinforces the role of capital regulators to read into the risk information provided by the banks paying close attention to rectifying any gaps in required capital (Demirguc-Kunt, Caprio and Kane 2008; Alder 2009).

2.2.1.1.3. Credit Risk – Securitization:

Banks, in order to reduce their capital requirement transfer their non-liquid assets (debts) to an independent jurisdiction called “Special Purpose Vehicle (SPV)” and then extend subordinated loans, called ‘shadow banking’ (Adrian and Ashcraft 2016). SPV operates independently by issuing securities that are backed by the debts bought by the SPV from the bank commonly referred to as Asset Backed Securities (ABS). ABS issued by SPV are normally structured in various degrees of seniority to generate cash flows. Most senior loans are settled first. Most junior loans called “equity tranche” are usually kept by the bank. Equity tranche enables bank to keep the main part of the risk on its balance sheet and absorb the first losses, therefore enabling ABS extremely attractive to the investors (Gordy and Jones 2003). On the other hand securitizing good quality loans and leaving themselves low quality loans can prove damaging to the bank’s own risk profile⁸². The structures where underlying loans are not physically transferred out of balance sheet of the originating bank but only credit risk is covered through the use of credit derivatives is commonly termed as synthetic securitization (BCBS 2002). Securitization structures are significantly complex, different in different cases with even more complex techniques to evaluate risk associated. Basel II therefore had an impossible task to come up with simple set of rules to determine capital requirements. Originating banks raise, directly or indirectly securitized exposures,

⁸² Pagano, M. and Volpin, P., 2012. Securitization, transparency, and liquidity. *Review of Financial Studies*, 25(8), pp.2417-2453 argues that there is conflict between growing complex financial instruments and liquidity on secondary markets giving rise to low level transparency.

place securities in the market and provide credit enhancement. Originating banks therefore subject to meeting the requirement qualify to exclude the securitized exposures from their calculation of RWA. Liquid assets have to be completely transferred out to SPV. Banks must follow standardized approach where assets are not transferred physically but hedged through the use of credit derivatives (Acharya et al 2013). Also if originating bank agrees to buy the securitized exposures back in any case, they must also calculate their RWA considering underlying exposures as part of their balance sheet. Investing banks can be introduced to bear the risk of a securitization exposure (BCBS 2002).

For banks that operate their credit risk under standardized approach for the securitization framework must comply with external rating based. RWA ranges from 20% for AAA rating to 350% for BB- (Standardized Approach). For off balance sheet item Credit Conversion Factors (CCFs) are used. Banks that originate the securitized exposure and receive external rating below BBB- should minus them from their capital base (BCBS 2002). The banks under IRB approaches use Rating Based Approach (RBA), the Internal Assessment Approach (IAA) and the Supervisory Formula (SF). RBA is applied in case securitized tranche has internal or external ratings but IAA used when there are no available ratings but only for exposures extended to Asset Backed Commercial Paper (ABCP) activity. SF is used in case there are no available ratings (Balthazar 2006).

Many operations achieve capital arbitrage through securitization under Basel II which can be classed as significant improvement over BCBS Consultative paper 1 following continued consultation with the sector. For example Supervisory Formula helps incorporate the underlying pool granularity, credit quality, asset correlation and tranche depth. (BCBS 2001c; BCBS 2002) Rating Based Approaches helps in confirming that AAA corporate bond does not automatically mean that the securitized exposure is AAA. It has been established that the securitized tranche with a good rating carries less risk than corporate bond associated with it and, a low rated securitized tranche is far riskier than the corporate bond with same rating (Acharya et al 2013). The rating approaches under Basel II assume main risk drivers and incorporate that in the risk weightings. By regular interaction with the industry it has been brought to light that although situation has improved significantly over the years there still are number of market participants still invest in securitization without sufficient risk management expertise. Basel II although claims to be updated and granular with regards to mitigating securitization incentives by

reduction in capital charge on mortgages held on the balance sheet up to 35% and by imposing a capital charge on short-term lines of credit. In effect loss in confidence in securitization had comprehensive role play in triggering current financial (Pagano and Volpin 2012).

2.2.1.2 Operational Risk

The losses generated from different forms of operations (e.g. losses from valuation risk through in house fraud, legal and documentation risk etc) shed light on the importance of effective management of operational risk (Foot 2002; Lastra 2004; Sheen 2005; Flores et al. 2006; Moosa 2008). It was established early on that operational risk capital charges that are meant for banks may not be suitable for average insurance services directive (ISD) (Foot 2002). According to QIS2 of the breakdown of economic capital by risk type, operational risk constituted comprehensively significant 16%. To effectively cope with risk of losses resulting from inadequate or failed internal processes, people and systems, or external events, Basel II continued consultation and as a result bank may adopt one of three approaches to measure operational risk (BCBS 2004d).

2.2.1.2.1 Basic Indicator Approach (BIA):

Operational risk is considered directly proportional to the size of the bank. The size of bank activity is calculated by the gross income of bank net of interest income, excluding profit from the sale of securities in the banking book and extraordinary items. Based on a single indicator for overall risk exposure, the capital requirement is calculated as 15% of average (positive) annual gross income over the previous 3 years (BCBS 2001b).

2.2.1.2.2 Standardized Approach (SA):

Under this approach banks are required to have an adequate Operational Risk Management with active involvement of the Board of Directors and that is subject to regular review by external supervisors. Banks must also ensure regular reporting of operational risk exposures and material losses. Banks allocate sufficient resources in Operational Risk Management in each business line and in the audit department. Once banks identify income from eight business lines, the capital charge for each business line is gross income multiplied by a fixed percentage. (Retail Banking, Retail Brokerage and Asset Management 12%; Commercial Banking and Agency Services 15%; Payments and

Settlements, Trading and Sales, and Corporate Finance 18%) The total capital to be set aside is the sum of these capital charges. Negative capital charges for a given business line can be utilized to offset capital charges from other business lines in that year (BCBS 2004d).

2.2.1.2.3 Advanced Measurement Approach (AMA):

Banks with advanced supervisory standards can use their own models to assess exposure to operational risk and calculate the amount of capital charge to be set aside. The banks can use internal (5 Years minimum) or external data to develop an internal assessment model, as well as scenario analysis. Banks must have reliable procedures to access their stored historical operational losses data and allocate them to the correct business lines. These internally developed models do not bear any acute specific criteria imposed by the regulators, but they must be adequate enough to differentiate losses due to operational risk over a year and capture events with least probability to occur. As risk mitigation, banks are allowed to have insurance cover against operational risk, and use it to reduce the operational risk capital charge by up to 20%. However, to use this benefit, banks must comply with certain conditions. The insurance must be for at least a year where insurer has an A rating by external agencies in terms of its ability to meet claims (BCBS 2001b).

The topic is elusive and need for availability of detailed operational risk standards for consultation is felt to encounter key operational risk issues facing a number of firms. There have been proposals of measuring banks' operational risk through cost variance, implementing enterprise risk/reward units and governing units through quantitative measures, nevertheless argued to be complex although banks acquired technology and varied data (Mainelli 2002). Basel II remains unable to define in clarity a specific criteria for the BIA or SA, nevertheless banks using this approach have been encouraged to use the Basel II guidelines (Sheen 2005). There have been questions as to what exactly constitutes AMA and there have been different explanations by different authors.⁸³ The argument has been, that the problems related to operational risk e.g. settlement failures, poor accounting, and lapse in internal controls should be dealt with effective corporate governance, internal controls systems, audit, compliance and insurance rather than assigning to equity capital. Basel II offers the matters to be dealt with by imposing a capital charge against operational

⁸³ See Moosa (2008) for detailed synopsis.

risk. That can represent up to 15% of the total minimum regulatory charge (BIA and SA), however under AMA any charge for operational risk is left on discretion of the banks supervisors see Lastra (2004). Therefore, BIA and SA did not achieve much appreciation because the guess is based upon a fixed percentage of gross income. AMA fundamentally received more considerations and urge banks to pay close attention to their operational risks. A very few banks⁸⁴, only with extremely sophisticated internal models have dared to invest in developing AMA in order to remove incentives for regulatory arbitrage (Moosa 2008). Following the evidence of advantages gained by adopting AMA, even for implementation of AMA, there are no specific guidelines in Basel II. Therefore Banks are encouraged to develop internally, an appropriate operational risk management system which is independent within the organization and supervised by competent regulators with active involvement of the board and senior level management (Flores et al. 2006). Furthermore, Basel II urges that bank operational risk must be capable of foreseeing or detecting the losses and assigning them to the corresponding business lines (BCBS 2006a). Moosa (2008) presents an in depth analysis of the literature with regards to the sectors approach on AMA claiming it to be complex to capture but notably beneficial for the banks who possess sophisticated internal risk management system. This is because AMA clearly produces lower capital charge than BIA and SA. Aligning regulatory capital⁸⁵ with economic capital⁸⁶ has become one of the prime concerns for banks and internal models are considered relevant and conducive in achieving so. The empirical study conducted on Spanish banking discovered that systems currently installed even in sophisticated entities are not all compatible with proposition of AMA see Flores et al. (2006). Manning and Gurney (2005) comprehensively looked at Lloyd's insurance market claiming operational risk extremely hard to measure and thus makes it hard to manage. Difference in size, scale and complexity of activities undertaken by organizations without presence of appropriately specified qualitative and quantitative requirements has made providing a sane set of requirements for operational risk management will be a daunting task (Shevchenko and Peters 2013).

⁸⁴ For instance Barclays, Citi, HSBC report parts of their operational risk under AMA

⁸⁵ Mandatory bank capital to be held by the banks according to the financial regulatory calculation

⁸⁶ Bank capital that is necessary to keep bank from going insolvent according to banks own estimation

2.2.1.3 Market Risk

Commercial banks have illiquid portfolios that are exposed to systemic risk and Investment banks have highly liquid assets⁸⁷. This historically implied that bank regulations to be different for both types of entities. Increased competition and internationalization have urged banks to become active in both directions, so called casino capitalism.⁸⁸ The growth in derivative activities required developing market risk measurement models for internal risk management purposes for calculating regulatory capital.⁸⁹ Market risk not only relates to financial derivatives; stocks and bonds it also takes into consideration interest rate risk and exchange rate risk (Casson 1996). VaR (Value at risk) was considerably popular amongst the banks as well as regulators despite other risk measurement techniques known. However, it was established that widely used standard deviation and VaR did not always reflected risk preferences accurately see Krause (2002). The financial crisis imposed losses resulting from market risk and became prime cause of the buildup of leverage occurred in the trading book (Moshirian and Wu 2009). This was attributed to the fact that the current capital framework for market risk, based on the 1996 Amendment to the Capital Accord to incorporate market risks, does not capture some key risks. It became clearly evident that on the bases of accuracy of VaR and market risk measurement models under Basel II guidelines, banks really showed their appetite excessive risk taking see Michael (2009). In response, the Basel Committee updated the existing value-at-risk based trading book framework with an approach that takes into account default risk as well as migration risk, for un-securitized credit products. Also incremental risk capital charge has been introduced, for securitized products with an exception for essential correlation trading activities (BCBS 2009b). The banks may be allowed to calculate comprehensive risk capital charge subject to strict qualitative minimum requirements. There is introduction of

⁸⁷ Commercial banks typically offer deposits and loans services and Investment banks trade in equities, raise capital for large corporations, underwriting and brokerage services

⁸⁸See Strange, S. (1997). Casino Capitalism [1986]. *Manchester & New York: Man.*

⁸⁹See McKenzie (2011); and Sinn (2010) for detailed discussion.

a stressed value-at-risk requirement taking into account a one-year observation period relating to significant losses, which must be calculated in addition to the value-at-risk based on the most recent one-year observation period (BCBS 2009b). Losses in most banks' trading books during the recent financial crisis have been significantly higher than the minimum capital requirements calculated under the Pillar 1 market risk rules (BCBS 2009b). This additional stressed value-at-risk requirement is tasked to help reduce the procyclicality⁹⁰ of the minimum capital requirements for market risk as well as decrease in the incentive for regulatory arbitrage between the banking and trading books (BCBS 2009a).

2.2.2 Pillar 2: The Supervisory Review Process

The Supervisory Process under Basel II requires, in general banks to develop their own transparent internal measurement systems to assess capital adequacy. The detailed Internal Capital Adequacy Assessment Process within banks containing principles for pillar 2 have been published in order to aid regulators correctly manage interest rate risk, credit risk, operational risk and securitization (BCBS 2004d). Despite the concept receiving recognition in the sector there still remain a number of concerns. The Supervisory Review Process (SRP) is accused of adding fatigue to existing work load on the banks. Compliance to pillar 1 alone can be complex where inclusion of pillar 2 can promote unlevelled playing field in favor of larger banks with comparatively superior structures having internal capital set below minimum requirements as well as differential implementation across borders (Caruana 2003; Lastra 2004). Principally risks external to the banks and risks not covered under pillar 1 are dealt with under the Supervisory Review Process (BCBS 2004d). Risks involved are: credit risk, market risk, operational risk, liquidity risk, reputation risk, strategic risk and interest rate risk in the banking book, and that can be different and extremely complex in case of international banks. If the risk profile is not reflected adequately in the capital the supervisors can urge the bank to increase their minimum capital (Garside and Bech 2003). Supervisors also confirm that banks using credit risk Internal Ratings Based approaches and operational risk Advanced Measurement Approaches submit and conform to their minimum requirements (BCBS 2004d). The banks

⁹⁰ Procyclicality is defined as the fluctuation of financial variables in response to economic cycle

must bear clear policies regarding risk factor integrated in the business plan, and establish reporting system for senior management to estimate the risk. Supervisors granularly review the banks internal capital adequacy assessment strategies and assess banks' ability to monitor their own competence in compliance with regulatory capital ratios (Garside and Bech 2003; Cartwright and Sarraf 2005). The responsiveness of senior management to the notification of changes in risk portfolio of the bank is also considered by the supervisors minutely. Banks moreover need to demonstrate they have capacity to operate above minimum required capital and can use mitigation and/or acquire additional capital in order to facilitate changes to their risk profile. Supervisors must conduct reviews on regular basis primarily to sense and alarm in early stages, such cases where banks might allow capital to fall below the minimum level (Decamps et al. 2004). Banks therefore, need to have brisk succession plan to address such situations. The Supervisory Review Process (SRP) currently considers only banks' internal models which may be developed individually by the bank in response to its peculiar circumstances (Samanta and Chakraborty 2016). There has been discussion of developing supervisory risk assessment models that could be used to benchmarking. Allowing national discretion also indicates regulators struggling to agree on a common model for complex situations while dealing with large institutions on an international scale. But even if they did this could mean going back a step leading to standardized risk models that can cause a systematic risk (Hassan and Tamer 2016; Brownbridge 2015). Nonetheless SRP is revolutionary effort for the regulators to realizing in principle that capital charge may not reflect the true quality of the banks' assets portfolio (Lastra 2004). There is sufficient indication of the importance of the effective execution of SRP case-by-case approach and the application of both discretion and judgment according the circumstances of the institution and the markets in which it operates see Roldan (2006). There have been financial crises with such preventing procedures in place, indeed raises the important questions of regulator's ability to oversee those internal proceedings and ensuring sufficiently consistent application across banks and countries (Alder 2009).

2.2.3 Pillar 3: Market Discipline

The foundation objective of the Pillar 3 is to effectively complement the minimum capital requirements (Pillar 1) and supervisory review process (Pillar 2) by development of disclosure requirements to allow market participants to assess key information (BCBS 2006a). These disclosures are required to be consistent with how senior management and

board of directors assess and manage the risk profile of the bank (BCBS 2004d). Supervisor may request information in regulatory reports or further still require banks to publish reports for public access. The nature of exact measures used may depend upon the legal powers of the supervisor as well as criticality of the disclosure deficiency. The foundation intention behind the market discipline is to promote safe and sound banking environment not to impose additional capital requirements. The motive here as well, disclosure requirements under Pillar 3 are not in conflict with general accounting standards. The disclosures will not be required to be audited unless required by accounting standard authorities or securities regulators. Generally Pillar 3 would require banks to have approved a formal disclosure policy that addresses the approaches bank undertakes in order to assess its risk profile (BCBS 2006a). Banks on the other hand already disseminate a lot of information for use by shareholders. However, it has been argued that limited risk disclosure occurs and the firms are not completely transparent at all times (Linsley and Shrive 2005). Pillar 3 works actively to ensure that important market participants such as equity or debt holders actively monitor the banks position in comparison with its risk profile, and be able to react in an effective manner. Allowing access to key information on the capital adequacy of the institution would help banks senior management as well as external analysts like credit rating agencies and insurance companies, anticipate potential financial health hazards and respond in a timely manner. The argument nevertheless, attracted a number of discussion in the literature (Nier and Baumann 2006). Furthermore, under active discussion is the issue of how much freedom should be granted to the regulators with regards to access to part of the disclosure that is not available to public. Non-disclosure of certain bits and pieces does not automatically mean additional capital requirement but disclosures concerning pillars 1 and 2 are considered extremely important (Hwang and Min 2013; Kishan and Opiela 2015). Pillar 3 allows regulators in designing the framework peculiar to market requirement and that can vary vastly between countries depending upon accounting rules adopted by those jurisdictions. Europe is historical cost⁹¹ oriented where United States and other international standards are mainly market value⁹²

⁹¹Historical cost measure used in accounting whereby asset reflects its original cost on the balance sheet Elliott, B., & Elliott, J. (2007). *Financial accounting and reporting*. Pearson Education.

⁹² Based on market value of the assets

based (BCBS 2000b). Of course RWA based upon market value approach would generate significant volatility in response to market fluctuations resulting in increased risk of procyclicality (Gordy and Howells 2006). On the contrary, directors can be reluctant to disclose full risk information because it can be potentially used by competitors or augment the concern about their ability to predict future outcomes of uncertain events. Subsequently the analyses conducted by the Basel Committee indicate that banks are not attempting full risk disclosures⁹³. Nevertheless instances such as WorldCom, Xerox and Enron stress the need for further consultation by Basel committee to promote in true manner the benefits of the Pillar 3 in the banking sector and address any irregularities in accounting procedures (Jo and Kim 2008).

2.3 Basel II: Implementation

2.3.1 Introduction

This section discusses the complex nature and the limitations of the Basel II accord in order to quantify the impact of the Basel II capital adequacy framework on capital amongst the compliant jurisdictions. This section furthermore looks into the scale of international transition and implementation progress across the globe. The implementation status mirrored the asymmetric development between core and periphery banking structures. This section is divided into the four subsections. First discusses the concept and complexity of the Basel II accord; second discusses the transition and implementation progress of Basel II; third discusses the impact of Basel II on capital in Basel II compliant countries; fourth section discusses the limitations of the Basel II accord.

2.3.2 Basel II: Concept and complexity

⁹³ M. Linsley, P., & J. Shrivs, P. (2005). Transparency and the disclosure of risk information in the banking sector. *Journal of Financial Regulation and Compliance*, 13(3), 205-214 for debate about requirement of excess disclosure required by Basel Capital Regulation

Basel II in theory, if effectively implemented would encourage and promote use of more and more internal data, risk management practices and models (Mariathasan & Merrouche 2014). Mariathasan & Merrouche (2014) argued that riskiness of assets declined upon IRB approval in a cross-sectional study of analysis of 115 banks from OECD countries⁹⁴. However, the complexity of Basel II implementation has been recognized and discussed. Practically Basel II implementation required cultural shift; recreation of all major processes, systems, data management; masterminding the new risk management theory and practice; calculation of new capital requirements, the list can go on. There is no definitive optimal organizational structure because each bank is threatened by compliance risk, has its unique circumstances and operates with respect to legal and regulatory environment see Edward and Wolfe (2004). Development of PD and LGD models is considered most crucial with regards to implementation. Further still, to fertilize effective Basel II implementation banks must demonstrate complete readiness i.e. capability to instantly identify, investigate and report to the senior management any non-compliance. However, after overcoming complex compliance function the process is theoretically followed by achieving complete control on each IRB process, adopting appropriate back testing, benchmarking and cross checking processes for each parameter of all portfolios (Mariathasan and Merrouche 2014). In addition, banks must show their capacity to use internal ratings system for not only assessment of PD estimate but also, integrate all relevant parameters to derive estimated LGD to each credit facility. The authenticity of the rating systems must be validated, initially by internal validation arrangements followed by designated external consultation (BCBS 2005). The banks are also required to set thresholds for the comparison of the actual versus predicted results and must bear transparent policies to address any breach to the set standards. Quantification of fundamental risk parameters carries incontrovertible importance in implementation of Basel II (BCBS 2004c). The quantification process can be data collection, a score function to estimate the data's relevance to the risk parameters, match the reference dataset with banks current portfolio and finally, rate the borrower with

⁹⁴ Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, Netherland, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States

developed score function (BCBS 2004d). At each stage, adjustments may apply in loss rate to account for referred dataset specifications. Of course the quantification process is also subject to Basel II guidelines and authorized independent validation (BCBS 2005).

Developing the model to assign risk weights to asset portfolio is the most important and key foundation activity, that's one thing, successfully integrating it operationally in procedures within an existing risk management framework can be real challenge see Shevchenko & Peters (2013). Banks have to comply with the regulations and therefore have to invest heavily to raise their IT (Information Technology) capabilities to achieve required standards of quality and transparency, undertake significant adaptations in their current data management system in order to facilitate reconciliation of information between the bank's finance and risk management functions (Garcia 2004; Moosa 2008). All parameters used to calculate the rating must be recorded to validate that the rating guidelines have been adhered to and necessary future comparisons between estimated and actual can be facilitated (Mariathasan and Merrouche 2014). A central database able to collect all information including financial information as well as qualitative evaluations, detailed recoveries, default events and so forth from all lines of business is inevitable (Garcia 2004). The information then contained in the central database can be used to calculate capital ratios to support risk management and produce other internal and external reports. Not only that, all retrievable record contained in the central database can be utilized to complete relevant back-testing. Indeed, banks are required to authentically document the data management process and ensure data integrity (Demirgüç-Kunt et al 2013). The fact, that internal data will often be limited has also been highlighted in requiring banks to undertake benchmarking that is, to carry out comparison with external ratings and/or other external models (Ozdemir 2009).

The existing evidence suggests that Practitioners as well Researchers have always been convinced of bank capital as key to sound performance of any banking institution (Kaur and Kapoor 2015). The concept that close monitoring and efficient management of capital of the banking institutions following Basel II guidelines, perhaps will consolidate the argument that banks with sufficient capital can lower cost of borrowing to enhance efficiency and become more profitable. This would improve their creditworthiness amongst the borrowers towards achieving financial stability. For instance there is evidence that bank capital supervision improved risk management in banking resulting in positive

bank performance (Huang et al 2008, Chortareas et al 2012). Overall focus of Basel II no doubt remained on credit risk because of it being most frequent and common reason for bank failure. Nevertheless, the importance of operational risk and market risk was significant enough and could not be ignored as they played a significant role in generating financial crises (BCBS 2009b). The calculation of “economic capital”⁹⁵ proved to be extremely challenging. It has been argued that a specific quantification procedure may not suffice to capture all forms of risk and that if the risks can be quantified at all, it will reduce the capital requirements (Blum 1999). Further limitations of the concept of quantification of risk under numerical models suffered steep challenges and held responsible to be cause of the inflated financial growth, casino capitalism and resulted in global financial crises where banks simply miscalculated the impact of the credit default initiating financial and banking crises (Lapavitsas 2009; Fouskas and Gokay 2012). Practically, economic capital frameworks only possible to be implemented under Basel advanced IRB approaches have been accused of being fragmented because even despite availability and implementation of such sophisticated risk measurement methods there still existed notable short falls in calculating economic capital from integrated risk point of view (Kaur and Kapoor 2015). One reason detected in literature can be that the institutions have been allowed to implement methods they believe to be accurate in reflecting their risk portfolio making it impossible to compare any two institutions from an outsider’s (Regulator) perspective (Reeves et al 2004). The complexity in concept as well as in practice has made it even more challenging for institutions in achieving the vastly argued objective of aligning economic capital with regulatory capital⁹⁶ (McKenzie 2011). Not to forget, the objective of aligning regulatory capital with economic capital received its fair share of criticism due to fact that both terms serve different objectives. For instance, regulatory capital is assessed by regulatory authorities in order to anticipate banks’ ability to survive or better still, prevent in future any catastrophic events e.g. “credit crunch”, whereas economic capital is required in running day to day business of the bank efficiently and is calculated by the risk managers

⁹⁵ Capital required for bank to stay solvent according to bank’s own calculation determined on the basis of quantification of risk

⁹⁶ Regulatory capital estimated by the regulator and compulsory for the bank to hold, where economic capital refers to banks own estimate of capital to be held for solvency

following peculiar business environment (Moosa 2008). Anyhow, Basel II established a framework for capital regulations focusing on regulatory capital defined as divided into Tier 1 and Tier 2 bank capital⁹⁷ (BCBS 2004d). There is evidence that Basel II efficiently addressed a significant hurdle of how to define regulatory capital consistent across the board. G-10 countries while implementing the new capital adequacy framework had perceived different definitions of the regulatory capital see Herring (2007). Nevertheless, Basel II dubbed capable of being implemented by 2004 in over 100 countries across the world did not happen. The initial expectations of Basel Committee for smooth dialogue and transition to Basel II failed, implementation did not take place in one smooth transition but was deferred on more than one occasions (e.g. US) as consultations progressed during implementation process by large international banks and then identified potential problems (Gordon 2004). Despite that, it was argued that Basel II implementation should be recognized as an opportunity due to the fact that possibilities of successful integration would be much higher at the time of implementation see Roldan (2006). The complexity of implementing proposal i.e. alignment of regulatory and economic capital; calibration of capital requirements to expected and unexpected losses was recognized at a number of levels, furthermore numerous other issues surfaced with time regarding Basel II convergence (McKenzie 2011; Shevchenko and Peters 2013; Kaur and Kapoor 2015).

The issue of “Home-host implementation” on a worldwide basis took the initial lime light with growing concerns that by doing so will increase the levels of complexity (Caruana 2003). There was evidence that larger and multinational banks already got used to operating dual reporting systems in order to comply with different regulations at home and host country level but nevertheless, the critical argument developed was that introduction of dual reporting systems will definitely generate a huge scope of confusion (Hudson 2004). However, according to the guidelines published by Basel II (BCBS 2007), home/host supervisors should retain their traditional responsibilities in regulating multinational banking institutions. This, in theory provided an opportunity to open up even more sophisticated level of cooperation between the home-host country supervisors and

⁹⁷ Tier 1 bank capital refers to core capital includes common stock and retained earnings, Tier 2 capital usually less than tier 1 capital on books, refers to complimentary or secondary capital includes revaluation reserves, undisclosed reserves.

ensure all host supervisors are able to supervise the local operations of foreign banks effectively. Despite the fact that increased complexity, such advancements should conceptually strengthen the regulation of both domestic and internationally active banks (Caruana 2003). There appeared a number of issues with home host kerfuffle see Persaud, A. (2010); D'Hulster, K. (2012). Nevertheless, with introduction of Credit, Market and Operational risk calculations in risk management framework, many internationally active banks took the initiative and undertook heavily expensive exercise to restructure their internal control and capital allocation in response to Basel II (Cornford 2003, Garcia 2004). The heated debate was what if benefits of Basel II implementation failed to outweigh the costs. Barfield (2004) analyzed in detail the impact that balance sheets of European Union banks could suffer with the go ahead to Basel II implementation and narrated incremental costs to be significant. Regulators feared sophisticated banks using securitization as a means of exploiting rules see Hudson (2004). However, well before such fears came to surface, Basel II had managed to develop hugely rejuvenated interest from all market participants in order to refine credit risk techniques. Not only to encounter known issues but to strive for even finer and more reliable techniques to translate credit ratings into expected losses (Altman 2002). Basel II (Pillar 1) attempts to control capital arbitrage by adjusting risk weights in order to reflect economic risks as accurately as possible (BCBS 2006a; Herring 2007). Nevertheless, Basel II was accepted significantly to be a tremendous improvement in calculating minimum capital requirements, would change completely the ways banks perceived the role of regulator in supervising banks risk management practice and the extent of information to be published by banks (Garside and Bech 2003; Caruana 2003; Garcia 2004; Wilson 2004). Nevertheless, with unfolding of events of financial crises of 2007-2008, Basel II not only failed to eradicate Capital Arbitrage⁹⁸, but issues of

⁹⁸ Banks like to hold less capital to do business with most of the money available. Capital arbitrage or regulatory capital arbitrage is practice of avoiding excess capital adequacy requirements for instance securitization i.e. sell safe assets and keep high premium assets and transfer default risk e.g. credit default swaps (CDS) see Reeves et al. (2004); Mitchell, M., & Pulvino, T. (2012); Acharya et al (2013)

Procyclicality⁹⁹, Systemic risk¹⁰⁰ and extremely financialized capitalism also surfaced (Lapavitsas 2013).

2.3.3 Basel II: International Transition and Implementation Progress

Basel II by no means was a legal text therefore Europe, US and other adopting regulatory authorities used national discretion in developing their own national rules to implementation of Basel II. Capital regulation in Canada revolved around minimum risk-based capital ratios and an inverse leverage¹⁰¹ (maximum assets-to-capital multiple). According to Basel Accord, internationally active banks needed to maintain tier 1 capital at minimum of 4% and total capital at minimum of 8% of the risk weighted assets. However, during 1997 implementation Canada imposed minimum targets in excess of the Basel II minimum requirements (7% minimum of tier 1 and 10% minimum of total capital). All large domestic Canadian banks are strictly compliant since the introduction of these targets (Ratnovski and Huang 2009). That in theory discouraged banking institutions in Canada to get involved in excessive risk taking. In Australia, Australian Prudential Regulation Authority (APRA) geared up for implementation of Basel II in January 2008. There already existed Probability and Impact Rating System (PAIRS) and Supervisory Oversight and Response System (SOARS), these frameworks were successfully designed under APRA for the purpose of early problem identification and intervention where necessary (APRA 2007). APRA, in Australia required all Authorized Deposit taking Institutes (ADI) to develop and maintain extensive Internal Capital Adequacy Assessment Process (ICAAP). An ADI have been obligated to ensure that ICAAP is comprehensively documented, proportional to its operations and consistent with the prudential requirements. ICAAP is also subject to rigorous review from the APRA where the frequency of the

⁹⁹Procyclicality in context of impact of economic fluctuations on the banks' capital adequacy requirements see Gordy and Howell (2006)

¹⁰⁰ See risk of contagion nature due to collapse of systemically important banks Caruana (2010), Demirgüç-Kunt and Huizinga (2013)

¹⁰¹ Inverse leverage ratio is calculated by dividing institutions totals risk weighted assets by total tier 1 and tier 2 capitals. Maximum multiple is set a 20 (leverage of 5%). The Office of the Superintendent of Financial Institutions (OSFI) hold the discretion to increase or decrease the maximum multiple on frequent individual assessment basis see Ratnovski and Huang (2009)

review depends upon the size and the business mix of the ADI (APRA 2007). In Europe Basel II was converted in CRD (Capital requirements directive) and planned in for implementation. Phased in standardized approach under Basel II capital framework implemented in EU (European Union) from January 2007 and IRBA approaches from January 2008, in United States Basel II implementation initiated in 2008 (Appendix 2). Apprehension about risk-sensitive capital would intensify pro-cyclicality, was the reason behind US decision to initially delay implementation of Basel II (Roldan 2006).

US agencies got engaged in careful consultations because the result of the QIS 4¹⁰² showed variances across the portfolios and institutions (OCC 2006). Later the same year US agencies agreed a bifurcated approach (Basel IA) to implementing Basel I in order to address competitive disadvantage issues between large and small institutions in United States. In June 2006 Basel committee issued the results of the fifth global quantitative impact study (BCBS 2006e) containing estimated change in the minimum required capital under Basel II along with European Union referred to EU Capital Directive as the final ruling with regards to implementing Basel II (Appendix 2). Final and full implementation was expected to be achieved by the year 2010 (2012 in case of US (Appendix 3). Large internationally active banks with foreign exposure in excess of \$10 billion and/or total assets greater than \$250 billion termed as ‘core banks’ would initially be required to implement advanced approaches under Basel II. Under US regulation¹⁰³ all banks met a “well-capitalized approach”, which required banks in the US to hold more regulatory capital than Basel approach (Herring 2007). Bifurcated approach was also taken up under the view that it would minimize political obstacles in Basel II implementation in US. Not to forget, core banks in US already implemented decent risk management systems. This implied that in ‘core banks’¹⁰⁴ of US there already existed sophisticated risk management

¹⁰² Qualitative impact study 4 2004-2005 conducted by BCBS, to see preparedness of Basel II amongst G-10 member countries

¹⁰³ USA regulations classify four categories (well-capitalized, adequately capitalized, under-capitalized, significantly under-capitalized see GAO (2007)

¹⁰⁴ Large internationally active banks were termed core banks with foreign exposure in excess of \$10 billion and/or total assets greater than \$250 billion. In US a total of 11 core banks operational with 42% of industry

infrastructure making it easy for them to facilitate implementation of advanced approaches under Basel II at comparatively less effort and costs. Furthermore the core banks in US upon implementation of advanced approach would also benefit with: a) relaxed leverage ratio facilitated by Federal Reserve Board (FED) upon gaining confidence in the new credit risk management process and b) reduction in regulatory capital because of AIRB by default significantly lowered risk weights for retail exposures (Herring 2007).

Additional operational risk charge introduced in order to minimize the impact of reduction under advance approaches of Basel II and to prevent a complete tilt of competitive advantage in favor of core banks. Although according to bifurcated approach in US non-core¹⁰⁵ banks were offered exemption from additional capital regulation and associated costs to achieve level playing field. However, it was argued in abundance that the bifurcated approach would fail to realize level playing field due to the clear advantage of lower risk weights in SME lending, Credit card lending and the largest asset market of all, residential loan market (Hannan and Pillof 2004; Berger 2004; and Lang et al. 2005). Despite that, some core banks¹⁰⁶ labelled advanced approaches under Basel II as deadweight costs and this would place them in international competitive disadvantage. This, due to introduction of increased complexity would result in increased costs for implementation and increased compliance issues (Herring 2007).

In order to stay dated with the efforts of the jurisdictions across the globe with regards to Basel II implementation Financial Stability Institute (FSI) conducted its first survey in the year 2004 and the practice continued to see the jurisdictions compliance status¹⁰⁷. In conducting the survey Jurisdictions, excluding BCBS member countries, were divided into six groups globally (Africa, Asia, the Caribbean, Latin America, the Middle East and Europe see BIS (2008). According to the findings of the survey, a total of 105 countries including BCBS member countries had already implemented or currently implementing

assets in comparison with 8,732 other banks with remaining 58%. See the list of 11 US core banks. Appendix 3.

¹⁰⁵ Banks with foreign exposure less than \$10 billion and/or total assets not exceeding \$250 billion

¹⁰⁶ For instance Citigroup, JPMorgan Chase, Wachovia and WAMU

¹⁰⁷ For instance 2008 survey was sent out to 130 countries with an overall response rate of 78%

Basel II. The results also showed that 57 countries by the end 2008 would have implemented Basel II as compared to 31 by the year end 2007. The survey further revealed the number of jurisdictions intending to implement Basel II and the number of Basel II compliant jurisdictions could increase up to as many as 105 countries by the end of year 2015 (see Table 4 below).

Table 4. Overview of Basel II Capital Regulation implementation

	2007	2008	2009-2015**
Africa	-	2	12
America*	-	3	14
Asia*	2	10	18
Caribbean	-	-	8
Europe*	27	34	44
Middle East	2	8	9
Total	31	57	105

Overview of Basel II Implementation (Source: Bank of International Settlements, www.bis.org)

* Including BCBS member countries

** includes countries with exact timeframe for full implementation not available

The results of the 2008 survey portray, in comparison with the previous surveys, that 56 jurisdictions will be offering advanced approaches for both credit risk and operational risk under the Pillar 1 of the Basel II capital accord by the year end 2015 (BIS 2008 chart 7). The fact that 77 jurisdictions will be implementing both Pillar 2 and Pillar 3 of the Basel II capital accord by the year end 2015 was a positive development (BIS 2008 chart 8 and 9). Although the figures seem encouraging for the overall study and represent an invaluable insight into the world of Basel II implementation. In Africa survey returned 57% response rate and revealed that implementation (Pillar 1) of Standardized approach has slowed right down during year 2009. In addition the number of countries intending to adopt the IRB approaches had also decreased against the previous reading of the year 2006 (BIS 2008). However, standardized approach remained to be used most widely and the number of countries intending to implement standardized approach stayed the same for the year 2015 (BIS 2008). The Basic indicator approach was intended to be adopted by 67%, significantly

higher portion (in comparison with Standardized approach at 50% and Advanced Measurement Approach at 33%) of the participation in order to calculate capital requirements for the operational risk by the year 2015. Pillars 2 and 3 seemed to have deferred by several participating jurisdictions in Africa since 2006 (BIS 2008). Asia had better rate of response at 82%, and all expected to implement Standardized approach (Pillar 1) by the end of year 2009. In addition, 65% of the respondents intend to adopt both Foundation and Advanced Rating Based approaches by 2015. All jurisdictions intend to upgrade from Basic Indicator approach to Standardized approach to calculating the minimum capital requirements under operational risk by the year 2015, however only 35% of respondents expressed their intentions with regards to using Advanced Measurement Approaches (BIS 2008). Like in African jurisdictions, several participants deferred implementation plans recorded in the previous survey with regards to Pillar 2 and Pillar 3. The survey in Caribbean saw a response rate similar to Asia at 82%. For Credit risk (Pillar 1) number of jurisdictions intending to offer all three approaches by the year 2015 saw rise, likewise for operational risk the participants planning to adopt all three approaches by the year 2015 rose. With regards to implementing Supervisory Review Process and Market Discipline (Pillars 2 and 3) by the 2015, the number of jurisdictions went up as compared to the previous studies (BIS 2008). Latin America produced another encouraging, 82% survey response rate. Out of 14 surveyed 12 jurisdictions confirmed to implementing Basel II. For credit risk (Pillar 1) 92% showed intent to adopt standardized approach. Furthermore, 50% and 42% survey respondents expect to offer Foundation and Advanced rating based approaches respectively. Jurisdictions offering Basic Indicator and Standardized approaches for calculating capital required under operational risk were 75% and 50% respectively, however in comparison to the last study some countries deferred their implementation plans with regards to adopting Advance Measurement Approach under operational risk (BIS 2008). Pillar 2 and Pillar 3 implementation seemed promising in future (92% respondents expect to be compliant with the Pillars 2 and 3 by 2015), however, currently some jurisdictions deferred implementation of Supervisory review process and Market Discipline (BIS 2008). Middle East returned 90% response rate with all respondents intending to implement Basel II, in fact all jurisdictions surveyed had implemented Standardized approach (Credit risk) and eight out of nine jurisdictions surveyed implemented Basic Indicator Approach and Standardized Approach (Operational

Risk) by 2008. In addition, 78% countries planned to adopt foundation internal rating based by 2015. However, 44% of the countries were to implement AIRB (Credit risk) and AMA (Operational risk) by 2015. The survey also revealed that 89% of the jurisdictions surveyed in Middle East implemented Pillars 2 and Pillar 3 of Basel II by 2008 (BIS 2008). In Europe (non-BCBS member countries), the response rate was 83%. Overall 34 out of 35 countries responding to the survey planned to implement all three approaches under Credit Risk as well as Operational Risk by 2008. Furthermore, 76% and 74% of the surveyed jurisdictions (non-BCBS member countries) would have implemented Pillar 2 and 3 respectively by 2008, and expecting to improve to 91% for Pillars (2 & 3) by 2015 (BIS 2008). Despite strides towards all round Basel II implementation, global financial crises carved its way through the defenses of capital adequacy structures of the core banks¹⁰⁸ of the US and Europe. The advance risk management under Basel II Capital Regulation fell short to capture the full exposure to risks associated with complex asset structures of the commercial banks and more integrated banks got hit harder by the global financial crises giving birth to the question, can Basel Capital Regulation tame the financialized capitalism (Lapavitsas 2013).

2.3.4 Basel II: The Impact on Bank's Capital Adequacy

Basel Committee focused on industry consultation in order to quantify the impact of Basel II implementation on minimum capital requirements and published updated versions of the Basel II capital accord regularly. Arguably a huge progress has been made since Basel I capital accord prompted developing a risk sensitive capital framework (Roldan 2006; Caruana ad Narain 2008). One major highlighting inclusion in the Basel I (BCBS 1988) at the time was treatment of off-balance sheet exposures and their conversion into equivalent on balance sheet exposures. The idea based upon risk differentiation through a simple risk weighting mechanism took off like a storm but quicker came down to earth, the short comings of Basel I 'one size fits all approach'. Basel II attempted to address the shortfall with a number of distinct improvements for instance introduction of more risk categories, insertion of Operational and market risk calculations; introduction of the three pillar

¹⁰⁸ Core banks defined as Large internationally active banks with foreign exposure in excess of \$10 billion and/or total assets greater than \$250 billion

approach to the framework (BCBS 2004d; BCBS 2009a). In order to continuously introduce improvements to then existing set of Basel II in 2004 guidelines, Basel committee working groups continue consultations on a huge scale to gauge the impact of the Basel II implementation. Quantitative Impact Studies (QIS) played a crucial part and served the objective of allowing BCBS to capture the impact of Basel II guidelines on minimum capital requirements (BCBS 2006a). In conducting the Quantitative Impact Studies the Banks were divided in two groups. Group 1, comprise of large Banks with Tier 1 capital in excess of €3 billion and Group 2 include specialized banks with less than €3 billion Tier 1 capital (BCBS 2003b). The scale of QIS 3 was huge and attracted enormous attention in line with Basel committee expectations¹⁰⁹. The launch of third Quantitative Impact Study (QIS 3) offered banks more time to collect and compile data and aimed to achieve participation of as many as over 200 banks across 40 countries in order to assess the likely effects of the revised capital framework. On a best-efforts basis, National supervisors and banks in participating countries constructed positive dialogue over the course of the QIS 3 to positively influence the results of the study and effectively capture the impact of the proposed latest changes on the minimum capital requirements (BCBS 2003b).

Table 5. Change in capital requirements of Banks

	GROUP 1			GROUP 2		
Portfolio	% of current capital	% change in capital requirement	Contribution	% of current capital	% change in capital requirement	Contribution
Corporate	32%	-9%	-2%	20%	-27%	-4%
Sovereign	1%	47%	2%	1%	51%	0%
Bank	5%	45%	2%	8%	-5%	-1%
Retail:(total)	20%	-47%	-9%	36%	-54%	-21%
__Mortgage	11%	-56%	-6%	19%	-55%	-16%
__Non-mortgage	7%	-34%	-3%	11%	-27%	-5%
__Revolving	2%	-3%	0%	6%	-33%	0%

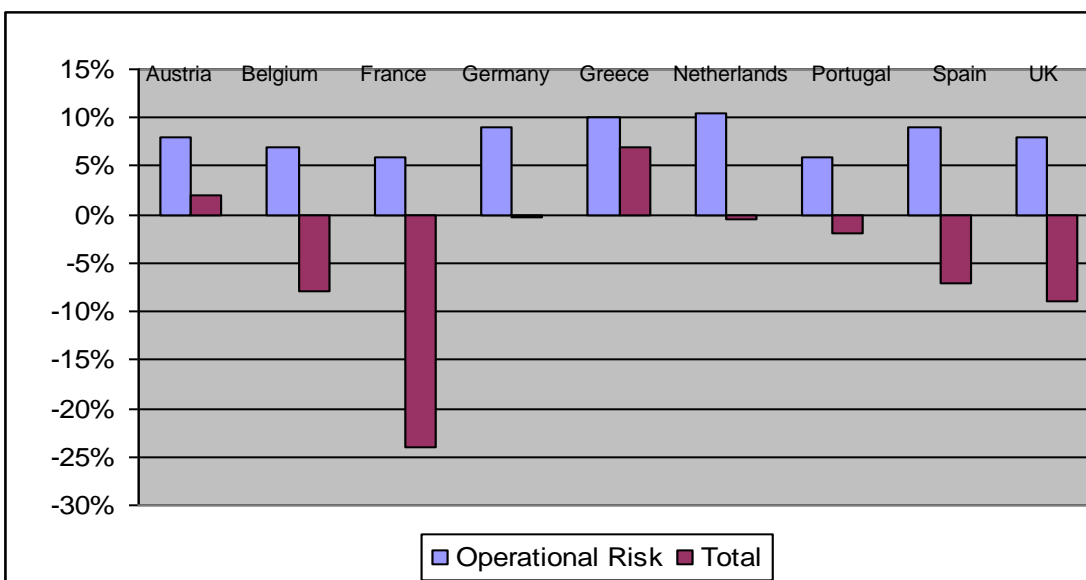
¹⁰⁹ Total of 188 banks in 13 G 10 countries and 177 banks from 30 other countries including all EU member countries

SME(total)	18%	-14%	-2%	21%	-17%	-4%
Equity	2%	115%	2%	2%	81%	2%
Trading Book	8%	5%	0%	3%	4%	0%
Securitized Assets	2%	103%	0%	3%	62%	-1%
Other Portfolios			1%			3%
General provision			-2%			-3%
Overall credit risk		-8%	-8%		-29%	-29%
Operational Risk			10%			7%
Overall change		3%	3%		-22%	-22%

Source: Bank of International Settlements www.bis.org QIS 3 Overview of Global results. p.23

In general capital requirements under IRB both foundation and advanced, were lesser in comparison to Standardized approach and more reflective of risk. On aggregate Group 2 banks implementing IRB approaches saw more benefit due to their specialized nature (Retail and SME exposures). Although banks with comparatively stronger retail portfolios saw greater reduction in minimum capital requirements, QIS 3 also recorded significant level of diversity within individual banks for positions with similar risks (BCBS 2003b). The results showed internationally active banks would reduce capital requirements upon implementing AIRB approach (BCBS 2003b), because of decrease in credit risk for corporate, retail and SME exposures. On the contrary, larger internationally active banks suffered increase in capital due to increase in other exposures, mainly Banks and operational risk (see Table 5). The nature of impact posed by increase in capital for Bank exposure and operational carried particular importance due to its potential impact on inter-bank loan activity in context of widely differing national market environments of the participating countries (BCBS 2003b). Barfield (2004) conducted an in depth analysis of impact of Basel II on the capital in participating countries and highlighted the impact of operational risk against overall capital (Figure 3).

Figure 3: Expected change in Capital requirement per country – credit and operational risk



Nevertheless, QIS 3 highlighted the limitations faced by banks in many countries in presenting data on all three approaches under pillar 1 in a format that is necessary to analyze impact of the new capital accord. Banks in many countries failed in recognizing all categories of collateral that reduced minimum capital requirement successfully. Also, although as noted earlier QIS 3 offered more time to collate data, banks still notified considerable levels of difficulty with regards to gathering data in the format required by the committee for setting PDs, LGDs and EADs¹¹⁰ resulting into further variations. In such conditions then, it was considered fair to argue that implementation of Basel II would enable banks to identify more collateral and increase possibility of borrowers to be rated effectively in addition, banks systems would also develop constructively. Basel committee working groups took necessary actions, integrated the results and inflicted changes in standardized approach to lower risk weights allocated to residential mortgages and made available alternative treatment for operational risk. Furthermore, IRB approaches also suffered some fine tuning resulting in updates introduced in the Basel II proposals (Hall

¹¹⁰ Probability of Default (PD); Loss given default (LGD); and Exposure at Default (EAD)

2006). QIS 3 in particular became a cornerstone in development of Basel II accord¹¹¹, followed by more tailored and specific Quantitative Impact Studies¹¹² in an attempt to even more precisely identify potential impacts of Basel II implementation. QIS 4 was structured in a way to be implemented in several countries and results presented in form of change in minimum capital requirements. There have been discussions constructing comparison between QIS 3 and QIS 4 highlighting some key points i.e. the economic conditions were comparatively benign at the time of QIS 4; the data management systems of institutions in participating countries, in a bid to eventually be compliant with Basel II framework, had improved significantly over the period therefore arguably Data collected during QIS 4 and 5 was considered more reliable and of higher quality in comparison with previous QIS. Furthermore, none of the previous occasions tested banks to assess the minimum capital requirements using advanced approaches. QIS 4 attracted significant response where US in particular, in collaboration with Basel committee working groups tailored a specific US version of QIS 4. QIS 4¹¹³ in US recorded significant decrease in all portfolio categories and also pointed out similar loan products in different institutions required different risk-based capital requirements. During QIS 4 Minimum required risk-based capital (MRC) and Effective minimum required risk-based capital (EMRC) were used as common measures (MRC is the threshold hold required to be maintained by institutions and consisted of total regulatory capital plus eligible reserves whereas EMRC is adjusted MRC where eligible reserve are deducted in order to calculate effective total regulatory capital). In application, MRC was used to analyze changes when moving from existing approach to the Basel II framework for individual exposures supporting the argument that in principle reserves did not impact independent portfolios significantly e.g. Banks mortgage portfolio. However, on the contrary effects of reserves can be significant when analyzing the impact of the change for the Bank as a whole, EMRC was used. The aggregated results for QIS 4 showed the changes in the MRC (Appendix 4). The results showed MRC decreases down to 12.5%

¹¹¹ see detail of QIS 3 results and discussion BCBS 2003b; Barfield 2004 and Hall 2006

¹¹² QIS 4 in 2004; QIS 5 in 2005; where QIS 6 initiated in 2010 after the crises

¹¹³ QIS 4 estimated reductions I minimum total risk based capital requirements of 15.5 percent (mean) and 26.3 percent (median), in addition reductions in minimum tier 1 risk based capital requirements of 26.3 (mean) and 31 percent (median) were also noted in comparison with Basel I

and EMRC 15.5% lower under Basel II capital framework in comparison with current US regulations based upon data collected from 26 participating institutions. The change has also been present portfolio wise (Appendix 5). The largest reductions occurred for mortgage exposures making an impact on the aggregate MRC. In fact most portfolios for over half of the participating institutions showed decrease in minimum risk-based capital requirement in double digits. Nevertheless the results of QIS 4 showed that every participating institution was allocated equal weight without consideration of the size of the exposures. There were few more important readings into the results of the QIS 4. There was no existing operational risk charge therefore no percentage variances could be recorded for operational risk. With majority of institutions, a fraction of operational risk charge would be associated with various portfolios. However, operational risk noted as a separate line amongst all portfolios, attempts to capture all risk based requirement associated with operational risk. The results in US further influence the approach undertaken by US regulatory authorities in delaying Basel II implementation. Nevertheless, QIS 4 in US encouragingly, hinted at greater sensitivity of the advanced approaches under Basel II (A-IRB, AMA)¹¹⁴ to economic conditions. QIS 4 was somewhat limited (only Germany, US and South Africa participated) however, QIS 5 targeted the impact Basel II implementation globally to evaluate changes in minimum capital requirements as industry progressed further towards Basel II implementation. QIS 4 and QIS 5 combined was enormous effort and collated responses from 32 countries. The data received contained participation of 382 banks from BCBS member countries, non- BCBS member countries and other non-BCBS member countries¹¹⁵. Data was collected on the bases of national implementation of Basel II capital framework, however that included adaptation of the Standardized approach by some jurisdiction to oblige their peculiar circumstance. Example of such cases were mostly other non- BCBS countries.

¹¹⁴ A-IRB (Advanced Internal Ratings Based: Credit Risk); AMA (Advance Measurement Approaches: Operational Risk)

¹¹⁵ BCBS member countries are Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States. Non- BCBS member countries are Bulgaria, Cyprus, the Czech Republic, Finland, Greece, Hungary, Ireland, Malta, Norway, Poland, and Portugal. Other Non-BCBS countries include Australia, Bahrain, Brazil, Chile, India, Indonesia, Peru and Singapore.

Table 6. Basel II Capital regulation credit risk compliance

	Group 1				Group 2			
	Total	SA	FIRB	AIRB	Total	SA	FIRB	AIRB
BCBS	82	30	43	62	146	130	108	12
Non BCBS	8	7	6	2	86	85	9	2
Other non-BCBS	6	3	6	4	54	50	5	2
Total	96	40	55	68	286	265	122	16

Source: Bank of International Settlements www.bis.org

Upon responding to their consequent supervisory authorities, a number of banks managed to provide data for all three approaches (Standardized Approach (SA), Foundation Internal Rating Based (FIRB) and Advance Internal Rating Based (AIRB)) towards credit risk under Basel II guidelines (see Table 6). However, majority of the data could only be produced by Group 1 banks of the G 10 consolidating their technical supremacy over competition. This also confirmed the fact that the data management systems had improved comprehensively within banks over the period.

Table 7. Basel Capital compliance intentions: Provisional

	Group 1				Group 2	
	SA	FIRB	AIRB		FIRB	AIRB
BCBS	0	23	59	33	102	11
Non-BCBS	2	4	2	78	7	1
Other non- BCBS	0	2	4	49	3	2
Total	2	29	65	160	112	14

Source: Bank of International Settlements www.bis.org

Approximately 68% of the Group 1 banks intended to adopt AIRB from all participating countries however, G 10 Group 1 banks again dominated the participation. 56% of Group

2 banks in all participating countries were interested in adopting Standardized approaches under Basel II (see Table 7) proving their intentions to stay in touch with competition with regards to adopting better more sophisticated credit risk management techniques.

Table 8. Basel II operational risk compliance approaches: BCBC member countries

Approaches	Group 1	Group 2
Basic indicator approach	2	81
Standardized approach	32	65
Advanced Measurement Approach	22	0
Total	56	146

Source: Bank of International Settlements www.bis.org

The data received with regards to using all three approaches under operational risk showed that AMA (Advance Measurement Approaches) proved challenging for Group 2 banks of G-10 member countries. Whereas, 40% of Group 1 banks produced data on AMA highlighting the fact that Group 1 banks have invested in abundance to improve their data management structures capturing operational risk (Table 8).

QIS 5 definitely pointed out that more and more Group 1 banks of BCBS member countries were implementing advanced credit and operational risk techniques as compare to Group 2 banks in particular in non-BCBS and other non-BCBS countries. Although from QIS 5, it became evident that there was progress made in terms of data survey quality however, need for further improvements were also discussed (BCBS 2006e).

Table 9. Group wise Basel II capital regulations credit risk compliance

	Standardized Approach %	FIRB Approach %	AIRB Approach %	Most likely Approach %
BCBS Group 1	1.7	-1.3	-7.1	-6.8

BCBS Group 2	-1.3	-12.3	-26.7	-11.3
Non- BCBS Group 1	-0.9	-3.2	-8.3	-7.7
Non- BCBS Group 2	-3.0	-16.6	-26.6	-15.4
Other Non- BCBS Group 1	1.8	-16.2	-29.0	-20.7
Other Non- BCBS Group 2	38.2	11.4	-1.0	19.5

Source: Bank of International Settlements www.bis.org

Overall change in the minimum capital requirements showed that with progression towards more advanced Basel II capital framework approaches, capital charge decreased for all groups with exceptions of Group 1 banks in BCBS member countries under Standardized approach and Group 2 banks in other non-BCBS member countries using Standardized and FIRB approaches. However, the results above showed that all banks implementing AIRB would increase minimum capital requirements upon converting into most likely approach whereas Group 1 banks under Standardized and FIRB approaches would gain benefit with significant decrease in required minimum capital upon adopting the most likely approach (Table 9). There remained exceptions of Group 2 banks in all BCBS, non-BCBS and other non-BCBS member countries who saw increased minimum capital requirement upon making switch to most likely approach (BCBS 2006e). Nevertheless, in contrast with previous impact studies QIS 4/QIS 5 showed overall decrease in minimum capital requirement for majority of the banking institutions in participating countries attributed to favorable macroeconomic conditions that impacted rather heavily on mortgage portfolios of the banks in participating countries (BCBS 2006e). Other variances were attributed to difference in portfolio characteristics and variable estimation methodologies¹¹⁶.

In addition to analysis of the findings country wise, QIS 5 effectively discussed the impact of the each of the tested approaches of Basel II on portfolio basis. Under standardized approach results presented largely a similar pattern for both Group 1 and Group 2 banks in all participated countries. The retail portfolio proved the strongest contributor towards the decrease in overall change in MRC (see Table 10 below). The retail portfolio for the study was further divided in to three main categories: Mortgage, Revolving and Other (Other

¹¹⁶ see BCBS (2006e) for comprehensive discussion estimation methodologies of QIS 5

subdivided into SME Retail; and Equity). According to the published results Mortgages was the biggest contributor towards decrease in overall capital requirements amongst all categories of the retail portfolio (Appendix 5). This was due to the fact that mortgages took the property as collateral and considered less risky. There was an extraordinarily large percentage change in the sovereign portfolio for other non-BCBS countries (G2 in particular) reflected in overall MRC as positive (Appendix 6). This was because exposures that currently carried 0% risk weight would result in an infinite percentage increase upon applying any risk weights under standardized approach, even if in absolute terms recorded change MRC is much less (BCBS 2006e).

Table 10. Standardized Approach: Overall change in MRC

Standardized Approach

	Group 1	Group 2
BCBS	1.7	-1.3
Non- BCBS	-0.9	-3.0
Other Non-BCBS	1.8	38.2

Source: Bank of International Settlements www.bis.org

Under IRB approaches the negative change in overall MRC is larger in comparison to Standardized approach (see Table 11). However, the pattern stayed almost unchanged largely. In all participating countries retail exposure was the major contributor towards overall decrease in MRC¹¹⁷.

Table 11. IRB Approach: Overall change in MRC

IRB Approaches

	Group 1	Group 2
--	----------------	----------------

¹¹⁷ BCBS member countries are Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States. Non- BCBS member countries are Bulgaria, Cyprus, the Czech Republic, Finland, Greece, Hungary, Ireland, Malta, Norway, Poland, and Portugal. Other Non-BCBS countries include Australia, Bahrain, Brazil, Chile, India, Indonesia, Peru and Singapore.

BCBS	-4.5	-14.1
Non- BCBS	-7.5	-18.0
Other Non-BCBS	-20.7	-5.4

Source: Bank of International Settlements www.bis.org

The PD and/LGD data was limited than expected because most banks applied treatment for immaterial exposures under national discretion of Basel II implementation in each jurisdiction (BCBS 2006e). The complexity of the securitized assets¹¹⁸ was highlighted however, compared to previous studies significant progress was noted. Therefore only average results were shown and evidence of results on a single-jurisdiction basis could be significantly diverse (see Table 12). The QIS 5 also most importantly, brought to light the fact that IRB approaches encouraged Internal Assessment Approach (IAA), that when used in conjunction with Group 1 banks ‘Liquidity Positions’ stood on 0% risk weight (Maturity < 1 Year). That was accused of being risk-insensitive and became an important driver of increase in capital charges for the future treatment of liquidity facilities representing significant portions of the banks portfolios in particular Group 1 banks (BCBS 2006e).

Table 12. Overall change in MRC for securitization portfolio (%age)

	Group 1		Group 2	
	Standardized Approach	IRB Approaches	Standardized Approach	IRB Approaches
BCBS	7.7	0.5	10.2	-17.3
Non- BCBS	21.2	7.9	-3.9	-14.6

Source: Bank of International Settlements www.bis.org

In calculating operational risk charges (average) for the minimum capital requirement only the approach used by the banks in actual. The contribution of operational risk was restricted because banks were in different stages of system development (see Table 13). Furthermore, significant dispersion was recorded depending upon the risk profiles e.g. banks when

¹¹⁸ See Acharya, V.V., Schnabl, P. and Suarez, G., (2013). Securitization without risk transfer. Journal of Financial economics, 107(3), pp.515-536 for detailed synopsis of technical charter of securitization.

providing financial services encounter higher operational risk as compared to providing loans when credit risk takes the importance (BCBS 2006e).

Table 13. Contribution of operational risk to MRC: All participating countries

	Approach	Group 1	Group 2
BCBS	Basic Indicator Approach	6.3	8.3
	Standardized Approach	5.7	7.6
	Advance Measurement Approach	7.2	-
Non- BCBS	Basic Indicator Approach	-	8.9
	Standardized Approach	5.5	7.9
	Advance Measurement Approach	5.9	5.4
Other non- BCBS	Basic Indicator Approach	-	13.5
	Standardized Approach	4.0	5.2
	Advance Measurement Approach	4.7	-

Source: Bank of International Settlements www.bis.org

Finally in a bid to capture impact of the trading book on capital requirements and treatment of double default, Basel committee gathered data but information received was scarce on both of the said topics therefore overall change in MRC was almost unaffected due to small sample size.

2.3.5 Critique of the Basel II capital accord

Basel Capital Accord (BCBS 1988) had limitations that attracted discussions in detail across the literature even before consultations that led to Basel II. Basel II capital regulations consultative document developed into an extremely complex set of capital

standards guidelines.¹¹⁹ Earlier discussions mainly targeted Basel I's approach of 'one size fits all'¹²⁰. Nevertheless, once arrived, Basel II showcased its own set of limitations, to start off with, Basel II instantly fell prey to varied status of compliance jeopardizing one of the main objective of Basel Capital regulations that was to achieve level playing field see D'Hulster, K. (2012) for home-host issues. The aforementioned discussion of the impact studies show achieving level playing field a daunting task because of varied level of sophistication in the banking structures of the core and periphery economies. In addition, many cited disadvantages of Basel II in the literature include cost of implementation; accountability in international administrative law; competitive inequalities i.e. between the banks that need to implement and the ones that do not; varied standards of compliance imposed by the regulators across different jurisdictions; operational risk charges labeled as burden costs; and most important of all its tendency to increase systematic risk, shadow banking and financialized capitalism (Barfield 2004; Barr and Miller 2006; Das 2007; and Dimirguc-Kunt et al 2008, 2013; Lpavitsas 2013; Hassan and Tamer 2016; Adrian and Ashcraft 2016). There is no doubt that Basel Committee injected tireless efforts in continually driving Basel II guidelines towards ultimate sophistication. Benefits of Basel II over Basel I even at the time of implementations remained incomplete in absence of a comprehensive cost benefit analysis of alternative approaches (Hall 2006). Basel II could be a world more risk sensitive than Basel I however, aforementioned serious limitations plague Basel II capital framework. The Basel Committee, considered one of the most influential trans-governmental regulatory network exercised across the globe, has been constantly engaged in a never ending process of reviewing Basel II guidelines towards overcoming identified flaws and preventing transnational externalities generated by global banking activities and regulation. One outcome of such externalities resulted in credit crunch and bank failures that traveled swiftly from one country to another (Fouskas and Gokay 2012). Basel II's ultimate objective is to achieve convergence in bank capital

¹¹⁹ See Danielsson et al 2001; Gordy 2003; BCBS 2006a for an early note on Basel II limitations.

¹²⁰ Basel I (1988) approach promoted 'one size fit all' meaning that all corporate loans were placed into the 8 percent capital bucket without giving any considerations to the fact that internal capital allocations for individual loans vary considerably within the institution depending on the estimated riskiness of the position in question see Dewatripoint and Tirole (1994) for detailed Basel I critique.

standards and coordination of bank supervision among the major industrialized countries whose banking environment dominates the global remained dubious rather seemed to aggravate financial capitalism and causing systemic risk see (Aglietta 2016; Pike and Pollard 2010; Demirguc-Kunt et al 2013). However, Basel II from the onset faced criticism as an agreement achieved by the wealthiest countries' central bankers therefore developed a reputation of 'trans-governmental agent network'. Despite that Basel convergence extended beyond the member countries for instance, over 100 countries voluntarily adopted the Basel II capital accord (BCBS 2003b; OCC 2006; and BCBS 2006e). Developing countries faced pressure from developed economies, to adopt the Basel II capital standards regardless of their ability to incorporate Basel II rules in their national supervisory structures, simply to keep up at pace with international developments. Nevertheless, the interaction initiated by Basel II amongst international, transnational and domestic administration was for the purpose of generating norms of behavior and structures of practice that enhance accountability and legitimacy in the global administrative environment. International regulation aimed to foster domestic norms of accountability and legitimacy, in particular with in developing economies where inside elite are blamed to block reforms and prevent transparent domestic regulatory environment from prevailing and (Bar and Miller 2006).

As noted earlier, majority of the banks confirmed implementing standardized approach. Standardized approach under Basel II credit risk was an improvement over its predecessor Basel I due to introduction of wider categories of assets that promised to deliver improved risk sensitivity of capital charges. Standardized approach to calculating credit risk requires Basel II Capital Regulation compliant banks to consider credit ratings released by external Credit ratings agencies¹²¹. However, this is subject to (a) if there is rating available through external credit ratings agencies and (b) do the ratings obtained by external rating agencies reflect actual risk and have been publically disclosed. Thus, standardized approach faced limitation including non-availability of ratings, which may be the case for the majority of institutions in the developing world (Foot 2006). Furthermore, ironically non rated firms

¹²¹ Moody's, Standard and Poor's to name the most frequently consulted.

are charged at lower rate than firms rated BB- or lower. Such scenario can promote practices where lower rated firms may decide go without ratings completely to be classed in lower capital charges category. In addition there has been evidence that ratings supplied by the ratings agencies lack consistency (across the agencies as well as across issuer category) therefore making it dubious to implement consistent application of ratings across the board and prevent firms ‘cherry picking’ desired ratings. Moreover, external credit ratings give only an extent of the riskiness of the institutions based upon their accounting information. In compiling the information for the allocation of credit weights market information is considered invaluable, however external credit rating agencies tend to rule out market fluctuations (Mariathasan & Merrouche 2014).

Basel II accord relies on four risk components to deal with the credit risk:

$$EL = PD \times LGD \times EAD \times f(M)^{122} \quad (BCBS 2006a)$$

However, it has been argued that where some complications related to the formula, some important causes of concerns are contained in the input assumptions too. All four risk components (PD, LGD, EAD and M) in order to determine the EL may be randomly-determined and obtained from distributions containing correlations. Correlation assumptions are crucial because substantial difference to the computed risk measures can be observed for the institution as whole. Depending upon chosen granularity (aggregation level) at the time of composition of the individual business units, an imperfect aggregation of risk may occur (Das 2007). Aggregation problems may also arise when different business unit compositions can press to adopt different measurements of marginal risk contributions and calculations of additional capital required; or upon addition or deletion of positions to existing portfolios; or when bank has multiple exposures to the same obligator (Gordy 2003). Nevertheless, in case the correlation between asset classes depend on granularity chosen can act as an unfair incentive for banks to then may adopt lower level of granularity for the their portfolios to keep less capital than actually required. There is

¹²² EL (Expected Loss); PD (Probability of Default); LGD (Loss given default); EAD (Exposure at default); M (maturity)

evidence that with reduction of level of granularity the risk measures fall but the overall risk remains unchanged. However, if the granularity is decreased continually there arrives a point where risk measure start to rise again see Das (2007). Furthermore, it remain unclear amongst the regulators that what granularity level the Asset Value Correlations¹²³ (AVC) should be set and how to test the accuracy of set correlations (AVC), especially at the time when assets are highly heterogeneous. There have been suggestions that assets classes should be defined more narrowly in order to mitigate such correlation issues, or better still to provide an underlying factor structure onto which all assets may be projected. In addition, the fact that credit loss distributions are sensitive to the changes in correlation assumptions should be considered whilst setting the credit correlation parameters under the Basel II framework. Basel II assumes single form of correlations impact credit risk however, does not take into account separately default probability correlations across issuers; correlations between PD and LGD; correlations of default in relation with PD; and correlations between credit risk and exposures (Das 2007).

For IRB approaches risk weights are based on banks own estimates of PD, LGD and EAD. According to Basel II a borrower should be treated as default if it is at least 90 days past due on coupon or principle payment for the wholesale exposures and 120 days for the retail exposure (BCBS 2006a). Default probabilities and LGD vary with business cycle and are considered wholly state dependent. Basel II suggests that LGD and EAD estimates to take into account partially depending on government monetary and fiscal policy decisions. Thus the computations of IRB approaches to calculating LGD and EAD rely upon economic circumstances and therefore government stance on monetary policy must be accounted for. In contrast, PD is defined as 1 year long term average default probability alien to prevailing economic climate (Jarrow 2007). Thus, making the PD, LGD and EAD calculations simultaneously complex under the IRB and A-IRB approaches. Note in case all three determinants¹²⁴ failing to take into account prevailing government strategies would result in bank capital requirements not reflective of the risk. This implies that same capital would

¹²³ Asset value correlation refers to measuring the relationship between two or more asset values and their potential interdependency.

¹²⁴ PD; LGD; and EAD

prevail in both conditions, i.e. when projected economic environment is in crises and when not. Nonetheless, theoretically the required capital should be less during economic boom and vice versa in order to effectively manage and monitor risk of bank failures over the business cycle. On the contrary, although state dependent capital rules sit perfectly with changing business cycle and changing risk preferences in the economy, it may exacerbate business cycle. For instance in times of economic crises, credit is scarce to obtain making it difficult for banks to arrange necessary additional equity and may result in banks starting to charge higher interest rates. In order to tackle such scenarios, governments possess monetary tools in order to maintain control and there is evidence that the interest rate levels during economic crises often lowered.

Market risk can result from market shocks and therefore there is a threat for systematic failure spread. As noted earlier, due to their tendency to generate instantly contagious bank failures market risk must be under regulation. The nature of operational risk is idiosyncratic¹²⁵. Although fundamentally operational risk does not carry threat of spread to other institutions nonetheless, evidence suggests that there is obvious risk of making loss influenced by other institutions suffering loss that operate in same or different market environment (Systemic risk). Capital adequacy regulations aim to highlight such spreadable bank failures risks not currently assigned to any risk category explicitly and proposed guidelines for such risks that can be labeled vague or unidentified so far (Kupiec 2007; and Jarrow 2007). The limitations of unclear modelling for risks that banks may be exposed to clearly evidenced in the global financial crises (Demirguc-Kunt et al 2013). A number of reasons support such claims through the onslaught of financial crises for instance limited existence of the databases that are equipped enough to support operational risk methodologies; and as noted earlier certain type of losses by default are unpredictable therefore the quantification of such losses is impossible (Flores et al. 2006; and Moosa 2008; Kaur and Kapoor 2015; Kishen and Opiela 2015). Moreover, operational risk overlook Reputational risk and Strategic risk (risk of losses due to failure to implement

¹²⁵ That is losses incurred due to operational risk directly impact individual bank's stake holders e.g. management, equity and bond holders see Danielsson et al (2001), Shevchenko and Peters (2013) gives an account of loss distribution approaches for operational risk under Basel II capital regulation

strategic policy). In addition, the risks also arise from the conflict between the ownership and management of a firm resulting from either fraudulent activity or mismanagement is only captured implicitly under the advanced approaches. The inclusion of Operational risk guidelines is significant upgrade but not sufficient (Jarrow 2007).

Basel II in particular encouraged institutions to adopt advanced approaches to cultivate capital requirements under credit risk that rely on the internal risk models developed by the banks. Basel II proponent pride these internal rating models due to mathematical complexity and accuracy, later on debated in abundance regarding their effectiveness (Mariathasan & Merrouche 2014). In theory, these complex models should enable banks to assess their portfolios effectively to calculate capital charges that reflect sensitivity to risk. This is a sound theory until, when times of economic distress impose condition on one institution to sell its riskier assets which in turn obligate other institutions to sell same assets decreasing the value of those assets in the market inflicting fragility to the banking system as a whole. Such implications are completely external for the banks therefore not considered by the individual banks while developing internal models. In additions, existing VaR¹²⁶ models fail to incorporate external events that potentially can be fuel for crises (BCBS 2004a; Dimirguc-Kunt et al 2008). Thus, the inefficiency of these measures during the financial crises, furthermore there exist no particular regulatory guidelines for individual banks to forecast such external issues in order to avoid financial destabilization. Financial crises conveniently inflict structural damages to the data management streams and thus there arise serious questions about the validity of the data preceding the beginning of the crises to be used for the future estimation of risk.

Regulators encourage advanced approaches of the Basel II and enhanced use of VaR models. Regulatory capital is considered the key to surviving in the events of a systematic nature. According to the advanced approaches VaR is to be assessed at 99.9% risk level assumption over a year period. According to this technique, banks are required to maintain capital for an event that occurs on average every 100 days in a year (Kupiec 2007; Jarrow 2007; and Petrov and Pmazanov 2009). However, there is no proof that systematic failures

¹²⁶ Value at risk models used widely by the banks to assess the sensitivity to market shock, calculated daily

occur on average every 100 days therefore suggesting a mismatch between regulatory assumptions and frequency of systematic risk occurrence. In addition, forecasts have been based on the estimation horizon set at one year, however it has been argued that forecast precision increase if longer horizon period are applied see Danielsson et al (2001). However, this time horizon may not correspond with the actual maturity of loan, for example for a three-year high risk loan, considering one year horizon would result in more than two thirds of the potential credit risk not in picture at all (Petrov and Pnmazanov 2009). In theory, diversified loan portfolio should require less capital than a single asset concentration. Despite that, in calculation VaR of a diversified portfolio can be higher for diversified loan portfolio (Jarrow 2007). The ASRF (Asymptotic single risk factor) model relying on results of Merton (1974) and Vasicek (2002) is implemented under Basel II to hold portfolio invariance (Petrov and Pomazanov 2009). Not to mention the limitations of ASRF model as incapable of factoring more than one risk factor see Jarrow (2006). Nevertheless, applying ASRF would imply that even diversified portfolio will have same required capital as concentrated portfolio. Guidelines to dealing with regards to handling concentration risk are covered separately under pillar 2 (BCBS 2006a). Moreover, upon applying the ASRF model, it assumes the actual correlation between assets (within an asset class) is by means of simple function of the asset's PD for non-defaulted wholesale exposures. In addition, the losses are assumed to be normally distributed implying that asset returns are normally distributed. These assumptions generate rough approximation (Jarrow 2007). The Basel II formula requires an adjustment for the maturity of the asset in question. This is because the actual formula does not automatically takes into account the market value of the assets. The book value does not give fair picture due to the loss in value particularly if the issues are downgraded over 1 year horizon. In order to incorporate market value fluctuations in the model the assets maturity needs to be adjusted. Asset's value downgrade depends upon the firms overall health. An asset's collateral or seniority may dictate a firm's probabilities of default as a whole, causing the particular asset's value to downgrade eventually. However, this is completely independent of any particular assets maturity. In essence, firm as a whole carries the fundamental importance not the maturity of any particular asset within the firm's portfolio (Jarrow 2007). Kupiec (2007) discusses that a major concern with regards to rough approximation generated by use of VaR model is how to gauge magnitude of the approximation error. The extent of the approximation

error¹²⁷ showed that AIRB significantly under estimated the capital required by the alternative rule, therefore concluding that Basel II generates poor approximation to the ideal capital rule under the advanced approaches.

The regulatory model used¹²⁸ to allocate capital according to the probability of default (PD), loss given default (LGD), maturity (M) and expected exposure at default (EAD) for the Credit in question. It is based on assumption, that banks portfolio is fully diversified and capital buffer is required only against the probable loss associated with a single non diversifiable source of risk (Gordy and Jones 2003). Basel II approaches are calibrated and in effect, for large internationally active banks AIRB approach produces lowest capital requirements acting as an incentive for upgrading from standardized and FIRB approaches. The costs of upgrading to AIRB approaches is presumed to offset with capital savings and improved efficiency associated with efficient measurement of credit risk. However, according to the results of QIS 5, estimates of minimum capital required under the AIRB approach varied significantly across the banks raising concerns with regards to the calibration of AIRB and guidelines for calculating PD, EAD and LGD inputs. This questions the rigor of prudential standards set under the Basel II capital framework and identifies limitations regarding implications of its calibration principles and input specifications. Moreover, the calibration comparison showed that AIRB approach substantially undercapitalized credit risk as oppose to FIRB when credit risk is overcapitalized (Kupiec 2007). The definitions that qualify for EAD and LGD can result in AIRB prudential standards that in effect are weaker than its predecessor Basel capital accord (BCBS 1988). In addition, in different jurisdictions evidence of varied interpretations lead to significant variation in estimates of minimum capital required by the banks (OCC 2006; and BCBS 2006e). There have been apparent limitations in achieving a

¹²⁷ The extent of approximation error is computed using alternative rule based on VaR in hypothetical Black-Scholes-Merton economy where the banks' asset portfolio consists of collection of risky zero coupon bonds following correlated geometric Brownian motions

¹²⁸ Model called Guassian Asymptotic Single Risk Factor of credit risk assuming that default risk is generated by Guassian uncertainty and includes a single common source of risk and independent risk factors see Vasicek 2003; and Kupiec 2007 for detailed argument.

clear interpretation standard set for all banks implementing AIRB approaches across jurisdictions¹²⁹ in order to deter any sources of ambiguity in the Basel II rules that can be damaging for the level playing field. Due to the fact that internationally active banks can achieve capital standards (under Basel II-AIRB) that enhance their implicit public safety net, non AIRB banks may consider this incentive to shift their banking assets towards AIRB banks to increase the value of their implicit safety net subsidies. As a result, an imbalance may be introduced in the level playing field. There is strong mention of the fact that the capital advantages gained by the internationally active banks upon implementing much encouraged advanced risk management technologies may undermine Basel II objectives of creating a level playing and the financial stability of the international banking (Kupiec 2007).

Improvement of internal risk measurement and management technologies of institutions in relation with the depth and sophistication of financial markets, supervisory authorities must continually find ways to incorporate market advances into their prudential policies (Barr and Millar 2006). Capital standards under Basel II recognize hedging, diversification and difference in risk management techniques e.g. portfolio management (for trading activities only). In addition, Basel II with introduction of advanced approaches attempts to raise awareness for Regulators to keep up to date with increasing sophistication with which banks are responding to the new regulatory framework (Moosa 2008; and Demircuc-Kunt et al 2008). The capital adequacy requirements primarily act as a closure threshold only and assume that in presence of regulatory forbearance, the market discipline can be utilized to reduce the closure threshold. Strong mention of the fact that direct market discipline can only be effective if regulatory authorities can avoid political influence and that indirect market discipline should be treated as void due to erratic market justifications during crises. Basel II proposals would prove insufficient in the absence of guaranteed independent supervisory review (Danielsson et al 2001; and Decamps et al. 2004). Capital requirements increase for banks that hold risky assets and decrease significantly for banks that hold safer portfolios (Caruana and Narain 2008; James and Allegra 2009). This theory dictates regulatory authorities' attempts to make capital requirements as risk-based as possible.

¹²⁹ BCBS and Non-BCBS member countries

Basel II was accused of playing an important role in creating incentives for banks to move risky assets to unregulated parts of the holding company in order to negotiate the minimum capital restrictions imposed by the authorities. In other words, banking institutions have been provided with an authentic excuse to undertake capital arbitrage and restructure their risk position in order to be classified in a category that attracts lower capital charges. Securitization as noted earlier, a significant technique used by large internationally active Banks in order to transfer risk to investors. However, regulatory capital arbitrage is not all bad news. This is because in absence of such arbitrage, a regulatory capital requirement that is inappropriately high for the economic risk of a particular activity could prevent the bank from offering important services at a competitive rate (Demirguc-Kunt et al 2008). The lack of acceptable rate of return on capital in such situation can force bank to quit that relatively low-risk business. The reason why major banks have become quite efficient at engaging in regulatory capital arbitrage, through securitization and other devices is that capital arbitrage may appropriately lower the effective capital requirements against some safe activities that banks would otherwise be forced to drop due to the influence of the supervisors. Supervisory authorities showed clear intentions not to interfere with internal decision making by the banks with regards to such resource allocation. However, such resource allocation comes with its price and implications. In addition, situations with inconsistencies between internally required economic capital and the regulatory capital standard fuel more issues. Due to the fact that regulatory capital ratios possibly mask the true level of insolvency probability it becomes dubious if banks arbitrage away inappropriately high capital requirements on their safest assets by removing these assets from the balance sheet via securitization. Such scenario raises concerns with the sufficiency of regulatory capital requirements on the assets remaining on the book (James and Allegra 2009).

2.3.6 Conclusion

The recent past witnessed creation of complex and difficult to assess risk portfolios in the name of financial innovation; inadequate underwriting practices; bespoke securitization and 'Internal Ratings Based' (IRBF and IRBA) approaches; questionable predictions by the credit rating agencies and excessive reliance on credit rating agencies; inaccurate judgment of liquidity, concentration and off balance sheet exposures; arguably the most

turbulent phase for the financial markets across the globe (Demirguc-Kunt et al 2008; James and Allegra 2009, Anderson 2010; and Moosa 2010). Despite introducing robust risk valuation methodologies, improved transparency and disclosure practices, amid identified critical limitations Basel II attracted significant criticism. Procyclical nature of Basel II (discussed in detail in the following section) remained at heart of the debate (Kashyap and Stein 2004; and Goodhart et al. 2006b). The fears of tilted playing field remain intact due to Basel II's continued heavy reliance of external rating agencies and allowing sophisticated institutions the use of internal models for risk assessments. Furthermore, the recent financial distress unveiled Basel II restriction with regards to liquidity. Nevertheless, Basel Committee respond contains serious developments of proposals to strengthen liquidity risk management. In addition, Basel III developed in response to the recent market movements aims to address frequently discussed shortcomings of Basel II (Blundell-Wignall 2010; and BCBS 2010b)

2.4 Procyclicality under Basel II

2.4.1 Introduction

This section takes the look at the most important issue of procyclicality of the financial system. Procyclicality in context of Basel Capital Regulation can simply be defined as impact of economic activity on capital requirements of the bank for instance earnings loss due to default can impair bank capital and raise risk based capital requirements.

2.4.2 Procyclicality of the Financial Sector

Relaxations of various controls on loan and deposit interest rates, credit allocations, and cross border flow of funds have allowed bank credit supply and deposit demand to respond positively to variations in economic activity. Literature advocates the fact that Basel II enhances the procyclical effects of banking regulation see Borio (2003); Estralla (2004); Quagliariello (2008); Khoury (2009); and Caruana (2010). There have been a number of attempts via development of various models in order to determine how bank capital charges would change in response to business cycle fluctuations see Kashyap and Stein (2004);

Goodhart et al (2006a); and Gordy and Howell (2006). Nevertheless, increased activity in variety of structured credit product practices continued and seemed to amplify business fluctuations promoting financial instability (CGFS 2009). In market practices, use of VAR and other market-sensitive risk management measures did not capture through the cycle volatility. It has been argued that traditional risk management measures often eased in times of boom due to rise in asset prices associated with low volatility. Therefore, excessive risk taking and leverage was promoted until the peak was obtained and then process reversed. The nature of banking operations by default, have been discussed to be procyclical¹³⁰, i.e. banks in general tend to shrink their lending in recession and expand during the boom boosting the amplitude of the business cycle (Kashyap and Stein 2004). In other words, recessions are severer and booms tend to become exceptionally inflationary. In times of economic distress, important risk parameters may be stressed enough to inflict a decrease in solvency ratio, which may force the banks into extremely careful lending behavior. In times of such lending behavior by the banks it becomes hard to obtain credit at a number of institutional and/or individual levels, and therefore may lead to a credit crunch (Andersen 2010). The role of capital regulations in linking capital with risk is extremely crucial. The journey of prudential capital requirements continued from being invariant to the economic circumstance to current capital regulations that significantly depend upon risk assessment of a particular set of borrowers under prevailing economic environment. This implies capital based regulations exacerbate procyclicality (Moosa 2010). Basel II capital framework however, due to its stringent risk sensitive capital requirement restrictions, believed to have played a vital role in enhancing the procyclicality of the banking system, one more reason contributing towards causing the global financial crises. This is because capital requirements for banks increased when estimates of default risk were high encouraging banks to lend abnormally in excess during economic stability and choke business during economic rescission. Hence the reason, most recent credit crunch exacerbated recession and imposed delayed recovery of the real estate

¹³⁰ Jackson (1999) argued that there was no obvious evidence suggesting Basel II exacerbated procyclicality. Nevertheless, in addition to capital rules, plenty factors concerning Basel regulation explored that may exacerbate the swings in the economic cycle increasing volatility, dubbed as procyclical (Lastra 2004; and Balthazar 2006).

as well as the financial sector (Moosa 2010; McKenzie 2011; Demirgüç-Kunt et al 2013). Introduction of fixed capital requirements raised concerns that it aggravated procyclicality. Initially with some scattered evidence of impact (on small business and mortgages sectors) due to the pressure banks faced to maintain minimum capital. Nevertheless, procyclicality exacerbated when set of borrowers suffer downgrading in the ratings during the recession causing capital requirement to increase for the banks doing business with that particular borrower (Demirgüç-Kunt et al 2013).

2.4.3 Procyclicality under Basel II

Procyclicality under Basel II and the extent of economic swing responding to the capital requirements pendulum depends upon the dynamic features of banks' IRB systems and their probability of default estimation techniques (Caruana 2005). The capital requirements under IRB approaches too are inclined to increase as an economy falls into recession and vice versa, makes the task for regulators to maintain macroeconomic stability extremely complex and challenging. In contrast, in times of crises, theoretically a countercyclical measure to help moderate the economic swings would be to make available funds by the financial institutions for the purpose of extending credit, and that may be achieved by creating incentives to over lend (Kashyap and Stein 2004; Caruana 2005; Benford and Nier 2007; Repullo and Suarez 2008; Repullo et al. 2009; Brunnermeier et al. 2009; Pederzoli et al 2009; McKenzie 2011; Demirgüç-Kunt et al 2013) Arguably Basel II, despite suggested to have positive macroeconomic implications fueled procyclicality. This is because of its compulsion for the banks to hold excess capital during the times of financial crises as means of safety buffer against default probabilities. In times of economic instability, to cater for potential fluctuations in the capital the widespread concerns have been the ways banks can meet increased capital requirements i.e. either through arranging excess capital or through adjusting their lending activity (Kashyap and Stein 2004). If there is a check put on banks' lending activity then, in order to meet excess in required minimum capital requirement alternate means must be applied to cover any given shortfall e.g. instead of limiting lending activity cuts may be applied on dividends¹³¹. This may restrict

¹³¹ Cuts in dividends may not be sufficient enough to be able to do the trick see Benford and Nier (2007)

the overall effect on the corporate and retail sectors. In order to avoid unnecessary increase in regulatory capital in hard times the Basel committee however under Pillar 2 of the current accord, suggests banks to conduct calculations in order to identify how much capital would be sufficient during times of crises and make provisions (Cihak et al 2013; Mariathasan and Merrouche 2014). Under Basel II, minimum capital requirements for large banks were set according to their internal assessment of the risk of their portfolios. Literature also points out to another issue, if banks' internal assessment procedure could have been carried out in times of boom then there is great possibility that it may be under the assumption that prevailing economic condition will continue. However, such assumption may prove to be too optimistic¹³². In times of boom the subjective probability of crises may become very low and banks allow their capital position to relax and start extending credit on softer terms and to broader range of borrowers. Not only that, the pricing of credit may also be relaxed as well as incentives offered to staff that reflect importance of short term profit making. Such approaches carry neglect of the impact they might impose long term and in particular, during economic downturns. Once an economic shock transpires, subjective probabilities are reversed and the whole financial system may face risk of crises (Carey et al 2012).

In addition, Basel II in broader context, with its micro-economic model structure¹³³ fails to take into account a global outlook on banks and markets for promoting achievable financial stability across the globe. The risk parameters¹³⁴ under Basel II are computed at one point in time rather than through the cycle (Kashyap and Stein 2004). If output is to be smoothed during the period, the results may be less procyclical capital ratio. However, pursuing too far in such direction would weaken the connection between capital and risk, where the whole idea of modern prudential regulation is that capital should reflect the banking risks (Brunnermeier et al. 2009). In addition, the risk that has been accumulated during healthier economic circumstances actually materializes during economic downturns. In principle,

¹³² In reality underestimating the long term riskiness of the exposures could exacerbate procyclicality (Danielsson et al. 2001).

¹³³ Only takes into account the domestic economic outlook at best, fails to incorporate international economic development in particular in an era of heightened financialized capitalism see Lapavistas (2013)

¹³⁴ PD (Probability of Default); LGD (Loss given default); EAD (Exposure at default); M (maturity)

the capital base should reflect this however, it has clearly been overlooked. Risk weightings based on ‘past-incorporating’ data tends to underestimate the tail risk and there are none known authentic ‘future-estimates’ toolkit (Brunnermeier et al. 2009). Most commonly discussed measures deal with the losses incurred during normal business cycle; they may be completely irrelevant in times of systemic crises. There is no guarantee that risk-adjusted capital proposals alone can tame the extremely and potentially fragile evolution of the financial system in unpredictable directions. Heavy reliance of Basel II,¹³⁵ on rating agencies and internal models to determine regulatory capital requirements attracted unprecedented discussion in literature in particular, during most recent financial turmoil (Moosa 2010). For instance, Basel II by offering credit rating agencies supervisory recognition not only rest faith in them, it most certainly allowed credit rating agencies to influence banks decision making more than Basel II itself (Cataneu-Rabell et al 2005). Basel II capital regulations unintentionally may have allowed the rating agencies play almost a deciding role in budding of the most recent subprime crises (Dedu and Nechif 2010; and Moosa 2010). The AAA ratings for securities backed by subprime loan became easy to obtain and therefore reliance on the rating agencies to dictate riskiness of assets appears ironic post crises. Furthermore, as a buffer to market fluctuations, contractual provisions seemed to be used as extra cushion to the creditors in case of unexpected market value deterioration (Goodhart et al 2006a; Gordy and Howell 2006; and Panagopoulos and Vlamis 2009). The buffer could be extra collateral or may be additional control rights over borrows’ decision making. Most rating agencies issued such buffer incorporated debts highest ratings¹³⁶. However, where such buffer systems effectively protected against idiosyncratic crises, it certainly exacerbated procyclicality in particular when shocks of systematic nature occurred. As a consequence, excessive debt financing may have been allowed by the market participants (Gai et al. 2007; and Moosa 2010). Excessive reliance

¹³⁵ Regulators relied on external rating agencies instead of supposedly administering the implementation of Basel II. European Savings Banks Group, British Bankers Association, and European Banking Federation agreed that rating agencies failed to deliver transparent ratings methodologies.

¹³⁶ Assessment criterion have been based upon models that assumed that future asset price volatility could be estimated with the historical data: In some instances irrelevant or inadequate historical data on some asset classes may further obstruct risk assessment and induce excessive leverage.

on credit agencies for determination of riskiness of assets have been proved to be misleading. Due to the fact that credit rating agencies followed market trend rather than forecasting them and failed to remain consistent with regards to issuing estimates of the risk of assets, giving birth to concerns whether rating agencies meet required Basel II criteria of credibility and transparency (Moosa 2010). In addition, the link between asset valuation and leverage has been proved to be extremely crucial towards exacerbating procyclicality. The decline in asset prices impose an adverse impact on availability of credit, not to forget, that credit availability feeds back into investment and consumption and therefore fed back into economic growth. This may be procyclical due to the fact that the value of collateral depends upon the point in time during the business cycle. In addition as a result of negative shock to economy, the bank's capital decreases and may induce excessive leverage (CGFS 2009). Furthermore, due to extremely unfavorable conditions for raising capital during times of economic crises, banks tend to raise capital through sale of the assets. Disposing off of assets feeds back into asset prices causing them to fall even more, thus confirming an initial stage of shock. The impact becomes massive if the shock hits several banks simultaneously and especially when banks are trying to maintain required leverage level¹³⁷. Inevitable liquidations at a huge scale have proved to result in triggering a vicious circle and systematic crises may become imminent. Most countries have adopted intelligent leverage ceiling, however leverage still poses active threats to speeding up the procyclicality¹³⁸.

Banks have been advised to hold excess capital than the minimum requirements under Pillar 2 and 3 of Basel II capital framework. In principle, this would enable banks during the times of economic distress to avoid liquidation and continue healthy lending activity. Effective risk management under Basel II, as in formation of better control structures, improved corporate governance and intelligent investment in IT infrastructures as well as human capital has been emphasized in abundance as counteractive measure against the procyclicality under Basel II (Moosa 2010). Under the Basel II regulatory framework,

¹³⁷ An entity is considered to be leveraged when it operates under conditions where exposures to risky assets exceed its equity capital.

¹³⁸ See Adain and Shin (2008) for detailed discussion regarding relationship of increase and decrease of asset prices and leverage in different countries.

calculation of capital ratios on the basis of risk adjusted assets exacerbates procyclicality. In order to introduce countercyclical capital buffer, the literature suggests that capital ratios may be calculated from total unadjusted assets. This would mean that required capital to be function of the change in assets, not just the risk-weightings (Moosa 2010). Basel II is more about compliance with regulatory requirements rather than a mere risk management tool. Risk management practices (with or without Basel II) exist primarily to enhance overall profitability of the institution, poise them better within competitors and usually have been tailored in line with institutions' peculiar requirements.

Despite frequently identified limitations of IRB approaches that exacerbate procyclicality, IRB capital ratio still easily qualified as the pioneer of the modern portfolio risk management standards. Internal Rating Based approaches (as discussed earlier that IRB techniques are formulated under asymptotic approximations to the risk factor models and are now widely used across internationally active banks) offer an extremely sophisticated measure of capital adequacy. Compulsion to comply with strict regulatory standards contains vital benefits of enhanced comparability of creditworthiness between banks and across time. The steep procyclicality under the IRB approaches may be curtailed via adaptation of through-the-cycle rating methodologies to diminish the impact of the business cycle fluctuations on borrower ratings¹³⁹. In addition to using through-the-cycle methodologies literature also advocates the fact that procyclicality can be diminished either by flattening the capital function in order to reduce the sensitivity of capital charges to changes in PD, or the regulators may exercise their discretion to impose a smoothing rule directly on to the output of the IRB capital function. Under the first two pillars, any of the above mentioned methods could be considered to sufficiently address the issue of procyclicality under Basel II. However under pillar III, the said approaches may develop certain conflict implications, e.g. flattening of the IRB capital function can cause distortion to relative capital charges across the borrowers. Adopting through-the-cycle ratings method would severely increase inability of the market participants to conclude changes in

¹³⁹ In order to reduce the sensitivity of borrowers PD to macroeconomic conditions using through-the-cycle system means each rating grade may be calculated as a long term historical average. This would enable to calculate regulatory capital requirement with diminished impact of macroeconomic conditions see Gordy and Howel (2006) for more detailed discussion)

portfolio risk from changes in a bank's capital ratio and seriously damage the transparency as well as comparability of IRB capital requirement across time. Gordy and Howell (2006), applied auto regressive filter (AR) and tested the behavior of smoothing rules that are applied directly to the output of an unmodified IRB capital function by assuming that bank rating system are point-in-time, expressed as a percentage of portfolio book value:

$$\hat{C}_{it} = \hat{C}_{i,t-1} + \alpha(C_{it} - \hat{C}_{i,t-1}) \quad (1)$$

Basel I operated by setting $\alpha = 0$, whereas Basel II rests $\alpha = 1$. According to Gordy and Howell (2006), the value of α is set in the middle would offer a compromise between Basel I and Basel II in determining sensitivity to the business cycle. By setting α (parameter that controls the degree of smoothing) at 0.25 in their simulation, Gordy and Howell (2006) showed the suspicion is the shocks to C_{it} are absorbed in to the minimum regulatory capital over several years rather than all at once.

An advanced counter-cyclical indexing rule would apply by introducing time-varying multiplier to the IRB formula i.e. $\hat{C}_{it} = \alpha_t C_{it}$. The multiplier α_t would be reduced by regulators during a recession to offset the effect of higher borrowers' PDs capital requirements. During an expansion, α_t would be raised, and similarly offset the effect of falling PDs, where α_t is a time-varying multiplier released publicly by the national regulator in each period and applies uniformly to every bank in the regulator's jurisdiction and specified as follows:

$$\alpha_t = \exp (a. (\omega_1 X_{t-1}^* + \omega_2 X_{t-2}^* + \dots + \omega_k X_{t-k}^* - a^2/2)) \quad (2)$$

Both AR and CC rules have been considered effective in smoothing capital volatility without requiring excessive operational requirements from banks. However, there exists significant difference in implementation requirements of the rules. Auto regression (AR) rule has clearly been dubbed decentralized. It smoothes the capital requirement independently for each bank using its own time-series filter of IRB capital requirements and allows bank to operate in local markets with business cycle distinct from the overall

national market. However, it has been critically argued that AR rule assumes that the banks conduct operations with stationary lending strategy. This would mean that banks may take the incentive to revamp their credit risk portfolio rapidly whereas required capital requirements following AR rule would only increase slowly and play catch up at all times (Gordy and Howell 2006). The role of regulator remains as a passive observer of the smoothing. In contrast, counter-cyclical (CC) indexing rule is set by the regulator in each period for all banks by applying a time varying multiplier to the IRB formula (i.e. >1 during boom and vice versa), thus confirming some level of regulator participation and control. The CC rule is robust to changing business mix at the individual bank level. This is advantageous with in markets where large flow of assets can be shifted between regulated banks and unregulated institutions. Regulator needs to possess some degree of control in order to keep business cycle synchronized across the major financial markets and check any involvement in capital arbitrage. It has been critically argued that in presence of reliable and transparent data on the operations of credit markets in question, CC rule should be favored. Regardless of the methodology followed, dampening output by flattening the capital formula generates some caution points. In case flattening is modest and uniform across the loan types would achieve modest dampening of procyclicality. On the other hand heavy dampening may be achieved by comprehensive flattening of the IRB capital formula, in such situation practice of capital arbitrage may increase. This is because where heavy dampening may comprehensively address procyclicality, it may result in severe distortion of the relative capital charges across loans at every point in business cycle. Thus, changes in the banks' capital requirements would not be correlated in its economic capital and there would be no means to conclude regulatory capital from economic capital. In such scenario, Pillar 3 would not be valid in order to aid market participants monitor bank over time (Gordy and Howell 2006).

Chapter 3: Basel Capital Regulation: Response to global financial crises

3.1 Introduction

Early 1980s witnessed US regulators instructed that federal banking agencies required a certain level of leverage ratio on primary capital. The US International Lending and Supervisory Act (ILSA) unified capital requirements for the various bank types at 5.5 % of the total assets and also unified definition of the capital. At the time there emerged number of developing countries where banks had exposures equaling more than twice their capital and reserves. Mexico declared that it was unable to pay its debt of 80 billion USD followed by number of countries restructuring their debt totaling 239 billion USD. That was not it, there seemed to be a queue of crises that haunted the world. Rumasa Crises flooded Spanish financial sector leaving a number of commercial banks and financial institutions bankrupt. At the same time Oil crises hit Continental Illinois commercial bank in USA when they announced their non-performing loans rose to 2.3 billion USD causing a threat of a bank run. A number of large US banks had to gang up together and offer a rescue bid of 5.3 billion USD. Regulators at the time instructed banks to write off their bad debts in progression and clear their balance sheets over a number of years to avoid numerous bankruptcies. On occasions the root cause of the crises was pronounced as decline in economic activity, unskilled management and lack of regulations. Shortly after 1986 followed with collapse of US S&Ls (Savings & Loan), US Federal insurer of S&Ls went bankrupt leaving 441 S&Ls insolvent and approximately 566 billion USD in question. Regulators were left with no choice but to interfere to avoid bank run by offering state guarantee for the depositors and bought the troubled S&Ls to sell them back to the banking groups. Only next year, 1987 brought the black Monday, the crash of stock exchange. The Dow Jones index lost 22.6 percent in one day. Other notable losses on the day were incurred by CAC40 in Paris and Nikkei in Tokyo losing 9.5 percent and 14.7 percent respectively. It highlighted the growing need for international convergence in banking regulation. The G10 countries created a committee of representatives from central banks and regulatory authorities at a meeting at the Bank of International Settlements (BIS) in Basel, Switzerland. Only to encourage internationally, a fair and level playing field and ensure giant international banking groups were not avoiding supervision through creation of holding companies. The reference paper issued, a few years later claimed the bases for national regulation in more than 100 countries.

Continuing a bird's eye view of the historical events, Norway witnessed growth in lending during early 1980s but the banks were hit by the spread of oil crises. The deposits insurance system was used to inject capital into troubled banks but in 1991 three largest Norwegian banks announced loan losses and significant increase funding cost. The deposit insurance system could not cope with the burden and the government had to intervene to avoid collapse of the whole financial system. In Sweden regulators allowed deregulation and high growth in lending activity resulted. The asset price bubble due to high volume of mortgage loans was inevitable. The bubble burst as real estate prices in Stockholm collapse by 35 percent in 1991 and first to suffer were NBFIs (Nonbanking financial institutions), eventually inflicting burden on the banking sector. Two of the biggest six banks in Sweden required state support to avoid bankruptcy. Switzerland also witnessed crises of same sort caused by increased lending activity in the real estate. United Kingdom saw demise of its oldest merchant bank, Barings, caused by market and operational risk. Although the bank was significant business this was not considered causing a systematic risk and taxpayers money was not used on this occasion to cover the losses.

On the other side of globe Bank of Japan increased interest rates five times during 1990 to curtail inflation to no avail¹⁴⁰. The stock market began to react and lost 50 percent in a year as well as real estate market started to slow down. Some small banks showed signs of high concern but regulators were optimistic about the recovery. Their optimism proved false and severe bankruptcies hit large Japanese banks later. Collapse of Sanyo Securities, Yamaichi Securities and Long-Term Credit Bank (LTCB) of Japan are to name a few. The government of Japan guaranteed deposits to avoid bank run followed by Financial Reconstruction Law in 1998. Exchange rates were changed only infrequently, and only with the permission of World Bank and IMF. These included the vast expansion of international trading and inflationary pressures in the major economies. The shift flexible foreign exchange rates introduced daily or intraday volatility exchange rates, the financial markets began to offer currency traders special tools for insuring against these new risks. The development of interest rate volatility and derivative instruments followed a similar path from the early 1970's. The end result of bank activity in these new derivative markets

¹⁴⁰ Asian Crises see Wade, R. (1998). The Asian debt-and-development crisis of 1997-?: Causes and consequences. *World development*, 26(8), 1535-1553.

was that banks naturally became even more exposed to volatile derivative instruments and these exposures had to be carefully risk managed.

The regulators did not spot the threat and fragility of the financial system, instead allowed over leverage to occur resulting in failure of top 5 US investment banks¹⁴¹. The failure of these investment banks have been argued to have played a key role in bursting of the US housing and credit bubble that peaked in 2005-06.

3.2 Basel Capital Accord and the Global Financial Crisis

Based on the adverse market advancements and extensive industry consultation Basel II had vowed to upgrade weaknesses in Basel I. As discussed earlier such weaknesses, in past had encouraged financial institutions to seek out opportunities for ‘arbitrage’ along with inadequate risk management and weak disclosure practices and that, participated significantly to the recent crises (Demirguc-Kunt et al. 2008; Caruana and Narain 2008; and Moosa 2010). Basel II undoubtedly an improved form of Basel I, stricter and aims to reduce spurious incentives to securitization by significant reduction in the capital charge for mortgages held on the balance sheet and introducing capital charge on new lines of credit. Nevertheless, recent financial crisis seriously questions effectiveness of the Basel II accord. Basel II agreed to be implemented during 2004, is still believed to be in integration process in a number of jurisdictions in particular advanced approaches. In addition, it boosted far more complex statistical methodologies accompanied by extremely complex IT models to be incorporated than under Basel I, and moreover Basel II required heavy investments in order to develop such models and expertise. The complexity under the new Basel II does not guarantee accuracy by any means. In fact it promotes less understanding of the underlying concept for all market participants and increases compliance burden in cost as well as implementation. Even upon overcoming such huge hurdles Basel II has significantly been doubted by a variety of market participants with regards to its ability to improve on setting the arbitrary target ratios over its predecessor. The highlighting points have been that there is no change in the definitions and rules for Tier 1 and Tier 2 capital,

¹⁴¹ Lehman Brothers, Bear Stearns, Merrill Lynch, Goldman Sachs and Morgan Stanley

and minimum ratios of capital to risk-weighted assets still hover around 4 and 8 percent with no comprehensive ruling as to why either of those ratios should be applied (Demirguc-Kunt et al. 2008).

Basel II's heavy reliance on external credit rating agencies and determination of regulatory capital based upon internally developed models was exposed at a global level in recent events. The rise in financial capitalism seemed to be untamable with mere risk management in banking.¹⁴² Literature argues that even with a complete transition towards Basel II was achieved prior to 2007-8, it would still have been insufficient in dealing with the onslaught of the global financial crises. This could be because Basel II by default is a capital based regulation and implementation has been more of a compliance practice by the banks as opposed to actual risk management. The current crises highlighted liquidity and leverage to be more serious issues than capital adequacy (Caruana and Narain 2008). The current financial crises also highlighted that Basel II was not equipped appropriately to addresses key regulatory issues. Despite that upon complete implementation of Basel II capital accord, a paradigm for domestic regulation is considered to be certainty. There have been substantial shortfalls in efforts as well as predicted benefits in harmonizing capital rules and best supervisory practices internationally (Moosa 2010). Such arguments give clear indication that global financial crises added to severe concerns over the core concept of the Basel II capital accord along with its existing heavily debated operational limitations and complexity¹⁴³ The Basel II accord attempts to tackle the issue with either Standardized approach or Internal Rating Based (IRB Foundation and Advanced) approaches. Standardized approach is more or less the same as its predecessor with an improved wider range of risk buckets and fundamentally requires use of assessments computed by external rating organizations. Inexplicably, unrated firms carry a risk weight of 100% in comparison with low rated firms that carry 150%. In presence of such rating bands and revenue-based

¹⁴² See Lapavitsas (2008; 2009; 2013) and Fouskas and Gokay (2012); Fouskas and Dimoulas (2013) on financial capitalism; Adrian and Ashcraft (2016) on role and rise of shadow banking; and Strange (1997) Press

¹⁴³ See progressive debate in this regards in Bruggink and Buck 2002; Caruana 2003; Hudson 2004; Garcia 2004; Demirguc-Kunt et al. 2008; Teitelbaum 2008; Reinhart and Rogoff 2009; Moosa 2010; Repullo and Suarez (2013); Araghi et al (2014); Samanta and Chakarborty (2016)

incentives for credit rating agencies, the quality of information provided by them is questionable. In evidence, during times of financial disturbance there have been frequent large downgrades seriously affecting highly rated and thus seriously harmed the credibility of ratings (Demirguc-Kunt et al. 2008). Bank Capital requirements must consider the buffer against unexpected losses. Credit ratings do not, and are computed with accounting for expected losses. Credit ratings do not contain information about volatility of a particular asset or a portfolio therefore they may only be useful in predicting the loss reserves. Therefore the target capital set aside as a buffer must incorporate measures of the volatility of an institutions' volatility of earnings dictated by unexpected events (Moosa 2010). Furthermore, once questions have been raised about the reliability and transparency of the ratings institutions faced reputation risk and a withdrawal of existing business upon maturing of the liabilities increased the liquidity risk (Demirguc-Kunt et al. 2008). Basel II remained unsuccessful in addressing such issues even with a wider more sophisticated range of credit risk categorization.

The treatment of 5 year data span, and 99.9 percent confidence threshold under the new Basel II accord proved limited and insufficient in order to catch a full business cycle. Furthermore, during the time of crises unexpected events evolved (US housing bubble) and new types of market participants were introduced at regular intervals and therefore models estimated from the period with no such advancements proved void. Upon satisfying the eligibility obligations, internal rating based approaches can be applied. In case of advanced ratings based approach institutions can rely comprehensively on their own estimates of PD, LGD, EAD and M¹⁴⁴, and that have been heavily criticized by researchers as well as other market participants. This is because it definitely provides grounds for complex financial models and dataset be manipulated in order to achieve desired capital requirements (Dowd et al. 2008). More sophisticated IRB approaches of the new Basel Capital Accord (Basel II) came under severe criticism during the global financial crises. This is because even most sophisticated models employed by largest and well equipped institutions proved inadequate to track risk. Few of the frequently sighted limitations of the internal models have been their inability to capture risk of tail events, or predict future; and focus on measures rather

¹⁴⁴ PD (Probability of Default); LGD (Loss given default); EAD (Exposure at default); M (maturity)

than effective management of risk (Danielson et al. 2001; Majnoni and Powel 2005; Kupiec 2007; and Jarrow 2007). These models have also been accused of completely disregarding the rise of casino capitalism, and other heterodox¹⁴⁵ economist views (Aglietta 2016; Kay 2015; Fouskas and Dimoulas 2013; Sinn 2010; Lapavitsas 2008). The models inaccurately captured types of risks in complex securitization environment and large losses were the result. These models take their foundation from value-at-risk (VAR) and faced severe criticism from researchers and practitioner alike during the recent financial disturbance. These highly sophisticated models, on basis of their high capability and accuracy level have been argued to promote false belief amongst risk managers of the financial institutions that upon implementing these models they are ready for the risk promoting complacency. The current financial crises highlighted the incapability of such models. For example VAR forecast that events of extreme economic shock occur only extremely rarely. However, in reality the history of banking contains significant evidence that such shocks that are severe in nature have been a lot more frequent than the models predict. In case of Goldman Sachs, at the beginning of the recent financial crises it was reported that Goldman Sachs recorded 25-standard deviation fluctuations, which according to the model should only occur once every hundred years (Dowd et al 2008). During the recent financial crises, such examples clearly demonstrated the limitations of the internal models with regards to estimating exposure to risk and brought to surface, difficulties associated with accounting for losses occurred due to high severity of unexpected economic shocks. In addition Banks, while developing their internal models, also proved to be unfairly over optimistic with regards to their risk exposures in order to achieve the incentive of lower regulatory capital requirements and increased returns on equity (Moosa 2008).

Basel II has assigned no particular protocol to be followed to aid regulators in monitoring and controlling insolvency risk. Regulators failed to demonstrate skill in order to adequately check and validate internal risk models (Wihlborg 2005). There exists serious requirement for Basel II to develop protocols for identifying a troubled bank and require it

¹⁴⁵ Wolfson, M. H., & Epstein, G. A. (Eds.). (2013). *The Handbook of the political economy of financial crises*. Oxford University Press; furthermore see McKenzie, R. A. (2011). Casino capitalism with derivatives: Fragility and instability in contemporary finance. *Review of Radical Political Economics*, 43(2), 198-215.

to recapitalize before it becomes inevitable for the government to intervene with taxpayers' money. Nevertheless, not only the existing role of regulator has been criticized in abundance but also regulators' authority, skill and political motivation have been questioned. In addition, national regulators enjoy greater discretion powers under Basel II and therefore there have been evidence of varied minimum capital requirements across the globe in response to their peculiar circumstances. In US the Basel II implementation is only mandatory for the larges institutions whereas in EU Basel II is required to be implemented in all banks. In particular, complete implementation of Basel II in a number of developing countries is dubious. Due to this reason Basel II cannot be uniformly implemented across the globe there have been widely discussed possibilities of increased regulatory capital arbitrage. As a consequence it prevents transparent and credible capital control questioning the role of Basel II standards as truly global. In addition, modern sophisticated institutions in response to volatility of and correlation between returns of range of asset categories take risks that cannot comprehensively be captured under one static rule. Therefore static rules give way to developing extremely complex mathematical models budding fears of regulatory arbitrage, reduced supervisory control, reduced transparency and so forth. Recent financial crises unveiled weaknesses of static models developed under Basel II. Therefore points out a serious need for supervisors to carefully respond to volatile market advances in evolving prudential regulation with extensive focus to market signals in development of appropriate stress testing.

Recent financial crises seriously questioned the concept that capital adequate institutions, if hit by huge losses would remain solvent (Chiu et al 2009). Nevertheless, after being struck with huge loss, financial institutions are likely to suffer invaluable loss of reputation regardless of whether the losses can be covered monetarily immediately or not. Even if the losses are immediately coverable, the capital may be with priority required to satisfy the creditors and therefore generates a need to raise capital in addition anyway in order to continue operations. This is where institutions may require bailout. In fact, there is strong argument that introduction of regulatory capital requirements have caused institutions to involve in excessive risk taking¹⁴⁶. The role of Basel II has been argued to be

¹⁴⁶ For example securitization or some form of capital arbitrage, dubbed as shadow banking see Adrian and Ashcroft (2016)

discriminatory. The financial turmoil confirmed that all sorts of financial institutions¹⁴⁷ became involved in over optimistic risk taking, suffered losses and needed bailouts. Yet Basel II addresses issues concerning commercial banks. In fact, main victim of the credit crises included investment banks (Zuberbuhler 2008). In addition, Basel II completely disregards business and reputation risk¹⁴⁸. Financial institutions that took positions on Collateral Debt Obligations (CDOs) in the wake of American International Group's (AIG) credit default swaps to provide sufficient protection became highlighted casualties of the business risk (error of judgment).

Leverage and liquidity played dominant role in intensifying credit and market risk during recent events of financial turbulence and that has not been comprehensively addressed under the new Basel II accord. Banks involved in practicing sale of highly liquid assets and critically relied on borrowed liquidity instead of building adequate reserves of liquid. Declared with adequate capital, Northern Rock and Bear Sterns are most frequently highlighted casualties of liquidity and leverage during the recent financial crises. Liquidity seriously hampered Rock's business and resulted in a run on deposits, the first in United Kingdom for 140 years (Demirguc-Kunt et al 2008). Liquidity has been discussed to be fundamentally different from insolvency. Capital regulations under Basel II primarily meant for banks to hold capital to address insolvency. In the wake of the current financial crises, the development of complex tradable instruments increased the interdependence between banks and market enhancing financial institutions' exposure to the liquidity risk. Practices of transferring illiquid assets took place rather frequently and Special Purpose Vehicles (SPVs) were created to off-load risks in a cost efficient manner. The liquidity risk associated in such practice was dangerously underestimated by decent market participants (Bankers and Regulators alike). Furthermore, vulnerable developments on the liquidity aspects of the banks usually promoted an environment of credit markets (for example ABS

¹⁴⁷ Ranging from large internationally active banks to small relatively less sophisticated institutions including investment banks hedge funds commercial banks insurance companies in both developed and developing countries are exposed to all kinds of risks credit, market, operational, reputation, business, legal

¹⁴⁸ Northern Rock significantly suffered reputation risk evident during the global financial. Reputation risk have not been given recognition under much criticized Basel II (Moosa 2010).

and CDOs) where institutions increased leverage significantly. Bear Stern ended up leveraged 32-1 at the time it collapsed in a bid to sustain amplified impact of the adverse market advances. Leveraged entity is one whose exposure to risky assets exceeds its equity capital. Leverage feeds on strong desire of firms to maximizing their profit in times of lower interest rates and rising asset prices (Moosa 2010). During 2003-2007 overall financial system leverage increased and amplified market risk as well as liquidity risk. In particular, countries with booming housing market witnessed considerable increase in mortgage debt and only partially funded by banks through securitization (CGFS 2009). Use of balance sheet leverage as a measure of risk exposure suffered a fair share of criticism in the literature¹⁴⁹. This is because it fails to capture risk from derivatives, does not adjust for the risk of assets and by no means is a measure of liquidity characteristics of the assets held on or off balance sheet towards capturing liquidity risk. On cross border level other limitations came to surface as well e.g. Balance sheet leverage under GAAP is calculated to be different to IFRS.

Thus, Basel II being capital based regulation, evidenced its limitations explicitly during the global financial crises with regards to capturing liquidity risk and leverage. In light of global financial crises, Basel Committee considered raise in capital standards to address issues of asset valuation and liquidity¹⁵⁰. Global financial crises motivated a debate that earlier implementation of the new Basel II capital accord may have prevented or reduced the severity the recent financial crises.¹⁵¹ On the other hand it has widely been accepted that Basel II models proved flawed and actually failed to signal an arrival of a financial crises let alone curtail the recent global financial turmoil. As discussed liquidity, leverage, business and reputation risks aggravated the financial crises beyond any capital focused regulation and Basel II did not deal with any of them significantly (Griffin 2008). Furthermore, the crises affected non-bank financial institutions as well (e.g. AIG), which Basel II did not cover. Global financial crises reflected upon inadequacy of the Basel II

¹⁴⁹ Balance sheet leverage is determined by the ratio of total assets on the balance sheet to the equity, off balance sheet assets may be considered in order to further fine tune balance sheet leverage.

¹⁵⁰ Blundell-Wignell, A., Atkinson, P. (2010) Thinking beyond Basel III: Necessary solutions for capital and liquidity. OECD journal: Financial Market Trends 2010(1), 1-23

¹⁵¹ See Wellink, N (2008) Basel II might have prevented credit crunch, available at www.bobsguide.com

capital adequacy accord or any capital based regulations. Frequently notable issues were that Basel II clearly lacked provisions to deal with liquidity and leverage; could not put check on improper use of internal ratings based models; showed over dependency on external credit rating agencies; contained complex models making it difficult to implement; and failed to promote uniform playing field¹⁵².

3.3 Basel III: Regulatory response to the global financial crises

3.3.1 Modified Basel II: Basel III

Basel Capital Accord (BCBS 1988), started the ball rolling within banking regulations with new standards at the time that were easily negotiable by the banks but visibly, contained exploitable loop holes. Banks found ways to escape capital charges¹⁵³ under Basel Capital Accord and got involved in riskier more profitable businesses. Basel II (BCBS 2006a) an update version of the original Basel Capital Accord attempted to address such issues and focused on setting common standards agreed amongst the big economies in order to identify a capital that is adequate for a bank during periods of economic distress, in a bid to make global financial system more resilient. Regulators under Basel II Capital Accord urged banks to engage in sophisticated assessment of their risk and adjust their capital requirements accordingly. It has been observed that banks instead, would engage in all sorts of arbitrary practices in order to reduce their capital charges. During the global financial crises Basel II emerged as an inconsistent arrangement. The approaches advocated by Basel II (Standardized and Advanced) in order to determine adequate capital could not protect banks from the onslaught of the global financial crises. The global financial crises identified crucial weaknesses in the practices of the financial world i.e. development of extraordinarily complex risk exposures in wake of financial innovation

¹⁵² Praet, P. & Nguyen, G. (2008) "Overview of recent policy initiatives in response to the crises," *Journal of financial stability*, 4 (d), 368-375

¹⁵³ For instance securitization as discussed by Acharya et al (2013). Securitization without risk transfer. *Journal of Financial economics*, 107(3), 515-536.

that were not completely understood or assessed by all relevant market participants; debatable underwriting standards gave way to fraudulent practices in subprime sector; questionable ratings provided by external credit rating agencies; and poor use of internal models for risk management that generated liquidity and concentration risk. Once the financial crises struck, it deepened because of increased risk aversion, falling assets prices and intensified leveraging. Basel II promoted better valuation techniques than Basel I; incorporated improved market transparency standards and perhaps managed to address rather than taming speculative securitization to a certain extent. However, as the global financial crises unfolded it became apparent that Basel II implementation would have stopped or even spotted the subprime crises in the bud. Over excessive activity in granting subprime loans in US as well as UK also points out to the fact that regulator needed to exercise higher level local knowledge in order to put a check on potentially hazardous practices within their respective jurisdictions. In the US Government-backed mortgage lenders Fannie Mae (Federal National Mortgage Association), Freddie Mae (Federal Home Loan Mortgage Corporation) and Ginnie Mae (Government National Mortgage Association) began to make mortgage loans on easier terms and instead of waiting for the life time repayments sold the mortgages on to commercial financial institutions. This enabled them to arrange more cash and they increased the lending activity globally without due caution¹⁵⁴. Northern Rock in the UK grew at a rapid pace undertaking activity of same sort. The growth was clearly abnormal in comparison with normal deposit taking institution and once peak was reached resulted in severe global consequences. Nevertheless, allowing same situation to alleviate in different jurisdictions confirms the sensitivity of the matter and the fact that there is no substitute to local knowledge of bank practices and economic conditions. Moreover, Royal Bank of Scotland and HBOS required £12 billion and £4 billion respectively to cover the losses announced in wake of the financial crises. This represents the fact that the amount of regulatory capital held before the financial crises, was based upon either overly optimistic or completely wrong computations. In case of Northern Rock, because of the good quality of its mortgage loan portfolio, the risk associated with the mortgage book was calculated to be 15% using their own internal rating

¹⁵⁴ See Financial Stability and transparency. *House of Commons Treasury Committee*, 6th Report, March 2008. Paragraphs 169-178.

based approach (under Basel II) as compare to a standard 50%.¹⁵⁵ Such practices acted as curtain raiser with regards to limitations of Basel II and highlight the need for reforming the current Basel II regulation.

Financial deregulation, financial capitalism, shadow banking and casino capitalism enjoyed the center stage of the discussion in determining the cause of the financial crises¹⁵⁶. Theoretically, relaxing controls on interest rates, charter power and portfolio structures should aid banks cultivate economic resilience. Therefore financial deregulation does not in any way propagate opportunities to shift private risk exposures on to a safety net. However, innovation in financial modeling had led to development of complex and nontransparent forms of risk transferring. Existence of inadequate or unskilled monitoring of leverage and asset price fluctuations allowed breakdown in innovative financial modeling¹⁵⁷. In midst of the global financial crises blanket guarantees, open ended liquidity support offers and regulatory moderation often raised the overall fiscal cost for crises resolution and prolonged the tenure of the financial crises (Demirguc-kunt et al 2008). Global financial crises in addition, detected certain similarities to the crises witnessed through the history of banking, e.g. as early as crises of 1772 that marked the end of credit boom, crises of 1929 marked the end of speculative boom of 1920s, and many more can be cultivated into the discussion¹⁵⁸. Global financial crises also had its roots in limitations in the way financial institutions and regulators interact. Market participants managed to ignore serious developments in important indicators of systematic risk e.g. asset price inflation, rising leverage, large sustained current account deficits and slowing of economic growth until it was too late and a systemic crises was eminent. Global financial crises that emerged in 2007, was not the first instance when financial institutions took advantage of the regulatory shortfalls and engaged in reckless risk taking that fueled an abnormal increase in leverage and boom in asset prices for considerable period of time, consequently

¹⁵⁵ See Green Paper, The run on the rock. *House of Commons Treasury Committee*, January 2008. Page 25

¹⁵⁶ Acharya et al (2013); Wolfson and Epstein (2013); Lapavitsas (2013); Aglietta (2016);

¹⁵⁷ Statistical models have been argued to have limitations in capturing risk see Borio, C., Drehmann, M., & Tsatsaronis, K. (2014). Stress-testing macro stress testing: does it live up to expectations? *Journal of Financial Stability*, 12, 3-15.

¹⁵⁸ Lapavitsas, C. (2012). *Crisis in the Eurozone*. Verso Books.

once the peak was achieved resulted in an economic shock (Demirguc-kunt et al 2008). The role of international regulator was brought under acute scrutiny after the global financial crises stating that regulation had clearly been guilty of allowing market participants to involve in such practices within the financial environment whereby selfish approach of market participants amplified intolerable systematic risk (McIlroy 2008). The global financial crises more than ever before, highlighted that the banks in particular due to their systemic nature need to be regulated to dispose of the threat of systemic risk in future. Global financial crises furthermore, confirmed that there is nothing mythical about systematic risk. Systematic risks truly and surely exists and pose serious threat to the international economic climate. The regulatory authorities post global financial crises, similar to previous comparable episodes seemed to have made peace with their limitation to capture full scale complexity of the financial structures developed pre global financial crises and reverted back to consultations strategy. As a reflection, in order to develop effective policies to mitigating the system wide risk and its procyclical implications, industry wide consultations advocated capital and liquidity buffers to be higher across the board; market discipline; control over the structure of the financial industry; improved market infrastructure; taxation and above all significantly improved supervision (Caruana 2010). One straight forward advantage of improving transparency and holding access capital during the times of boom is that banks would not need to refer to asset liquidation in order to acquire required capital during the times of economic recession (McIlroy 2008). However, translating general industry insights into practical financial regulatory policies is a challenge in itself and although, these financial policies may construct a major portion of the solution it may not entirely capture the complexity of the systematic events. In addition, implementation of the regulation across board banking institutions with same rigor proved the biggest challenge of all (Caruana 2010). Nevertheless, noticeable acceleration in response to market participants and in line with industry and Financial Stability Forum recommendations, Basel committee aimed to introduce the modification of the capital treatment of structured credit risk transfer instruments (CRT); improved management guidelines for liquidity; further improve Pillar 2 principles concerning stress testing practices, management of off-balance sheet exposures; and revamp market discipline by stricter disclosure obligations of complex securitizations and valuation

practices. In addition, BCBS published a string of consultative papers since the global financial crises in a build towards ‘Basel III’ (BCBS 2010b).

Limitations of VAR methodologies of the Basel II capital accord in capturing market risk were addressed by the Basel Capital regulations for instance in order to boost capital held for market risk in the trading book portfolio a multiplier of 3 to VAR for the treatment of specific risk and stressed risk has been introduced. The results of Basel Committee consultations regarding trading book showed the impact of aforementioned that average capital requirements for banks would rise by 11.5% however the median would only increase by 3%.

3.3.2 Review of Basel III proposals

Development of Basel III aims¹⁵⁹ to address shortfalls identified in Basel II in response to the global financial crises in particular by encouraging banks to promote practices of liability-driven asset management (Allen et al 2012). Important improvements further include proposals to roll out Tier 3 capital¹⁶⁰ requirements and insertion of going concern capital i.e. common shares and retained earnings; targeted debt-equity arrangements that are subordinated and may qualify for discretionary dividend under the Tier 1 (BCBS 2010c). In addition Basel committee proposes that Tier 2 capital to be stricter (for instance 5 year minimum maturity, no redemption incentives). Equity is treated as most reliable means of capital to cover sudden losses and therefore under Basel III all deductions¹⁶¹ that are not recognized on the balance sheet have been disallowed in common equity. Furthermore, to address the failure to capture the off balance sheet risks and tame the procyclicality banks now required to assess their capital requirements for counterparty

¹⁵⁹ As of March 2016 all 27 BCBS (Basel Committee on Banking Supervision) member jurisdictions have final risk-based capital rules in place. Amongst non-BCBS member countries final risk-based capital rules adopted by 63 countries see BIS (2016) “Implementation of Basel standards: A report to G20 Leaders on implementation of Basel III regulatory reforms”. August. Available at Bank of International Settlement website www.bis.org with complete list of countries, scope and methodology of the survey.

¹⁶⁰ Tier 3 Capital includes greater amount of undisclosed reserves and general loss reserves in comparison with tier 2 capital and mainly allocated to support market risk, commodities risk, foreign currency risk

¹⁶¹ For instance Goodwill (Balance sheet item); bank’s investment in its own shares; minority interest; and deferred tax assets that are net of liabilities

credit risk using proposed stressed inputs. Capital charges associated with depreciating reputation of the counterparty should be included instead of overall default charges. Application of increased margining periods should be mandatory for calculating regulatory capital of illiquid derivative exposures to the counterparty (BCBS 2010a). Banks will need to introduce a 1.25 multiplier to asset value correlation (AVC) of exposures to regulated financial firms. In order to put a check on excess leverage build up, Basel III proposes introducing a leverage ratio (BCBS 2010a; and BCBS 2010b). The proposed leverage ratio is Tier 1 capital based and supports 100% treatment to all exposures net of provisions but does not include netting of off-balance sheet derivative exposures and collateral held. Basel III decrees that banks have a 30-day liquidity cover in case sudden economic calamity, for instance value of assets and cash flows to be considered similar to when in major economic shock (BCBS 2010b). To tame the procyclical effects of Basel II identified during the recent financial crises Basel III proposes to dampen the cyclicity through enhanced use of Pillar 2, for instance banks should focus on long-term calibration of the PD within their of risk models. In particular, Basel III aims to support expected loss based principles rather than incurred loss based. Basel III also intends to introduce deductions from bank capital any shortfall in such provisions to address the issues of under provisioning (Repullo and Suarez 2008; Repullo et al 2009; and BCBS 2010b). In addition, Basel III proposes banks to hold buffers well above regulatory capital to address any economic downturns comprehensively. This should primarily be achieved with significant cutbacks in discretionary dividend and staff bonus. Basel III promotes principles of a buffer system that works in a countercyclical pattern, to be used in macro prudential setting to restrain excessive risk taking.

The proposals of Basel III make some concrete improvements towards Basel II. However some fundamental issues still remain unaddressed. Pillar 1 continues to advocate rating system that assumes portfolio invariance enhancing possibilities of concentration risk and capital arbitrage incentives see Blundal-Wignell and Atkinson (2010). In addition, VAR models based on single risk factor undermines the limitation of the model with regards to recognizing different forms of risk again requiring impractical and awkward supervisory overriding practices. The introduction of leverage ratio in presence of risk weights mechanisms makes the matters tricky. For example if the leverage is set high the required capital will fall and give banks an excuse to engage in arbitrage to get rid of excess capital.

Such cost savings by the banks are due to distract regulatory authorities in setting maximum capital ratios rather than minimum. In result institutions, exactly replicate past practice with keeping lower risk-weighted assets and shifting riskier ones outside the banking system. That may again become recipe for development of shadow banking through regulatory capital arbitrage¹⁶². Yet again suggesting extreme reliance on supervisory authorities to track such practices and nip the evil in the bud. The liquidity proposal discussed above had some serious operational limitations for instance if banks prove that they are solvent with satisfactory capital adequacy, that would mean the liquidity and fund management at the institution is sound and there is no justification for any interference by regulator. The role of regulator is promoted under Basel III to ascertain that institution can absorb losses and therefore avoid unnecessary liquidity measures that can seriously damage market confidence. Blundal-Wignell and Atkinson (2010) argue that focus of the supervisors should be to deal with insolvency through resolution regimes when it arises.¹⁶³ Above discussion shed light on the some extremely sensible propositions contained in Basel III draft however, on the surface some serious limitations have also been explored.

Basel II implementation was seriously distorted by the recent global financial crises, and Basel III published proposals in response to concerns with regards to effective transition. In US, for example the implementation of Basel II suffered delays initially however crises sparked some urgency in implementing remedial policies. In the US, the initial responses introduced improvements to the Pillar 2 of the Basel II in addition to Basel III proposals. However, these were the Capital Purchase Program (CPP), Supervisory Capital Assessment Program (SCAP) and the release of “the treasury guidelines” (Smith III 2010). In Europe amendments to the already in effect CRD with some regional variation are in broadly in line with Basel III proposals of suggested changes in trading books and banking books. In addition changes proposed in Pillar 2 and 3 have also incorporated in the amended

¹⁶² Encouragement for banks to pursue profit making getting involved in speculative arbitrage activities i.e. swapping high risk assets with low risk and ending up with needing rescue operations such as quantitative easing.

¹⁶³ For example in case of Northern Rock liquidity problems started to rise after confidence in capital adequacy was lost.

CRD (Bake et al 2010). Promotion of countercyclical capital buffers under Basel III package could dampen the impact of economic fluctuations¹⁶⁴.

3.4 Emerging and Developing Economies (EMEs)¹⁶⁵

3.4.1 Introduction

The first section discusses the challenges faced by the EMEs with regards to capital regulation; the second section looks at the Basel II implementation in EMEs; the third section discusses the progress made in EMEs; fourth sections looks at the impact of the recent global crises in EMEs; and fifth sections discusses the role and limitations of Basel II in EDEs in light of the global financial crises.

3.4.2 Basel II Bank Capital Regulation challenges in Emerging and Developing Economies:

The capability of Basel I and Basel II in warning of the financial turmoil is of significance and should be under acute scrutiny. In particular Basel II, a development over Basel I as more risk sensitive paradigm was in process of being implemented in most countries lagged behind the scheduled transition. Nevertheless, the revised Basel framework (Basel II) advocating the ‘three pillar approach’ was clearly not designed with developing countries in mind¹⁶⁶. Basel II not only increased the number of risk categories in Pillar 1, it also proposed a mix of statistical models and expert opinion to help track a bank’s exposure to insolvency risk over a period. The new accord developed in 2004 claimed to make capital

¹⁶⁴ Countercyclical Capital Buffer (CCyB) calculated as the weighted average of the buffers in effect in territories to which banks have credit exposure, Basel III makes it compulsory for banks to calculate and report CCyB. See empirical evidence in Angelini et al (2015). Basel III: Long-term Impact on Economic Performance and Fluctuations. The Manchester School, 83(2), 217-251.

¹⁶⁵ International Monetary Fund. (2007). World economic outlook database.

¹⁶⁶ Griffith-Jones, S., Spratt, S., & Segoviano, M. (2002) “Basel II and Developing Countries”, The Financial Regulator, 7(2). 1-14

more sensitive to credit risk by adopting either (i) external credit ratings issued by rating organisations (the standardised approach) or (ii) the internal ratings based on the bank's own risk models (IRB and AIRB). Banking institutions in emerging market economies did not qualify to integrate the advanced ratings based systems under Basel II, therefore at best adopted standardized approaches. Nevertheless, external ratings as well as internal credit rating techniques did not seem to aid in setting up capital requirements and remained only useful in establishing loss reserves for particular asset portfolios. Developing countries due to a less structured or restricted bank credit setup in developing markets, and operation in volatile political and economic conditions found it very difficult to implement exact same risk management techniques of Basel Capital regulation used in large internationally active banks¹⁶⁷. In fact, importance of more work within emerging economies was realised at the first annual meeting of Deputy Governors from the emerging markets that took place at the BIS in February 1995 focusing on the challenges faced by central banks as countries moved towards a more liberal banking system in the context of wider capital account convertibility (Turner 2006). The process of bank supervision in many emerging countries remains inadequate, and had failed to keep up with the rapid pace of exacerbated financial system fragility therefore the role of bank capital regulations in taming financial capital remains significant.

In developing countries, institutional financial agencies tend to continue playing a considerable role in their respective financial systems. For instance, the main reason for the lack of change in the financial sectors of most Asian developing countries over decades appeared to be the oligopolistic structure of their financial markets, the concomitant political power to the large banks, and the governments' desire to manipulate the financial system to finance its own expenditures at low interest cost as well as investment in priority sectors of the economy (Haggard et al 1993). Measures such as the imposition of foreign exchange controls, interest rate ceilings, high reserve requirements and suppression or non-development of private capital markets can all increase the flow of domestic resources to the public sector without higher tax, inflation or interest rates (Fry 1973, Nichols 1974). There existed loan rate ceilings as well as deposit rate ceilings in most financially repressed

¹⁶⁷ For instance HSBC Holding, Barclays PLC and Citigroup Inc.

economies. In developing countries credit allocation is rarely random that is credit is not allocated according to expected productivity of the investment products but according to transaction costs and perceived risks of defaults. Therefore the average efficiency of investment is usually reduced as the loan rate ceiling is lowered to convert investments with lower returns profitable. In developing countries, banks have often required to allocate minimum percentages of their asset portfolios for loans to priority sectors of the economy at subsidized loan rates of interest. Abolishing interest rate ceilings altogether produces the optimal result of maximizing investment and raising still further investment's average efficiency resulting in higher rate of economic growth (McKinnon 1973)¹⁶⁸. McKinnon argued that financial markets play key role in economic development, a contending approach to the predecessors with neoclassic approach that the impact of financial system on real growth is minimum due to low influence on investments in physical capital (Solow 1956)¹⁶⁹. Furthermore, some evidence suggested that financial development can be important factor for economic growth at the macro-level as an increase in national income and wealth permits people to make more deposits and encourages monetary sophistication (Khan & Senhadji 2000; Andersen & Tarp 2003). Advanced financial intermediation could enable firms to raise and manage large amounts of funds more effectively, resulting in rapid economic development¹⁷⁰. A number of empirical researchers remained convinced that banking sector development is particularly important for developing economies since a bank-based system has a greater impact on growth at the early stages and market-oriented financial system found to perform better in developing economies¹⁷¹. Fase & Abma, (2003) defined economic growth complex to capture nevertheless and argued Gross National Product as comparatively effective measure of economic growth than per capita indicators.

¹⁶⁸ McKinnon, R. (1973). *Money and capital in economic development*. Washington, DC: The Brookings Institution.

¹⁶⁹ Solow, R. M. (1956). A contribution to the theory of economic growth. *The quarterly journal of economics*, 65-94.

¹⁷⁰ See Barth et al (1998) "Financial regulation and performance: cross country evidence" World Bank Policy Research Working Paper, (2037)

¹⁷¹ See for example Tadesse, S. (2002). Financial architecture and economic performance: international evidence. *Journal of financial intermediation*, 11(4), 429-454.; Levine, R. (2002) Bank-based or market-based financial systems: Which is better? *Journal of Financial Intermediation* 11. 398–428.

He argues Per capita economic indicators as weak reflection of wealth of nation. In order to measure financial development, in addition to the aforementioned economic indicators he considered size of banking sector; scale of financial intermediation¹⁷². Yet, in the context of developing economies, a too rapid and uniform liberalization of the banking industry may not bring optimal outcomes. Contending empirical evidence suggest that countries having liberalized their banking systems are significantly more likely to face a financial crisis (Demirgüç-Kunt et al 1997). This evidence is consistent with economic theory related to information asymmetry in a lending market (Hellmann et al., 1996; Hellmann et al., 1998a and Hellmann et al., 1998b; Stiglitz & Weiss 1981, Krugman 1993). The efficiency of complete and immediate interest rate liberalization as part of stabilization package now seem dubious. Bank supervision and some degree of price stability seem essential prerequisites for success of financial liberalization. (Delano and Mirakhor 1990). In addition, in developing countries, some public financial institutions are expected to have different objectives, such as nationwide financial service provision and political credit allocation to priority sectors, other than cost minimization.

The aforementioned crises in developing countries, had dramatic consequences domestically and caused major upheaval internationally. In most cases they went hand in hand with massive macroeconomic disruption: sharp increases in interest rates, substantial currency depreciation and dramatic deflation of domestic demand. The demand for credit fell because of recession and the greater reluctance of borrowers to become indebted. Simultaneously the supply of bank credit declined, banks became more risk averse and a major stiffening of supervisory oversight reinforced this effect in many countries. The financial unrest on 1990s amongst emerging markets paved the way in finding reasons behind crises in developing countries notable discussion revolve around role of

¹⁷² Scale of financial intermediation, defined as function of channeling of savings from surplus to deficit units, where paradoxically deficit units increasingly constitute business and government sectors.

financialization¹⁷³, rise of short term debt instruments¹⁷⁴ and international illiquidity¹⁷⁵. Recent empirical evidence nevertheless, suggests, during 1970s and 1980s positive causal relationship between financial developments measured by liquid assets of the financial system as share of GDP caused reduction in moderate poverty, however same relationship could not be achieved during 1980s to 1990s sample when financial development measured through proxy of credit extended by the financial institutions (Perez-Moreno 2011). Amongst debaters, Asghar and Hussain (2014) use panel data and evidence strong relationship between financial development and economic growth amongst developing countries. Rashti et al (2014) discusses that capital markets had a positive impact on economic growth of developing countries during 1990-2010, using GMM methodologies in light of global financial crises. Al Samman and Azmeh (2016) showed that financial development had positive impact on economic growth in a sample of 47 developing countries.

3.4.3 Basel II: Integration in Emerging and Developing Economies

Increasing number of developing countries gave clear indication of Basel II adoption, for instance as per the results of the survey of Financial Stability Institute (FSI) of Bank of International Settlements (BIS) conducted in 2008 revealed that a total of 92 countries excluding BCBS member countries have implemented Basel II or are in progress of implementing Basel II (BIS 2008). Basel II perceived to have developed a number of proposals that may be beneficial in point of view of the developing economies e.g. removal of OECD/non-OECD distinction and reduction of excessive incentives towards short term

¹⁷³ Increasing role of financial institution in building credit portfolio called asset portfolio in banking terms, development of complex and profit making financial instruments inclusive of securitization of shadow banking, and scale of financial intermediation see Epstein, G. A. (Ed.). (2005). *Financialization and the world economy*. Edward Elgar Publishing.

¹⁷⁴ See Diamond, D. W., & Rajan, R. G. (2001, June). Banks, short-term debt and financial crises: theory, policy implications and applications. In *Carnegie-Rochester Conference Series on Public Policy* (Vol. 54, No. 1, pp. 37-71). North-Holland.

¹⁷⁵ See Chang, R., & Velasco, A. (2001). A model of financial crises in emerging markets. *Quarterly Journal of Economics*, 489-517.

lending under the standardized approach are very encouraging. However, the important question is this: can capital regulations under the Basel II contain systemic risk in emerging economies where banking institutions are vulnerable due to currency mismatches and maturity adjustments? Literature advocates concerns with regards to the way Basel II addressed the issue of direct or indirect foreign exchange exposure of banks in emerging economies. The role of net foreign exchange exposure sits at the heart of crises in developing countries according to the history of crises in emerging economies. There is requirement for additional proposal in the Basel II to incorporate risk related to such exposures. More questions prevailed over Basel II capabilities to reduce bank credit levels to developing countries, possible implications of such could be slow economic growth and reduced investments in case of poorer countries.

Basel II implementation may enhance procyclicality¹⁷⁶ of bank lending (from international as well as regional banks perspective) leading to possibilities of risks of systematic nature in banking sector due to increase in volatility of growth and investment. In addition, it would be interesting to note the impact of Basel II implementation on loans extended to SME's or other market participants that may be vital for investment, economic growth and improvement in employment. However, due to competitive advantage foreign banks may have could seriously promote negative consequences for loans extended to SME's i.e. only handpicked firms may qualify for loan on basis of their reputation. This would lead to concentration risk and banking instability. Upper hand of the foreign banks such as use of advanced IRB in competition with host banks' standard approaches, threatens supervisory authorities to practice their discretion in order to effectively regulate them. On the contrary, compliance with standardized approach under Basel II to meet regulatory capital requirements in host country would mean for an international IRB compliant bank to have a separate reporting system one for home regulator and host regulator. This potential area of conflict between institution and regulators definitely warrant hard work and consultations (Majnoni and Powel 2005; and Griffith-Jones and Gottschalk 2006).

¹⁷⁶ The concept that financial system is procyclical and exacerbates swings in real economy gained momentum during recent decades, due to collapsing of linkage between borrowers and savers due to banks collapses see Gordy and Howell (2006); Khoury (2009); Rupello and Suaraz (2008, 2013); Pederzoli et al (2010)

There is extensive debate in literature that Basel II implementation has direct consequences for the domestic provision of credit in developing economies¹⁷⁷. Nevertheless, most developing countries affected through the capital accords' effects on international capital flows. There are indeed, macroeconomic implications for emerging economies of implementing Basel II accord. By and large capital adequacy regulation might fail to improve stability of the domestic financial markets. Inefficient regulation creates more serious problems to the financial stability than capital adequacy provisions (Barth et al 2010). The guidelines published by the Basel committee for regulating banking activity should have contained proposals to be adopted by any country regardless of resourcefulness of its banking infrastructure. Mohanty et al. (2006) argued that following core principles proposed by the Basel committee fail to create a regulatory and supervisory environment that can effectively host improved banking performance. For instance by compliance with Basel II core principles the share of nonperforming loan (NPL) deteriorate and inflict decrease in the net interest margin (Bushman and William 2012). Furthermore, Basel II implementation impacts adversely on provision of domestic credit by slowing down the lending activity. The impact of Basel II on capital flows in emerging economies could cause declines in credit activity and increase pricing of loan as a direct response to regulatory capital requirements that fed through international lending rates resulting in a 'credit crunch'. Direct impact of new risk weights would result in introduction of increased capital ratios and dent the long-term non-speculative credit agreements in emerging economies.

Basel II regulators failed to translate Basel Capital regulation principles into implementable policies and practical action plans in the member BCBS countries for example integrating cross-border banking framework and principles proved a challenge for Basel II within the developed world¹⁷⁸. In applying the Basel Capital Regulations uniformly across the globe specifically in emerging countries to promote sound risk management, the main challenge

¹⁷⁷ Bayne, N., & Woolcock, S. (2016). *The new economic diplomacy. Decision-Making and Negotiation in International Economic Relations*, Aldershot, Ashgate Publishing Limited.

¹⁷⁸ See Demirguc-Kunt, A., Detragiache, E. and Merrouche, O., (2013). Bank capital: Lessons from the financial crisis. *Journal of Money, Credit and Banking*, 45(6), pp.1147-1164

in emerging markets is that they are at different levels of preparedness in order to cope with the far-reaching challenges and potential implications of Basel Capital Regulation. Given the different stages of development and levels of market complexity, applying Basel II, designed basically to cater developed economies, seemed impossible to integrate in developing economies without some significant customization in order to accommodate emerging markets conditions. Serious liquidity issues go hand in hand with a higher level of market unpredictability in emerging markets, that may not be adequately captured in the under the rule of the Basel II framework.

Despite the significant critique of Basel Capital Regulation, capital regulations still seem to be considered the way forward with continued consultation and rollout of Basel III Capital regulation. Emerging economies indicated clearly to implement Basel II to bring their credit risk management in line with the sophisticated practices of the developed world to stand some chance of financial stability (BIS 2008). However, the requirement of concise principles for regulators of emerging economies may be imminent in order to evaluate technical issues like data integrity as well as broader implications of financial stability. Once developing countries confirmed their intentions of implementing Basel II, BCBS needed to develop a more efficient and comprehensive legal, accounting, regulatory and market infrastructure to facilitate Basel convergence in developing countries. In addition, as a critical part of implementation strategy, the training of supervisory staff on Basel Regulations (BIS 2008).

3.4.4 Basel II: Progress in Emerging and Developing Economies

The banking systems in emerging economies have been transformed over the last few decades in response to the neoliberal structural reforms in developing world¹⁷⁹. Globalization thence, encouraged entry of foreign banks in domestic markets of the developing countries with competitive advantage impacted the performance of local banks in emerging markets. For instance instead of lunging into privatization blindly, China and India were among the first of the emerging countries to announce planned corporate governance reforms and reduce planned privatization in order to improve performance of

¹⁷⁹ Siddiqui, K. (2012). Developing Countries' Experience with Neoliberalism and Globalisation. *Research in Applied Economics*, 4(4), 12.

state owned banks. Despite challenging conditions faced by state owned banks to attract strategic investor without offering guarantees against hidden losses, in general state owned banks of emerging economies have gradually improved their governance and performance. In addition to privatization and corporate governance reform, several approaches of consolidation were witnessed among the emerging economies. In most parts of Asia where the banking systems are highly fragmented, government-driven financial consolidation planning came into force. In Russia takeovers and closures of smaller banks by larger banks were the case. In Central-Europe mergers and acquisitions were witnessed by the large banks of the Europe as a way of consolidation. In theory large banks should be able to manage and diversify risk in a comparatively better way. The role of foreign bank leading in Mexico and Europe made job of the regulatory authorities difficult in particular, in jurisdictions where the foreign bank subsidiaries were systemically crucial. The role of foreign banks remained restricted in Asia and rest of the Latin Americas. Introduction of bank lending in a sophisticated environment of risk assessment gave rise to some new risks. Macroeconomic volatility fell sharply in emerging economies in comparison with developed markets. In addition, years in the run up to 2007 crises witnessed growth and increased commodity prices. At the heart of the reasons were improved reserves of foreign exchange, flexible exchange rates systems and growth of domestic debt markets were mentioned. In particular, growth of local currency debt markets reducing costs for banks to adjust their risk portfolios in response to economic shock. This however, increased the risk of transmitting external shocks from global financial market more quickly. In addressing the most important issue of systematic risk, notable progress has been made in emerging economies through introduction of policies that are mainly in line with Basel II proposals. The policies are on rules on corporate governance to ensure banks are well managed; disclosure requirements to help promote healthy market participants to monitor important advances e.g. banks' changing risk exposure; prudential regulations and supervisory control process; anticipate and development of clear and concise corrective action policies to track emerging uncertainties; deposit insurance and lender of last resort (LOLR) arrangements.

The major revival of bank lending in emerging market economies following an era of declining growth required more research in investigating possible factors explaining the growth; track trends of lending by the commercial banks and the level of sustainability of

these improvements (Mohanty et al. 2006). Bank stability and capabilities of credit supply is building block to growth and innovation. Events that contribute to improve banks' lending capacity introduce capital inflows or a laid back monetary policy resulting in significant credit supply in the economy causing excessive growth in bank lending and asset price bubble, followed by 'credit crunch' (Bernanke and Gertler 1995; and Rajan and Zingales 1998). In addition, financial deregulation of poorly regulated banks, incapable supervisory standards and over optimistic incentive structure have induced economic fluctuations in emerging market economies¹⁸⁰. Banks in emerging economies, during past couple of decades noticeably improved their lending capacity due to increase in deposits; foreign borrowing; reductions in net lending to the government and increase in other miscellaneous borrowing (Mohanty et al 2006). In addition, commercial banks remained the backbone of the credit supply in the emerging economies. Several emerging economies (Latin America, Central Europe, Russia, Saudi Arabia and Turkey) witnessed steep rise in bank lending to the productive private sector. However, in Asia China, India and Korea saw increased lending activity but there remained declining curve in domestic credit growth in Hong Kong, Singapore, Thailand and the Philippines. In addition, strong growth noticed in household credit in almost all emerging market economies. In case of developing countries the sustainability of the financial system remains questionable i.e. banks face lack of data availability on household credit history in a situation where banks have transferred a significant portion of their market risk to household. This reflects an environment of excess liquidity, strong competition in retail loan market and strong income growth motives by the banks, perhaps another interpretation of casino capitalism in developing world.

3.4.5 Global Financial Crises: Impact on Emerging and Developing Economies

The financial crises sparked a concern with regards to the improvements in functioning of international financial system. International financial regulatory authorities initiated a number of international standards to shape and facilitate market advances. The new Basel

¹⁸⁰ Barth, J. R., Caprio Jr, G., & Levine, R. (2013). Bank Regulation and Supervision in 180 Countries from 1999 to 2011. *Journal of Financial Economic Policy*, 5(2), 111-219.

proposals formed an important element of the financial architecture. Nevertheless, as in case with majority of remedial policies, the policy mechanism lacked inputs from the developing markets (Classens et al 2008). There are no doubts about the fact that recent financial crises stamped down on the emerging market economies with ruthless force. The financial crises caused an extraordinary drop in export demand that corresponded with a significant setback in global bank lending and overseas portfolio investment. Most developing countries, in wake of sharply increased cost of external financing witnessed helplessly deteriorating exchange rates and rapidly falling equity prices (Ahmed and Zlate 2014).

Restricted consumer and investor activity in developed world raised the pace of declining demand for EME exports, which in turn impacted capital inflows adversely demolishing an extended growth era. In a build up towards the recent global financial crises most EMEs enjoyed strong exports-based growth associated with rising gross savings resulted in large capital inflows. China and India in particular enjoyed exports-GDP ratio of as much high as 100% in 2007. Other Asian EMEs and central European countries also witnessed rising levels of exports. Moreover, foreign exchange levels accumulated at an abnormal pace and emerging economies got involved in complex financial integration with developed countries. GDP growth in EMEs jumped to an average of 7.4% per year during the period 2003-2007 (pre recent global crises) in comparison with 6% for the period 1992-1996 (pre Asian crises). Growth in exports and global savings turned EMEs significant global trade participants. Nevertheless, the structure of growth proved flawed and significantly varied across the EMEs, perhaps contributed to fueling the recent economic distress (BIS 2009). Before the onslaught of the recent financial crises majority of EMEs had adopted policies to respond to the crises in a resilient manner, with exception of central and eastern European countries. Nevertheless, as the crises gained tempo developments in capital inflows followed a pattern suggesting loss of confidence in emerging market policies. EMEs once had accumulated larger current account and fiscal deficits; and sectors with significant foreign exchange exposures suffered from the wiped out capital and restricted financing arrangements. The prices began to slip after peaking therefore impact of the reversal in capital inflows was severe in most part equity markets. To address their own liquidity issue resulting in withdrawal of foreign investments from EMEs for instance \$30 billion were wiped out of Poland, Malaysia, Czech Republic, China and Chinese Taipei

towards the end of the year 2007 showing detrimental impact of global financial crises towards developing countries (BIS 2009). Global financial crises furthermore caused widespread distortions in EMEs financial architecture i.e. sharp decline in equity inflows, EMEs currencies loosing value, spreads on international sovereign bonds widened quickly and domestic bond yields rose in many EMEs rapidly¹⁸¹. EMEs (South Africa and Central European Countries) with larger current account deficit felt the impact of rising costs and demolished external finances. In addition at the time slump in oil and commodity prices further intensified the impact of global financial crises on developing economies for example Argentina, Russia and Venezuela. With sudden decline in exchange rates against major international currencies, corporations with heavy international debt obligations the recent financial crises acted as curtain raiser in identifying crucial vulnerabilities due to off-balance sheet active trading in derivatives markets by EMEs. When local currencies depreciated in international trading, generated sustained losses. International debt market, frozen primary funds reduced secondary trading of emerging market bonds, even in comparatively sophisticated EMEs (Brazil, Malaysia and South Africa). To top that, the highly volatile bond markets in many EMEs (Hungary, Indonesia, Mexico and Turkey) lost important business due to liquidity issues inflicting risk aversion practices amongst foreign investors. Once the crises got a strong foothold EMEs suffered devastating decline in cross-border loan to the banking sector by the developed countries (Ahmed and Zlate 2014). On the contrary, EMEs of smaller financial infrastructure where foreign banks held controlling stake seemed to be less affected by reduced foreign investor activity (BIS 2009). Nevertheless, crises have sparked a worldwide loss of confidence, and investors (in particular the ones with excess to foreign market) tend to revert to more liquid foreign currency assets during the times of economic recession. Trade finance became another casualty of the global financial crises, due international players only renewed about as much as 50-60% of their specialist commitments with regards to business credit agreements adversely impacting trade volumes and commodity prices. Reduction of trade credit had worst effects for Africa and some of Asia due to non-sophisticated financial systems and inability of governments to increase supply of funds. Despite reasonably stable

¹⁸¹ See Ahmed, S., & Zlate, A. (2014). Capital flows to emerging market economies: a brave new world? *Journal of International Money and Finance*, 48, 221-248.

historically, Foreign Direct Investment (FDI)¹⁸² during the recent financial crises declined significantly. In addition increased profit remittance from some EMEs due to many multinational players needed to ensure liquidity.

To direct the EMEs on to a vigorous global economic recovery route, there is urgency to bring about trade expansion. Historically as well as discussed earlier, growth in exports played vital role in the recovery of the EMEs. However, due to unpredicted severity of the import decline in developed countries the recovery through the exports based growth was slow. Imports forecast for US, Europe and Japan remained disappointing post global financial crisis. Nevertheless, the recovery of EMEs also depends upon the domestic demand fluctuations to offset the impact of reduced foreign exports. Moreover, the recovery of EMEs depends on the repair of the capital inflows that played vital supporting role in growth of EMEs. On the other hand, the current crises emerged in the financial infrastructure of the developed world therefore the focus of the international regulators remains primarily to develop policies to strengthen the financial architecture of the developed world, the fate of EMEs in hands of developed world remains uncertain¹⁸³.

3.4.6 Role and Limitations of Basel II in Emerging and Developing Economies

Financial markets in EMEs experience more volatility in comparison with developed countries. Frequently discussed indicators of financial stability have been capital adequacy, asset quality, management, efficiency earnings, liquidity and market sensitivity. Basel II captures market signals through the use of VAR and rating agencies. Rating agencies claim to incorporate implications of business cycle on relative terms rather than absolute in rating borrower. Nevertheless, in reflecting the prices and ratings in the market, market fluctuation may be reinforced as banks downgrade or upgrade clients on a large scale, exacerbating procyclicality. Due to comparatively more volatile environment, this issue

¹⁸² See Lall, S., & Narula, R. (Eds.). (2013). Understanding FDI-assisted economic development. Routledge on FDI as form of investment in other countries by large multinational businesses.

¹⁸³ Barth, J. R., Caprio Jr, G., & Levine, R. (2013). Bank Regulation and Supervision in 180 Countries from 1999 to 2011. *Journal of Financial Economic Policy*, 5(2), 111-219.

becomes prime concern for EMEs because the impact is adversely felt on external financing and lead to even more severe business cycles domestically (Classens et al . 2008). Banking crises had remarkable adverse externalities that could impose economic costs to any society. However, developing economies tend to pay higher price in comparison with developed countries e.g. between 1976 and 1996, a total of 59 banking crises were recorded amongst the EMEs costing them on average 9% of the GDP. On the contrary, 10 crises recording during the same time frame in developed countries costing them an average of 4% of their GDP (Ahmed 2009). Basel committee, IMF, World Bank and other bearers of the banking regulations flag across the globe permitted this far, only limited representation of EMEs. Representation of EMEs is far from in line with their contribution in the global economic activity, clearly irrespective of their legitimacy and impact on global economic environment. The reason that EMEs have had minimal influence on formulation of the new amended regulations is not hidden by any measure. In light of recent modifications, there have been claims that it may reduce the availability of external credit for a significant number of EMEs. Nevertheless, hierarchy and membership list of G20 and Financial Stability Forum leaving little doubt that the global financial architecture continues to be dominated by the G-20 industrial nations. Therefore, Basel Capital proposals majorly influenced by the international banks i.e. the new rules skip important policy issues concerning EMEs e.g. an appropriate exchange rate regime for developing countries or possible nomination of international lender of last resort see Truman (2006). Nevertheless, absence of EMEs appropriate participation led to development of standards too high for most EMEs i.e. lack of conventional debt management system increased the risks of lending to EMEs confirming the status of high volatility of external funding in most developing countries. The new standards aimed to improve cross border financial practices through sound macroeconomic policies, better exchange rate rules, and in particular improved regulatory and supervisory practices (Classens et al 2008).

Basel I, relatively simple set of proposal was followed by extremely complex Basel II raised significant implications for the EMEs. Implementation of Basel II increased relative compliance costs more for smaller and less sophisticated banks in EMEs. Domestic banks in EMEs can't afford to compete with their international counterparts due to lack of sophisticated risk management systems. Most exposures in EMEs would attract 100 per cent (BB+ to B-) or even worst 150 per cent (below B-) see BCBS (2006a). In addition,

some banks and corporation were more creditworthy than that of the sovereign entity therefore they should be separately assessed from the sovereign. Yet, this has been not the practice under the Basel II. The new risk weightings inflict significant increase in capital requirements for the loans to lower rated borrowers, which is typically the case in EME causing adverse impact on lending activity to such borrowers. Moreover, the capital adequacy requirements for smaller banks are binding in comparison with larger banks with their capital adequacy requirements calculated in line with risks associated, reaping the benefits of diversified portfolio see Gropp and Heider (2007).

Less resourceful institutions in EMEs suffer from procyclical lending behavior and are somewhat deprived of significant access to financial services. In addition implementation of Foundation- IRB approach under Basel II leads to an increase in average capital requirements in a number of EMEs. Adopting improved capital adequacy ratio resulted in credit crises in Korea (Shin and Chang 2005). Basel II implementation in EMEs evidently increased the cost of external. On the contrary, banks in EMEs receive funds from sources such as capital markets and non-bank financial institutions that do not fall under capital adequacy requirements under the Basel II capital regulations, hence reducing the impact of Basel II to some extent (Cihak et al 2013).

Basel II capital regulation may contribute to general uplifting of the global financial market practices and improve risk management through improvement in supervisory practices, for EMEs it comes with considerable cost. The impact of Basel II seems clearly twisted in favor of developed countries in comparison with EMEs advocating the argument that impact of EMEs remains small despite increase participation in global financial system.

3.5 Conclusion

The spectacular onslaught of the global financial crises identified need for comprehensive principles to address the issues of liquidity and leverage. The way recent financial crises unveiled limitations of the Basel II's reliance on external rating agencies under the standardized approach; internal rating based approaches in calculating minimum regulatory capital; and boosting procyclicality in the banking sector has raised tremendous concerns with regards to the way forward in capital based regulation that is uniform across the globe (Repullo and Suarez 2008; Repullo et al. 2009; and Moosa 2010, Cihak et al 2013, Demirgüç-Kunt et al 2013). Developing economies faced difficulties in translating

complex Basel II methodologies into policies and required major reconstruction of the regulatory infrastructures and skilled human resources. Different jurisdictions should be allowed to adopt the exchange rate regime that suits their circumstances, as was the case after the fall of Bretton Woods System (Moosa 2010). In particular, an attempt to incorporate the globally recognized and reputed advanced approaches under Basel II would fail and put financial institutions in emerging economies at the risk of huge losses due to significant competitive disadvantage see Davies (2005). Classens et al (2008) finds evidence that Basel II affected external financing agreements of the EMEs adversely. Basel II applies higher capital adequacy requirements for institutions employing Standardized approach, typically the case in EMEs where financial institutions tend to be smaller and less sophisticated to benefit from advanced approaches under Basel II (Davies 2005; and BIS 2008). Higher capital requirements for the banks in EMEs would mean higher cost of capital and restricted access to external investment. In addition, procyclicality of the capital flows to EMEs increase because international banks apply advanced approaches. Due to the fact that developing countries suffer from volatile capital flows, exacerbated fluctuations in foreign loan extension practices puts EMEs at even greater risk of crises (Majnoni et al. 2004; Majnoni and Powell 2005; Barrell and Gottschalk 2006; and Classens et al. 2008).

Chapter 4: Banking Sector of Pakistan

4.1 Introduction

This chapter constitutes five subsections. First section essentially introduces the banking sector of Pakistan and its economic set up as the stage for the Basel Capital regulation compliance; second section discusses in detail the banking regulatory environment and the role of principal banking regulator of Pakistan: ‘The State Bank of Pakistan’; third section introduces the Islamic Banking in Pakistan; fourth section discusses Basel Capital regulation compliance in Pakistan, the role and limitation followed by conclusion.

The banking system is the only mechanism of transferring funds within the economy i.e. all large money transactions take place through banks. Therefore banks undoubtedly have the potential to play an important role in economic growth. Over the last couple of decades, banking sector of Pakistan¹⁸⁴ has undergone a number of reform initiatives (Qayyum and Ahmed 2007). Primarily, in order to acquire in broader context macroeconomic stability through important financial sector recovery equates to a major objective and set the tone of the neo-liberal approach in Pakistan¹⁸⁵. Restructuring process in Pakistan initiated in late 1980s became foundation to convert majorly state owned banks into private ownership and strengthen the structure of banking sector. Introduction of market based financial environment began to phase in Pakistan by introduction of private investment in the banking sector (UL Haque 1997)¹⁸⁶. The reform procedure of Pakistan urged restructuring of major banks, continued strengthening of the banking system of Pakistan through encouraged mergers and acquisitions, introduction and reinforcement of an improved

¹⁸⁴ See Appendix 8

¹⁸⁵ Hassan, R., & Shahzad, M.M. (2011) “A macroeconometric framework for monetary policy evaluation: A case study of Pakistan” *Economic Modelling*, 28(1-2), 118-137; Khan, M. (2008). Main features of the interest-free banking movement in Pakistan (1980-2006). *Managerial Finance*, 34(9), 660-674

¹⁸⁶ See UL Haque 1997 for complete financial drawing of Banking and Non banking institutions in Pakistan including Commercial banks; development financial institutions (DFIs); Non-bank financial intermediaries (NBFIs), Debt, Equity, Foreign Exchange and Informal financial markets.

regulatory regime, and enhanced transparency, corporate governance and credit friendly environment. The extent of success remains the key question see McCartney (2015)¹⁸⁷. Financial market deregulation and liberalization has transformed the banking systems of a large number of countries over the last couple of decades, and especially in some developing countries. Late 1980s amongst the neo-liberal storms across the globe, Pakistan joined IMF and embarked upon structural adjustment program in order to iron out macroeconomic imbalances through adopting neo-liberal approaches including cut in public expenditure and subsidies, tax increases and encouraging imports. Prior to joining the IMF, fiscal position of Pakistan witnessed decline and constituted 8.5% of the GDP due to subsidies and tax rebates. In addition government of Pakistan monitored and restructured the tax brackets and abolished tax exemptions and brought fiscal budget deficit down to 4.6% of GDP in a decade¹⁸⁸. The banking sector of Pakistan too, witnessed government substantially de-regulated the allocation of credit, interest rate, liberalized entry into the sector, privatized major state-owned banks, introduced modern prudential regulation and supervision (Khan and Aftab 1994; Khan 1995; Ul Haque 1997; Rizvi 2001 and Parera et al. 2010). Pakistani authorities in addition, pursued to liberalize exchange controls, permitting the opening of foreign currency deposits by both residents and non-residents (Hardy and Patti 2003; Burki and Niazi 2006; and Qayyum and Ahmed 2007). Despite political fragility in Pakistan balances in these accounts grew rapidly, especially in the foreign banks showing signs of improvement (Masood et al. 2008). From the end of 1997, banks were required to maintain an 8% minimum risk-weighted capital ratio, and loan classification and provisioning requirements were tightened (Burki and Niazi 2003; and Patti and Hardy 2005).

¹⁸⁷ McCartney, M. (2015). The Missing Economic Magic: The Failure of Trade Liberalization and Exchange Rate Devaluation in Pakistan, 1980-2012. *The Lahore Journal of Economics*, 20, 59.

¹⁸⁸ See Anwar, T. (1996). Structural Adjustment and Poverty: The Case of Pakistan. *Pakistan Development Review*, 35(4 Part II), 911-926.

4.1.1. Review of Pakistani Banking Sector Performance:

The commercial banking sector in Pakistan¹⁸⁹ progressed significantly over the neo-liberal period and with time sufficiently up to the mark in terms of technology, skills and financial resources in a bid to act in an efficient role in financial intermediation (Khan 2006; Masood and Bruno 2008; and Ahmad et al. 2010). Financial assets grew at a staggering 70 percent for the period from 2000 to 2005, recorded at Pak Rupees (Rs) 5.1 trillion and contributed to 80 percent of GDP. The growth of banking sector was speedier in comparison with non-bank sectors and accounted for 71 percent of the financial industry assets (Khan 2006; Ansari 2007). Banks assertively increased their lending exposures with a jump in their gross advance percent from Rs 1.63 trillion in year 2004 to Rs 2.05 trillion during year 2005 (SBP 2006a). In addition, consumer financing in the overall credit portfolio stood at Rs. 213.8 billion for year 2005, a rise of 75% from Rs 122.4 billion for year 2004. Total deposits of all commercial banks stood at financial soundness of the system. As a result of increased Net Domestic Assets (NDA) of the banking system M2 in Pakistan estimated at Rs. 3.41 trillion in June 30, 2006 as compare to Rs. 2.96 trillion in June 30, 2005, a significant 14.54 percent rise, hinting at improved liquidity available with the banks (Khan 2006). In addition, Net Foreign Assets (NFA) on the sized private banks grew their operations robustly due to expansion in geographical borders and improved service quality. In year 2005 the banking sector employed 85,469 people (81,759 in 2004) and operated a network of 6,858 branches as opposed to 6,584 in 2004 (SBP 2006a). Banking sector profit (after tax) amounted at Rs. 63.3 billion in 2005, a significant improvement over Rs. 34.7 billion in 2004, generating increased return on assets to 1.9 percent, good enough by any international standard. Capital adequacy ratio (CAR) improved to 11.3 percent in 2005 from 10.5 percent in 2004 showing strengthening of the system (Khan 2006). Non-performing loans dropped significantly, reducing NPLs to loans and, net NPLs to net loans ratios to 8 percent and 2.1 percent respectively (Khan 2006; SBP 2006a; Masood et al 2010). Furthermore, encouraging results recorded in terms of foreign inflows, advancement in IT infrastructure, increased ATM transactions and on-line banking. Banks focus increased in particular, SMEs and consumer financing in order to improve margins.

¹⁸⁹ See Appendix 8

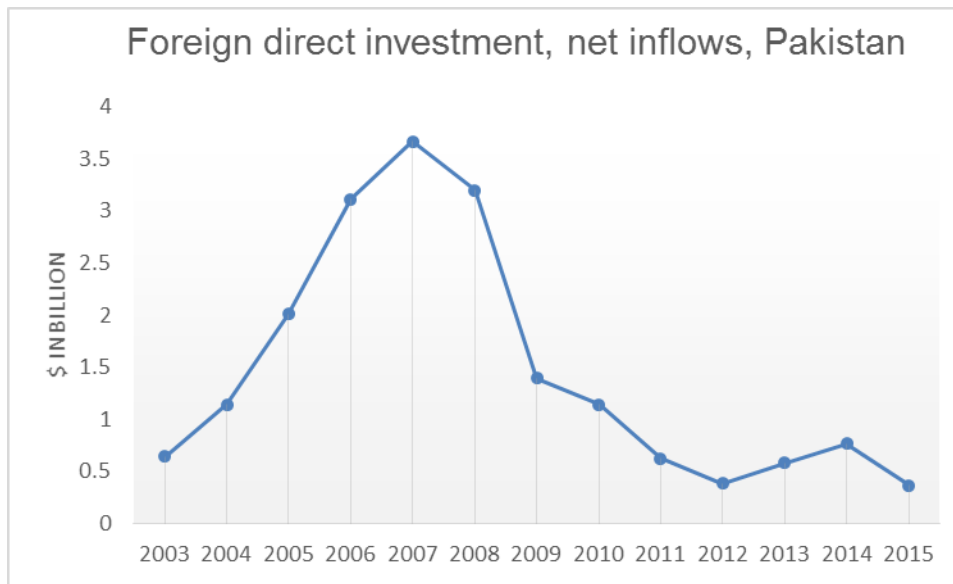
Nevertheless, despite improvement in the risk management system in the banking sectors, such growth curve exposed banks to higher risk level and need for effective and stringent regulatory environment was felt in order to efficiently tame the risk taking appetite of the banks in Pakistan. State Bank of Pakistan (SBP) demonstrated its commitment and capacity with regards to ensuring consolidation and introduction of effective risk management policies (Khan 2006). The risk management system within Pakistani banks improved significantly, with introduction of greater disclosure requirements and strengthened corporate governance structure in order to promote transparency. In addition, in order to acquire enhanced transparency in reporting and streamline the classification and provisioning of NPLs the Prudential Regulations underwent significant amendments (Khan 2006, Ul-Haque 2009, Masood 2010).

4.1.2 Impact of Global Financial Crisis on Pakistani Banking System

Commercial Banks of Pakistan operate in conditions similar to comparing emerging and developing countries, for instance political and economic instability resulting in unstable domestic macroeconomic policies, weak exchange rate regime, and domestic financial structure flaws due to insufficient bank supervision and regulation (Eichengreen and Rose 1998). Furthermore, presence of information asymmetries makes it even more challenging for the commercial banks of Pakistan to perform systemically important banking duties, in particular liquidity transformation. Limitations faced by commercial banks in liquidity transformation¹⁹⁰ could contribute significantly towards initiating banking crisis. Foreign direct investment through a foreign bank to domestic bank remains an important factor in facilitating liquidity transformation and expediting cross border financial transactions. Pakistan, likewise emerging and developing economies benefited with capital inflow prior to the global financial crisis of 2007, an era of heightened integration of cross border markets with accelerated cross border lending (Figure 4).

¹⁹⁰ For instance global financial crisis saw loans default causing banks a liquidity crunch where banks found challenging to raise funds and eventually seek bail out.

Figure 4: Foreign direct investment



Empirical literature suggests that important economic indicators, for instance Gross Domestic Product (GDP), Real growth rate of GDP in commodity producing sector of Pakistan, Foreign Exchange Reserves and Per Capita income remain key determinants of FDI inflows in Pakistan (Awan et al 2011). Furthermore, empirical literature also suggest that in Pakistan increase in foreign direct investment would increase real exports in long run (Yousaf et al 2008). Foreign Direct Investment (FDI) in Pakistan rose at a tremendous pace in the years preceding global financial crisis of 2007-8 reaching a \$4 billion mark (Figure 4). In year 2007 foreign direct investment in Pakistan accounted for a 70% of the total foreign investment in Pakistan. In Pakistan Foreign Direct Investment rose for a number of reasons, for example availability of low cost labour, with population in excess of 150 million boasting a large Consumer goods market, and growing middle class with

improved purchasing power. Foreign direct investment figure in Pakistan fell sharply¹⁹¹ due to the global financial crisis. Global financial crisis sparked loss of confidence in financial assets and solvency status of the foreign banks. This further caused international as well as domestic commercial banks to restrict lending due to their reliance on external capital flows¹⁹². Nevertheless, despite the dip in foreign direct investment since 2007 commercial banks of Pakistan proved robust due financial reforms¹⁹³ pre crisis had boosted financial soundness in commercial banks of Pakistan with less reliance on external funding and negligible lending exposure to crisis originating countries. This response is similar to the financial sectors of a number of emerging and developing countries undergoing similar reform regimes¹⁹⁴. In Pakistan therefore, due to ongoing efforts towards improved regulations, careful liberalization of banking system to restrict trading book practices and securitization exposure, commercial banks remained less exposed to global financialization and managed to grow their asset portfolio through the reign of the global financial crisis of 2007-8 (Nazir et al 2012).

4.2 Banking Regulations in Pakistan

4.2.1 State Bank of Pakistan (SBP): The Principal Regulator

The State Bank of Pakistan (SBP) continues full command of the Pakistani financial system in order to achieve the neo-liberal policy objective of price stability through financial durability. The State Bank of Pakistan in addition to its role as the central banker of Pakistan takes on the challenging responsibility of the banking sector regulatory authority. More importantly the State Bank of Pakistan assigned itself the reforms of the banking sector of Pakistan as its prime task in line with the governments prevailing financial

¹⁹¹ See Milesi-Ferretti, G. M., & Tille, C. (2011). The great retrenchment: international capital flows during the global financial crisis. *Economic Policy*, 26(66), 289-346.

¹⁹² See Frank, N., & Hesse, H. (2009). *Financial spillovers to emerging markets during the global financial crisis* (No. 9-104). International Monetary Fund.

¹⁹³ Financial reforms regime in Pakistan included.

¹⁹⁴ See Cetorelli, N., & Goldberg, L. S. (2011). Global banks and international shock transmission: Evidence from the crisis. *IMF Economic Review*, 59(1), 41-76

stability assessment regimes. Monetary Policy and Research (MPR), Banking Policy and Regulations (BPR), and Banking Supervision (BS) are the dominant functional groups set up under the State Bank of Pakistan taking on the challenge of financial stability through the current financial stability program. MPR group operates on macroeconomic level in order to acquire price consistency. In order to achieve this objective, MPR group assists the monetary policy making through conducting in depth surveillance of the monetary policy and exchange rate policy management and practices of the entire financial system. BPR group reviews the legal and regulatory framework and develops policies in response to important recent developments in a bid to ensure banking system stability whereas, BS group supervises and regulates the risk exposures on individual banks basis (SBP 2010a).

4.2.2 Importance of Regulation in Pakistan

The need for aligning banking supervision with those of developed economies regulatory authorities around the developing World critically begun to re-evaluate their existing financial stability practices and the role of regulatory authorities in achieving that. The State Bank of Pakistan strongly advocated international initiatives underway in Macro Prudential Framework, Capital adequacy framework, review of provisioning requirements, strengthening of risk management systems and models, refinement of stress testing techniques (to capture the systemic risk) and, improved disclosure requirements. Pakistan duly complies with the 'Core Principles of Effective Banking Supervision' and initiatives are already underway for addressing any shortfalls in the compliance (BIS 2010). The State Bank of Pakistan yet again, in a bid to keep its legal and regulatory framework at par with international best practices in response to the recent global financial developments, proposed a number of measures to ensure stability in the banking system (Khan and Saqib 2008; BCBS 2010b; Bake et al. 2010; and SBP 2010b). Once extremely risky nature of banking is revealed, a cautious approach must be adopted to regulate and monitor financial practices. Higher capital requirements should be in place firmly in order to promote prudent and solvent financial institutions, and also to check abnormal growth curves of the small financial institutions. The State Bank of Pakistan supports the policy of well capitalized banking institutions and the minimum Paid up Capital (free of losses) requirements for banks (revised in April 2009) which for locally incorporated banks was set at Rs 6 billion by December 31, 2009, required to raise to Rs 10 billion by December 31, 2013. In

addition, Banks and Development Financial Institutions (DFIs) were required to operate on average Capital Adequacy Ratio (CAR) of at least 10 percent through out. The State Bank of Pakistan remained firm and consistent with regards to CAR policies and therefore despite slowdown in economic growth, the solvency ratio of entire banking industry remained at a comfortable 14 percent in year 2009 (SBP 2010a).

The financial liberalization program initialized in early 1990s, resulted in increased activity of mergers and acquisitions in the financial market (since 2000, more than 40 transactions of mergers and acquisitions were recorded) and witnessed improvement and presence of a number of banks and their controlling groups in previously restricted areas of leasing, insurance, asset management, brokerage and other non-banking financial practices (Malik and Humayoun 2010; Ahmad et al. 2009; Akmal and Saleem 2008; Ansari 2007; and Burki and Niazi 2006). Encouragement of such practices allowed groups controlling banks access to stakes in non-financial/real sector of economy as well as improvised universal banking thanks to in particular, leasing and investment banking activities. Such growth of varied range of business practices and generation of complex ownership structures added to the supervisory burden i.e. increased possibilities of systematic risk.

In addition, The State Bank of Pakistan plays a leading role in the government of Pakistan's relentless pursuit of institutional competitiveness and operational efficiency; diversification from the ownership portal, diminish government participation in business activities, easing burden on budgetary resources, improving their revenues and making the most of the sale proceeds for reduction in national debt and poverty mitigation (SBP 2011). The government of Pakistan in 2009 released rejuvenated privatization incentives. Ongoing privatization process of House Building Finance Corporation Limited (HBFCL) and SME Bank was expected to be completed by 2008. However due to global financial crises it was recognized that SME Bank needed restructuring in order to complete its privatization. The State Bank of Pakistan in consultation with Ministry of Finance initialized restructuring of HBFCL and the SME Bank. On the other hand the government of Pakistan cleared its intentions to maintain First Woman Bank Limited (FWBL) as a

public entity and buying back the shares of FWBL through the State Bank of Pakistan from the private investors¹⁹⁵.

Realizing these upcoming challenges in wake of recent corporate developments, the State Bank initiated a project for the consolidated supervision of banks¹⁹⁶. The State Bank of Pakistan proposals released during 2007-08 attracted exhaustive discussions amid different market participants including bank, Ministry of Finance (MOF) and Securities & Exchange Commission of Pakistan (SECP) and consultants from key regulatory bodies of a number of other countries (SBP 2011). Extensive deliberations continue and necessary adjustment in order to finalize the consolidated supervision of banks and financial institutions in Pakistan are being carried out. The State Bank of Pakistan has also signed Memorandum of Understanding (MOU) with SECP for sharing of information and regulatory expertise. In order to efficiently conduct consolidated supervision of banks, a dedicated joint task force has been established jointly under The State Bank of Pakistan and SECP that regularly monitors and manages the risks posed by continued complex developments in the corporate structures of the banks in Pakistan.

The State Bank of Pakistan started conducting sensitivity based stress testing using individual bank's portfolio since year 2004 and in year 2005 it was made mandatory for all banks to conduct sensitivity based stress testing of its financials¹⁹⁷. In addition, the State Bank of Pakistan introduced Macro-stress testing of Credit risk to assess the resilience of the banking system towards credit shocks since June 2008. The macro-stress testing models developed and applied to forecast default rates ahead, in particular to capture the business cycle fluctuations (SBP 2010a, SBP 2011).

¹⁹⁵ The recent mergers and acquisition activities under the supervision of the State Bank of Pakistan include: Telenor Pakistan acquiring majority shareholding of Tameer Microfinance Bank Limited; KASB Capital Limited and Network Leasing Corporation Limited were merged into KASB Bank Limited; Arif Habib Bank Limited and Atlas Bank Limited subject to the condition: the two banks shall be merged into one banking company; the acquisition of RBS Pakistan by Faysal bank Limited; and proposed merger of Albaraka Islamic Bank (Pakistan operation) and Emirates Global Islamic Bank Limited are under consideration.

¹⁹⁶ Core Principles of Effective Banking Supervision (Principle No. 24 – Consolidated Supervision)

¹⁹⁷ See BSD Circular No. 7 of 2005 available at www.sbp.org.pk

The State Bank of Pakistan took bold steps in order to encourage a robust risk management framework in the banking sector by introducing deposit protection scheme, Internal Controls over Financial Reporting (ICFR) and reinforcing of the loan classifications provisioning requirements. Financial liberalization program induced complex ownership structures within the banking structure of Pakistan resulting i.e. nearly 80 percent of the banking system's assets now belong to private sector institutions. Moreover, complex ownership structures in practice reduced the effect the available protection to depositors under the Bank Nationalization Act, 1974. To correct that, the State Bank of Pakistan initiated formal explicit deposit protection scheme in 2008 in consultation with prime stakeholder and awaits Ministry of Finance formal approval. The proposals should in principle, protect a broad range of eligible depositors. This is because the participating banks aim to contribute in regular installments towards the fund, reducing any bailout reliance on taxpayers in case of bank failure.

In order to cope efficiently with the threats posed by continually changing risk environment, the State Bank of Pakistan issued directive to the banks to prepare and submit quarterly, half yearly and annual financial statements in line with revised International Accounting Standards (IAS-1) with effect from mid2010. Moreover, to enforce the control program with regards to financial reporting, banks were required to submit a comprehensive progress report on ICFR for the third quarter in 2010 identifying status of compliance. Any shortfalls needed to be addressed with remedial policies and deadlines. In order to address the deterioration of credit as a response to the recent credit crises, State Bank of Pakistan further strengthened the loan classification and provisioning requirements by rationalizing the provisioning requirements by making the 'Forced Sale Value' (FSV) of collateral buffers available to the banks.

The State Bank of Pakistan plays an extremely crucial part in countering money laundering, and financing of terrorism. In Pakistan Anti-Money Laundering (AML) Act was only approved by parliament in 2010 and acquired law status. The Asia Pacific Group on Money Laundering (APGML) conducted evaluation of Pakistan to assess the efficiency of legal and regulatory framework in countering money laundering and terrorist financing in the

country. The State Bank of Pakistan in line with APG's recommendations instructed banks to not only provide records to law enforcement agencies but obtain more authentic CNIC (Computerized National Identity Card) from account holders. The State Bank of Pakistan also took initiative in installation and development of monitoring software as well as met staff training requirements.

The Prudential Regulations on Corporate Governance are brought in line with international principles and best practices i.e. implementation of the 'Fit and Proper Test' (FPT) requirements. Pakistani banks are required to seek prior authorization from the State Bank of Pakistan (under the FPT Criteria) for appointment of key executives for their overseas operations. The due diligence procedure for directors, sponsors, and chief executives of the Pakistani Banks has been further refined with flexibility regarding payment of remuneration to their non-executive directors for attending important meetings to enable utilizing highly skilled professionals in order to gain best strategic input.

The State Bank of Pakistan¹⁹⁸ has developed a comprehensive branch licensing policy (BLP) to enhance the outreach of banking facilities. Under the BLP banks can independently make their branch location decisions within broad parameters. The very justification of BLP is to spread branches in rural/underdeveloped areas by making it mandatory for all conventional and Islamic banks to open at least 20 percent of their planned branches in such areas. The total number of conventional bank branches increased from 8729 to 8999 showing a growth of 3.10 percent during the period of 2009-10. In the same period total number of Islamic bank branches increased from 528 to 667 showing a growth of 26.33 percent. The total number of microfinance bank branches increased from 268 to 287 showing a growth of 7.09 percent. In addition, the State Bank of Pakistan actively promoted branchless banking (BB) to fundamentally reduce the cost of delivery of services and increase convenience for customers and expand coverage to new, historically underserved regions of the country. Branchless Banking Regulations were

¹⁹⁸ State Bank of Pakistan Act, 1956, and the Banking Companies Ordinance, 1962, provide legal frame work for licensing of banks and their branches whereas licenses for Microfinance banks and their branches are issued under the Microfinance Institutions Ordinance, 2001

issued by the State Bank of Pakistan in 2008, to use technology productively to assist a range of market participants including commercial banks, microfinance banks, Islamic banks, and mobile phone operators¹⁹⁹.

The State Bank of Pakistan continued to enhance its supervisory practices and in order to save time and effort the State Bank of Pakistan required submission of ‘Quarterly Data File Structure’ (DFS) for Micro Finance Banks (MFBs) in both hard and electronic copies of Quarterly Report of Condition under Reporting Chart of Accounts (RCOA) from Sep-09. To improvise timely propagation of data to all market participants, State Bank of Pakistan reduced the deadline period for submission of quarterly DFS under RCOA with effect from December 31, 2009²⁰⁰.

The State Bank of Pakistan conducted detailed analysis of the existing off-site rating system of the Microfinance banks (MFBs) in Pakistan (i.e. United Nations Development Program (UNDP), Asian Development Bank Institute (ADBI), Consultative Group to Assist the Poor (CGAP), and Microfinance Information Exchange (MIX)), effectively upgraded analytical tools through incorporating assessment mechanisms fundamentally based on system generated data, new ratios with realistic benchmarks and peer analysis. The revised Off-Site Rating Framework suggested uniform and multidimensional data presentation, availability of CAMELS (C: Capital Adequacy; A: Asset Quality; M: Management; E: Earnings; L: Liquidity and S: sensitivity to market risk) ratings for all quarters and improved sharing of data with other stakeholders.

¹⁹⁹ SBP allowed Tameer Microfinance Bank ‘Easy Paisa’ and United Bank’s ‘OMN-I’ whereas First Microfinance Bank’s model has been conjoined with Pakistan Post. Dubai Islamic Bank has also been allowed to start branchless banking at convenient public locations. In addition, innovation and use of alternate delivery channels allowed MCB Bank, KASB Bank, and Habib Bank to offer Mobile Phone Banking to their existing account holders

²⁰⁰ All financial institutions are now required to upload their quarterly data through Data Acquisition Gateway (DAG) Portal within 18 working days from the end of each calendar quarter instead of 30 days.

The State Bank of Pakistan in a serious bid to protect interests of stakeholders in line with international best practices set up Banking Inspection (on-site) Department (BID). BID (on-site) update inspecting guidelines and carry out on-site visits of the financial institutions to assess functionality of their Information Systems (IS), Foreign Exchange regime and CAMELS framework. In addition BID (on-site), investigate and resolve requested issues and complaints received from important market practitioners.

Despite embarking upon a mass consumer awareness program, growing consumer and SME lending have highlighted financial disputes between the banks and borrowers. The need for a transparent complaint and dispute resolution mechanism to enhance public confidence in banking system was instantly urged. The State Bank of Pakistan set up a dedicated Consumer Protection Department (CPD) to address any such grievances against banks. For example year 2009-10 witnessed more than 5,000 complaints received with regards to ATM/Debit/ Credit Cards, mortgage, Automobile/Personal loan, Customer services and other fraud (See Table 14).

Table 14. Regulatory compliance in commercial banks of Pakistan: Complaints handling

Table 3.3: Complaint Handling in numbers

Category Name	Complaints
ATM/debit cards	77
Auto finance	87
Credit Card irregularities	291
Delay in remittances/ collections/clearing	72
Frauds & forgeries	161
Mortgage finance	5
Loans/advance	530
Misbehaviour/misconduct	247
Operation of PLS/ deposit account	288
Pension problems	67
Personal loan	23
Service charges	81

Staff matters	148
Miscellaneous	3063
Total	5140

Source: State Bank of Pakistan (www.sbp.org.pk)

4.2.3 Challenges faced by Pakistani Banking Sector

Despite, above discussed far reaching policy refurbishments and stringent regulation of the operations of the banking system, Pakistani banking sector still encounters a number of key challenges i.e. much higher administrative costs in comparison with productivity, political interference and diminishing state owned banks to promote healthy competition (UL Haque 1997; Masood and Bruno 2008; Masood et al. 2008; and Parera et al 2010). In addition, a significant number of banks are realistically undercapitalized facing serious hurdles in complying with the State Bank of Pakistan requirement of raising capital to Rs 10 billion. SME's, agriculture, housing and other important sectors are faced with issues e.g. lack of credit availability (Khan 2006). The retail banking model encouraged by the State Bank of Pakistan in line with international standards requires significant branch networking, not the case in Pakistan. In addition, low credit penetration ratios, insufficient liquidity and limited human resources are serious challenges faced by Pakistani banking sector. Although banking sector in Pakistan enjoyed continued growth in profitability in the recent years due to growth in advances, increasing net interest income and reduced tax rates, still banks face challenges to customize their operations to remain competitive. Performance of individual banks remains highly depending on its assets portfolio, geographical coverage, financial position and credit worthiness of bank guarantors, skills of human resources and information technology infrastructures. In fact, expanding business activities of the private banks, introduction of foreign global financial institutions, revamped regulations (i.e. Basel II implementation), principle upgrade requirement in IT and development of new products set a significant impact on banks resources. In such environment, large resourceful privatized entities (e.g. HBL, UBL etc) induce fierce competition in Pakistan, although medium size banks have held their ground well, smaller banks seem to fall prey to acquisition activity (Khan 2006). Nevertheless, in wake of recent

phase of financial structure reformation, vibrant competition in Pakistani banking sector is striving towards improved service quality and product innovation (Ahmad et al 2010).

4.2.4 Conclusion

In broader context post 1990s indicators of financial system reflected improvements in profits, banks capital base and nonperforming loan performance (Khan 2006; Khan and Saqib 2008; and Ahmad et al. 2010). Nevertheless, in presence of inherent weaknesses²⁰¹ in Pakistani Banking System faced enhanced threats of liquidity crises in response to economic shocks (Griffith-Jones et al 2002; Weder and Wedow 2002; CGFS 2004; and Khawaja and Mian 2008; Abbas and Malik 2010). In addition to the global financial distress, Pakistan faced disastrous flood that adversely impacted the performance indicators causing nonperforming loans (NPLs) of the banking system to grow in shadow of decreasing asset base for third quarter in year 2010²⁰². ‘Strategic Plan 2005-2010’ rolled out by the State Bank of Pakistan promised a number of measures and developments (SBP 2010a). In order to stay par with the situation of the economic distress, transparency and disclosure requirements were subject to be brought in line with strict international standards.

The State Bank of Pakistan conducted stress testing²⁰³ with various scenarios considered, and reported on capabilities of the banking system to absorb losses resulting from economic disturbance. In addition, all banks were required to raise their minimum capital to Rs 6 billion by 2009, and be subject to variable Capital Adequacy Ratio (CAR) based on the ratings assigned by the Institutional Risk Assessment framework (IRAF) to each bank depending upon its financial condition. On the basis of foregoing and keeping in view the global response towards Basel II, State Bank of Pakistan had decided to adopt Basel II in

²⁰¹ See Ul Haque (1997) for detailed discussion of the limitations of the Pakistani Banking infrastructure; Khan, M. (2008). Main features of the interest-free banking movement in Pakistan (1980-2006). *Managerial Finance*, 34(9), 660-674

²⁰² See State Bank of Pakistan Quarterly Review of the Banking System September 2010 (SBP 2010b) for detailed performance overview following floods in Pakistan.

²⁰³ See Appendix 8

Pakistan and intended to complete transition by January 2008. The State Bank of Pakistan efficiently proposed changes applicable to the current regime of minimum capital requirement i.e. to include capital charge for market risk that comprised interest rate, equities investment position and foreign exchange risks. Under the State Bank of Pakistan proposals the market risk capital requirement needed to be calculated in addition (SBP 2010a).

In 1991, the State Bank of Pakistan had set up Credit Investigation Bureau (CIB) to gather, organize and disseminate critical information with regards to credibility of borrowers to help financial institutions with lending decisions and reduction of the occurrence of default. During 2003, in a bid to further enhance sophistication in credit risk management systems in financial sector State Bank of Pakistan uploaded CIB services online namely 'e-CIB'. The membership on e-CIB increased to 101 member financial institutions with over 5 million borrowers record on its data bases. All financial institutions in Pakistan are required to update their borrowers' (Rs 0.5 Million or above) data by submitting information to CIB monthly. The e-CIB, now evolved into hi tech entity employing state-of-the-art technology, facilitated over 1.4 million enquiries during year 2009-2010 alone. Access to e-CIB data bases fundamentally aimed to improve accuracy in risk prediction and fraud prevention amongst the member banks. In order to improve access to the credit profile of those customers, Credit Information Bureau (CIB) witnessed structural upgrades. In addition, the minimum limit of Rs. 0.5 million for data reporting was abolished to facilitate accurate capture of the risks associated with the consumer and SMEs sectors with recent default history (SBP 2010a).

The State Bank published detailed risk management guidelines for identifying, measuring, monitoring and managing credit, market, liquidity, country and operational risks. The State Bank of Pakistan, recognizing the absolute importance of a properly designed and implemented internal control system for an adequate risk management framework, published clear principles on internal controls and guidance for implementation and monitoring. In addition the responsibilities of Board of Directors for ensuring efficient internal control system were also disclosed in clarity. Submission of half-yearly progress

reports regarding the status of compliance with the guidelines for the banks was also made mandatory (SBP 2010a).

4.3 Islamic Banking in Pakistan

4.3.1 Introduction

Last few decades witnessed continued growth in Islamic Banking practices across the globe and importance of Islamic banking attracted significant debate in comparison with conventional (Sarkar 1999; Iqbal 2001; Baqar 2005; Siddiqui 2008; and Ahmad et al. 2010). Nevertheless, conventional international players moved in to seize the opportunity to serve large Muslim market. Islamic banks strictly follow ‘riba free (interest free) banking’ under the ‘Shariah’²⁰⁴, instead contracts developed under Islamic Banking are equity based (Siddiqui 2008). Widely known savings and investment products offered by Islamic Banks are *Murabaha* (Sales that already incorporate markup), *Bay “bi thaman ajil”* (Agreements for credit sales), *Musharaka* (Joint ventures), *Modaraba* (Profit and loss sharing investments on behalf of customers), *Salam* (Agreement for the sale to be completed in future), *Ijara* (Leasing agreements) and *Qard-e-Hasna* (interest free loan facilitation)²⁰⁵. Like traditional banks Islamic banks face risk. However, in case of Islamic banks with their Profit and Loss Sharing (PLS) mode of financing, already existing prudential regulations (based on CAMELS) to monitor risk exposure of the financial sector as a whole may require essential amendments. In addition, PLS based lending activity by Islamic institutions attracts higher capital adequacy ratio and larger liquidity ratio from the regulatory authorities i.e. Basel II has set higher minimum capital requirements for Islamic banks (Siddiqui 2008). This has essentially urged regulatory authorities with conventional as well as Islamic banks in their jurisdiction to set varied capital adequacy requirements for Islamic institutions in order to effectively manage risk of the banking sector as a whole. In addition, due to ‘no interest law’, Islamic banks fail to take interest benefit for their quota of reserves with central bank and lose out on the central bank’s facilitation as the

²⁰⁴ Shariah is based upon *Quran*, the *Hadith* and the *Sunnah* see Sarkar (1999)

²⁰⁵ See Sarkar (2000); and Siddiqui (2008) for full definition of all Islamic Contracts

lender of last resort because central bank pays and charges interest for holding reserves and providing liquidity for commercial banks. In order to deal with such issues, the central bank needs to set up an Islamic bank deposit service and develop loan instruments on basis of profit and loss sharing in order to facilitate (e.g. provide liquidity at a crucial instance) the Islamic institutions in its jurisdiction (Siddiqui 2008).

4.3.2 Evolution of Islamic banking in Pakistan²⁰⁶

In Pakistan, Islamic banking finds its roots in 1977, launch of banking restructure ordered by the president of Pakistan. The Council of Islamic Ideology (CII) appointed experts to convert the banking structure of Pakistan from interest based traditional banking to interest free Islamic banking model, and 1979 non-bank financial institutions of Pakistan for instance National Investment Trust (NIT), and National House Building Finance Corporation (NHFC) started offering interest free products. The State Bank of Pakistan (SBP) and Pakistan Banking Council (PBC) pursued the task of converting the prevailing traditional interest based banking system of Pakistan into Islamic way of interest free banking since 1980. By mid1980s banks offering PLS²⁰⁷ saw their deposits grow in PLS accounts and PLS deposits funded 3.1 percent of the total investment portfolios. Nonetheless, mid1980s also witnessed, the State Bank of Pakistan allow banks to invest PLS funds in interest-based banking products and that seriously hampered the process of Islamization of banking sector of Pakistan. A number of contributing factors caused the initiative of converting banking in Pakistan completely towards Islamic banking halted²⁰⁸. Nevertheless, it did provide Islamic Banks with opportunity to offering interest free products and services in Pakistan along with the traditional interest based banking. Thus, in Pakistan there is a dual banking system in place and both interest based and interest free banking products are on offer. The Islamic banking in this dual banking environment in

²⁰⁶ Khan, M., & Bhatti, M. I. (2008). Islamic banking and finance: On its way to globalization. *Managerial Finance*, 34(10), 708-725

²⁰⁷ PLS means interest free and stands for 'profit and loss sharing' basis bank account as per Islamic Banking principles.

²⁰⁸ See Ahmad, A., Malik, M. I., Humayoun, A. A. (2010) "Banking developments in Pakistan: A journey from conventional to Islamic banking" *European Journal of Social Sciences*. 17(1). 12-17

Pakistan grew at a consistent pace over the last couple of decades (Ahmad et al 2010). The total assets of Islamic Banking increased at 31.1 percent since June 2009, with deposits grew at staggering 38.5 percent for the same period. In addition, the financing and investment portfolios saw a 21.5 percent rise to Rs 235.5 billion. As shown in Table 15, continuous increase in size accompanied with the continued high levels of growth rates since 2004, clearly justify the increasing acceptability and popularity of Islamic banking in Pakistan. Due to equity based nature of the Islamic products, disclosure quality of the investment books is excellent, however lack of asymmetric information induce increased default probabilities in particular, countries like Pakistan. Pakistan significantly suffers documentation challenges for instance only a handful of people registered and pay tax out of population of over 180 Million. Nevertheless, although Islamic banking in Pakistan continues to witness growth still far off to become real threat to the throne of traditional banks (Siddiqui 2008; Shahid et al 2010; and Ahmad et al 2010).

Table 15. Trends in Islamic Banking in Pakistan

Table 3.1: Trends in Islamic Banking in Pakistan

(billion rupees, growth in percent)

	Deposit	Financing & invest	Total assets
Jun-04	13.2	13.1	18.8
Jun-05	37.8	37.2	54.0
Growth	188.0	184.0	187.0
Jun-06	59.7	57.9	87.6
Growth	58.0	56.0	62.0
Jun-07	107.4	89.2	157.9
Growth	80.0	54.0	80.0
Jun-08	163.1	163.4	229.6
Growth	52.0	83.0	45.0
Jun-09	238.2	193.8	313.0
Growth	46.0	18.6	36.3
Jun-10	329.8	235.5	411.1
Growth	38.5	21.5	31.3

Source: State Bank of Pakistan (www.sbp.org.pk)

The share of Islamic Banking in banking industry of Pakistan also rose to more than 6 percent with deposits reaching as much as 6.4 percent of the total banking system. The Islamic banking institutions (IBIs) count in Pakistan stands at 19. Six are classed ‘full-fledged’ Islamic banks whereas thirteen conventional banks have Islamic banking branches. The branch network reached 667 branches. The growth in branches was shared evenly by the ‘full-fledged’ Islamic banks and conventional banks having Islamic banking branches (see Table 16). The growth momentum despite slowdown in overall economic activity during the last couple of years remains in line with forecasts of the Strategic Plan for Islamic Banking Industry in Pakistan (Ahmad et al 2010). Witnessing growing number of conventional banks setting up Islamic banking branches, State Bank of Pakistan decided to release detailed proposal in order to facilitate conventional banks in conversion of their existing conventional branches into Islamic banking branches.

Table 16. Islamic Banking branches in Pakistan

Table 3.2: Islamic Banking Players
in number

	2003	2004	2005	2006	2007	2008	2009	2016*
Islamic banks (operating)	1	1	2	4	6	6	6	6
a) Branches of Islamic banks	8	10	32	48	122	223	389	1171
conventional banks operating Islamic banking branches	0	5	9	11	13	12	12	17
b) Total standalone Islamic banking branches of conventional banks	0	10	30	39	61	103	139	821
Total Islamic banking branches(a+b)	8	20	62	87	183	326	528	1992

Source: State Bank of Pakistan

(www.sbp.org.pk)

*As of 30 June, 2016

4.3.3 Regulation of Islamic Banking in Pakistan

Realizing the growth potential and regulatory challenges posed by Islamic banking, State Bank of Pakistan initiated a number of proposals in order to further promote Islamic banking in Pakistan including adoption of Shariah Standard as a priority. Harmonization of Shariah in Islamic Banking Institutions (IBIs) of Pakistan is foundation objective of the Islamic Banking Department of the State Bank of Pakistan. ‘Essentials of Islamic modes of financing’ and related Model agreements were issued by State Bank of Pakistan in 2005 as minimum requirements for Shariah compliance. These general guidelines were later on made compulsory in 2008. In addition, Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) Shariah standards may be used as guidelines only by consultations with their Shariah Advisers. AAOIFI standards are under review for adoption in Pakistan and are being gradually incorporated amid consultations between IBI’s in Pakistan, Shariah Advisor Forum (SAF), different divisions of State Bank of Pakistan and State Bank of Pakistan Shariah Division. Discussions have also been aimed at the next phase of Islamic banking in Pakistan introducing Shariah Standards on Sharika (Musharaka) and Modern Companies, Investment Sukuk, Guarantees, Conversion of a Conventional Bank to an Islamic Bank, Salam and Parallel Salam, Istisna’a and Parallel Istisna’a (SBP 2010a).

Internationally State Bank of Pakistan is effectively coordinating with Islamic Financial Services Board (IFSB hereafter) on various supervisory and regulatory aspects in a bid to create a better enabling supervisory and regulatory environment for Islamic finance to progress. State Bank of Pakistan effectively joined hands with IFSB to conduct a Study on Displaced Commercial Risk and facilitated a survey on Islamic capital markets. In addition, State Bank of Pakistan constructively working towards development of Guidance Notes for Stress testing of Islamic Financial Institutions (IFIs) and liquidity risk management. The Guidance Notes in principle aimed at refining the regulatory and risk management framework for IFIs, making the Islamic financial system more sound and stable. In addition to IFSB, The State Bank of Pakistan reserves a seat on the International Islamic Financial Markets (IIFM) Board and actively participates in its strategic decision making²⁰⁹.

²⁰⁹ IIFM is a Bahrain based institution focusing on development of liquidity management solutions and standardization of documents for hedging transactions.

4.4 Basel II implementation in Pakistan

4.4.1 Introduction

As discussed earlier, mounting complexity of operations and product innovations left financial institutions vulnerable to a varied list of risks i.e. credit, interest rate, liquidity, foreign exchange, strategic, compliance, reputational, country and operational risk. The need to tame complexity of risk management has turned ever more urgent following recent global financial turmoil. The past couple of decades witnessed financial institutions, dominated mainly by the large banking organizations invested significantly in strengthening their key internal infrastructures in order to capture risks. In contrast bank supervision and regulations continued tirelessly in devising more responsive and sophisticated solutions towards risk management. Basel II with the three pillars approach effectively converted the conventional regulatory framework into an extremely sophisticated regulatory and supervisory mechanism through continued industry consultations.

4.4.2 Roadmap of Basel II Implementation in Pakistan

In Pakistan, Basel II transition started in June 2006 (SBP 2005). State Bank of Pakistan developed the ‘roadmap of Basel II implementation’ for the transition. Following the international implementation pattern in Pakistan, initially the standardized approach to credit risk and operational risk will be implemented and then proceed to the compliance with the internal ratings based (IRB) approach subject to due diligence of the banks with international presence. The State Bank of Pakistan set up the ‘The BASEL-II Unit’ in the department in 2007 to oversee the implementation of capital accord initiated in 2006 (Appendix 7). In addition, the Basel II Unit assisted financial institutions prepare for on-site inspections; released guidelines for capital charge on credit risk under standardized approach, market risk charge and other recent advancements in Basel II framework; and conducted skills training (SBP 2006a).

4.4.3 Basel II: Implementation in Pakistan

In January 2008 standardized approaches under Basel II capital regulations was made mandatory for Pakistani banks, following a parallel run of 18 months back in June 2006 (SBP 2006b). Implementation of advanced approaches under Basel II remains discretionary and implementing institutions are required to submit their updated action plans to State Bank of Pakistan. In addition, guidelines on Internal Capital Adequacy Assessment Process (ICAAP) were made available in August 2008. Based on scale and complexity of their operations, banks were left with the option to adopt best suited capital adequacy assessment framework. Nevertheless, regardless of the capital adequacy regime adopted, financial institutions in Pakistan have been instructed by the State Bank of Pakistan to introduce Internal Credit Risk Rating Systems and submit the ratings of all corporate borrowers to the State Bank of Pakistan's e-CIB portal. In addition, scoring of all consumer loans has been made obligatory for all financial institutions since June 2010 and the scores must be submitted to e-CIB. Bank of International Settlements (BIS) issued minimum global standards for improving the resilience of the banking sector to be implemented by 2012 in response to recent financial turmoil (BCBS 2010b). The Basel III reforms are expected to be implemented in a phased manner and the full Basel III reforms will be fully implemented by January 2019 (see Table 17).

Table 17. Phase-In Arrangement Projections: Capital Ratios

Phase-In Arrangement Projections

	2013	2014	2015	2016	2017	2018	2019
Minimum common equity capital ratio	3.5%	4.0%	4.5%	4.5%	4.5%	4.5%	4.5%
Capital conservation buffer				0.6%	1.3%	1.9%	2.5%
Minimum common equity plus capital	3.5%	4.0%	4.5%	5.1%	5.8%	6.4%	7.0%
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Minimum Tier 1 capital	4.5%	5.5%	6.0%	6.0%	6.0%	6.0%	6.0%
Minimum Total capital	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Minimum total capital plus conservation	8.0%	8.0%	8.0%	8.6%	9.3%	9.9%	10.5%

Source: State Bank of Pakistan (www.sbp.org.pk)

4.4.4 Basel II transition: Limitations in Pakistan

The evidence across the globe suggests that successful implementation of the basic standardized approach under Basel II demands accurate, timely available and reliable data. Despite rigorous improvements, Pakistan still hosts an inadequate data management infrastructure for the purpose. In addition, current practice of international financial accounting standards and reporting system lacks the standards expected for standardized approach under Basel II. More importantly, reliability in business continuity planning and sophistication of the IT resources of complete banking architecture of Pakistan need to significantly improve on current status in order to justify and take advantage of Basel II implementation. Not to forget, the installation of modern risk assessment mechanism, staff training and revamped IT infrastructures under Basel II requires banks to incur huge costs. Meeting such phenomenal costs is obvious hurdle for the less resourceful banks in Pakistan (Hoggarth et al. 2002; HSBC 2003; and Garcia 2004). Another challenge is that Pakistan, amid other developing countries utilizes services of separate regulatory authorities for separate market participants i.e. only banks are required to comply with Basel II and other financial services provider remain free from such obligations. Such situations create incentives for regulatory arbitrage. In Pakistan therefore, it is critical that SECP and the State Bank of Pakistan coordinate significantly with regards to formulation and compliance of regulatory policies. In addition, risk assessment practices of banks are seriously affected by imperfect market advancements and challenges posed by them, so is the case in Pakistan. The risk of price manipulation by key market participants can destroy the true value estimation of the securities portfolio and in addition to banking sector portraying a responsible character in this regard, Pakistani regulators need to embed skills to read market fluctuations and still are long way away to develop sound policies to encourage market discipline (Akhtar 2006). Pakistani regulations require increased monitoring for market risks. In addition to market risk, Basel II is significantly accompanied with its much debated inherent capabilities of exacerbating procyclicality. Pakistani regulatory authorities despite publishing tons of regulatory guidelines somehow missed out on clear understanding of its discretionary powers to address Procyclicality under Basel II and there seems a lack of coordination between the State Bank of Pakistan and SECP (Akhtar 2006).

Increased capital requirements in developing countries contained serious concerns for the developed economies due to their status of capital flows to the developed countries (Griffith-Jones et al. 2002; CGFS 2004; Classens et al. 2008). Studies show that there will be a significant drop in capital flows to developed countries due to higher risks portfolios and inadequate rating and risk management systems (Majnoni et al. 2004; Majnoni and Powel 2005). This problem is amplified for Pakistan in particular. Banks in Pakistan in a bid to grow pursue to extend business coverage to the varied unexplored small businesses and relatively deprived segments of the society. Therefore, banks in Pakistan upon including such risks in their portfolio will face serious restrictions of increased capital under the Basel II capital accord due to inadequate credit scoring mechanisms for small business and vulnerable segments of population, further increasing the risks of decreased foreign capital flows (Akhtar 2006). Nevertheless, the State Bank of Pakistan encourages banks in Pakistan to facilitate small businesses through better and transparent credit appraisal mechanisms rather than increasing capital. Such encouragements of flow of credit towards underserved particles of the economy induced fears of deviation from fundamental implementation of Basel II in Pakistan. The State Bank of Pakistan faces a daunting task to develop realistically adoptable solution that not only encourages credit availability to SMEs but also prevents any potential deviation from Basel II. The issue concerning cross-border flows further indicates to the limitations in information-sharing across sectors and across borders. The State Bank of Pakistan seeks to ensure accurate information disclosure in accordance with the rules defined under Basel II (pillar III) in order to maintain confidence level in international market.

4.5 Conclusion

Banks in Pakistan are pursuing important advancements towards the implementation roadmap of Basle II. Nevertheless, the quality and level of such advancements vary i.e. comparatively large and resourceful banks in Pakistan with foreign presence and consistent growth patterns are progressing soundly. On the contrary, smaller banks clearly lack capacity and seek support (Akhtar 2006). Banks in Pakistan in order to introduce more competition in the credit rating business are required to make persistent and focused capacity building measures i.e. initiate fundamental improvements in the auditing field;

acquire properly skilled teams; develop internal risk models and advance risk management systems; and enhanced coordination between the financial industry and all regulatory authorities.

Part 2: Methodology, Empirical Findings and Discussion

Chapter 5: Research Methodology

5.1 Introduction

The chapter contains comprehensive discussion towards arriving at the methodology including the research design, the methods of data collection; the identification of the population, sample size, sampling procedures, methods of data analysis, and the research instrument.

The research design in short, followed a conclusive viewpoint and provided structured foundation in order to examine specified hypothesis, requiring defined, formal and structured information with a significant sample size to be representative (Saunders et al. 1997). Qualitative data collection was carefully executed through administration of structured questionnaire to key staff of the credit risk management departments of all sampled commercial banks in Pakistan. In addition, study deployed panel data approach to analyze relationship between bank specific variables including size of bank (LGTA), return on assets (ROA) and return on Equity (ROE), Non-performing loans (NPL), Capital Adequacy Ratio (CAR); Credit Risk, Market Risk and Operational Risk exposures of the sampled commercial banks for the period from 2007 to 2014. Growth rates of the country's GDP and Industrial Production (IIP) were included in the panel data set to establish the procyclical relationship.

5.2 Research Methods

5.2.1 Data collection approaches

5.2.1.1 Primary Data

The data instigated for the sole purpose of addressing the research problem fundamentally constitutes the primary data. Therefore, primary data consequently tailored to match the

identified requirements of the study carries immense importance. Regardless of exploratory or conclusive research designs, the study identified various approaches available to be adopted in collecting primary data. Panel Approach, Observation Approach, Documentary Approach, Interviewing, and Questionnaire based approaches were considered by the research. In discussing 'Panel approach', that is a group of people engaged in a focussed but free flowing debate on a specified topic, fundamentally contributes to bridge social and cultural gap between researchers and participants. Panel approach requires the discussion amongst the participants to be initiated and supervised by a trained mediator in an informal environment that does not follow a structure. Before conducting discussion, size of group, grouping of participants, time allowed for discussion and topic for discussion should be set. In addition, best practices suggest that advance planning should involve due consideration to developing protocols in the beginning for justified use of information (Malhotra and Birks 2007). The study acknowledged the limitations of the panel approach in a restricted time frame bound project and therefore not adopted. Swiftly moving on to, 'Observation approach', on the other hand can be identified as an indirect approach and the purpose of the project is normally kept out of sight of the participants to obtain as natural observations as possible. A research diary may be kept in an exploratory research process as opposed to an observation schedule in the conclusive research due to the fact that the scale of honesty or the pre-coding protocols used may require to be considered in full detail. The study takes an implicit nature and ignores observation approach for transparency. 'Documentary approach' for both exploratory and conclusive research designs, advocates statistical testing of the research question and applies open or a pre-coded form according to the research design²¹⁰. The undertaken study remains conclusive and therefore pre-coded approach was adopted. Advancing on to 'Interview approach' in an exploratory design are uncomplicated, open and unstructured in a bid to encourage an informal debate in a scenario where respondent is allowed a free hand to glide the direction of the interview. Interviewer assumes role of a spectator. In contrast, pre-coded interviews form a conclusive research design where the script questions are controlled by the interviewer. The purpose of the study is normally disclosed and direct approach adopted for primary data collection. The study although followed a conclusive

²¹⁰ Silverman (2016)

design, did not adopt interview approach. Questionnaire approach was considered most appropriate where questionnaire may be defined as a structured set of questions for gathering information from the participants. The study employs the structured questionnaire for primary data collection. The questionnaire was designed to be simple with clear instructions and the objective of the study was disclosed.

5.2.1.2 Secondary Data

Secondary data constitutes vital parts of successful research if not the whole project and may be acquired much quicker than primary data. Secondary data may have been created for reasons other than the main research problem however it still caters for range of uses starting from justification of key variables to be measured, formulating appropriate research design; developing sampling plan and hypothesis testing through to validating the research findings. The study utilises multiple sources to acquire secondary data to compare standard statistical procedures. Special attention observed by the study towards maintaining the accuracy of the secondary data in line with research objective. The study attempts to analyse data that is most recent, appropriate and best fit in context of the study. This is because acknowledging the fact that where various studies serve several crucial and interesting objectives the secondary data may still hint a time gap between collection and publication. The study ensures that credible data sources selected acknowledging the importance of dependability as well as provides justification of selected key variables and their relationship.

5.2.2 Research Design

The study acknowledges the significance of both exploratory as well as conclusive research designs. An exploratory research fundamentally adopts unstructured methods help establish the obvious link between the various variables in the study. Exploratory research is conducted in order to develop an understanding of a fact, where the subject matter cannot be fully justified quantitatively or the process of measurement may result in an unjustified association amongst a particular set of virtues in consideration. In contrast, conclusive research actively advocates structured methods to test specific hypothesis and examine the relationships amongst identified variables. Furthermore, conclusive research applies

structured approach to extract information that is clearly defined prior to commencing the research, and where the representative sample size may be large and justified to facilitate quantitative data analysis.

5.2.2.1 Conclusive Design

The study aims to offer all research participants the opportunity to critically review information contained in this study of risk management of banks in Pakistan, therefore research design is considered essential map for conducting successful research. The study attempts to accomplish clear objectives to meet research question and maintain a clear course throughout the whole of study towards serving the research objective. The study attempts justifying and acquiring appropriate data, identifying reliable data collection sources and the testing of the hypothesis by developing effective research design (Malhotra and Birks 2007; and Saunders et al: 1997). Following, conclusive research design the study aims to adopt a dual methodology. Both secondary and primary data would revolve around risk management in banking and continued developments in Basel Capital Accords to establish procyclicality of banks capital adequacy. Secondary data sources include academic journals, working papers, International Monetary Fund (IMF), Pakistan Bureau of Statistics (PBS) reports, State Bank of Pakistan (SBP) reports, Bank of International Settlements (BIS) publications, Basel Committee of Banking Supervision (BCBS) working papers and Annual reports of Commercial Banks of Pakistan. The study also develops qualitative/quantitative data analysis making use of coding process, graphical presentations and cross tabulation as appropriate. Primary data would be collected through structured questionnaires. The study discusses qualitative/quantitative sampling process and identifies sample data of senior risk management officials of commercial banks in Pakistan

5.2.3 Research Instrument

5.2.3.1 Structured Questionnaire

In literature there is strong mention of the operational complexity of numerical models advised to be used for measuring risk under Basel capital accord (Danielson et al 2001; Jarrow 2007; Kupiec 2007; and Das 2007). This reinforces the fact that the effectiveness

of Basel Capital Accord not only depends upon the accuracy of the numerical models developed by the banks but also there exists an issue of how the model itself is applied by the bank operatives who in actual are responsible for Basel Capital Accord compliant day to day risk management. Hence, it is considered necessary to learn how risk managers applied risk management under Basel II and their grasp of its correlated topics (Wahlstrom 2009). Furthermore, there is strong argument that selected skilled workers are perceived to be extremely informative. As above, the study prominently considered various approaches available to be adopted in collecting primary data as discussed earlier e.g. Panel Approach, Observation Approach, Documentary Approach, Interviewing, and Questionnaire based approaches.

Structured questionnaire applying Rensis Likert²¹¹ ranking scales would be deployed by the study as main instrument for acquiring primary data and facilitating hypothesis testing. Rensis Likert ranking scales would be employed acknowledging the fact that all questions revolve around the same topic area and response alternatives purposefully integrated to draw out desired information, evade any loss of validity and diminish the impact of any excessive practice of 'neutral' answer. In addition, to extract as honest information as possible the questionnaire will be executed with extreme caution and respondents would be assured of the confidentiality. Furthermore, pilot questionnaire conducted in advance provided with useful feedback with regards to the conciseness of the questions and to assess potential restrictions that may be imposed on respondents by their organizations with regards to filling in the questionnaire.

Structured questionnaire, in addition is preferred due to the fact that the study aims to analyse data on a comparatively large scale, not only that questionnaire based methodology is relatively simple to administer i.e. coding, analysis, interpretation and the general processing of data. Deploying structured questionnaires would allow the researcher to conduct the research proceedings with precision and control. Data obtained using structured questionnaires would be potentially consistent with risk of variability limited to the response alternatives provided. Therefore questionnaire based methodology is expected to facilitate primary data to be narrated in a meaningful and understandable milieu (Saunders et al. 1997; and Malhotra and McCourt 2001). In banking, the views of the key risk managers of the sampled institutions have effectively been obtained through

²¹¹Likert, R. (1932). A technique for the measurement of attitudes. *Archives of psychology*.

structured questionnaires in order to analyse political risk and determinants of non-performing loans (Masood and Sergi 2008; Wahlstrom 2009; Masood and Stewart 2009). The questionnaire contained two sections where section 1 is demographical profiling and the section 2 evaluate Basel II implementation, Active Risk Management (ARM) under Basel Capital Accord and the impact of procyclicality on the capital requirements of the sampled Commercial Banks. The respondents, senior level risk managers, are responsible for supervising, the implementation; and day to day running of the business in accordance with Basel Capital Adequacy framework. This would enable the researcher to extract reality rich information from risk managers who are actually responsible for complying with Basel Capital Accord in Pakistani Banks based on their decision making process and weighing key factors see Saunders and Allen (2002). In addition to descriptive statistical analysis, appropriate hypothesis testing would be applied to analyse collected primary data, where chi-squared test considered most appropriate and has been applied frequently see - Masood and Sergi (2008). However, Mann-Whitney test, medians, K-S test and K-W test can also be reported (Malhotra and Birks 2007, Masood and Sergi 2008). The study would aim to accomplish approximately over hundred (100) observations where population sample size of banks remains twenty five (25).

5.2.4 Research Population

5.2.4.1 Commercial Banks of Pakistan

Considering the importance of the research topic following a conclusive design and resources in question including time, budget and so forth, it made sense to deploy sampling as conducting the research, the entire census may not be realistic. In order to exterminate sampling error, the target population of the study remained professionals with expertise and decision making authorities in risk management of commercial banks in Pakistan. A relatively large sample was considered due to research topic being vital and relevant to the most recent global financial crises. The study acknowledges the complex relationship between different categories i.e. the risks calculated under Pillar 1 of the Basel Capital Accord, determination of Capital Adequacy ratios and Procyclicality; and recognise the significance of cross tabulation. After collecting and compiling, the data is summarized in order to facilitate observer to construct a clear purpose of database of the study. The typical values in the data and its variations follow e.g. the population, sampling procedures and data presentation (Fisher 2007).

5.2.5 Sampling Protocol

Population defined as the entire set of elements considered for the purpose of investigating the research problem containing common parameters. In order to acquire information about the characteristics of the population, either a census or a sample may be considered. Census may be defined as entire collected population and the sample constitutes a subgroup of population (Malhotra and Birks 2007). Risk personnel in Commercial Banks of Pakistan constitute a fairly large population size however, with small variance in the characteristics predicted. The study adopted sampling in order to limit cost of non-sampling errors (Verma and Le1996).

In discussing the sampling approaches Bayesian Approach remained prominent that elements added to sample and data drawn followed by calculating sample statistic sequentially. Other approaches include sampling with or without replacement elements. Nevertheless, the sampling process in research inevitably carries immense importance (Rossi et al 2013). The sampling process must intensely identify the target population precisely to avoid any vague results. Target population normally includes all elements that potentially hold information required to contribute towards conclusion of the research, however it may also include elements not fit for the objective. It was assured that respondents have been assessed in context of the research requirement to qualify for the target population and kept sampling error to minimum. Sample size may be influenced by similar studies undertaken however, in deciding sample size precision of the information, number of variable and nature of research can play a dictating role. Smaller sample size may deem sufficient for an exploratory research than that of a conclusive. The sample size must unquestionably be able to cater appropriately chosen data analysis technique. The study believed in employing fairly large sample to enable information rich data analysis considering completion rate of responses and resources available in conducting the survey. The respondents were filtered through the criteria based on their skill level within the research topic based on their responsibilities within the sampling frame. The filtering process confirmed validity of the sample as well as elements not found in the sampling frame were discarded.

Sampling remains serious business for the research and therefore close attention to sampling techniques observed. Furthermore, sampling techniques are either probability or

non-probability. In a bid to employ best suitable options the study attempted a detailed overview of both. Stratified and Simple Random sampling techniques highlighted in Probability sampling. All population elements (without omitting any) transported into respective sub-population termed as 'strata' (Kjell 2000). For the collection of primary as well as secondary data the study partially adopted this technique in separating commercial banks from specialised and justified all 36 commercial banks as main population out of which sample of 25 banks chosen based on required information availability and data symmetry (Appendix 8). The criteria of Simple Random sampling that each element in population possess equal opportunity to qualify as a sample has been criticised to boost large samples with lower precision rate and higher standard errors (Verma and Le 1996). Cluster and Systematic sampling considered similar to simple random sampling also considered by study but not used. This is because 'Cluster sampling' remains complex and multistage procedure where target population divided into cluster and sample selected randomly. Systematic sampling may be easier that starts with choosing sample, rest samples choice follows an evenly sequential pattern within the sampling frame. In selection of non-probability sampling techniques, where expert judgement is favoured over random selection' objective estimate of accuracy of the sample remains questionable. The study nevertheless, reviewed Quota, Judgement, Convenience and Snowball sampling to adopt most suited. Convenience sampling is done when selecting most convenient or accessible respondents from entire sampling unit and therefore struggles to justify representation (Silverman 2016). The study did not adopt Convenience sampling at any stage however, judgement sampling was considered when sampling personnel from the banks in combination of other sampling techniques used by the study. Judgement techniques justified practicality in line with objective of the study where elements believed to be in possession of specific skill to qualify as representation. Quota sampling also ignored by the study, implied developing quotas of population by constructing list of decided control characteristics in the target population and then selections made that fit the quota criteria based on judgement. Lowest sampling error is facilitated by Snowball sampling (Atkinson and Flint 2001). The research employed snowball sampling using the data from State Bank of Pakistan and Commercial banks of Pakistan for primary data collection. Snowballing started with initial group of respondents confirmed randomly comprising of respondents in possession of certain expertise. In the study this was simply achieved by targeting heads of

risk management divisions of the sampled commercial banks as well as personnel heading regional credit teams reporting to risk management divisions. The group then started the process rolling by identifying potential respondents within their organisation belonging to the target population occupying same expertise and so on. The structured questionnaires were then administered with expectations of a good response rate facilitating a valid representation of the target group. In determining sample size, the study adequately allotted large sample size as predetermined. Confidence interval approach to sample size determination was also considered to construct logical guess of an interval inside which a fixed proportion of the sample mean would appear.

For secondary data analysis the study initially considered whole of the commercial banking sector of Pakistan as research population. At this stage sample comprised of all 36 commercial banks in Pakistan (Appendix 8). After careful research on the availability of key variables and units of measurement in the annual reports the sample was reduced to 25 commercial banks for the period between 2007 and 2014 to achieve complete consistency in data. The main collection of secondary data conducted from published annual reports of the sampled banks. The sample of 25 commercial banks accounted for more than 92% of the banking assets in Pakistan and includes the ‘big five’ and therefore considered adequate for primary data collection the study also²¹².

5.3 Data Analysis Approaches

In effectively negotiating with both primary and secondary data, significant handling of qualitative as well as quantitative data is the key. This demanded crucial focus observed in employing appropriate strategy in line with research sense. Efforts were made in order to enable research gradually develop analysis through different phases of the project life. Quantitative data already deals in figures and hence the study considered various quantitative data analysis methods in detail. The study likewise seriously acknowledges the importance of mastering various methods of adjusting qualitative for quantitative data analysis. The study carefully considered important procedures for statistically fine tuning qualitative into quantitative data including weighting, use of variable re-specification and

²¹²Quarterly performance review of the banking system October to December 2014, available at sbp.org.pk

scale transformation (Silverman 2016). Weighting was ruled out because participants were already selected due to their knowledge and skill in the field of the study. Weighting is usually applied by giving weight to the sample that possesses specific characteristics making it more representative of the target population. The study also classed out the need for variable re-specification or use of dummy variables due to the structured questionnaire that sets out clear variables towards the objectives of the study. The study rules out scale transformation as the scales employed by the study did not result lower and upper scale. Scale transformation or 'Standardization' may be applied in cases where participants' response carries conflict, i.e. use of either upper end or lower end rating scales.

5.3.1 Qualitative Data Analysis

Data preparation logically considered to begin as soon as first completed questionnaire received, that implied all received filled questionnaires inspected for completeness, legibility, errors or missing information (Malhotra and Birks 2007). Little or no variance in responses or pattern of responses itself may indicate misinterpretation on the respondents part. The plan was put in place as follows if the questionnaires are returned with missing information then attempts may be made to resend the questionnaire for response. If resending questionnaire back is deemed impractical missing values will be allocated. However, missing responses would be discarded where key variable values left blank (Malhotra and Birks 2007). Missing responses pose serious problem for the research if exceed 10 percent of the returned questionnaire. Casewise and Pairwise approaches may be at hand to tackle the issue however not with consequences and major of what remains sacrificing data. Further treatment of missing responses involves substituting by mean response to the variable or by jotting a suitable response derived from the pattern of other responses by the same respondent. To exterminate any claims of bias, the later may be done so by statistically identifying the relationship with other variable based on the data collected (Malhotra and Birks 2007)

Structured questionnaire employed by the study were coded and calibrated to pool comparable concepts collated from respondents taking part in the study. Coding, appropriate organization and inputting of the data on computer would facilitate the study to utilise participant views effectively into interpretations and draw conclusion. Achieved

contribution would be corroborated with comparable work in fields of risk management in banking and Basel capital regulations.

5.3.1.1 Hypothesis testing

The study acknowledges the fact that in tests of associations or differences regardless of primary or secondary data, null hypothesis (H_o) is rejected and alternate hypothesis (H_a) is accepted. Alternate hypothesis is simply opposite of the null. Null hypothesis may prove one or two-tailed. The study aims to carefully apply correct sequence i.e. assign appropriate statistical technique to test the null hypothesis, choose the level of significance, calculate the test static, determine the critical value and compare the critical values to arrive at the decision. The study remains aware of the risk to encounter ‘Type I error’ when the sample results may lead to rejection of the null hypothesis falsely. ‘Type II error’ on the other hand is when results wrongly lead to acceptance of null hypothesis. ‘Type I and Type II’ were taken into account to identify the sample size and data collection. T-test and z-scores computed to determine the probability based on levels of significance.

Null Hypothesis

H_o : Capital requirements of Commercial Banks in Pakistan reflect banking risks

H_o : Capital requirements of Commercial Banks in Pakistan reflect economic activity

Alternate Hypothesis

H_a : Capital requirements of Commercial Banks in Pakistan do not reflect banking risks

H_a : Capital requirements of Commercial Banks in Pakistan do not reflect economic activity

The hypothesis proposed to be tested based on using chi squared test as a test statistic at a confidence level of 95%. The chi-squared test is considered appropriate allowing for just over hundred observations where the population sample size of banks remains twenty-five (25). Questionnaire designed to extract information regarding the relationship of risk variables under Basel Capital Accord; bank capital adequacy ratios; bank profitability and

loan performance; and Procyclicality for which a statistical significance of association of cross tabulation may be evident.

5.3.2 Quantitative Data Analysis

The statistical analysis techniques may start by simply determining measures of central tendency and measures of dispersion. Where basic measures have been widely employed by the studies for quantitative data analysis, the study takes much in depth look into varied statistical techniques and involved steps. Statistical techniques primarily deal in data measured on either an interval or nominal scale identified as metric or non-metric data respectively. Univariate techniques cater for analysing variances of single. Multivariate techniques focus on relationships when two or more variables analysed simultaneously. Samples are treated as independent when drawn randomly from diverse population. The data analysis technique applied usually guide how data may be collected as well as the number of samples. Literature carefully scrutinised for varied statistical testing i.e. use of z-test and t-test to investigate difference in mean sources when dealing with metric data where two or more independent samples involved (Malhotra and Birks 2007). Literature also witnesses ANOVA or 'F-statistics' applied in abundance, in contrast t-test used in testing two means whereas F-test in testing several (Fisher 2007). Frequency distribution, Medians, Kolmogorov-Smirnov (K-S tests), Mann-Whitney, Chi-squared test and Kruskal-Wallis one way analysis of variance (K-W ANOVA) appear significant in dealing with non-metric data (Malhotra and Birks 2007). Cross-tabulation, analysis of variance and covariance, multiple regression, two group discriminant analysis or conjoint analysis may be applied when there is only one dependent variable involved. When dealing with two or more dependent variables, multivariate analysis (MVA) and multiple discriminant analysis (MDA) may be considered appropriate. In situations where variables may not be classified as dependent or independent, factor, cluster and multidimensional scaling considered appropriate to test the interdependence (Silverman 2016).

Correlation, generally used to justify association between two or more variables, calculated from standardised measures of covariance. Correlation generates self-explanatory outcomes i.e. positive, negative or neutral correlation. Correlation may also vary according

to the strength of the relationship. Correlation coefficient (r or R) denotes the strength of the relationship and lies between -1 and $+1$. Analysis of variance (ANOVA) and covariance (ANCOVA) usually applied to investigate mean values of the dependent variables. Analysis of variance (ANOVA) tests the means of two or more populations where dependent metric variable and independent non-metric variables involved. ANOVA may be one-way or n -way depending upon involvement of a single factor or combination of two or more factors respectively. ANCOVA looks at combination of metric and non-metric variables. Regression analysis also deals in more than one independent variable. In general independent variables are interval scaled. Here categorical variables may be dealt with introducing dummy variables. The study is aware of the importance of ANCOVA to host both its metric and non-metric variables. Study further acknowledges importance of comparing proportions and the role played by Chi-squared test in analysing existing relationships and proportions of the variables. To confirm the nature of relationship among the variables and that collected data are close to the generally expected value, Chi-squared test adopts construction of contingency tables to determine the difference between expected and observed frequencies divided by expected frequencies. Cross-tabulations travel hand in hand with questionnaire based methodologies. Both the chi-squared test and cross-tabulation techniques were made available to the study. Not to forget, study seriously acknowledged Regression as a powerful methodology for examining associated relationship between varied dependent and independent variables (Malhotra and Birks 2007). In research regression: a mathematical equation of relationship of variables may be applied either to determine strength of the relationship or predict values of the dependent variables or both. Number of observations may be noted including error term normally distributed and that means of all normal distributions of Y , given X are on straight line with slope b . Further assumptions are the mean of error term is zero and the variances of error terms are uncorrelated. Regression takes either bivariate or multivariate form. Bivariate regression involves two variables and this is not mere correlation, here determined mathematical relationship must verify one dependent and other predictor variable. The study already established to investigate multiple variables verified as one dependent and more than one independent variable therefore adopt multiple-regression to determine R^2 . R^2 is square of multiple-correlation coefficient and determines the strength of association between dependent and independent variables. The usual regression journey involves:

construct a scatter diagram, determine general model to be tested, estimate parameters and standardised regression coefficient; and test for significance of association. In addition, checks may be made to determine the strength and significance of the relationship amongst variables and prediction accuracy. Residuals examined and model validated. Stepwise regression may be applied to deal with large sample size in terms of predictor variables. This is achieved by including only those predictor variables that justify the most variation in the dependent variable. The procedure also involves adding and removing predictor variables from the regression equation. In doing so, presence of correlation between variable may restrict important variable to be included or less important variables to be deleted. Stepwise regression however, does not aid in determining larger R^2 . Regression may be complicated with the presence of Multicollinearity due to which Partial regression coefficient may not be estimated precisely resulting in high standard error reading. Multicollinearity is present when two or more predictor variables are highly correlated. Dampening multicollinearity would involve varying complexity by using one of the variables in presence of highly correlated variables, Ridge regression and latent root regression may also be considered (Moulton 1987, Deaton 1995, Wooldridge 2010).

5.3.2.1 Econometric Model

Extensive review of existing literature resulted in a number of successful studies emerged using econometric methodologies in fields of risk management in banking and assumed procyclicality of banks minimum capital requirements. Here time series, cross section and panel data models analyzed critically for the purpose of understanding patterns and forecasting. Time series data characteristics are bred in data from varied disciplines and sub disciplines of medical studies, engineering, sociology, meteorology, economics the list can go on. Time series defined as set of readings at specified or unspecified time intervals, in fields of Economics enjoy a long tradition of limelight amongst professional and academics alike. Examples range from analysis of statistics on production, exchange rates, interest rates, growth rates of various economic variables and so forth. Time series serves varied objectives starting from simply identification of patterns to forecasting and post economic event critique. Hypothesis revolve around the theory of cause-effect relationship between dependent and independent variable stated in terms of prediction. Time series

limitations primary attribute to the fact that observation may incur loss of mutual independence due to a single event causing a change in all later data points. In addition presence of autocorrelation makes it challenging to interpret true trends or underlying mechanisms. Cross section data, defined as varied units selected from population at one point in time carries more of descriptive status while providing interest based outcome from a random sample of whole population in a snapshot. Changing time frame may vary the outcome tremendously making it difficult to justify causal relationship (Wooldridge 2010). Panel Data offers greater identification and measurement of effects because of its inherent analysis ability of variables across entities and over time. Panel data methodology best serves as balanced however it deals with missing information far more effectively than mere time series or cross sectional methodologies (Hsiao 2007). Panel data are suggested to be heterogeneous and allow that crucial control for individual heterogeneity, not inherent in time series or cross section data designs. In contrast where multicollinearity remains strongest contender in afflicting time series and cross section studies with biased results is dealt with, to some degree integrally within panel datasets (Moulton 1987; Batlagi and Levin 1992). Other advantages of panel data over time series or cross section include superior study of adjustment dynamics (Deaton 1995); enabling to construct complicated behavioral modelling i.e. fewer restrictions applied in panel on distributed lags than time series (Koop and Steel 2001; Hsiao 2007); and reduced biased resulting from including similar variables in comparison with time series dataset (Klevmarken 1989). The study proposes to test the following equation.

$$CAR_{it} = \beta_0 + \beta_1 CRR_{it} + \beta_2 MRR_{it} + \beta_3 ORR_{it} + \beta_4 ROA_{it} + \beta_5 ROE_{it} + \beta_6 NPLR_{it} + \beta_7 LGTA_{it} + \beta_8 GDPGR_t + \beta_9 IIPGR_t + u_{it}$$

β_0 is constant and $\beta_{(1,2,3 \dots)}$ represent coefficients of predictor variables and u_{it} is error term. CAR_{it} represent Capital Adequacy Ratio of bank i in year t ; CRR_{it} represent Credit risk weighted assets to total assets of bank i in year t ; MRR_{it} represent Market risk weighted assets to total assets of bank i in year t ; ORR_{it} represent Operational risk weighted assets to total assets of bank i in year t ; ROA_{it} represent Return of Assets of bank i in year t ; ROE_{it} represent Return on Equity of bank i in year t ; $NPLR_{it}$ represent Ratio of non-performing loan to total loans of bank i in year t ; $LGTA_{it}$ represent Natural logarithm of total assets of

bank i in year t ; $GDPGR_t$ represent GDP growth rates in year t ; and $IIPGR_t$ represent Industrial production index of Pakistan growth rates in year t .

5.3.3 Limitations of the data

Data for the study was collected in Panel data set to utilize properties of both time as well as cross section dimensions of the data and thus the study deploys Panel Data estimation to the final sample. The sample captured annual data for an eight year period starting from 2007 to 2014 across 25 commercial banks in Pakistan out of total 36 banks with the exception of Kasb bank for 2014 only. Kasb bank suffered losses and failed to maintain targeted capital adequacy ratios through the period in question. Due to the concurrent losses Kasb bank failed to continue its operations and was taken over by Bank Islami in May 2015 resulted in no data available for Kasb bank for 2014 only. However, unbalanced panel data character remain similar to balanced panel and is consistent (Baltagi and Levin 1992; Hsiao 2007; Wooldridge 2010). The time period chosen simply because to facilitate data symmetry i.e. not enough information disclosure present on risk weighted assets and CAR before 2007 in Pakistan²¹³. Basel Capital Regulations methodology applied across the board in Pakistan as standard since 2007. All commercial banks in Pakistan followed the standardized approach under Basel guideline set by the central bank State Bank of Pakistan.

5.4 Data Presentation

Quantitative data analysis forms crucial portion of the study in addition to qualitative data that too converted into pseudo quantitative data through codes before analysis. The study considered set of 25 commercial banks of Pakistan. The balance sheets of the banks in Pakistan are simpler than sophisticated international banks, containing less complex products and transactions. Data collected included Credit risk, Market risk, Operational risk charges, Capital Adequacy Ratio (CAR), Total Assets (LGTA), Non-performing loan (NPL) ratio, Return on Equity (ROE) and Return on Assets (ROA). In addition, GDP and Industrial Production Index of Pakistan (IIP) growth rates over a period of 8 years also

²¹³ Monthly or quarterly data not available for our key variables, Pakistan Bureau of Statistics release annual GDP growth rates of Pakistan only.

collected to establish the procyclicality of the banking system. It would be interesting to present the extent to which regulators influenced the capital adequacy of individual institutions according to susceptibility to the economic events. The study would attempt to gauge the relationship between all collected economic and bank specific performance and risk variables. The study will discuss stylized facts to endeavour that collated data on capital adequacy ratios, risk charges, bank performance variables including Size and Non-performing loans' behaviour, as well as growth rates of the GDP and Industrial production of Pakistan make research sense. Data where deemed appropriate will be tabulated and presented in appropriate graphs (Tables, Line graphs, histograms and bar or pie charts). The study acknowledges the fact that the style of presentation plays significant role in extracting the meaning out of data (Few 2005).

5.4.1 Software for Data Analysis

In number of software packages at hand, Microsoft Excel may be suitable for very basic, simple and descriptive statistical data analysis. Where the complexity level is higher, advanced software packages may be used including Minitab, Statistical Package for the social sciences (SPSS), E- views. The study used Statistical Package for the Social Sciences (SPSS) for the primary data. The SPSS was found user-friendly in dealing with complex analysis with cross tabulations, bivariate and possibly multivariate analysis. SPSS remains well regarded software by academic and practitioners alike in dealing with primary data. The study adopted Econometric views 9 (E-views) for the secondary data analysis because it also was found user-friendly in dealing with panel data and collaborate well with excel spread sheets for importing the data and allows number of analytics.

5.5 Error Rate

The study will attempt to reduce if not fully escape the error rate by carefully targeting questionnaires to practitioners/risk management decision makers in banking sector of Pakistan. In order to ensure adequate data and reduced respondent errors the study will administer questionnaire to all 25 sampled scheduled commercial. This is to achieve significant high response rate and reduction in representation sampling error. Questionnaire was brief, to the point and easily answered with only tick mark to record the

observation. Secondary data analysis will also go through appropriate diagnostics to determine the best fitting model.

5.6 Limitations

The research remained limited to Pakistan. Primary data based on collected structured questionnaires and secondary data compiled from commercial banks of Pakistan including the annual reports and accounts, reports submitted to State Bank of Pakistan, reports from Bureau of National Statistics of Pakistan. Limitations of secondary data remain as discussed above.

5.7 Ethical Considerations

The study ensures to remain focused on the fact that it is being carried out ethically to address widely acknowledged limitations in fields of Risk Management in commercial banks and the Capital regulations. There are absolutely no intentions, hidden or apparent to degrade or harm individuals concerned directly or indirectly. In order to remain ethical in line with usual professional researchers practice, the topic was approved to carry out research at University of East London following the University's rules and code of conduct for the research. Furthermore, the research project accordingly obtained ethics approval from the University of East London Research Ethics Committee in carrying out questionnaires.

The following was observed to address important ethical considerations including right to privacy, confidentiality and anonymity, informed consent, transparency and data handling.

The secondary data was obtained from 25 out of 36 commercial banks and the questionnaires were administered within the same set. The questionnaires carried the information sheet which clearly addresses important ethical consideration in line with the University of East London Research Ethics Committee guidelines. The information sheet remained concise, stating the aim and objectives of the research in addition to the contribution requested by the participants. No personal information required from participants was also clearly evident from the information sheet. Furthermore, the information sheet clearly sets out the steps taken to observe confidentiality of data (Data Protection Act 1988) as well as ensures the privacy of respondents observed. In addition,

information on how the secure data storage and treatment would be achieved was made explicitly clear. The participants and institutions were also made aware of the intentions for the results to be published for equal benefit of the researches and practitioners. Participation in the study remained purely participants' choice therefore each participant was made aware through the information sheet what to do if one does not wish to continue participation.

The study ethically attempt making sense of the research material and discuss possible interpretations of the research findings considering the fact that there may arise more insights relating the research topic area. Therefore the study would continue appreciate input from all-round clientele of the study. Not only that, the research findings may challenge the existing outlook of the topic triggering the research plan to be altered accordingly. The study claims to steer clear of any misuse of research at all costs. This will be achieved by reporting findings with utmost morality and completely impartial (Homan 1991; Richard Winter 1989; Fisher et al 2007).

5.8 Concluding Remarks

The research work seeks to ultimately address at least a portion of the challenges associated with measuring and controlling for economic impact of bank regulation and supervision under Basel Capital Accord's progressive consultations. The research deployed utmost effort in obtaining most suitable and appropriate methodologies i.e. data collection and analysis, software for use and keeping the research ethical.

Chapter 6: Primary Data Analysis

6.1 Introduction

This chapter tell-tale the results of the questionnaires administered in commercial banks of Pakistan. The chapter contains Cross tabulations and the descriptive statistics in addition to the results presented in frequency tables to facilitate effective data analysis of the survey. The questionnaire contained two broad sections, one: questions included on demographic profiling and two: questions exploring role and limitation of risk management practices in commercial banks of Pakistan under international bank supervisory guidelines of the Basel Capital Regulations. Appropriate coding applied to extract meaningful analysis of the factors considered through data collected (see Tables 18 and 19 below).

Table 18. Questionnaire coding protocol

Variables	Age_group	Qualification	Experience	Basel_training	Implementation_status
CODING	5 : 41 years and above	6 : Other/Professional	5 : Above 21 years	5 : 9 or more courses	5 : Don't Know
	4 : 36 - 40 years	5 : PhD	4 : 15 - 20 years	4 : 7 - 9 courses	4 : Not compliant
	3 : 30 - 35 years	4: Mphil	3 : 11 - 15 years	3 : 4 - 6 courses	3 : To some extent (calculate credit risk only)
	2 : 26 - 30 years	3 : Masters	2 : 6 - 10 years	2 : 1 - 3 courses	2 : To large extent (calculate credit, market and operational risk)
	1 : 20 - 25 years	2 : Bachelors 1 : Diploma	1 : 0 - 5 years	1 : None	1 : Fully compliant (AIRB)

Demographic questions (see coding compiled in Table 18) included age, qualification, experience and extent of Basel Capital Regulation training attended. In particular, a question included in questionnaire regarding respondents' knowledge of Basel compliance in their own banks (see table 1 for coding calibration). It would be interesting to see how

respondents' view Basel compliance in their banks where according to State Bank of Pakistan commercial banks in Pakistan comply with Basel Capital Regulation standardized approach and apply risk weightings to the assets under Basel Capital Regulation guideline. This can be compared in line with evidence from secondary data collected from commercial banks of Pakistan and discussed in the next chapter. None of the commercial banks in Pakistan achieved the status to qualify for applying Advance Internal Rating Based (AIRB) approach, which allows banks to develop their own risk assessment models.

Table 19. Risk Management questions coding protocol

Variable	Question (strength of agreement)	Coding
Credit_on_CR	Impact of credit risk on capital requirements	5 : Strongly agree 4 : Agree 3 : Neutral 2 : Disagree 1 : Strongly disagree
NPL_on_CR	Impact of Non-performing loans on capital requirements	
Market_on_CR	Impact of market risk on capital requirements	
Effective_compliance	Importance of Basel Capital Regulation for effective risk management	
Liquidity_on_CR	Impact of market risk on capital requirements - strength of agreement	
Profit_on_CR	Impact of profitability on capital requirements	
Advanced_data_analysis	Basel Capital Regulation as most advanced data analysis	
Operational_on_CR	Impact of operational risk on capital requirements	
Economic_on_CR	Impact of economic activity on capital requirements	
Size_on_CR	Impact of bank size on capital requirements	
Complex_models	Basel risk calculation models are very complex	
Regulatory_compliance	Basel Capital Regulation as matter of regulatory compliance	
Variable	Question (level of importance)	Coding
Bank_Risks_Credit	Most important banking risks: credit risk	5 : Most Important 4 : Important
Risk_Mgmt_LBR	Factors effecting risk management in banks: Local bank regulations	
Bank_Regulate_NPL	Most important for regulating banks: Non-performing loans	
Bank_Regulate_CR	Most important for regulating banks: Non-performing loans	
Risk_Mgmt_Econ	Factors effecting risk management in banks: Economic Impact	

Bank_Risks_Market	Most important banking risks: market risk	3 : Neutral
Bank_Regulate_Profit	Most important for regulating banks: Non-performing loans	2 : Un-important
Bank_Risks_Operational	Most important banking risks: operational risk	1 : Most un-important
Risk_Mgmt_IBR	Factors effecting risk management in banks: International bank regulations	
Risk_Mgmt_Glob	Factors effecting risk management in banks: Globalization	
Bank_Risks_Liquidity	Most important banking risks: liquidity risk	
Bank_Regulate_Econ	Most important for regulating banks: Non-performing loans	
Bank_Regulate_Size	Most important for regulating banks: Non-performing loans	
Risk_Mgmt_Political	Factors effecting risk management in banks: Political factors	
Bank_Risks_Procyclicality	Most important banking risks: procyclicality risk	

Questions revolving risk management in commercial banks of Pakistan included and remained investigative of respondents' indicated strength of importance and/or agreement with respective assertions. See table 19 for the complete coding protocol.

6.2 Results and Discussion:

6.2.1 Descriptive Statistics

Descriptive stats as calculated (Table 20) show minimum, maximum, mean and standard deviations. The factors are ranked 1 though to 32 according to the mean values. The highest rank is assigned to the value having the largest mean. The table below notes that impact of credit risk on capital requirements of the bank sits at the pole and impact of procyclicality on capital requirement last. Credit as most important risk to commercial banks of Pakistan sits on second spot. The impact of non-performing loans on capital requirement of the commercial banks of Pakistan tied with 'Local bank regulations most important of risk management in commercial banks of Pakistan' in the third place. The descriptive stats favor credit risk as most dominating risk determinant of the commercial banks in Pakistan. The results in table also show that there is no evidence that procyclicality impact the minimum capital requirements of the commercial banks of Pakistan.

Table 20. Descriptive Statistics (Primary data)

Factors	Rank	Min	Max	Mean	Std. Deviation
Credit_on_CR	1	3	5	4.33	0.548
Bank_Risks_Credit	2	1	5	4.25	0.963
NPL_on_CR	3	1	5	4.16	0.814
Risk_Mgmt_LBR	4	1	5	4.16	1.133
Market_on_CR	5	2	5	4.09	0.765
Effective_compliance	6	1	5	4.04	0.869
Liquidity_on_CR	7	2	5	4.02	0.788
Profit_on_CR	8	2	5	4.02	0.859
Advanced_data_analysis	9	1	5	4	0.776
Operational_on_CR	10	2	5	3.96	0.869
Economic_on_CR	11	2	5	3.88	0.878
Size_on_CR	12	1	5	3.8	1.028
Bank_Regulate_NPL	13	1	5	3.78	0.955
Bank_Regulate_CR	14	1	5	3.59	1.432
Complex_models	15	1	5	3.58	0.962
Risk_Mgmt_Econ	16	1	5	3.56	1.164
Regulatory_compliance	17	1	5	3.44	1.283
Age_group	18	1	5	3.34	1.212
Bank_Risks_Market	19	1	5	3.34	1.22
Qualification	20	2	6	3.16	0.765
Bank_Regulate_Profit	21	1	5	3.08	1.094
Bank_Risks_Operational	22	1	5	3.06	1.113
Risk_Mgmt_IBR	23	1	5	2.74	1.358
Risk_Mgmt_Glob	24	1	5	2.68	0.968
Experience	25	1	5	2.63	1.098
Bank_Risks_Liquidity	26	1	5	2.6	1.128
Bank_Regulate_Econ	27	1	5	2.3	1.407

Bank_Regulate_Size	28	1	5	2.26	1.393
Basel_training	29	1	5	2.2	0.989
Implementation_status	30	1	4	2.1	0.744
Risk_Mgmt_Political	31	1	5	1.86	1.226
Bank_Risks_Procyclicality	32	1	5	1.76	1.326

Table 21 below shows the minimum, maximum, mean statistic and standard deviation with highest rank to the largest mean value. All variables show large mean values showing that all variable considered below have impact on capital requirements of the commercial banks of Pakistan. Noted from the table below most important variables impacting the minimum capital requirements of commercial banks of Pakistan are credit risk, non-performing loans, market risk and liquidity.

Table 21. Descriptive Statistics (Variables-primary data)

Factors	Rank	Min	Max	Mean	Std. Deviation
Credit_on_CR	1	3	5	4.33	0.548
NPL_on_CR	2	1	5	4.16	0.814
Market_on_CR	3	2	5	4.09	0.765
Liquidity_on_CR	4	2	5	4.02	0.788
Profit_on_CR	5	2	5	4.02	0.859
Operational_on_CR	6	2	5	3.96	0.869
Economic_on_CR	7	2	5	3.88	0.878
Size_on_CR	8	1	5	3.8	1.028

Table 22 below notes the results of the reliability analysis of the variables and reports the value of Cronbach's Alpha 0.681 shows that the data is reliable. The reliability values of 0.5 to 0.6 are considered acceptable (Churchill 1979).

Table 22. Reliability Analysis

Reliability Statistics	
Cronbach's Alpha	N of Items
.681	8

6.2.2 Questionnaire Results and Analysis

Frequency tables presented results obtained from the questionnaire. The aim of the discussion remains assessment of current practice of credit risk management under International Basel Capital regulations in determining minimum capital requirements of commercial banks of Pakistan and its reflection on the economic activity.

Table 23. Age group

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 20 to 25 Years of age	9	8.7	8.7	8.7
26 to 30 Years of age	13	12.5	12.5	21.2
31 to 35 Years of age	40	38.5	38.5	59.6
36 to 40 Years of age	18	17.3	17.3	76.9
41 Years and above	24	23.1	23.1	100.0
Total	104	100.0	100.0	

Source: questionnaire results of the study

The survey result compiled in frequency distribution table 23 regarding the age group revealed that 38.5% of the participants belonged to age group between 31 to 35 years followed by 23.1% over 41 years of age. Further 17.3% and 12.5% belonged to age groups 36-40 and 26-30 years respectively. The least proportion of participants (8.7%) was the youngest age group that is 20-25 years of age.

Table 24. Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor's Degree	8	7.7	7.7	7.7
	Master's Degree	81	77.9	77.9	85.6
	MPhil	10	9.6	9.6	95.2
	Other	5	4.8	4.8	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

The survey result in table 24 shows that risk management in Pakistani banks is serious business. Risk personnel hold higher education and are research driven with all round professional expertise. This is evidenced as largest proportion of participants (77.9%) held a Master's degree. 9.6% participants were MPhil and further 4.8% participants had professional qualification proving that career progression as a senior operative in risk management at important positions required higher education and research driven backgrounds. Majority personnel holding Master's degree and above proves that they are considered better equipped to understand, implement and manage Basel Capital regulations for effective risk management. Only 7.7% participants held Bachelor's degree.

Table 25. Experience as a senior banker

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 to 5 Years	11	10.6	10.6	10.6
	6 to 10 Years	46	44.2	44.2	54.8
	11 to 15 Years	26	25.0	25.0	79.8
	16 to 20 Years	12	11.5	11.5	91.3
	Above 21 Years	9	8.7	8.7	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Table 25 above shows an interesting mix of experience amongst the participants. The balance is tilted in favor of more experienced as the largest proportion (44.2%) was bagged by the participants with experience between 6 to 10 years as senior risk manager. The second largest stood at 25% of participants with even more experience that is between 11 to 15 years. A healthy 11.5% participants had experience between 16 to 20 years and 8.7% with experience above 21 years. The novice most category stood at 10.6% had experience up to 5 years. The results of the survey show that experience is regarded a crucial expertise in fields of risk management in Pakistan for career progression and decision making ranks.

Table 26. Number of Basel training courses attended

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	25	24.0	24.0	24.0
	1 to 3 Courses	48	46.2	46.2	70.2
	4 to 6 Courses	18	17.3	17.3	87.5
	7 to 9 Courses	11	10.6	10.6	98.1
	9 or more	2	1.9	1.9	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

The table 26 shows that the highest percentage of participants (46.2%) attended up to a maximum of 3 Basel Capital training courses. This may be considered sufficient exposure to introduction of basic mechanics of Basel Capital Accord. Further 17.3% participants attended 4 to 6 and 10.6% participants attended 7 to 9 Basel Capital training courses. 1.9% participants attended an impressive more than 9 Basel Capital training courses and could be considered forming an elite group of respondents with highest level of Basel Capital Regulations mechanics and current most recent developments. The evidence from the survey results suggest that overall high proportion of participants attended Basel Capital training courses but there is room for improvement. There still remain 24% participants not attended any Basel Capital regulation training course, yet acquired high positions in risk management in commercial banks of Pakistan. This could be attributed to the theory

that experience gained by the participants seemed to have got them in their current role as senior risk managers. Nevertheless that, and a large proportion of participants only hovering between 1 to 3 courses point out to that need for Basel refresher trainings may be the way forward in Pakistan. Basel training courses could create opportunity to bring risk management personnel in Pakistan commercial banks at par with current most recent developments in Basel Capital regulations for improved intuitions of risk management practices in banking.

Table 27. Implementing Basel is a matter of “Regulatory Compliance only” for you bank

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	5	4.8	4.8	4.8
	Disagree	33	31.7	31.7	36.5
	Neutral	1	1.0	1.0	37.5
	Agree	41	39.4	39.4	76.9
	Strongly agree	24	23.1	23.1	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Table 27 contains participant responses when asked regarding Basel compliance as regulatory compulsion. This was considered important question to establish the role of central bank, State Bank of Pakistan as regulatory and supervisory body in making Basel compliance as an important regulatory requirements. Participant responses in table 7 therefore hint on the role of regulator in implementing Basel Capital Accord in Pakistan. 23.1% participants strongly agreed followed by 39.4% agreed. Higher proportion of overall participants agreeing with the assertion conclude that majority seriously viewed Basel implementation as a regulatory obligation and took the matters seriously. This show that an effective role is played by the principal regulator and supervisor, State Bank of Pakistan not only to bring Basel Capital implementation in line with international standards but also successfully delivered the message that Basel Capital Regulation implementation remains

a serious matter of regulatory obligation in Pakistan. This argument also supported by the secondary data collection of the study, whereby actual Capital Adequacy Ratios calculated by the commercial banks in line with Basel compliance analyzed from the annual accounts of the banks. Thus there exists strong evidence through both primary data collected for the study as well as secondary data that commercial banks in Pakistan are compliant with Basel Capital regulation and adequately under way “in phase Basel III implementation” since 2013. On the contrary, 31.7% disagreed and 4.8% strongly disagreed with the statement. 1.0% of participants neither agreed nor disagreed. The results also point out that there still is a significant proportion of respondents (36.5%) overall, disagree with the assertion evidence there for reflects an interesting theory that respondents simply do not view Basel Capital Regulation compliance as an important regulatory compulsion, and therefore disagree with the assertion.

Table 28. Full compliance with Basel is most significant requirement for effective risk management in your bank

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	1.9	1.9	1.9
	Disagree	7	6.7	6.7	8.7
	Neutral	4	3.8	3.8	12.5
	Agree	63	60.6	60.6	73.1
	Strongly agree	28	26.9	26.9	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Table 28 shows the participant responses when asked if Basel compliance was the most significant requirement for effective risk management. 26.9% participants strongly agreed followed by the largest proportion of participants (60.6%) agreed. 6.7% disagreed and only 1.9% strongly disagreed. 3.8% of respondents remained neutral. The survey results show that large percentage of participants agreed that implementing Basel Capital Regulation as most significant requirement for effective risk management in Pakistan is reflective of their understanding of the subject and its practical applications. This outcome remains in line

with the objective of the research to gauge the role and limitation of Basel Capital Regulations in Pakistan. The results displayed in table 8 above constitute unique findings of the study with regards to perceived versus achieved actual effectiveness of the Basel Capital Regulations in Pakistan in view of important industry operatives. The response evidence suggests that large proportion of participants not only agreed with Basel Capital implementation in Pakistan but were also convinced that it is an effective risk management tool for the commercial banks of Pakistan.

Table 29. To what extent Basel in implemented in your bank

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Fully Compliant (AIRB)	18	17.3	17.3	17.3
To large extent	64	61.5	61.5	78.8
To some extent	16	15.4	15.4	94.2
Not Compliant	6	5.8	5.8	100.0
Total	104	100.0	100.0	

Source: questionnaire results of the study

Survey results compiled in frequency distribution table 29 are with regards Basel compliance status. Once established the importance of regulatory compliance as well as conceptual significance of risk management under Basel Capital Regulation it was considered important to build up on that, and identify the extent of Basel Capital Regulatory framework in view of the respondents. 17.3% participants were of the view that they are fully compliant i.e. bank achieved status of advanced internal rating based models are in effect. This followed by 61.5% participants ticked compliant to large extent. Compliant to large extent referred to the status where banks calculate and submit all three risk exposures under Basel Capital regulation namely Credit, Market and Operational risks. 15.4% viewed as they were compliant to some extent i.e. calculate only credit risk under Basel Capital regulation. Smallest proportion (5.8%) of participants voted as not compliant. The results show that majority risk management personnel (61.5%) were well informed of their banks take on risk management practicality in line with international standards and

overall an overwhelming 94.2% participants confirmed Basel Capital regulation compliance in commercial banks of Pakistan.

Table 30. Basel provides most sophisticated and advanced data analysis methodologies for risk management in banking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	1.9	1.9	1.9
	Disagree	4	3.8	3.8	5.8
	Neutral	7	6.7	6.7	12.5
	Agree	70	67.3	67.3	79.8
	Strongly agree	21	20.2	20.2	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Table 30 compiles participant response to the statement that Basel Capital regulation propose most sophisticated and advance risk management methodologies to calculate Credit risk, Market risk and Operational risk. 20.2% participant strongly agreed with the statement followed by 67.3% agreed. 6.7% participants remained neutral. 1.9% of participants strongly disagreed and 3.8% participants disagreed with the assertion. The evidence in table 8 of the survey result suggests that risk personnel in Pakistan have been in progression of implementation of Basel Capital regulation for some period of time and seem now able to pin point positives and negatives between previous data management practices and currently imposed most advanced methodologies proposed by Basel Capital regulation. Better still, based on majority participants in favor of the assertion justifies the decision of Basel compliance by Pakistan to improve risk management in banks.

Table 31. Risk management models developed by Basel for credit, market and operational risk are very complex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	3.8	3.8	3.8

Disagree	10	9.6	9.6	13.5
Neutral	25	24.0	24.0	37.5
Agree	52	50.0	50.0	87.5
Strongly agree	13	12.5	12.5	100.0
Total	104	100.0	100.0	

Source: questionnaire results of the study

Table 31 contains responses to the assertion that risk management models developed by Basel Capital regulation for Credit risk, Market risk and Operational risk are very complex. 12.5% strongly agreed with the statement and 50.0% agreed. 3.8% and 9.6% strongly disagreed and disagreed respectively. As 24% of the participants remained neutral, it may be concluded that a significant 24% of respondent were not exposed to the mathematical derivation or assignment of risk weightings for the Capital Adequacy ratios of their banks. The results shed an interesting insight into the complex methodology advocated by the Basel Capital Regulation as there is majority proportion agreeing with assertion (62.5%), and further suggests that products developed in commercial banks of Pakistan continue to be less complex in comparison with their globally active more advanced counterparts headquartered in larger and more developed economies of the world.

Table 32. Credit risk has a significant impact on Bank capital requirements

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Neutral	4	3.8	3.8	3.8
Agree	62	59.6	59.6	63.5
Strongly agree	38	36.5	36.5	100.0
Total	104	100.0	100.0	

Source: questionnaire results of the study

Credit risk remains one of the most important risk covered under Basel Capital Regulation. The participants exposed to day to day operation of managing credit risk, therefore gives an important insight to credit risk management in commercial banks of Pakistan. Table 32

shows 59.6% agreed and 36.5% participant strongly agreed that Credit risk has significant impact on Bank Capital requirements therefore showing an overwhelming 96.1% proportion of respondents agreeing that credit risk impact on minimum capital requirements of the commercial banks of Pakistan. 3.8% neither agreed nor disagreed. Interestingly, none of the participants disagreed with the assertion. The results heavily tilt in favor of identifying minimum capital requirements incorporating credit risk under Basel Capital Regulation as an important measure for monitoring the financial health of commercial banks of Pakistan. The result remains in line with the research objective of investigating if capital requirements of commercial banks of Pakistan reflect most important banking risks namely credit risk under Basel Capital Regulation priorities. In addition, the result is also reflective of the industry operatives agreeing to Basel international consultation in Pakistan captures credit risk upholding null hypothesis of the study.

Table 33. Market risk has significant impact on Bank Capital requirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	8	7.7	7.7	7.7
	Neutral	2	1.9	1.9	9.6
	Agree	67	64.4	64.4	74.0
	Strongly agree	27	26.0	26.0	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Table 33 shows that 26% strongly agree with the statement that Market risk has significant impact on Bank Capital requirements. A further 64.4% agreed. 7.7% disagreed and 1.9% remained neutral. Market risk is covered under pillar 1 of the Basel Capital Regulation and directly impacts the Capital Adequacy Ratio. The results largely agree with the assertion that market risk have a significant impact on Banks capital requirements. The results accept the null hypothesis of the study in agreeing that market risk has significant impact on capital requirements.

Table 34. Operational risk significant impact on Bank Capital requirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	11	10.6	10.6	10.6
	Neutral	8	7.7	7.7	18.3
	Agree	59	56.7	56.7	75.0
	Strongly agree	26	25.0	25.0	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Operational risk directly relates to the role and performance of the participants in overall risk management of the commercial banks of Pakistan. The results compiled in table 34 above show that 25% and 56.7% strongly agree and agree respectively to the statement that Operational risk has significant impact on Bank Capital requirements. Operational risk too is covered comprehensively under pillar 1 of the Basel Capital Regulations showing strong evidence of Basel Capital Regulations compliance in commercial banks of Pakistan. 7.7% neither agreed nor disagree and 10.6% disagree.

Table 35. Liquidity has significant impact on Bank Capital requirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	7	6.7	6.7	6.7
	Neutral	10	9.6	9.6	16.3
	Agree	61	58.7	58.7	75.0
	Strongly agree	26	25.0	25.0	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

In table 35 results compiled of respondents view of significant impact of liquidity on minimum capital requirements of the commercial banks of Pakistan. The results show that 25% participants strongly agreed and 58.7% agreed with the assertion that liquidity risk has significant impact on Bank Capital requirements. Liquidity risk was not covered under

initial consultation of Basel Capital Regulations up to Basel II however, now included in Basel III. Phase in implementation of Basel III is underway in commercial banks of Pakistan. 6.7% of the respondents disagree and 9.6% neither agree nor disagree. None of the participants strongly disagreed.

Table 36. NPL have significant effect on Bank Capital requirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	1.9	1.9	1.9
	Disagree	4	3.8	3.8	5.8
	Neutral	3	2.9	2.9	8.7
	Agree	61	58.7	58.7	67.3
	Strongly agree	34	32.7	32.7	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Considering Credit risk as most important factor in determining Capital Adequacy Ratio under Basel Capital Regulation, non-performing loans go hand in hand with credit risk portfolios, it was viewed as an important input by the respondents as they manage and run risk portfolios of commercial banks of Pakistan on daily basis. The question was put to the participants and response rates to this question recorded in table 36 above show that 32.7% strongly agree and 58.7% agree with the assertion that Non-performing loans significantly impact Bank Capital requirements. Further 1.9% strongly disagree and 3.8% disagree. A small proportion of respondent (2.9%) neither agree nor disagree.

Table 37. Bank size significantly impacts Bank Capital requirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	2.9	2.9	2.9

Disagree	13	12.5	12.5	15.4
Neutral	10	9.6	9.6	25.0
Agree	54	51.9	51.9	76.9
Strongly agree	24	23.1	23.1	100.0
Total	104	100.0	100.0	

Source: questionnaire results of the study

Bank size remains an important indicator of the banks health both in times of economic recession and boom in view of the participants of the study. Respondents directly in position to impact the bank size in terms of assets growth or decline were asked if Bank size impacts on the minimum capital requirements of the banks. The results compiled in table 37 show that 23.1% strongly agree and 51.9% agree with the assertion that bank size has significant impact on Bank Capital requirements. Further analyzing the result revealed 2.9% strongly disagree and 12.5% disagree. 9.6% of respondent neither agree nor disagree.

Table 38. Bank profitability significantly impacts Bank Capital requirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	10	9.6	9.6	9.6
	Neutral	7	6.7	6.7	16.3
	Agree	58	55.8	55.8	72.1
	Strongly agree	29	27.9	27.9	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

The participants of the study showed with their responses that profitability can be impacted with lending profile of the banks and influenced by the risk management preferences of the banks. Table 38 shows that 27.9% of the participants strongly agreed with the statement that bank profitability has significant impact on Capital requirements of the commercial banks of Pakistan followed by the largest proportion of respondents (55.8%) agreeing with the same. Further 9.6% strongly disagree and 6.7% neither agree nor disagree. None of the respondents strongly disagreed with the statement.

Table 39. Economic fluctuations significantly impact Bank Capital requirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	13	12.5	12.5	12.5
	Neutral	8	7.7	7.7	20.2
	Agree	62	59.6	59.6	79.8
	Strongly agree	21	20.2	20.2	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Economic activity considered impacts the assets of the banks and respondents directly managing and altering loan portfolios, therefore equipped with firsthand knowledge of the impact of economic activity on the financial considerations of the commercial banks in Pakistan. We compile the results in table 39 showing that 20.2% of the participants strongly agree and 59.6% agree that economic fluctuations significantly impact Bank Capital requirements. Further 12.5% disagree and 7.7% neither agree nor disagree. The results show that participants of the study are in good position to judge the impact of economic fluctuation while managing day to day risk portfolios of the commercial banks in Pakistan. Large proportion of participant response as agreed reflects that risk management in the commercial banks of Pakistan is reflective of the influence of the economic environment of the country. Therefore, sensitivity of commercial banks to the economic activity is worth considering while scrutinizing the financial health of the commercial banks of Pakistan.

Table 40. Please rank important bank risk – Credit risk

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most un-important	3	2.9	2.9	2.9
	un-important	1	1.0	1.0	3.8
	neutral	17	16.3	16.3	20.2
	important	29	27.9	27.9	48.1

most important	54	51.9	51.9	100.0
Total	104	100.0	100.0	

Source: questionnaire results of the study

Participants were also asked to rank most important risks faced by the commercial banks of Pakistan. This would help identify the proportion of the respondents considering credit risk as most important in comparison with other risks identified in effective risk management of the commercial banks of Pakistan. The views of respondents remain largely similar to each other as Table 40 shows that when asked to rank important banking risks, 51.9% and 27.9% ranked Credit risk as most important and important. 16.3% remained neutral and 2.9% ranked Credit risk as most unimportant. Lowest 1.0% viewed it as unimportant. An overwhelming majority of risk operatives took part in the research ranked credit risk as the most important reflects the fact that extending credit remains the main business in commercial banks of Pakistan. The evidence that high capital adequacy ratio maintained by commercial banks of Pakistan indicates that more capital buffers installed to counter credit risk in Pakistan than market risk of operational risk. Thus there is evidence that in applying Capital Adequacy Ratio formula under the Basel Capital Accord, credit risk weighted assets form the major portion of the denominator in commercial banks of Pakistan. Operational risk weighted assets as well as market risk weighted assets constitute comparatively much smaller proportion of the capital adequacy ratio consideration in commercial banks of Pakistan. Therefore to conclude, according to the responses compiled in table 20a show that credit risk remains the main determinant of the capital adequacy ratio in commercial banks of Pakistan.

Table 41. Please rank important bank risk – Market risk

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid most un-important	8	7.7	7.7	7.7
un-important	19	18.3	18.3	26.0
neutral	29	27.9	27.9	53.8
important	26	25.0	25.0	78.8

most important	22	21.2	21.2	100.0
Total	104	100.0	100.0	

Source: questionnaire results of the study

The results compiled in table 41 show that 21.2% of the participants view market risk as most important followed by 25% of participants ranked market risk as important in commercial banks of Pakistan. A rather large proportion of the participants remain neutral at 27.9%. Furthermore, 18.3% ranked market risk unimportant and 7.7% ranked market risk as most unimportant in commercial banks of Pakistan. The results reflects that although majority of respondents ranked market risk as an important risk faced by the banks, still 27% of the respondents remained neutral around 25% ranked market risk as unimportant overall reflects to the fact that there is not enough awareness of the impact of market risk on the commercial banks of Pakistan. This also points out to availability of limited research and publications in field of market risk management, practicality of VAR and its impact on commercial banks of Pakistan. It would be interesting to find out if participants agreed that foreign exchange risk covered under market risk as per Basel Capital Accord guidelines is practical in commercial banks of Pakistan. The results however, point out that the respondents generally viewed commercial banks of Pakistan are less exposed to market risk.

Table 42. Please rank important bank risk – Operational risk

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid most un-important	8	7.7	7.7	7.7
un-important	28	26.9	26.9	34.6
neutral	27	26.0	26.0	60.6
important	32	30.8	30.8	91.3
most important	9	8.7	8.7	100.0
Total	104	100.0	100.0	

Source: questionnaire results of the study

Table 42 shows results when asked to rank operational risk as important banking risks, a mere 8.7% of the respondent considered operational risk as most important. Nevertheless 30.8% participants ranked operational risk as important in commercial banks of Pakistan. Together the important category constitutes 39.5% of the respondents overall view. A healthy 26% remained undecided reflecting their knowledge of the practice of operational risk in commercial banks of Pakistan. On the contrary 26.9% of the respondents were of a view that operational risk was unimportant followed by another 7.7% ranking it as most unimportant so an overall 34.6% of the participants viewed operational risk as unimportant.

Table 43. Please rank important bank risk – Liquidity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most un-important	16	15.4	15.4	15.4
	un-important	38	36.5	36.5	51.9
	Neutral	31	29.8	29.8	81.7
	Important	10	9.6	9.6	91.3
	most important	9	8.7	8.7	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Table 43 shows results of respondents' view of liquidity as most important risk faced the commercial banks of Pakistan. The result show that 36.5% of the participants were of the view liquidity is unimportant followed by the second highest proportion of 29.8% of respondents undecided. Only 8.7% ranked liquidity as most important followed by 9.6% ranked Liquidity risk as important. 15.4% ranked Liquidity risk as most unimportant. The result remains in line with the fact that commercial banks of Pakistan in general operate with high capital adequacy ratios.

Table 44. Please rank important bank risk – Procyclicality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most un-important	69	66.3	66.3	66.3
	un-important	18	17.3	17.3	83.7
	important	7	6.7	6.7	90.4
	most important	10	9.6	9.6	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

The results shown in table 44 points out very interestingly that largest proportion of respondents at 66.3% ranked procyclicality as most unimportant. A bleak proportion of 9.6% and 6.7% ranked Procyclicality risk as most important and important. 17.3% ranked unimportant. There were no neutral responses recorded. Overall balance in favor of unimportant shows that participants are not convinced that procyclicality causes a threat to the financial soundness of the commercial banks of Pakistan.

Table 45. Please rank most important for regulating banks – Capital requirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most un-important	11	10.6	10.6	10.6
	un-important	18	17.3	17.3	27.9
	neutral	16	15.4	15.4	43.3
	important	17	16.3	16.3	59.6
	most important	42	40.4	40.4	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Respondents when asked to rank if capital requirements is most important for regulating banks, 40.4% ranked capital requirements as most important for regulating banks followed by 16.3% ranking capital requirements as important. Together both categories add up to a total of 56.7%. On the contrary 17.3% and 10.6% of participants represented views of

unimportant and most unimportant. The result in table 45 remain in line with research expectations where majority of respondents remained convinced that capital requirements is sound indicator of the financial health of the commercial banks of Pakistan making it justifiable to comply with Basel Capital Accord and in line international banking practices.

Table 46. Please rank most important for regulating banks – NPL

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid most un-important	3	2.9	2.9	2.9
un-important	9	8.7	8.7	11.5
neutral	16	15.4	15.4	26.9
important	56	53.8	53.8	80.8
most important	20	19.2	19.2	100.0
Total	104	100.0	100.0	

Source: questionnaire results of the study

Rise in non-performing loans spell out difficult times for banks may it be economic recession or boom, although historically rise in non-performing loans is associated with economic downturn, therefore it was important to extract views of important participants in monitoring non-performing loans as an important measure in regulating banks. Table 46 presents responses when asked to rank if non-performing loans is most important in regulating banks. A very high proportion of respondents ranked non-performing loan as an important indicator for regulating commercial banks in Pakistan, with further 19.2% ranking it as most important. A small population of respondents (8.7%) ranked unimportant further deteriorating to 2.9% ranked as most unimportant. 15.4% remained neutral.

Table 47. Please rank most important for regulating banks – Bank profitability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most un-important	9	8.7	8.7	8.7
	un-important	17	16.3	16.3	25.0
	neutral	49	47.1	47.1	72.1
	important	15	14.4	14.4	86.5
	most important	14	13.5	13.5	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Table 47 showcases results when respondents were asked to rank bank profitability as most important in regulating banks, small proportion of participants seemed convinced of profitability being an important measure in regulating commercial banks in Pakistan. In short, 13.5% and 14.4% ranked Bank profitability as most important and important respectively. On the contrary did not witness comprehensive status neither, 16.3% ranked unimportant and 8.7% ranked as most unimportant. Interestingly almost half of the respondents (47.1%) remained neutral making it significantly clear that majority of participants failed to justify profitability as an important measure in regulating in commercial banks of Pakistan. The results remain in line with the research expectations as majority of respondents viewed profitability did not constitute major indicator for regulating commercial banks of Pakistan.

Table 48. Please rank most important for regulating banks – Bank size

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most un-important	41	39.4	39.4	39.4
	un-important	32	30.8	30.8	70.2
	neutral	6	5.8	5.8	76.0
	important	13	12.5	12.5	88.5
	most important	12	11.5	11.5	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Participants views on bank size as an important indicator for regulating banks yield some interesting insights arranged in table 48, as a mere 15.4% participants considered bank size as most important followed by 2.9% ranked as important. The opposite viewpoint prevailed in grand manner, with largest proportion of participants (38.5%) ranked bank size as most unimportant followed by the second largest viewpoint (26.9%) in the same category ranked bank size as unimportant in regulating commercial banks in Pakistan. 5.8% of the respondents remained neutral. The results remain in line with international bank regulation approaches and majority of banks operatives classed bank size as unimportant in regulating commercial banks in Pakistan.

Table 49. Please rank most important for regulating bank – Sensitivity to economic activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most un-important	40	38.5	38.5	38.5
	un-important	28	26.9	26.9	65.4
	neutral	17	16.3	16.3	81.7
	important	3	2.9	2.9	84.6
	most important	16	15.4	15.4	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Results of an important factor namely sensitivity to economic activity as an important indicator regulating commercial banks in Pakistan are locked in table 49 above. The results remained interesting as an overwhelming majority at 38.5% recorded their response as most unimportant where the 26.9% participants ticked unimportant in the questionnaire. 15.4% of respondents ranked Economic impact as most important with only 2.9% convinced as important. 16.3% remained neutral. The results represent that the respondents were not convinced that monitoring sensitivity of commercial banks of Pakistan to economic activity is most important in regulating banks. The result showed participants response attributed to limited evidence of impact of economic activity on commercial banks of Pakistan and limitations in development of a sensitivity index.

Table 50. Please rank factors significantly impact effective risk management in banks – International Bank Regulation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most un-important	22	21.2	21.2	21.2
	un-important	32	30.8	30.8	51.9
	neutral	15	14.4	14.4	66.3
	important	21	20.2	20.2	86.5
	most important	14	13.5	13.5	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Participant responses were gathered when asked to rank if international bank regulation impact significantly on effective risk management in commercial banks in Pakistan. The responses are shown in table 50 above. 13.5% of the respondents viewed international bank regulation and supervision as most important followed by 20.2% participants ranking it as important. Opposite concept seemed to take lead in this question where 30.8% of the participants ranked unimportant and 21.2% ranked as most unimportant, where 14.4% remained neutral.

Table 51. Please rank factors significantly impact effective risk management in bank – Local Bank Regulation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most un-important	5	4.8	4.8	4.8
	un-important	7	6.7	6.7	11.5
	neutral	8	7.7	7.7	19.2
	important	30	28.8	28.8	48.1
	most important	54	51.9	51.9	100.0

Total	104	100.0	100.0	
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Source: questionnaire results of the study

Table 51 above looks in results of the responses when asked to rank local bank regulation as most important in effective risk management in commercial banks of Pakistan. A whopping 51.9% and 28.8% ranked local regulations as most important and important respectively. 6.7% ranked unimportant and 4.8% ranked as most unimportant. 7.7% remained neutral. The results clearly point out to the role of central bank of Pakistan namely State Bank of Pakistan is significant in impacting the risk management practices in commercial banks of Pakistan. The results remain in line with research expectation as overwhelming majority of respondents somewhat approve of that fact that bank regulation and supervision plays an important role in effective risk management in commercial banks of Pakistan.

Table 52. Please rank factors significantly impact effective risk management in banks – Globalization

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid most un-important	4	3.8	3.8	3.8
un-important	49	47.1	47.1	51.0
neutral	36	34.6	34.6	85.6
important	6	5.8	5.8	91.3
most important	9	8.7	8.7	100.0
Total	104	100.0	100.0	

Source: questionnaire results of the study

Table 52 shows results when asked to rank if globalization is most important in significantly impacting effective risk management in commercial banks of Pakistan. The result shows that 8.7% of the participants marked most unimportant and only 5.8% ranked globalization as important. On the contrary, 47.1% ranked globalization unimportant and 3.8% ranked as most unimportant. 34.6% remained neutral. The result shows that the

participants were of the view that banks in Pakistan somewhat remains not sensitive to global climate change. The results constitute an interesting finding as there is evidence of restricted global cash flows towards Pakistan during global financial crises of 2007-8.

Table 53. Please rank factors significantly impact effective risk management in banks – Economic Factors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most un-important	11	10.6	10.6	10.6
	un-important	4	3.8	3.8	14.4
	neutral	25	24.0	24.0	38.5
	important	44	42.3	42.3	80.8
	most important	20	19.2	19.2	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Table 53 shows results when asked to rank economic factors as most important in impacting effective risk management in commercial banks of Pakistan. 19.2% of the participants shared their view as most important with 42.3% ranked economic factors as important and significantly impact effective risk management in commercial banks of Pakistan. A further 3.8% ranked unimportant and 10.6% ranked as most unimportant. 24.0% remained neutral. The results show that majority of participants remained convinced that economic factor should be considered in managing risk in commercial banks of Pakistan. The result of this question showed that although majority of respondent remained unsure or unconvinced of the sensitivity in regulating banks, they remained firmly convinced that effective risk management benefits with monitoring economic factors.

Table 54. Please rank factors significantly impact effective risk management in banks – Political Factors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	most un-important	62	59.6	59.6	59.6
	un-important	12	11.5	11.5	71.2
	neutral	20	19.2	19.2	90.4
	important	3	2.9	2.9	93.3
	most important	7	6.7	6.7	100.0
	Total	104	100.0	100.0	

Source: questionnaire results of the study

Upon asking to rank if political factors act as significant aspect in effective risk management in banks in Pakistan, vast majority of participants 59.6% marked as most unimportant followed by a further 11.5% ticked as unimportant see results compiled in table 54. 6.7% and 2.9% ranked political factors as most important and important. 19.2% participants remained neutral. According to the results respondents firmly seemed convinced of irrelevance of political factors in effective risk management in commercial banks of Pakistan.

Ranking question are particularly helpful in extracting respondents' own views as to what they regard as most important based on their skills occupied during work experience in field of risk management in commercial banks of Pakistan on top of agree/disagree options. This is facilitated through making choices available to respondents to pick the option they most deem fit. We analyse further the ranking questions and calibrated the option termed as 'most important' as highest rank of importance. Here we only discussed the top rank as evidence of most important risk faced by the banks, nevertheless it made sense to discuss the complete picture portrayed by the respondents. The results locked in tables 40 through to 44 based on assertion that what in participants' opinion is most important risk for the commercial banks of Pakistan. The options included Credit risk, Market risk and Operational risk as default, currently covered by the Basel Capital Regulation's Basel II, in addition liquidity was also included as an option along with procyclicality. Liquidity is now in stage of phase in introduction under Basel Capital Regulation's Basel III for the

purpose of calculating capital adequacy ratios. In addition, Procyclicality, was included to test that if participants viewed it as risk to the commercial banks of Pakistan. The results depict that Credit risk stood top of ranking as clear winner in most important risk faced by the commercial banks of Pakistan category, with over half of the participants viewed it as most important. Credit risk was well clear at the top as the second most important risk faced by the banks market risk scored only 21% well behind credit risk. The results clearly showed that the participants of the study viewed that commercial banks of Pakistan are mostly exposed to the credit risk. Here, it would be interesting to note that operational risk currently covered under Basel Capital Regulations along with credit risk and market risk was considered by 9% of the respondents, just behind procyclicality considered by 10% respondents as most important. This was not by much but still hints at the fact that procyclicality is not only understood the risk management operative took part in the study but also, regarded it just a tad more important than operational risk in commercial banks of Pakistan. We continue to march on to analysing our next ranking question regarding the participants' opinion on what is most important in regulating commercial banks in Pakistan. The options included bank's capital requirements, nonperforming loans, profitability, size and sensitivity to economic activity. Results are compiled in tables 45 through to 49 above. The results showed that capital requirements was top ranked with 40.4 percent participant viewed it as most important in regulating banks. This results remain in line with research expectation and objectives of Basel Capital International banking regulations and supervision. It was also interesting to note that 19% respondents viewed nonperforming loans as most important in regulating banks and 15% respondent stamped on bank's sensitivity to economic activity as most important in regulating banks. The results regarding respondent views on most important factors significantly impacting effective risk management in commercial banks of Pakistan presented in tables 50 through to 54. The options for the choice included international bank regulations, local bank regulations, globalization, economic and political factors. The results showed that local bank regulation was clear winner in significantly impacting effective risk management in commercial banks of Pakistan with 52% respondent marking it as most important. The second spot was grabbed by the economic factors with 19% respondents making it the most important factor in significantly influencing effective risk management in Pakistan. International bank regulations losing to local bank regulations as most important factor for

effective risk management indicates that participants adequately regulated by the local authority. The participants therefore viewed that international rules may not deem fit for the territory and international procedures needed to be filtered through the local authority to create a bespoke fit for the commercial banks in Pakistan. This relishes the importance of local bank regulation in implementation of effective risk management protocols in commercial banks of Pakistan may it be a local construct or an internationally implemented standard.

6.2.3 Results of Cross tabulations

Table 55. Full Basel Compliance and impact of Globalization

Full compliance with Basel is most significant requirement for effective risk management in your bank *

Please rank factors significantly impact effective risk management in banks - Globalization Cross tabulation

				Please rank factors significantly impact effective risk management in banks - Globalization					Total
				most un-important	un-important	neutral	important	most important	
Full compliance with Basel is most significant requirement for effective risk management in your bank	Strongly disagree	Count		0	2	0	0	0	2
		% of Total		0.0%	1.9%	0.0%	0.0%	0.0%	1.9%
	Disagree	Count		0	4	1	2	0	7
		% of Total		0.0%	3.8%	1.0%	1.9%	0.0%	6.7%
	Neutral	Count		1	3	0	0	0	4
		% of Total		1.0%	2.9%	0.0%	0.0%	0.0%	3.8%
	Agree	Count		2	25	28	2	6	63
		% of Total		1.9%	24.0%	26.9%	1.9%	5.8%	60.6%
	Strongly agree	Count		1	15	7	2	3	28
		% of Total		1.0%	14.4%	6.7%	1.9%	2.9%	26.9%

Total	Count	4	49	36	6	9	104
	% of Total	3.8%	47.1%	34.6%	5.8%	8.7%	100.0%

Source: questionnaire results of the study

Table 55 above indicates that globalization remained largely unimportant in significantly disturbing effective risk management in commercial banks of Pakistan when analysing side by side with the views of participants regarding full Basel Capital Regulation compliance and globalization. The results above indicate that only 4 participants classed globalization as important, backed by further 9 participant as most important in effective risk management out of 91 participants who agreed or strongly agreed with Basel Compliance as most significant for effective risk management leaving in the same viewpoint group 50 participants classing globalization as unimportant followed by a further 3 as most unimportant. A large proportion of participants who agreed or strongly agreed that full Basel compliance is most important in effective risk management remained neutral when asked if globalization significantly impacts effective risk management in commercial banks of Pakistan.

Table 56. Senior Banker and Training

Experience as a senior banker * Number of Basel training courses attended Cross tabulation								
			Number of Basel training courses attended					
			None	1 to 3 Courses	4 to 6 Courses	7 to 9 Courses	9 or more	Total
Experience as a senior banker	0 to 5 Years	Count	2	9	0	0	0	11
		% of Total	1.9%	8.7%	0.0%	0.0%	0.0%	10.6%
	6 to 10 Years	Count	19	21	5	0	1	46
		% of Total	18.3%	20.2%	4.8%	0.0%	1.0%	44.2%
		Count	4	10	8	4	0	26
		% of Total	3.8%	11.1%	7.7%	3.7%	0.0%	25.3%

11 to 15 Years	% of Total	3.8%	9.6%	7.7%	3.8%	0.0%	25.0%
16 to 20 Years	Count	0	6	4	2	0	12
	% of Total	0.0%	5.8%	3.8%	1.9%	0.0%	11.5%
Above 21 Years	Count	0	2	1	5	1	9
	% of Total	0.0%	1.9%	1.0%	4.8%	1.0%	8.7%
Total	Count	25	48	18	11	2	104
	% of Total	24.0%	46.2%	17.3%	10.6%	1.9%	100.0%

Source: questionnaire results of the study

Table 56 locks in cross tabulation that offers a useful insight of experience gained in risk management as well as Basel Capital Regulation training undertaken by the participants. The above results paint a mixed picture. First of all it is noticeable that there 25 out of 83 participants that is 30% of respondents with up to 15 years of experience as senior bankers have not attended any Basel training courses. Within the same experience group further 48% respondent lurk in the category of between 1 to 3 Basel training courses. The results point out to the fact that participants with up to 15 years of experience as senior bankers have only had a maximum of three Basel training sessions. The result also shows that respondents with experience over 15 years, all have had exposure to Basel training. Overall amongst the respondents only 2 attended an impressive more than 9 training sessions and 29 attended between 4 to 9 Basel training sessions showing that opportunities for Basel exposure in Pakistan arise far and between, stressing need for a regular program for the industry operatives in commercial banks of Pakistan to keep abreast the recent consultation and developments.

Table 57. Senior Banker and Basel Approach

Experience as a senior banker * Basel provides most sophisticated and advanced data analysis methodologies for risk management in banking Cross tabulation

	Basel provides most sophisticated and advanced data analysis methodologies for risk management in banking	Total
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			Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Experience as a senior banker	0 to 5 Years	Count	0	0	0	4	7	11
		% of Total	0.0%	0.0%	0.0%	3.8%	6.7%	10.6%
	6 to 10 Years	Count	0	2	5	33	6	46
		% of Total	0.0%	1.9%	4.8%	31.7%	5.8%	44.2%
	11 to 15 Years	Count	0	0	0	22	4	26
		% of Total	0.0%	0.0%	0.0%	21.2%	3.8%	25.0%
Total	16 to 20 Years	Count	2	1	0	5	4	12
		% of Total	1.9%	1.0%	0.0%	4.8%	3.8%	11.5%
	Above 21 Years	Count	0	1	2	6	0	9
		% of Total	0.0%	1.0%	1.9%	5.8%	0.0%	8.7%
		Count	2	4	7	70	21	104
		% of Total	1.9%	3.8%	6.7%	67.3%	20.2%	100.0%

Source: questionnaire results of the study

Table 57 above displays cross tabulations of the participants' experience and Basel provided data analysis methodologies for risk management in commercial banks of Pakistan. Overall in total only 6 participants within varied experience range disagreed with the assertion that Basel provides most sophisticated and advanced data analysis methodologies for risk management. All of the participants with experience between 0 to 5 years and 11 to 15 years agreed or strongly agreed that Basel Capital Regulation as most sophisticated for risk management in commercial banks of Pakistan, however interestingly none of the respondent with experience over 21 years strongly agreed with that.

Respondents with experience as a senior banker between 16 to 20 years showed a varied response with a couple disagreeing strongly and 4 agreeing strongly. The results show valuable responses regarding Basel Capital Regulation guidelines for risk management in commercial banks of Pakistan and that there is always room for improvement. This also points out to involving as well as encouraging risk management operatives from variety of backgrounds and experience to take active part in ongoing Basel Capital Regulation consultations.

Table 58. Credit Risk and Economic Fluctuations on Capital requirements

Credit risk has significant impact on Bank capital requirements * Economic fluctuations significantly impact Bank Capital requirements Cross tabulation

			Economic fluctuations significantly impact Bank Capital requirements				Total
			Disagree	Neutral	Agree	Strongly agree	
Credit risk has significant impact on Bank capital requirements	Neutral	Count	0	2	2	0	4
		% of Total	0.0%	1.9%	1.9%	0.0%	3.8%
	Agree	Count	6	5	40	11	62
		% of Total	5.8%	4.8%	38.5%	10.6%	59.6%
	Strongly agree	Count	7	1	20	10	38
		% of Total	6.7%	1.0%	19.2%	9.6%	36.5%
Total		Count	13	8	62	21	104
		% of Total	12.5%	7.7%	59.6%	20.2%	100.0%

Source: questionnaire results of the study

Above table 58 presents results of cross tabulation of credit risk as a significant impactor versus economic activity as significantly impactor on bank capital requirements. The cross tabulation offers an opportunity collect views of respondents regarding impact of economic activity on minimum capital requirements of commercial banks of Pakistan. Credit risk not only impacts bank's capital requirements but forms a crucial part of formula in calculating capital adequacy ratios as per Basel Capital Regulation guidelines and above results in table 26 clearly show that respondents practically agreed with that. Therefore there are no respondents with disagree or strongly disagree option when asked if credit risk significantly impact bank capital requirements, only 4 industry operatives chose to remain indifferent. An overall majority of participant totalling 81 out of 100 respondents who agreed or strongly agreed with credit risk impacting bank capital requirements also agreed or strongly agreed that economic fluctuations significantly impact bank capital requirements. Yet there is no clear mechanism researched significantly for incorporating economic activity in capital adequacy formula or policy recommendations facilitating simultaneous monitoring of capital requirements of bank in line with economic activity to enable improved bank regulation and supervision.

Table 59. Basel compliance and Bank Size for risk management

Full compliance with Basel is most significant requirement for effective risk management in your bank *

Please rank most important for regulating banks - Bank size Cross tabulation

			Please rank most important for regulating banks - Bank size					Total
			most un-important	un-important	neutral	important	most important	
Full compliance with Basel is most significant requirement for effective risk management in your bank	Strongly disagree	Count	0	0	0	2	0	2
		% of Total	0.0%	0.0%	0.0%	1.9%	0.0%	1.9%
	Disagree	Count	2	5	0	0	0	7
		% of Total	1.9%	4.8%	0.0%	0.0%	0.0%	6.7%
	Neutral	Count	3	1	0	0	0	4

		% of Total	2.9%	1.0%	0.0%	0.0%	0.0%	3.8%
		Count	22	21	5	7	8	63
	Agree	% of Total	21.2%	20.2%	4.8%	6.7%	7.7%	60.6%
	Strongly agree	Count	14	5	1	4	4	28
		% of Total	13.5%	4.8%	1.0%	3.8%	3.8%	26.9%
	Total	Count	41	32	6	13	12	104
		% of Total	39.4%	30.8%	5.8%	12.5%	11.5%	100.0 %

Source: questionnaire results of the study

Table 59 displays views of respondent regarding importance of bank size as a measure for regulating banks with full compliance with Basel Capital Regulation as most significant requirement for effective risk management in commercial banks of Pakistan. The cross tabulation in table 27 yields interesting insights with majority population of respondents agreed or strongly agreed to Basel Capital compliance as an effective tool for risk management in commercial banks of Pakistan. It is interesting to note that an overall 73 respondents who agreed or strongly agreed with full compliance of Basel Capital Regulation for effective risk management also noted bank size as unimportant or most unimportant for regulating banks. Interestingly all respondent who disagreed with Basel Capital Regulation compliance as an effective tool for bank risk management ticked bank size unimportant and most unimportant, all in all only 25 respondents thought bank size

was important or most important. The result overall confirms that respondents viewed bank size as irrelevant in effective risk management.

Table 60. Liquidity and NPL on capital requirements

Liquidity has significant impact on Bank Capital requirements * Please rank most important for regulating banks - NPL Cross tabulation

				Please rank most important for regulating banks - NPL					Total
				most un- important	un- important	neutral	importa nt	most important	
Liquidity has Disagree significant impact on Bank Capital requirements	Count	2	2	1	2	0	7		
	% of Total	1.9%	1.9%	1.0%	1.9%	0.0%	6.7%		
	Neutral Count	0	0	2	6	2	10		
	% of Total	0.0%	0.0%	1.9%	5.8%	1.9%	9.6%		
	Agree Count	1	6	10	29	15	61		
	% of Total	1.0%	5.8%	9.6%	27.9%	14.4%	58.7%		
	Strongly agree Count	0	1	3	19	3	26		
	% of Total	0.0%	1.0%	2.9%	18.3%	2.9%	25.0%		
Total		Count	3	9	16	56	20	104	
		% of Total	2.9%	8.7%	15.4%	53.8%	19.2%	100.0 %	

Source: questionnaire results of the study

Table 60 above displays cross tabulations results of the responses between important risk management topics namely liquidity and nonperforming loans. Overall 73% respondents considered nonperforming loans as an important measure for bank regulations as compared to 84% respondents who viewed liquidity has significant impact on bank capital requirements in commercial banks of Pakistan. The majority of respondents who agreed or strongly agreed with the assertion that liquidity has significant impact on bank capital

requirements also ranked nonperforming loans as important or most important in regulating banks. Only a handful respondents who agreed with the role played by liquidity as significant in impacting bank capital requirements classed nonperforming loans as unimportant or most unimportant. The result explicates that bank regulation and supervisory authorities can use indicators in addition to Capital Adequacy ratio to keep track of the financial health of the commercial banks of Pakistan.

Table 61. Capital requirements and procyclicality for regulating banks

Please rank most important for regulating banks - Capital requirements * Please rank important bank risk -

Procyclicality Cross tabulation

			Please rank important bank risk - Procyclicality				Total
			most un- important	un- important	important	most important	
Please rank most important for regulating banks - Capital requirements	un- important	Count	4	0	4	3	11
		% of Total	3.8%	0.0%	3.8%	2.9%	10.6%
	un-important	Count	17	0	0	1	18
		% of Total	16.3%	0.0%	0.0%	1.0%	17.3%
	neutral	Count	8	2	1	5	16
		% of Total	7.7%	1.9%	1.0%	4.8%	15.4%
	important	Count	8	9	0	0	17
		% of Total	7.7%	8.7%	0.0%	0.0%	16.3%
	most important	Count	32	7	2	1	42
		% of Total	30.8%	6.7%	1.9%	1.0%	40.4%
Total		Count	69	18	7	10	104

% of Total	66.3%	17.3%	6.7%	9.6%	100.0%
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Source: questionnaire results of the study

The above table 61 locks in interesting findings regarding views on capital requirements and procyclicality cross tabulations. Result of the cross tabulation show that almost all respondents were of the view that procyclicality as an unimportant banking risk within commercial banks of Pakistan. The highest proportion of respondents (64%) marked procyclicality as important risk to commercial banks of Pakistan were interestingly of a view that capital requirement is most unimportant for regulating banks. This viewpoint however constituted the smallest group of respondents. The highest number of participants stood at whopping 84% who thought procyclicality as most unimportant banking risk while almost confirming that capital requirements remains the most important measure for regulating commercial banks in Pakistan.

The result remains in line with broader research objective of contributing to risk management in commercial banks as participants seemed fully aware as well agreeable to the international practices of bank regulations and supervision with claiming capital requirements as most important for regulating banks and discarding procyclicality as an important banking risk.

Table 62. Basel implementation status and profitability on capital requirements

To what extent Basel is implemented in your bank * Bank profitability significantly impacts Bank

Capital requirements Cross tabulation

	Bank profitability significantly impacts Bank Capital requirements				Total
	Disagree	Neutral	Agree	Strongly agree	
Count	4	0	7	7	18

To what extent is Basel implemented in your bank	Fully Compliant	% of Total	3.8%	0.0%	6.7%	6.7%	17.3%
	To large extent	Count	6	5	37	16	64
		% of Total	5.8%	4.8%	35.6%	15.4%	61.5%
	Neutral	Count	0	2	10	4	16
		% of Total	0.0%	1.9%	9.6%	3.8%	15.4%
	Not Compliant	Count	0	0	4	2	6
		% of Total	0.0%	0.0%	3.8%	1.9%	5.8%
	Total	Count	10	7	58	29	104
		% of Total	9.6%	6.7%	55.8%	27.9%	100.0 %

Source: questionnaire results of the study

The results displayed in table 62 in the series of cross tabulations regarding how participants viewed Basel compliance in their banks side by side with their responses on profitability as a significant influencer of bank capital requirements. An overall 87 out of 104 respondents agreed with the assertion that bank profitability impacts bank capital requirements significantly. Analysing further commercial banks in Pakistan calculate credit risk, market risk and operational risk with standardized approach under Basel Capital Regulation with no banks achieved the status of Advanced Internal Rating Based (AIRB) methodologies. AIRB methodologies are developed by large internationally active banks, none in Pakistan. The response option ‘to large extent’ with regards to extent of Basel Compliance reflected the most accurate status of Basel Capital Regulations compliance in Pakistan. Large majority (62%) of respondent did tick the correct option indicating that overall industry operative are well aware of their banks take on Basel Capital Regulation compliance. Interestingly, 53 out of 64 participant who thought that their bank complied with Basel to large extent also agreed or strongly agreed with the assertion that profitability impacts bank capital requirement significantly and 6 remained neutral.

Table 63. Economic fluctuations and NPL on capital requirements

Economic fluctuations significantly impact Bank Capital requirements * Please rank most important for regulating banks - NPL Cross tabulation

			Please rank most important for regulating banks - NPL					Total
			most un- important	un- important	neutral	importa nt	most important	
Economic fluctuations significantly impact Bank Capital requirements	Disagree	Count	0	0	3	8	2	13
		% of Total	0.0%	0.0%	2.9%	7.7%	1.9%	12.5%
	Neutral	Count	0	2	1	1	4	8
		% of Total	0.0%	1.9%	1.0%	1.0%	3.8%	7.7%
	Agree	Count	3	5	9	36	9	62
		% of Total	2.9%	4.8%	8.7%	34.6%	8.7%	59.6%
	Strongly agree	Count	0	2	3	11	5	21
		% of Total	0.0%	1.9%	2.9%	10.6%	4.8%	20.2%
Total		Count	3	9	16	56	20	104
		% of Total	2.9%	8.7%	15.4%	53.8%	19.2%	100.0 %

Source: questionnaire results of the study

Table 63 shows that 34.6% of participants who agreed with assertion economic fluctuations significantly impact bank capital requirements also considered nonperforming loans as an important measure in regulating commercial banks of Pakistan followed by 8.7% viewed nonperforming loans as most important in regulating commercial banks of Pakistan. The same trend continued with a total of 15.4% of the participants who strongly agreed with economic factors significantly impact bank capital requirements also considered nonperforming loan as most important in regulating commercial banks of Pakistan.

Table 64. Credit risk and NPL on capital requirements

Please rank important bank risk - Credit risk * NPL have significant effect on Bank Capital requirements Cross tabulation

				NPL have significant effect on Bank Capital requirements					Total
				Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Please rank most un- important bank risk - important Credit risk	Count			0	0	0	3	0	3
	% of Total			0.0%	0.0%	0.0%	2.9%	0.0%	2.9%
	un-important	Count		0	0	0	0	1	1
	% of Total			0.0%	0.0%	0.0%	0.0%	1.0%	1.0%
	neutral	Count		2	0	0	15	0	17
	% of Total			1.9%	0.0%	0.0%	14.4%	0.0%	16.3%
	important	Count		0	0	2	20	7	29
	% of Total			0.0%	0.0%	1.9%	19.2%	6.7%	27.9%
	most important	Count		0	4	1	23	26	54
	% of Total			0.0%	3.8%	1.0%	22.1%	25.0%	51.9%
Total				Count					
				% of Total					
				2	4	3	61	34	104
				1.9%	3.8%	2.9%	58.7%	32.7%	100.0%

Source: questionnaire results of the study

In our series of cross tabulations, table 64 above displays interesting side by side analysis of when participants were prompted to give views regarding credit risk as most important banking risk and their status of agreement regarding significant impact of nonperforming loans on bank capital requirements. An overwhelming 22.1% and 25% of participants agreeing and strongly agreeing that nonperforming loans have significant effect on bank capital requirements also thought Credit risk as most important banking risk faced by

commercial banks of Pakistan followed by 19.2% and 6.7% participant who viewed credit risk as important agreed and strongly agreed respectively, with nonperforming loans breeding significant impact on bank capital requirements. Interestingly, 14.4% of the participants who remained neutral to credit risk being most important banking risk respectively also agreed with nonperforming loan have significant impact on capital requirements of commercial banks of Pakistan.

Table 65. Liquidity and Market risk on capital requirements

Please rank important bank risk - Liquidity * Market risk has significant impact on Bank Capital requirements Cross tabulation

			Market risk has significant impact on Bank Capital requirements				Total
			Disagree	Neutral	Agree	Strongly agree	
Please rank most un-Count important bank risk - important % of Liquidity Total			2	0	12	2	16
			1.9%	0.0%	11.5%	1.9%	15.4%
	un-important	Count	2	2	19	15	38
		% of Total	1.9%	1.9%	18.3%	14.4%	36.5%
	neutral	Count	2	0	25	4	31
		% of Total	1.9%	0.0%	24.0%	3.8%	29.8%
	important	Count	2	0	3	5	10
		% of Total	1.9%	0.0%	2.9%	4.8%	9.6%
	most important	Count	0	0	8	1	9
		% of Total	0.0%	0.0%	7.7%	1.0%	8.7%
Total			8	2	67	27	104
			7.7%	1.9%	64.4%	26.0%	100.0%

Source: questionnaire results of the study

To sum up our series of cross tabulation analysis, table 65 above present views of participants regarding importance of liquidity cross tabulated with impact of market risk

on bank capital requirements. Interestingly a significant percentage 18.3% and 14.4% of respondent respectively agreed and strongly agreed with assertion that market risk has significant impact on capital requirements of the bank, but viewed liquidity risk as unimportant. A further 11% and 1.9% respectively, added to agree and strongly agree category that market risk causes significant fluctuations in bank capital requirements remained even more unimpressed marking liquidity risk as most unimportant. The result shows that participants who overall agreed with market risk causing fluctuations in capital requirements also viewed liquidity as unimportant in commercial banks of Pakistan.

6.2.4 Results of Chi-Square tests

Chi-square test applied as the study used categorical variables in order to test the validity of the distribution. Null hypothesis under chi-squared tests that data follow expected distributions. The behaviour of observed versus expected counts analysed below.

Table 66. Credit risk on Bank capital requirements

Credit risk has significant impact on Bank capital requirements			
	Observed N	Expected N	Residual
Neutral	4	34.7	-30.7
Agree	62	34.7	27.3
Strongly agree	38	34.7	3.3
Total	104		

Source: calculations from questionnaire results of the study

H_o : Credit risk has no significant impact on Bank capital requirements

H_a : Credit risk has significant impact on Bank capital requirements

The above table 66 shows a net positive residual of 30.6 in favour of the assertion that credit risk impact on bank capital requirements with no opposition.

Table 67. Market risk on Bank capital requirement

Market risk has significant impact on Bank Capital requirements

	Observed N	Expected N	Residual
Disagree	8	26.0	-18.0
Neutral	2	26.0	-24.0
Agree	67	26.0	41.0
Strongly agree	27	26.0	1.0
Total	104		

Source: calculations from questionnaire results of the study

H_o : Market risk has no significant impact on Bank capital requirements

H_a : Market risk has significant impact on Bank capital requirements

The net positive residual of observed remains above expected count in favour of the statement that market risk has significant impact on capital requirements of the commercial banks of Pakistan as per results displayed in table 67 above.

Table 68. Operational risk on Bank capital requirement

Operational risk significant impact on Bank Capital requirements

	Observed N	Expected N	Residual
Disagree	11	26.0	-15.0
Neutral	8	26.0	-18.0
Agree	59	26.0	33.0
Strongly agree	26	26.0	.0
Total	104		

Source: calculations from questionnaire results of the study

H_o : Operational risk has no significant impact on Bank capital requirements

H_a : Operational risk has significant impact on Bank capital requirements

The results displayed in frequency table 68 above show net positive residual over expected confirming that operational risk has impact on minimum capital requirements of commercial banks of Pakistan.

Table 69. Liquidity on Bank capital requirements

Liquidity has significant impact on Bank Capital requirements

	Observed N	Expected N	Residual
Disagree	7	26.0	-19.0
Neutral	10	26.0	-16.0
Agree	61	26.0	35.0
Strongly agree	26	26.0	.0
Total	104		

Source: calculations from questionnaire results of the study

H_o: Liquidity has no significant impact on Bank capital requirements

H_a: Liquidity has significant impact on Bank capital requirements

The net residual of observed over expected remains in favour of the statement that liquidity risk has significant impact on capital requirements of the commercial banks of Pakistan as per results displayed in table 69.

Table 70. NPL on Bank capital requirements

NPL have significant effect on Bank Capital requirements

	Observed N	Expected N	Residual
Strongly disagree	2	20.8	-18.8
Disagree	4	20.8	-16.8
Neutral	3	20.8	-17.8
Agree	61	20.8	40.2
Strongly agree	34	20.8	13.2
Total	104		

Source: calculations from questionnaire results of the study

H_o: NPL have no significant impact on Bank capital requirements

H_a: NPL have significant impact on Bank capital requirements

Table 70 above locks in results for the chi square test displaying that net positive residual in favour of the assertion that nonperforming loans have significant impact on minimum capital requirements of commercial banks of Pakistan.

Table 71. Bank size on Bank capital requirements

Bank size significantly impacts Bank Capital requirements			
	Observed N	Expected N	Residual
Strongly disagree	3	20.8	-17.8
Disagree	13	20.8	-7.8
Neutral	10	20.8	-10.8
Agree	54	20.8	33.2
Strongly agree	24	20.8	3.2
Total	104		

Source: calculations from questionnaire results of the study

H₀: Bank size has no significant impact on Bank capital requirements

H_a: Bank size has significant impact on Bank capital requirements

Table 71 above presents the result that the net residual of observed values over expected values in favour of the statement that bank size effects minimum capital.

Table 72. Bank profitability on Bank capital requirements

Bank profitability significantly impacts Bank Capital requirements			
	Observed N	Expected N	Residual
Disagree	10	26.0	-16.0
Neutral	7	26.0	-19.0
Agree	58	26.0	32.0
Strongly agree	29	26.0	3.0
Total	104		

Source: calculations from questionnaire results of the study

H₀: Bank profitability has no significant impact on Bank capital requirements

H_a: Bank profitability has significant impact on Bank capital requirements

The statement regarding impact of bank profitability on minimum capital requirements of the commercial banks of Pakistan delivered a net residual of 35 over expected value in favour as shown in table 72 above.

Table 73. Economic fluctuation on Bank capital requirements

Economic fluctuations significantly impact Bank Capital requirements			
	Observed N	Expected N	Residual
Disagree	13	26.0	-13.0
Neutral	8	26.0	-18.0
Agree	62	26.0	36.0
Strongly agree	21	26.0	-5.0
Total	104		

Source: calculations from questionnaire results of the study

H_o : Economic fluctuation have no significant impact on Bank capital requirements

H_a : Economic fluctuations have significant impact on Bank capital requirements

The results displayed in table 73 above shows a net residual value of 31.0 over the expected values in favor of the question that procyclicality significantly impacts the minimum capital requirements of the commercial banks of Pakistan.

Table 74. Test Statistics

SPSS- Test Statistics								
	Credit risk has significant impact on Bank capital requiremen ts	Market risk has significant impact on Bank Capital requirement	Operational risk significant impact on Bank Capital requirement s	Liquidity has significant impact on Bank Capital requirement	NPL have significant effect on Bank Capital requirement s	Bank size significantly impacts Bank Capital requirement s	Bank profitability significantly impacts Bank Capital requirement s	Economic fluctuations significantly impact Bank Capital requiremen ts
Chi-Square	49.000 ^a	99.308 ^b	63.000 ^b	70.846 ^b	131.865 ^c	77.250 ^c	63.462 ^b	69.769 ^b
Df	2	3	3	3	4	4	3	3
Asymp. Sig.	.000	.000	.000	.000	.000	.000	.000	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 34.7.

- b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 26.0.
- c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 20.8.

Above table 41 shows the expected values of the number of sample observations in each level of variables. The results decree that data cannot accept the null hypothesis and observed sample frequencies differ significantly from expected frequencies.

6.3 Chapter Conclusion

The results of the analysis of the questionnaires carried out used straight analysis across the board. In addition cross tabulations applied on restricted cases adding closing remarks with chi-square test results. It turns out that risk management in commercial banks of Pakistan is overwhelmingly approved and applied. Industry operatives of commercial banks in Pakistan were educated and experienced in the field of risk management in banking, therefore proved particularly knowledgeable of the international bank regulations and supervision practices on risk management compliance in commercial banks of Pakistan under Basel International Capital Accord. This reflects to the effective contribution of the Bank Regulations and Supervisory institutions of Pakistan in particular State Bank of Pakistan through circulars and Bank surveillance division in clarifying the objectives of complying with international standard of Basel Capital Adequacy regime as a serious business. As a result of the efforts extended by the State Bank of Pakistan the participants of the study seemed convinced of improvements introduced to risk management practices in commercial banks of Pakistan under International Basel Capital Adequacy regime. The participants of the study significantly evidenced their expertise and showed their awareness as well as approval of the current composition of capital adequacy ratios under Basel Capital Regulation for regulating and supervising banks. However, the results did not support the null hypothesis of the study that capital adequacy ratio under Basel is sufficient enough indicator of solvency health of commercial banks of Pakistan. The results point out to the fact that participants approved of factors in addition to current ingredients of credit risk, market risk and operational risk significantly affect directly or indirectly the minimum capital requirements of the commercial banks in Pakistan. These included nonperforming

loans, bank size, profitability and liquidity. With liquidity now incorporated in the Basel calculations, the participant views decree that there still remain more indicators that should be monitored under risk management to have even clearer picture of financial health of commercial banks of Pakistan for the purpose of bank regulations and supervisory. The results of the survey also shed light to the fact that participants carried experience in the risk management practices in Pakistan and applied their experience, market knowledge and skills in risk management decision making under the guidelines set by the regulator. The participants also viewed procyclicality as an important factor and approved that economic fluctuations also impact minimum capital requirements of the commercial banks in Pakistan and therefore aggravate procyclicality.

Chapter 7: Secondary Data Analysis

7.1 Introduction

The study aims to examine in Pakistan in particular, the widely assumed role of international financial regulation and supervision on banks in improving risk management, profitability and thence overall reducing commercial bank sector's contribution towards causing events of economic collapse (Michalopoulos, Leaven and Levine 2009; Barth et al 2010; Chortareas et al 2012). There is plentiful evidence of varied shuffles of bank specific variables and economic indicators arranged in baffling sets of relationships in attempt to gauge the impact of banks capital behavior on the economic activity. The bulk of the literature, owing to extensive research activity makes notable progress in China, Gulf, United Kingdom, Europe and Americas²¹⁴. The literature on developing economies

²¹⁴ See Bouheni et al (2014); Messai and Jouini (2013); Klein (2013) for detailed discussion on Europe and Americas. Al-Khouri (2011) examined data of 43 commercial banks in the Gulf over the period 1998-2008 applying fixed effect model. Cai and Huang (2014) for China.

evidence number of attempts to estimate impact of financial sector on economic activity in Pakistan however, research on role of commercial banks capital behavior in the economy for instance, continues well off pace in addressing capital adequacy shortcomings²¹⁵.

7.2 Research Data

Data discussed as follows, directly extracted from the balance sheet, profit and loss statement and notes to the accounts of the sampled banks. The secondary data comprise of Bank Specific Variables namely Non-performing loan ratio (NPLR), Return on Asset (ROA), Return on Equity (ROE), Size (LGTA), Credit risk weighted assets to total assets (CRR), Market risk weighted assets to total assets (MRR) and Operational risk weighted assets to total assets (ORR); and 2 Macroeconomic variables GDP growth rates (GDPGR) and Industrial Production Index of Pakistan growth rates (IIPGR), hypothesized to capture the influence on the dependent variable Capital Adequacy Ratio (CAR). Pakistan is compliant with International Financial Reporting Standards (IFRS) under the organizing bodies of ‘The Institute of Chartered Accountants of Pakistan’ (ICAP) and ‘Securities and Exchange Commission of Pakistan’ (SECP)²¹⁶.

7.2.1 Capital Adequacy Ratio (CAR)

Capital Adequacy Ratio (CAR), the dependent variable extracted directly from notes to the accounts of the commercial banks of Pakistan. The CAR is regarded by the International Bank Capital Regulations and Supervision authorities as most important predictor of Banks

²¹⁵ In Pakistan see contributions by Ali et al (2011) by way of descriptive statistics and regression for the period between 2006 and 2009; Akhtar and Nishat (2002) use of DEA; Usman (2010) studied impact of Global financial crises on Pakistan; Alam et al (2011) attempts to study Pakistan commercial banks financial performance.

²¹⁶ The Institute of Chartered Accountants of Pakistan (ICAP) regulates chartered accountants in Pakistan and standard setting body for Islamic Financial Accounting Standards. Securities and Exchange Commission of Pakistan (SECP) financial regulatory body that monitors accounting standards for all entities in Pakistan. SECP is member of International Organization of Securities and Commissions (IOSCO), International Association of Insurance Supervisors (IAIS), International Organization of Pension Supervisors (IOPS) and Corporate Registers Forum (CRF).

ability to respond to external shock and demands regulators' full attention in thoroughly scrutinizing banks' positions. CAR indicates the level of banks financial fitness to absorb external shock in times of economic distress and calculated as percentage of risk weighted assets. In Pakistan risk weights are applied under Basel Capital guideline in line with research motive to establish the behavior of Basel Capital regulation in times of economic bother and after the global financial crises in Pakistan. Minimum capital requirements set at minimum of 8% and as calculated under pillar 1 of Basel Capital Accord affects directly the banks' capital structure with follow up reflections on the risk weightings. Larger minimum capital requirements would impact in restricted operations of the banking sacrificing profitability and growth, whereas lower minimum capital requirements can be argued to allow banks to increase business investing in riskier positions (Wei 2011).

7.2.2 Bank Size (LGTA)

Total assets indicate the extent of bank operations, size and asset portfolio. Total assets are directly linked with the fluctuations in the capital structure of the bank therefore remain an important determinant of the capital ratios. On the contrary large banks enjoy good reputations and ratings but are equally subject to lower capital adequacy ratios see Jackson et al (2002); Gropp and Haider (2007). The study used natural logarithm of total assets as proxy of bank size (Kashyap and Stein 1995).

H₀: Bank size has no significant impact on Capital Adequacy Ratio

H_a: Bank size has significant impact on Capital Adequacy Ratio

7.2.3 Profitability (ROE and ROA)

Return on Equity and Return on Assets constitute most important profitability indicators. Profit after tax is used to calculate both ratios. There is no denying in profit directly influence capital base of the banks in form of retained earnings. In addition, the profit serves as proxy to the riskiness of banks assets impacting the risk management and Capital Adequacy Ratio see Buyuksalcarci and Abdioglu (2011):

H₀: ROA has no significant impact on Capital Adequacy Ratio

H_a: ROA has significant impact on Capital Adequacy Ratio

H₀: ROE has no significant impact on Capital Adequacy Ratio

H_a: ROE has significant impact on Capital Adequacy Ratio

7.2.4 Non-performing loan ratio (NPLR)

The ratio calculated as the non-performing loans to total advances. Non-performing loan easily qualifies as most important indicator relating to whole of the economy (Sorge 2004). This can be simply explained as growing economy generally increases income levels suggesting better affordability of loans. For banks non-performing loans directly impact profitability, represent financial riskiness and influence capital adequacy ratios. NPL thus becomes an important bank specific predictor to impact of minimum capital requirements in Pakistan (Khemraj and Pasha 2009).

H₀: NPLR has no significant impact on Capital Adequacy Ratio

H_a: NPLR has significant impact on Capital Adequacy Ratio

7.2.5 Credit risk weighted assets to Total Assets (CRR)

Keeping at par with international risk management practices credit risk weightings are applied as per Basel Capital Guidelines in Pakistan. Credit risk is major determinant of Asset quality in banking. In fact, Basel Capital Regulation declares Credit risk as most important element in calculating Capital Adequacy Ratio (CAR). Basel Capital Regulation also sets CAR as central measure of Bank's ability to respond to economic shock. The study puts Basel claims to test and aims to identify if CAR incorporates the true impact of Credit risk in Pakistan. In addition, CRR has positive relationship with Capital Adequacy Ratio as increase in credit risk should theoretically mean an increase in minimum capital requirements. The research monitors the behavior of actual credit risk weighted assets to determine the credit riskiness of the total assets for each bank. The following formula applied to derive CRR where data is taken from notes to the accounts:

$$CRR = \text{Credit risk weighted assets} / \text{total assets} \times 100$$

H₀: CRR has no significant impact on Capital Adequacy Ratio

H_a: CRR has significant impact on Capital Adequacy Ratio

7.2.6 Market risk weighted assets to Total Assets (MRR)

Market risk weightings are applied under Basel Capital Guidelines. The Market risk directly impacts the risk management in banking and should be reflected in their day to day positions. Importance of market risk is duly acknowledged by the Basel Capital Accord and is therefore a major determinant in calculating CAR as per Basel Capital regulations. Higher market risk simply equates to additional capital required to deal with the situation. Here too, actual market risk weighted assets was taken against total assets to determine market riskiness of the total assets portfolio, data from annual accounts was used in the following formula to derive MRR:

$$\text{MRR} = \text{Market risk weighted assets} / \text{total assets} \times 100$$

H₀: MRR has no significant impact on Capital Adequacy Ratio

H_a: MRR has significant impact on Capital Adequacy Ratio

7.2.7 Operational risk weighted assets to Total Assets (ORR)

Basel Capital Accord identifies Operational Risk and third most important factor in calculating CAR, at par with Credit risk and Market risk. Commercial banks in Pakistan apply operational risk weighting under Basel Capital Guidelines in calculating CAR. The ORR has positive relationship with Capital Adequacy Ratio and actual operational risk weighted assets data used from the annual accounts in the following formula derive ORR as an indicator of operational riskiness of the total assets profile:

$$\text{ORR} = \text{Operational risk weighted assets} / \text{total assets} \times 100$$

H₀: ORR has no significant impact on Capital Adequacy Ratio

H_a: ORR has significant impact on Capital Adequacy Ratio

7.2.8 Gross Domestic Product (GDPGR)

In order to construct economic impact of banks capital requirements it is important to gauge economic activity in line with fluctuations in banks capital base, however the evidence in literature of a causal relationship is scarce (Martynova 2015). Gross domestic product (GDP) serves as the best proxy of economic activity where increased economic activity encourages borrowing directly affecting the size and quality of banks assets. Increased economic activity would mean better credit quality and lower CAR. GDP growth rates therefore is considered important determinant of the CAR with inverse relationship and included in our econometric model.

H₀: GDPGR has no significant impact on Capital Adequacy Ratio

H_a: GDPGR has significant impact on Capital Adequacy Ratio

7.2.9 Industrial Production Index of Pakistan (IIPGR)

Industrial production index of Pakistan is an important proxy of economic activity concentrating sector wise banks' lending on manufacturing, mining, construction and energy distribution (Ali et al 2010). Thus IIP of Pakistan growth rates used by the study to establish the role of IIPGR in predicting CAR. Economic growth historically encourage sector wise borrowing and directly impact minimum capital requirements of the banks through asset quality.

H₀: IIPGR has no significant impact on Capital Adequacy Ratio

H_a: IIPGR has significant impact on Capital Adequacy Ratio

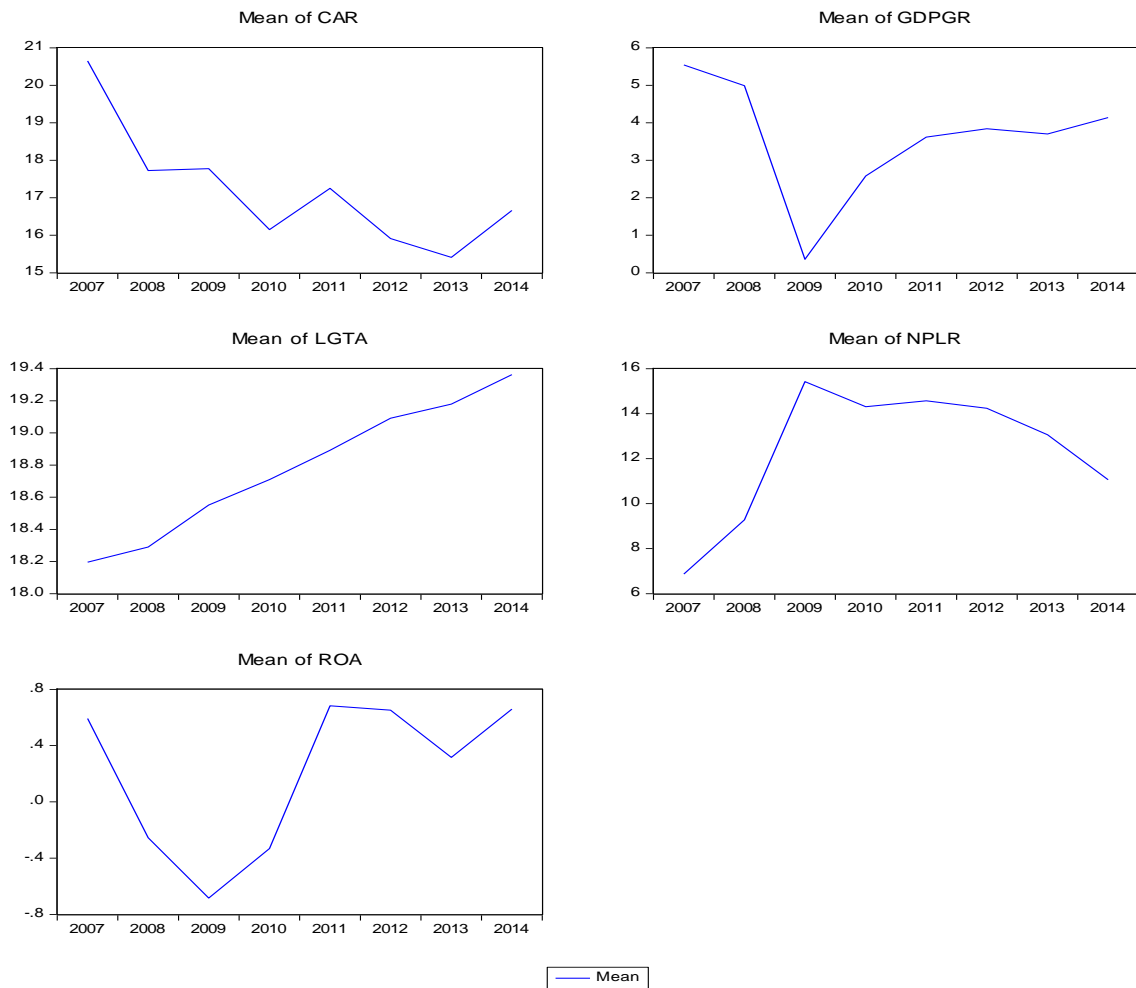
7.3 Stylized facts

Financial liberalization in Pakistan began in early 90s when private sector, knocking at the doors of the banking sector of Pakistan was allowed a way in. Late 90s saw privatization of two large state owned banks²¹⁷ out of seven at the time. The decade also witnessed

²¹⁷ Muslim Commercial Bank (MCB) and Allied Bank Limited (ABL) both banks part of the current big 6. Other 4 are United bank limited (UBL), National bank of Pakistan (NBP), Habib bank limited (HBL) and Bank Al-Falah (BAFL)

minimized intervention by the government in banking sector of Pakistan. Pakistan commercial banks grew in asset size, similar trend followed in foreign banks' assets operating in Pakistan. Deposits and advances grew tremendously during the decade. Privatization further put in top gear through 2000's where the banking sector remained largely resilient even during the crises period (Jalil and Feridun 2011). Economic growth of Pakistan remained strong since 1950s recession, however steep decline in GDP growth rates (GDPGR) witnessed as Global financial crises did penetrate Pakistan economy inflicting sudden decline in foreign investment. Despite rise in remittances, the GDP growth rates remained on a downward trend due to decline in exports as well as energy crises, inflation, security issues, poverty and inequality, where signs of recovery surfaced much quicker. Figure 4 shows that return on assets (ROA) of commercial banks of Pakistan remain strongly positively correlated with the GDP growth rates with almost equivalent negative dive. The nonperforming loans (NPLR) show strong negative correlation with both GDP growth rates and return on assets (ROA) from 2007 to 2009 showing a steep climb. Commercial banks in Pakistan operate well above Capital Adequacy Ratio (CAR) threshold of 8% set by the Basel International regulatory guidelines and their internationally active counterparts. Capital adequacy ratio of commercial banks in Pakistan witness downward trend since 2007 nevertheless still trails well above Basel Capital Regulations guidelines. The drop in capital can be intuitive of number of scenarios for example acting as a buffer to encounter liquidity issues faced due to shortage in foreign investment; increasing asset portfolios; or simply to align with Basel Capital guidelines of 8%. Nevertheless, the total assets (LGTA) of banks in Pakistan shows a constant growth pattern.

Figure 5: Banking Sector of Pakistan



7.4 Empirical Results

Sample means, medians, maximums, minimums, standard deviations, skewness and kurtosis arranged in table 75. Data asymmetry is evident as skewness negative for GDPGR, IIPGR, LGTA, ROE and ROA suggesting fat tails towards the left where CAR, CRR, MRR, ORR and NPLR with positive skewness. Kurtosis seen deviate from 3 in majority of series to confirm non normality. P-values for the calculated Jarque-Bera statistic show that null hypothesis for normality distribution assumption for CAR, MRR, ORR, GDPGR, IIPGR, ROE, ROA and NPLR rejected at 1%; rejected for LGTA at 5%; and rejected for CRR at 10%.

Table 75. Descriptive Statistics (Secondary Data)

	CAR	CRR	GDPGR	IIPGR	LGTA	MRR	NPLR	ORR	ROE	ROA
Mean	17.19503	50.85653	3.596250	3.372500	18.78101	4.162764	12.38750	7.841684	-1.559196	0.201558
Median	14.47000	47.90000	3.770000	3.515000	18.88000	2.880000	10.13500	6.495000	7.410000	0.660000
Maximum	65.43000	90.87000	5.540000	9.030000	21.35000	26.46000	91.11000	80.09000	28.57000	3.980000
Minimum	0.560000	10.41000	0.360000	-4.180000	15.74000	0.030000	0.220000	0.400000	-270.5500	-7.080000
Std. Dev.	10.86166	14.20106	1.486674	3.700637	1.306938	4.567547	10.28677	9.175587	35.94958	1.888551
Skewness	1.898491	0.392601	-0.947349	-0.567606	-0.168658	1.886415	2.924425	6.383892	-3.944495	-1.571557
Kurtosis	7.088175	2.990309	3.331503	2.946775	2.201025	7.368392	19.65877	46.36950	22.95257	5.751644
Jarque-Bera	258.1216	5.112942	30.83146	10.76282	6.236529	276.2543	2545.744	16692.09	3816.997	144.6955
Probability	0.000000*	0.077578***	0.000000*	0.004601*	0.044234**	0.000000*	0.000000*	0.000000*	0.000000*	0.000000*
Obs	199	199	200	200	199	199	196	196	199	199

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

For unit root testing in panel datasets Levin, Lin and Chu (2002), Im, Pesaran and Shin (2003), and Fisher-type (Choi 2001) test null hypothesize that all the panels contain a unit root. In order to overcome the issue of heterogeneity bias across cross-sections and confirm reliability of the parameter estimates, time series properties of data examined. Levin, Lin and Chu test results in column 2 of the Table 76 significantly reject the null hypothesis and hence all variables exhibit stationarity traits.

Table 76. Stationarity tests

Variables	Levin, Lin and Chu	p- value	Im, Pesaran and Shin	p- value	ADF- Fisher Chi- square	p- value	PP- Fisher Chi- square	p- value
-----------	--------------------------	-------------	----------------------------	-------------	----------------------------------	-------------	---------------------------------	-------------

CAR	-22.86	0.00	-4.83	0.00	111.2 4	0.00	93.36	0.00
CRR	-28.45	0.00	-8.56	0.00	145.2 5	0.00	117.3 9	0.00
MRR	-9.79	0.00	-2.41	0.00	85.65	0.00	90.92	0.00
ORR	-72.80	0.00	-19.74	0.00	139.8 7	0.00	134.8 9	0.00
NPLR	-9.36	0.00	-2.55	0.00	83.86	0.00	104.5 7	0.00
LGTA	-8.35	0.00	0.82	0.79	59.56	0.16	46.89	0.59
ROA	-18.08	0.00	-6.07	0.00	136.5 5	0.00	136.1 4	0.00
ROE	-10.17	0.00	-3.37	0.00	100.1 3	0.00	110.8 6	0.00
GDPGR	-18.06	0.00	-5.66	0.00	137.0 2	0.00	97.28	0.00
IIPGR	-12.95	0.00	-4.99	0.00	125.7 1	0.00	90.66	0.00

7.4.1 Fixed and Random Effects

Panel data sometimes termed as longitudinal data or cross sectional time-series, most importantly allows for individuality of each cross section, for example level of staff expertise, cultural applications or occupational practices and so forth in each commercial bank of Pakistan. Panel data may be analysed with ‘Fixed effects’ and ‘Random effects’ techniques. In order to establish impact of variables that vary over time in panel data sets, fixed effects technique is commonly deemed appropriate. Fixed effects modelling reconnoitre relationship between dependent and independent variables within each commercial bank, responding to assumptions that each bank in the sample has its own individual characteristics that may or may not influence the predictor variables. Fixed effects model controls for any unobservable characteristics existing within each bank that may or may not impact the independent and dependent variables. In other words the effect

of those time-invariant properties must be removed to bring to surface the net effect of the explanatory variables on the dependent variable. Advancing on the concept, fixed effects model assumes each bank is unique so that those time-invariant properties are unique to each bank. Fixed effects can be estimated in following forms:

$$Y_{it} = \beta X_{it} + \alpha_i + u_{it}$$

Where Y, X and u represent the outcome variable, independent variables and the error term, i represent bank at time t , β represents the coefficients of independent variables. The fixed effects is α_i ²¹⁸ that induces unobserved heterogeneity and X_{it} represents observed heterogeneity. The term u_{it} contain the remaining omitted variables. Test for redundant fixed effects is applied to test for unobserved heterogeneity, if there is no unobserved heterogeneity the model reports pooled regression. Fixed effects Least Squares Dummy Variable (LSDV) facilitates enhanced understanding of the fixed effects by adding a dummy variable for each bank absorbing the effects unique to that bank, therefore by adding dummy for each bank, pure effect can be estimating by controlling for unobserved heterogeneity. LSDV estimation model includes $n-1$ dummy variables. Fixed effects rewritten for LSDV as:

$$Y_{it} = \beta X'_{it} + \alpha_1 D^1_i + \dots + \alpha_n D^n_i + u_{it}$$

Fixed effects model can capture the business cycle, unexpected variation or special events, therefore the period effects may be added as:

$$Y_{it} = \beta X'_{it} + \alpha_i + \delta_t + u_{it}$$

δ_t captures omitted variables at every time period and is constant over cross sections. Random effects technique takes into account that variations across the banks could be random and uncorrelated with the predictor variables in the model. Each bank's error term is uncorrelated with the explanatory variables and therefore allows time-invariant variables to join in as explanatory variables. Thus, Random effects modelling serves the assumption that there may be reason to believe that the difference across banks have some predictor capabilities on the dependent variable. Random effects modelling allows for time invariant

²¹⁸ α_i ($i=1 \dots n$), where n is bank specific intercepts

variables to be included with introduction of between entity estimator ϵ_{it} in the model below:

$$Y_{it} = \beta X'_{it} + \gamma + \epsilon_{it} + u_{it}$$

In sum, we report Fixed effects (LSDV) model tackle the issue of heterogeneity by allowing each bank to have its own intercept value that does not vary over time. Fixed effects model seems to be to appropriate, however in data sets with large number of cross sections in comparison with time periods Random effects appears appropriate²¹⁹. Random effects estimation reported with generalized least squares (EGLS). Generalized Least Squares takes care of unobservable heteroscedasticity and autocorrelation present in panel datasets.

7.4.2 Hausman test

Hausman test based on chi-squared test static applied to decide between fixed effects and random effects models and then appropriate model reported (Wooldridge 2010). Hausman test tests whether the unique errors (u_i) are correlated with regressors therefore null hypothesis under Hausman test is that unique errors (u_i) are not correlated with regressors. In testing our panel data we start by reporting redundant fixed effects – likelihood ratio in table 77, we observe the value of F-statistic at 23.19 (p-value 0.000). The results suggest that panel data can apply either or both cross-section random and fixed effects estimation (Bai 2009).

Table 77. Likelihood ratio

Redundant Fixed Effects Tests

Equation: EQ01

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	23.196499	(24,160)	0.0000

²¹⁹ see Kaufman (2013)

We report our estimations results in table 78. Equation 1 correspond to cross section fixed effects and equation 2 cross section random effects for comparison where the standard errors are reported in brackets. *, **, *** denote significance level at 1, 5 and 10% respectively.

Table 78. Regression Results

Dependent variable: CAR

Explanatory Variable	Equation 1	Equation 2
	FIXED EFFECTS	RANDOM EFFECTS
Constant	167.3917* (31.6648)	136.3107* (14.7041)

CRR	-0.264053*	(0.063532)	-0.228854*	(0.031096)
MRR	-0.079384	(0.103639)	-0.039773	(0.097454)
ORR	0.181179**	(0.07284)	0.201769*	(0.033246)
NPLR	-0.051907	(0.045843)	-0.059094	(0.04565)
LGTA	-7.323359*	(1.516714)	-5.789702*	(0.717929)
GDPGR	0.074524	(0.599851)	0.120555	(0.699873)
IIPGR	0.044211	(0.239108)	0.010784	(0.284673)
ROE	0.052732**	(0.021481)	0.056857*	(0.014378)
ROA	-0.959714*	(0.359391)	-0.979191*	(0.33912)
Panel observation (unbalanced)	194		194	
R-squared	0.889358		0.493221	
Adjusted R-squared	0.866538		0.468433	
F-statistic	38.97281		19.8975	
Prob(F-statistic)	0.0000		0.0000	

Standard errors are reported in brackets. *, **, *** denote significance level at 1, 5 and 10% respectively

Hausman test reported in table 79 below suggests that the coefficients of the random effects model are the same as fixed effects. Therefore, p-value is insignificant as per the results of the Hausman test, therefore null hypothesis not rejected by our data and random effects model is preferred.

Table 79. Hausman Test

Correlated Random Effects - Hausman Test

Equation: EQ01

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	16.465030	9	0.0578

Table 78 presents the regression results with both models and presents the general picture. It is evident that all variables exhibit consistency in sign and significance in their relationship with Capital Adequacy Ratio in both models. The table 0.4 also show that variables CRR, ORR, LGTA, ROE and ROA significantly impact Capital Adequacy Ratio, on the contrary variables MRR, NPLR, GDPGR and IIPGR have no effect on Capital Adequacy Ratio. Based on Hausman test, Random Effects model (Equation 2/Table 78) reported in more detail.

Random effects model we observe R-square at 49% suggesting that half of the variability in capital adequacy ratio can be explained by the variables selected. The null hypothesis that all coefficients are simultaneously zero significantly rejected based on computed F-value of 38.97 ($p < 0.000$) of our panel estimation, therefore concluded that estimation is significant.

7.4.3 Discussion

The results shows that impact of CRR on CAR is highly significant at 1% and bears a negative sign therefore we reject our null hypothesis that credit risk has no significant impact on Capital Adequacy Ratio of the bank.

The impact of MRR on CAR is not statistically significant therefore we accept our null hypothesis here that market risk does not have significant effect on Capital Adequacy Ratio.

The impact of ORR on CAR is highly significant at 1% therefore we reject our null hypothesis that Operational Risk has no significant impact on Capital Adequacy Ratio.

The impact of NPLR on CAR is not significant therefore we accept our null hypothesis that Non-performing loan has no significant impact on Capital Adequacy Ratio.

The impact of LGTA on CAR is highly significant at 1% with a negative sign therefore we reject null hypothesis that size of the bank does not significantly impact Capital Adequacy Ratio.

The impact of GDPGR on CAR is not significant there for we accept the null hypothesis that there is no impact of Gross domestic product growth on Capital Adequacy Ratio.

The impact of IIPGR on CAR is not significant there for we accept the null hypothesis that there is no impact of Industrial Production of Pakistan growth on Capital Adequacy Ratio.

The impact of ROE on CAR is highly significant at 1% therefore we reject null hypothesis that return on equity does not have significant impact on Capital Adequacy Ratio.

The impact of ROA on CAR is highly significant at 1% and bears a negative sign therefore we reject null hypothesis that return on assets have no significant impact on Capital Adequacy Ratio.

In analysing the behaviour of credit risk, identified as the most important risk according to Basel Capital Regulation. The result of our estimation falls in line with expectation of the research and Basel Capital Regulation objectives. Negative sign and significance of the coefficient of CRR reflect to a negative relationship between Credit risk and Capital Adequacy Ratio. The estimation result here suggest that a unit increase in Capital Adequacy Ratio reduces Credit risk by 22% points, therefore confirming upon the Basel Capital regulatory objective of raising Capital in times of economic slowdown to avoid credit default. This seems all good and prove the point, i.e. Pakistan benefits with compliance with Basel Capital Regulation. However we analyse the contrary, the commercial banks in Pakistan have been operating with higher Capital Adequacy Ratio than Basel Capital Regulations recommendations, and this due to the peculiar political and economic environment Pakistani banks operate in. In complying with International Basel Capital Regulations, the concerns of home and host country are highlighted. However, the results corroborates with banking sector growth in Pakistan. Commercial banks in Pakistan decreased capital in order to aligning banks' capital with regulatory requirement. In the process, commercial banks in Pakistan seemed to have managed to free up some cash resulting in asset growth, however with a trade-off of raised credit risk by nearly a quarter of a point with each unit of Capital decreased. Raised credit risk points out to the riskiness of assets and associated with higher returns. This implies that in case banks need to raise capital would mean for each unit of capital raised, credit risk decrease by a quarter of a point implying lower returns and reduced profitability for the bank restricting asset growth. The results confirm the complexity involved in keeping the CAR in line with regulatory requirements without compromising credit risk quality in Pakistan and questions significantly, the role of International Capital Regulation in influencing the minimum capital requirements of the banks. Therefore, in Pakistan without evidence of

procyclicality, the role of Basel Capital Regulation can be debated to either encourage banks to get involved in riskier position or discourage in restricted asset growth.

Most interestingly the regression results point out that market risk does not have any impact on Capital Adequacy Ratio in Pakistan as MRR has no significant impact on CAR. Market risk is reflective of the volatility of banks trading book positions that are directly exposed to fluctuations in interest rate, for –ex rates, equity and commodity prices. Under Basel Capital Regulations market risk is tackled with VAR techniques as a measure of determining minimum capital requirements (Trenca 2009). Basel Capital Regulation identifies market risk as an important contributor in calculating minimum capital requirements and form part of Capital Adequacy Ratio formula. Capital Adequacy Ratio of commercial banks in Pakistan not reflective of Market risk can somewhat be explained by the fact that banks in Pakistan mainly exposed to credit risk and have restricted market positions. Nevertheless, this result is not consistent with our research intentions and Basel Capital Accord. According to our estimation output, Operational risk is significant in effecting Capital Adequacy Ratio with a positive sign and that however, remains in line with the Basel Capital Regulations claims as well as the objective of the research. The empirical result reveals that for each unit capital is raised, Operational risk is raised by 0.20 of a unit. The results reveal the concerns with operational risk management remain very much alive in Pakistan just like the rest of the world.

Our estimation shows that NPLR has no significant impact on CAR, which comes as a surprise. Non-performing loans directly impacts the lending activity and remain an important indicator of the financial health of the bank (Khemraj and Pasha 2009). Non-performing loan portfolio form a significant part of the capital requirement. Capital adequacy ratio, used as the main tool to determining minimum capital requirement remains not reflective of the behaviour of non-performing loans in Pakistan. Our regression further reveals that size is statistically significant in effecting Capital Adequacy Ratio. The coefficient of LGTA is significant at 1% and bears a minus sign. According to our regression increase in 1 unit of CAR would mean 5.7 units decrease in the size of the bank. The finding is very significant and seems corroborative of the growth in Pakistani banking. Commercial banks in Pakistan largely operate with higher capital adequacy ratio and

remain in position to further enhance their asset size. GDP growth rates and industrial production growth rates included in our model to identify the procyclicality of banks' capital behaviour. Our estimation shows that both GDPGR and IIPGR have no significant impact on capital adequacy ratio of banks. The result of our estimation suggest that there is no evidence of impact of economic activity or industry growth on the capital adequacy ratio of the commercial banks in Pakistan. The result is not consistent with the research objective as well as the evidence in post financial crises research of comparable countries (Caggiano et al 2014). Nevertheless, due to the fact that the research only takes into consideration data for a comparatively shorter period that is period from 2007 and 2014 seems not enough to capture the procyclical impact of Capital Adequacy Ratio under Basel Capital Regulations umbrella. Our estimation reveals that both profitability indicators ROE and ROA have statistically significant impact on CAR, i.e. ROE with a positive sign and ROA with a negative sign. The result is show that Return on Equity has positive impact on Capital Adequacy Ratio of the commercial banks of Pakistan and fluctuates by 0.05 percent for each unit change in CAR. The Return on Assets on the other hand bears a negative relationship with 1 unit change in CAR would cause return on assets decrease by nearly the same proportion in the commercial banks of Pakistan. This presents with very interesting phenomenon that profitability shows direct (ROE +) as well as inverse (ROA -) relationship with Capital Adequacy Ratio of the commercial banks in Pakistan. Both profitability ratios are as important as each other, however in Basel compliant environment minimum capital requirements have negative impact on ROA in commercial banks of Pakistan. Given the findings, commercial banks of Pakistan faced with an ambiguous consequence making it almost impossible task when trying to control for profitability at the same time as carrying out required regulatory adjustments in the capital adequacy as profitability and capital adequacy coefficients predicting opposite signs.

7.5 Chapter Conclusion

Secondary data analysis results revealed that market risk and liquidity (NPL), two of the major risk determinants under International Basel Capital Regulation not reflected in the capital adequacy ratio of the commercial banks in Pakistan. Market risk is major constituent of the current Basel II capital adequacy formula and liquidity currently being phased in through Basel III accord. Nevertheless, both aforementioned variables are

extremely important in gauging the risks faced by the commercial banks of Pakistan. Therefore, this identifies capital adequacy ratio as a weaker than expected representative of important banking risks faced by the commercial banks in Pakistan. In contrast, the results of the secondary analysis of the study show that bank size and profitability are statistically significant in impacting on capital adequacy ratio. Therefore we accept alternate hypothesis of the study and conclude that capital adequacy ratio under Basel Capital does not reflect important banking risks factors adequately in commercial banking sector of Pakistan. The results also show that the impact of procyclicality not reflected in capital adequacy ratio as economic indicators used for the study²²⁰ remain statistically not significant in predicting capital requirements of the commercial banks in Pakistan. This could be explained by the fact that research only managed to accumulate data for a comparatively short period, only 7 year from 2007 to 2014 and therefore not covering complete business cycle to reflect procyclicality of Capital base variations of the commercial banks of Pakistan under Basel Capital Regulations. In addition the result remain reflective of the sophistication of the GDP as a superior economic indicator incorporating whole of the economic activity of country and therefore diluting impact on capital adequacy ratio of the commercial banking sector of Pakistan. Nevertheless, despite all discussed the analysis also reveals that commercial banking sector of Pakistan remain financially healthy with higher than required Capital Adequacy Ratios by the Basel Capital Accords, thus creating additional capital buffer and therefore seemed adequately equipped to handling any form of the economic calamity.

²²⁰ Gross Domestic Product and Industrial Production Index growth rates

Part 3: Conclusion

Chapter 8: Findings, conclusions and recommendations

8.1 Introduction

Banking risks generally led by credit risk, market risk, operational risk, liquidity risk, and procyclicality played crucial role in causing global financial concern on number of occasions and yet most recent past witnesses the brutality of aforementioned banking risks. Basel Capital Adequacy regime²²¹, the global flag bearer of the bank regulations and supervision, recommended approaches for calculating, maintaining and monitoring minimum capital adequacy ratios (CAR) for international banks to be ready in case a financial event unfolds. Basel Capital Adequacy framework started with progressive introduction in the G-10 countries followed by countries across the globe, setting the global bank regulations and supervision trend. In keeping at par with the international bank regulatory compliance developments in the rest of the world, State Bank of Pakistan also initiated Basel II implementation in Pakistan. Basel Capital Accord, the revolutionary three pillar approach to calculating minimum capital requirements don't come cheap. In order to embed Basel Capital Framework in their existing systems, banks invested heavily in upgradation of technology as well as training and development of human resources. Despite all round advancements, compliance and consultations, Basel Capital Accord in its form of Basel II, the most complete modern International Bank Regulations and Supervision at the time, fell short of its expectations. The Global Financial Crises of 2007-8 questioned explicitly the limitations of monitoring Capital Adequacy Ratios as true warning sign amongst most advanced Banking institutions.

The study attempted to gauge economic impact on capital requirements of commercial banks of Pakistan and endeavored to test that minimum capital requirements computed

²²¹ Basel Capital Adequacy framework, the global flag bearer of international bank capital regulation and supervision was initially proposed by the G10 countries: Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the UK and the USA

using Basel methodology reflects all important banking risks to guesstimate solvency of the financial system of Pakistan. The objective of the research remained to investigate the role and limitations of International Basel Capital Regulations in commercial banking sector of Pakistan. There is no denying the huge gap that exists between scale of commercial banking operations of Pakistan and developed world. Therefore research extends crucial insights to limitations faced by developing economy of Pakistan in choosing to follow the path of developed countries in fields of bank regulations and supervision to improve risk management in commercial banking sector.

The chapter contains the summary of the epic ‘Taming Financial Capital - Role and limitations of Basel Capital Adequacy Regulations’ in commercial banking sector of Pakistan. The plot unfolded through a dual methodology regime employed by the study including primary approach ‘the questionnaires analysis’ and secondary approach ‘panel data modelling’. The approaches adopted by the study investigated the relationship of a striking cast of economic variables (GDP and IIP), bank specific variables (ROE, ROA, NPL, SIZE) with integral banking risk determinants (Credit risk, Market risk, Operational risk) on Capital Adequacy Ratio (CAR) derived under currently deployed Basel Capital Adequacy risk management manifesto in commercial banks of Pakistan. In addition, invaluable contribution extracted from the participation of the industry operatives, the chapter précises the major outcomes of the study, revolutions and revelations that draw concluding remarks of the entire research and finalized recommendations. The chapter also hints at the limitations of the research, highlights areas for further research and boldly attempts to go beyond the scope of the study.

8.2 Summary of Findings

The study dug into the efficacy of Bank regulations and supervision ‘Basel Capital Accords’ in taming financial capital by investigating ‘the Role and Limitations’ of Basel Capital convergence in Pakistan. The research, in addition to pioneering crucial insights into extent of Basel compliance in Pakistan, dared to contest claims that Capital Adequacy Ratios under Basel Capital Framework adequately reflects all important banking risks in predicting financial health of commercial banking system of Pakistan and taming the financial capital.

The research unfolded some revealing facts:

- The research premier most revealed that Pakistan, a developing economy succeeded in incorporating Basel Capital Accord across her commercial banking sector as per claims of the principal regulator: State Bank of Pakistan, under standardized approaches of the Basel Capital Accord. Therefore despite Basel compliance in Pakistan, there remains much work to be done to achieve advanced internal rating based methodologies compliance status. Nevertheless, the commercial banks of Pakistan managed significant investment to integrate Basel Capital Accord into their systems and culture. In short, commercial banks of Pakistan found resources and successfully upgraded technology to facilitate advanced reporting protocols incorporating Basel requirements as well as staff training and development. The results of both primary as well as secondary data analysis credit this in abundance. The views of the participants significantly confirmed the Basel compliance status as per results shown in table 29 of the primary data analysis. The industry operatives took part in the study were not only aware of Basel compliance in their institutions but also up to date with current developments including Basel III capital ratios. Not only that, participants approved of Basel Capital effectiveness in Pakistan as per results in tables 28 and 30 of the primary data analysis. Basel compliance status of commercial sector of Pakistan was also evident from the secondary data collected for the study as the CAR, along with other constituents collated for the study from the year 2007. This evidence also suggests that commercial banks in Pakistan comply with standardized approach and none of the banks have developed Internal Rating Based approaches for calculating risk.
- The results of the primary research of the study showed that majority of the participating risk managers occupied between 6 to 15 years of experience with post graduate qualification and were fully conversant with the risk management operations of Pakistani commercial banking sector. Risk management operatives

with their erudite responses, welcome Basel compliance in Pakistan and a way towards better risk management in commercial banking sector. The primary research evidence that risk management is serious business for the commercial banks of Pakistan and all commercial banks of Pakistan operate with specialist risk management departments actively incorporating International Basel Capital Adequacy regime to Pakistan's economic outlook. The participants of the study gave particular importance to bank specific risk determinants on capital requirements including credit risk, market risk, and operational risk in current Basel setup. In addition to aforementioned, the participants also considered liquidity, non-performing loans, profitability and size of the banks impact the capital requirements, however currently not reflected in the capital adequacy ratio formula of the Basel Capital Accord

- The primary results of the survey showed that participants approved of procyclicality however, did not think reflected in the minimum capital requirements of the commercial banks of Pakistan. Therefore the research failed to find evidence of impact of economy on minimum capital requirements of the commercial banks of Pakistan.
- The participants of the study ranked credit risk as most important banking risk. The participants also ranked Capital Adequacy as the most important measure for regulating commercial banks of Pakistan; and finally participants ranked local bank regulations as most important factor in effective risk management of commercial banks in Pakistan. The participants also distinguished non-performing loans from the liquidity risk arising from the market positions and gave more importance to the non-performing loans showing credit risk as a prime banking risk determinant in Pakistan.
- Overall the respondents viewed credit risk, non-performing loans and market risk followed by liquidity risk, profitability and operational risk are most important variables that effect minimum capital requirements. Economic impact and bank

size were the least important on the list in their opinion that impact minimum capital requirements of the commercial banks in Pakistan.

- The regression results showed explanatory variables that captured credit risk, operational risk, profitability and the size of the banks significantly influenced capital adequacy ratio of the commercial banks of Pakistan. Credit risk and size of the banks showed negative significant relationship with the capital adequacy ratios of the commercial banks of Pakistan. The explanatory variables for market risk, non-performing loans, GDP growth rates and Industrial Production growth rates did not have significant impact on the capital adequacy ratios of the commercial banks of Pakistan.
- The secondary research also shows that Capital Adequacy ratios of Commercial banks of Pakistan exceed the required Basel Capital Adequacy framework and therefore revealed that commercial banking sector of Pakistan²²² as largely solvent. Capital Adequacy Ratios remains the principal statutory benchmark and considered most dominant measure of banks' financial health. The financial soundness also backed by less vulnerable financial system of Pakistan and further supported by risk portfolios largely based on collateral. The evidence therefore points out to the fact that the financial products in Pakistan continue to be less complex as compared to advanced economies. Nevertheless, maintaining high capital adequacy ratios endorsed market confidence and evidence ability to encounter economic shock in commercial banking sector of Pakistan.
- The primary research also stresses the importance of the role played by the Local Bank Regulations. The State Bank of Pakistan succeeded in putting the message across commercial banking industry of Pakistan that 'Basel compliance is a serious regulatory duty' as revealed by the results in table 51 of primary data. The argument further supported by the results of table 57 of primary data showing that participants

²²² With the exception of Kasb bank, not managed to keep up with the required Capital Adequacy Ratios and continuously experienced declining trading eventually fell prey to takeover in 2014.

viewed risk management in commercial banks of Pakistan benefited by the Basel Compliance. This reflects to the effectiveness of local banking regulations in emerging economies setup and also shows that industry operatives in commercial banking sector of Pakistan seriously developed Basel Capital framework knowledge for compliance in their institution as per State Bank of Pakistan directive.

- The primary results of the study support the alternate hypothesis extended by the research that Basel Capital Framework does not reflect all important risk determinants of the commercial banking sector of Pakistan in judging the health of the financial sector. The results in tables 32 through to table 34 reflect that participants approved of the Basel calculated Capital Adequacy Ratio as a major indicator of the financial health of the commercial banks in Pakistan. Industry players however, as evident in tables 35 through to 39 of the primary data analysis also pointed out additional factors including procyclicality, non-performing loans, bank size and profitability crucial in impacting the capital requirements of the commercial banks not covered under Basel Capital Accord explicitly and therefore no buffer raised to address these concerns. By allocating a capital buffer would serve as a cushion to economic distress and somewhat address the issue of higher probability of default, certainly seemed a sane option than having to inject funds from the taxpayers.
- Secondary as well as primary data results point out credit risk remained the predominant risk determinant of the commercial banking sector of Pakistan and significantly impact minimum capital requirements of Basel compliant commercial banks in Pakistan. This result may further favour the notion that Pakistani banking structure follows a basic setup lacking sophistication in derivatives market. On the contrary, the study noted that commercial banks in Pakistan actively involved in the market activity, in progress of achieving sophistication in risk instruments thick and fast; thence the risk weighted assets in commercial banks on rise. This points out to the need for regulator to design and introduce provident reporting systems to capture development and complexity in derivatives market.

- Secondary results of the study suggest that Credit and Operational risks impact the minimum capital requirements of the commercial banks of Pakistan, however market risk, the third musketeer of Basel Capital Framework exert no explanatory power on the Capital Adequacy Ratio of the commercial banks of Pakistan. This remains an important revelation as all three credit, market and operational risk are major constituents of the Capital Adequacy formula devised under Basel Capital Accords, the forerunner regulatory framework for determining capital adequacy of banks across the globe. The research further revealed that in Pakistan, foreign exchange risk and Equity position risk remain smaller constituents of the total market risk weighted assets figure, the interest rate risk represents well over half of the market risk weighted assets composition. This indicate optimum recording of market risk. Keeping in mind Pakistan, a developing economy remains significantly reliant on foreign exchange influx both remittances and foreign aid, and therefore exposed to foreign exchange risk predominantly. In addition to that, Pakistan following liberalization of financial sector witnessing development of money market system which consequently is prone to plentiful market risk factors. Nevertheless, the secondary data analysis result suggested market risk although captured correctly as per evidence in the secondary data collection, not reflected in capital adequacy framework to mirror the full scale of market risk in Pakistan, this again supports the alternate hypothesis of the study that capital ratios of banks do not aptly reflect all important bank risks in commercial banking sector of Pakistan.
- The results of the secondary data analysis reveal that capital adequacy ratio of the commercial banks of Pakistan failed to reflect economic activity. This could partially be attributed to the time period of the research that did not capture completed business cycle. This was further supported by the primary data analysis results in table 44 with majority participants view procyclicality as unimportant. Therefore there is no evidence that capital requirements of the commercial banks of Pakistan exacerbate procyclicality. The result thence supports the second alternate hypothesis tested by the study that change in minimum capital requirements do not exacerbate procyclicality in Pakistan. Nevertheless, the results

of primary data analysis in tables 39, 49 and 53 also show economic activity indirectly impacts on minimum capital requirements of the commercial banks of Pakistan. Therefore the results indirectly support the advocates of procyclical view that banks do better during the times of economic boom.

8.3 Conclusion

The research takes the stage right in midst of heightened focus on the limitations of international bank regulations and supervision following the global financial crises lit by the failure of big US banks. Pakistan had also turned to Basel Compliance like the rest of the world, to improve asset quality and adhere to more predictive capital adequacy ratios. The defeat of Basel II capital regulation by sheer strength of global financial crises questioned the role of capital adequacy ratios and their predictive strength. This in turn perceptibly paved the way in for continued consultation of the topic amongst varied industry players and thence the release of even more comprehensive regulations: Basel III, however still, keeping faith in capital adequacy ratios. The study motivated by the cause extended investigation in determining role and limitations of the international banking regulations and supervisory in tackling procyclicality and important banking risk issues through its Basel Capital compliance in commercial banks of Pakistan. The study investigated the determinants of capital adequacy ratios and limitations of international bank capital regulations in Pakistan by compiling views of 104 key risk managers of the commercial banks of Pakistan through structured questionnaires. The research also applied panel data modelling approach with tailored combination of risk determinants, bank specific variables and economic indicators. In addition to primary investigation, the research efforts in devising unique proxies to capture the riskiness of the Pakistani commercial banking assets and procyclicality portray originality of the study. The hypothesis of the study tested if the capital adequacy ratios are predictive of the financial health of the commercial banks of Pakistan i.e. reflected all important banking risk factors and captured the economic impact.

The empirical outcome of the study favours the viewpoint that economic factors like GDP growth and Industrial Production growth do not significantly impact the Capital Adequacy Ratio of the commercial banks of Pakistan. To add to the economic sphere, the secondary data analysis also reveal that market risk did not significantly impact Capital Adequacy Ratio of the commercial banks of Pakistan despite being major risk determinant recognized by the international banking regulation pundits. All in all, the results reveal that minimum capital requirements alone, currently relied upon by banking regulators and supervisors does not act as an optimum determinant to gauge the impact of economic activity on the commercial banks of Pakistan or capture all banking risk factors adequately favouring alternate hypothesis of the study.

The results of the secondary data analysis further revealed that Non-performing loans activity in Pakistan, strongly negatively correlated to GDP did not impact the capital adequacy ratio of the commercial banks of Pakistan showing weak representation of economic activity in capital requirements of the commercial banks in Pakistan. Lending, the largest activity by the commercial banks in Pakistan with no exception to the rest of the world or historic banking patterns, seems plagued by the variation in non-performing loans and yet this impact is not reflected in the minimum capital requirements of the commercial banks of Pakistan though capital adequacy ratios. Increase in non-performing loans tend to espouse uncertainty in risk management practices in commercial banking sector. The growth in deposits of commercial banks of Pakistan depicts increased pressure faced by Pakistan commercial banks to increase their lending activities. Nevertheless, losses due to non-performing loans seriously dent the confidence of commercial banks in growing their business and therefore restrict lucrative profit making propositions. Drop in GDP of country easily responsible for rise in non-performing loans in Pakistan highlighting heightened depreciation in quality of assets. That in turn had sparked increased capital requirements of the commercial banks of Pakistan and therefore handicapping banks' ability to further their business or even sustain current profitability levels.

The empirical results however also show, variables that captured Credit risk and operational risk along with the size of bank and profitability show significant impact on

capital adequacy ratio in Pakistani banking sector. In particular credit risk have significant negative relationship with the capital adequacy ratio of the commercial banks of Pakistan. The negative significant relationship between credit risk and capital adequacy, contrary to Basel expectations implies that in commercial banking sector of Pakistan, reducing capital requirements down to the suggested levels of the Basel Capital Accord would result in increase in the credit risk. This again reveals the limitation of Basel Capital Accord in capturing the peculiar credit risk structure of Pakistani commercial banks signified by lending on collateral and henceforth partially justifies the existence of higher capital adequacy ratios in Pakistani commercial banking sector.

In summary, the research notes from the data analysis that Pakistani commercial banks complied with Basel Capital Regulations in applying risk weights to their assets under standardized approaches and therefore heavily reliant of external credit rating agencies. The research further records that commercial banks of Pakistan operate with higher than compulsory Basel regulatory capital requirements. This demonstrates significant financial health and that commercial banks of Pakistan, according to their capital adequacy ratios calculated under Basel Capital Accord are solvent. Nevertheless, the picture could be imprecise as the research shows that Basel clad Capital Adequacy Ratios in Pakistan represent mere extract of the riskiness of the commercial banking business of Pakistan rather than the full saga. The results of the study support the alternate hypothesis and conclude that capital adequacy ratios under Basel Capital Regulation do not reflect all the important banking risk factors that dictate the financial fidelity of the commercial banking sector of Pakistan. The research thereafter concludes, capital adequacy ratio signifies a weak measure to capture the impact of the whole of the financial sector on the commercial banking segment of Pakistan. The study also, despite justifying importance of economic impact on banks' capital requirements, failed to spot any evidence that procyclicality is reflected in capital requirement calculated under Basel Capital Accord in Pakistan. Therefore in Pakistan, Basel Capital Ratios alone do not act as optimum option or a reliable measure for the banking regulators in cautioning of any financial collapse epidemic.

8.4 Recommendations

The research amasses following recommendations:

- In view of the study commercial banks in Pakistan seems ready to move forward the credit risk ratings allocation of their customer base from external agencies credit ratings to developing own internal ratings based models. The commercial banks of Pakistan seem to have successfully integrated Basel Capital Accord thus far in their engineering. In addition, the industry operatives that are experienced and educated, portrayed topic authority in managing day to day risk in commercial banks of Pakistan while complying with Basel Capital Standardized approach. Credit risk remains the top priority of the commercial banks and therefore general internal rating based framework under the State Bank of Pakistan supervision is the way forward and should be initiated. However, it remains important that the internal rating based framework for Pakistan tailored by the Pakistani commercial banking industry players under the Basel Capital guidelines must be closely supervised by the regulatory authority. The research advocates that the newly developed internal ratings based framework in Pakistani commercial banking sector could be used in collaboration with the external credit ratings agencies and therefore substantiate the internal ratings based model credit ratings. This initiative would be key step for the commercial banks of Pakistan towards moving from standardised approach to internal ratings based approaches of Basel Capital Accord and seeking Basel Committee on Banking Supervision (BCBS) accreditation in this regard.
- Based on the findings of the research as well as recommendation in preceding paragraph, the study recommends that training on risk management in banking and Basel Capital Accords should become more frequent for staff. Regular Basel Capital Accord training and refresher course opportunities should be organised on regular intervals a through year and widely advertised amongst the bank employees in Pakistan as there seems limited training opportunities and resources at present. More training would promote better credit risk management practices and bring

more exposure to international capital adequacy developments in banking. In addition to improving knowledge of the existing risk personnel, it would prepare staff adequately in migrating from standardized to internal rating based approach in commercial banks of Pakistan.

- The study also recommends regulatory authorities initiate development of stricter regulation of the derivatives market based on increased sophistication and financial liberalization on rise in Pakistan. Prudential regulatory framework for securitization in particular, should be developed by the State Bank of Pakistan. Market risk although captured in the market risk weighted assets under Basel Capital Accord, not reflected in the capital adequacy ratios of the commercial banks of Pakistan. State Bank of Pakistan should take active consideration of this fact and devise alternative measures to keep check on the market positions of the commercial banks of Pakistan to forecast liquidity issues arising from market movements. Based on sensitivity of commercial banks of Pakistan to market movements, Pakistani regulatory authorities should assign if necessary, a capital charge reflecting riskiness of market positions through capital adequacy ratio based on the sophistication and systemic importance of individual commercial banking institutions rather than a standardized industry framework. This would overall determine systemic importance of the big industry players and keep the scale of their risk taking under observation effectively.
- Procyclicality remains clear and present economic occurrence based on the primary results analysis of the study. Furthermore, the Basel Capital regulatory framework of the commercial banks of Pakistan failed to significantly reflect that in their risk monitoring through capital adequacy ratios. Therefore as a precautionary setup Commercial banks of Pakistan should allocate a capital charge for procyclicality. For the purpose of effective regulations and transparency the capital charge for procyclicality should be reflected through capital adequacy ratio. This will act as necessary warning signs and cushion against contagion. The State Bank of Pakistan should endeavour to supervise the capital ratios more closely to ensure that additional regulatory capital buffer for procyclicality installed.

- Non-performing loans show no significant impact on the capital requirements therefore behaviour of non-performing loans cannot be predicted through capital adequacy ratios of the commercial banks of Pakistan. The study views that in making loans the commercial banks of Pakistan in addition to monitoring Capital adequacy ratios for credit risk management, should conduct rigorous scrutiny of variables effecting economic activity in order to dilute impact of non-performing loans on liquidity as well as profitability of the commercial banking sector of Pakistan. As a starting point, in extending loan profile commercial banks of Pakistan should pay extra attention to the real economic implications on their loan portfolios as dip in economic growth usually brings the non-performing loan culprits to light. In addition, Pakistani commercial banking sector should duly incorporate global economic impact on cash flows of international partners of domestic export businesses. Local firms of Pakistan involved in international trade heavily rely on cash flows from the foreign partners to continue operations and prone to varied liquidity concerns arising from export/import demand fluctuations. In addition, close consideration should be given in passing on the interest rate detriment to the loan customers given the reality that loan defaults could be frequent when real interest rates increased. The State Bank of Pakistan should also develop regulatory framework incorporating prudential economic indicators when assessing the creditworthiness of commercial banking sector of Pakistan.
- The study also recommends that commercial banks of Pakistan should also incorporate analysis of Risk Adjusted Return on Capital (RORAC) in order to involve performance evaluation in their broader risk management landscape. This would in turn, further improve risk management practices in commercial banking sector of Pakistan in a performance driven culture. In addition, liquidity should be given consideration as priority and the commercial banks of Pakistan should develop culture to balance the business mix optimally. Commercial banks of Pakistan must consider economic viability to effectively introduce low risks low profit businesses to borrowers with convincing cash flows position rather than

continuing with excessive risk taking for higher profit margin with speculative businesses with increased liquidity risk.

8.5 Limitations of the study

The study remains limited to Pakistani commercial banking sector and the results represent implications to Pakistani commercial banking sector and economic outlook. The secondary data was collected from a total of 25 commercial bank of Pakistan as well as primary research also carried out in commercial banking sector of Pakistan with 104 structured questionnaires administered to the risk management personnel of the commercial banks of Pakistan. The secondary data captures time period from 2007 to 2014 on yearly bases. The study considered the time frame based on availability of data including the research variables and symmetry. Also commercial banking sector of Pakistan had not fully complied with Basel Capital Accord prior to 2007 in Pakistan therefore limited or no data available before 2007 for operational risk of the commercial banks of Pakistan. In addition, only yearly frequency could be captured due economic indicators including GDP growth rate released yearly rather than quarterly.

8.6 Future Research

The participants of the study also included 104 senior risk operatives of commercial banking sector of Pakistan, more participation could bring better representation of the risk management practices in Pakistan under Basel Capital rule, it would be a great idea to incorporate questions regarding risk adjusted rate of return (RAROC). The study could be replicated amongst comparing economies or further raise the scale of the research to regions including emerging economies, Europe and or Americas. In addition, unlike Pakistan quarterly data capability amongst a number of countries and regions would facilitate same mix of risk proxies and variables on quarterly basis and greatly allow even more in-depth analysis of risk management practices and highlight the role and limitations of Basel Capital regulations.

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Appendix 1: BCBS Groups

Accord Implementation Group (AIG):

The Accord Implementation Group (AIG) tasked to promote consistency in implementation of the Basel II Framework. AIG provides a forum for discussing members' approaches to implementing Basel II and share best practices amongst regulator counterparts. Currently the AIG operates further two subgroups that share information and discuss specific issues related to Basel II implementation:

- *The Validation Subgroup (AIGV) deals with issues related to the validation ratings and parameters system that serve as inputs into the internal ratings-based approaches to credit risk.*
- *The Operational Risk Subgroup (AIGOR) addresses issues related to implementation of AMA for operational risk within banks.*

The Policy Development Group (PDG):

The Policy Development Group (PDG) formerly Capital Task Force works for BCBS by identifying and monitoring emerging supervisory issues and responds by proposing and developing policies that not only address detected issues but also help promote a banking system with adequately equipped with capital according to its exposure to risk and maintain supervisory standards. PDG operates following subgroups:

- *The Risk Management and Modelling Group (RMMG) maintains updated contact with the industry on the latest advances in risk measurement and management. Its focus remains on assessment of the range of industry risk management practices and develop supervisory guidance to promote and share best risk management practices.*
- *The Research Task Force (RTF) serves as a forum for research academics and economists from member institutions to exchange information and engage in research projects on supervisory and financial stability issues.*
- *The Definition of Capital Subgroup explores emerging trends in eligible capital instruments in member jurisdictions and also through the course of implementation of Basel II, facilitate monitoring of capital requirements to ensure that banks in their jurisdiction maintain required capital base throughout the economic cycle.*
- *A Basel II Capital Monitoring Group aims to share national experiences in monitoring capital requirements.*
- *The Trading Book Group (TBG) highlights issues relating to the application of Basel II to the exposures arising from trading activities e.g. development of principles towards the treatment of event risk in the trading book.*
- *The Cross-border Bank Resolution Group (CBRG) addresses issues concerning national policies, legal frameworks and other cross-border operations.*

The Accounting Task Force (ATF)

The Accounting Task Force (ATF) works towards development of prudential reporting guidance and international accounting & auditing standards.

ATF operates following subgroups:

- *The Conceptual Framework Issues Subgroup monitors and responds to the conceptual accounting framework project of the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board in the United States.*
- *The Financial Instruments Practices Subgroup assesses implementation of international accounting standards for the financial instruments, and explores any links between accounting practices and prudential supervision.*
- *The Audit Subgroup works towards encouragement of publishing reliable financial information by responding to international audit standards-setting proposals, other issuances of the International Auditing and Assurance Standards Board and the International Ethics Standards Board for Accountants, and audit quality issues.*

The International Liaison Group (ILG)

International Liaison Group (ILG) formerly Core Principles Liaison Group is responsible for providing a forum in order to engage Committee with supervisors around the world on a broader range of issues. That include Senior representatives from eight BCBS member countries (France, Germany, Italy, Japan, the Netherlands, Spain, the United Kingdom and the

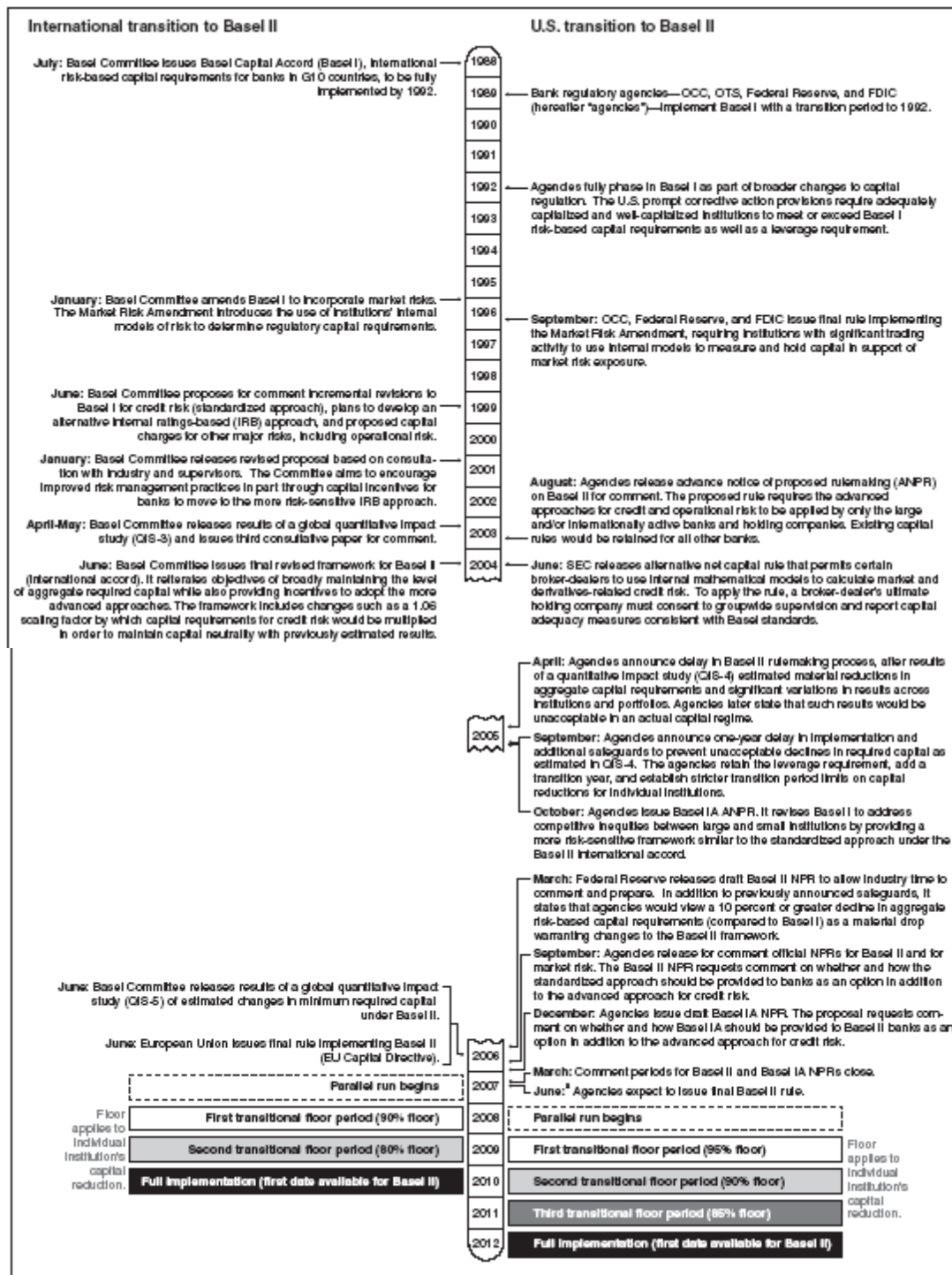
United States), 16 non- BCBS supervisory authorities (Argentina, Australia, Brazil, Chile, China, the Czech Republic, Hong Kong, India, Korea, Mexico, Poland, Russia, Saudi Arabia, Singapore, South Africa, and the West African Monetary Union), the European Commission, the International Monetary Fund, the World Bank, the Financial Stability Institute, the Association of Supervisors of Banks of the Americas and the Islamic Financial Services Board.

ILG operates following subgroups:

- *The ILG working group on Capital (ILGC) works in collaboration with the AIG. They take responsibility for Basel II implementation issues and regularly hold joint group discussions.*
- *The Anti-Money Laundering and Countering the Financing of Terrorism Expert Group (AML/CFT-EG) responsible for monitoring AML/CFT issues that affect banking supervision.*

Source: www.bis.org

Appendix 2: U.S. and International Transition to Basel II Capital Accord



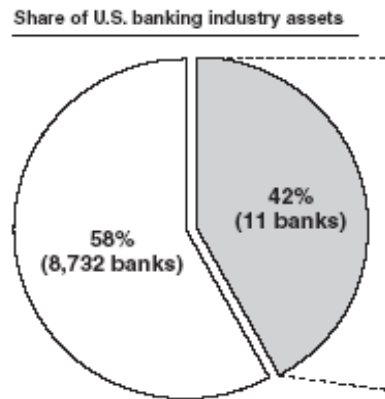
Source: GAO (2007)

Note: Dates shown for both the international and U.S. parallel run and transition periods are for the advanced risk Measurement approaches. *Donates estimated date

Appendix 3: List of U.S. Core Banks

1. Bank of America
2. JP Morgan Chase
3. Citibank
4. Wachovia
5. Wells Fargo
6. Washington Mutual
7. HSBC ^a
8. State Street ^a
9. Bank of New York ^a
10. Northern Trust ^a
11. Deutsche Bank ^a

^a Include 10% Foreign assets Trigger



List of 11 Core Banks in US, Core banks defined as large internationally active banks with foreign exposure in excess of \$10 billion and/or total assets greater than \$250 billion.

Source: GAO-07-253, p23

Appendix 4: Change in Minimum Required Capital

QIS-4 Result: Change in Minimum Required Capital						
Portfolio	% change in portfolio MRC	% point Contrib. to MRC Change	Median% change in Port. MRC	Weighted Median % change in Port. MRC	Share of Basel I MRC	Share of Basel II MRC
Wholesale Credit	(24.6%)	(10.9%)	(24.5%)	(21.6%)	44.30%	38.20%
Corporate, Bank, Sovereign	(21.9%)	(7.4%)	(29.7%)	(13.5%)	33.90%	30.30%
Small Business	(26.6%)	(1.2%)	(27.1%)	(24.8%)	4.6%	3.9%
High Volatility CRE	(33.4%)	(0.6%)	(23.2%)	(42.4%)	1.8%	1.3%
Income Producing RE	(41.4%)	(1.7%)	(52.5%)	(52.4%)	4.0%	2.7%
Retail Credit	(25.6%)	(7.8%)	(49.85)	(28.7%)	30.6%	26.0%
Home Equity (HELOC)	(74.3%)	(4.6%)	(78.6%)	(76.8%)	6.1%	1.8%
Residential Mortgage	(61.4%)	(6.8%)	(72.7%)	(64.4%)	11.1%	4.9%
Credit Card(QRE)	66.00%	4.00%	62.80%	72.2%	6.1%	11.6%
Other Consumer	(6.5%)	(0.4%)	(35.2%)	(18.3%)	6.0%	6.4%
Retail Business Exposures	(5.8%)	(0.1%)	(29.2%)	11.6%	1.2%	1.3%
Equity	6.60%	0.10%	(24.4%)	9.6%	1.3%	1.6%
Other Assets	(11.7%)	(1.2%)	(3.2%)	(11.6%)	10.0%	10.1%
Securitization	(17.9%)	1.40%	(39.7%)	(45.8%)	8.1%	7.6%
Operational Risk		9.20%			0.0%	10.5%
Trading Book	0.0%	0.0%	0.0%		5.2%	5.9%
Change in MRC	(12.5%)	(12.5%)	(23.8%)	(17.1%)	100.0%	100.0%
Change in Effective MRC	(15.5%)		(26.3%)	(21.7%)		

Source: Bank for International Settlements www.bis.org

Appendix 5: BCBS average by Portfolio in percent

BCBS average by portfolio in percent						
Portfolio	Group 1			Group 2		
	size	Change in MRC	Contribution	size	Change in MRC	Contribution
Wholesale; of which:	32.2	7.9	2.5	21.8	-4.1	-0.9
_ Corporate	26.9	3.2	0.9	16.1	-6.5	-1.0
_ Bank	4.9	30.0	1.5	5.1	4.3	0.2
_ Sovereign	0.4	55.5*	0.2	0.5	-14.8	-0.1
SME corporate	8.6	-2.5	-0.2	16.4	-0.5	-0.1
Specialized lending	4.6	-5.5	-0.3	1.5	7.2	0.1
Retail; of which:	26.5	-26.9	-7.1	36.0	-25.0	-9.0
_ Mortgage	22.3	-28.3	-6.3	22.1	-28.2	-6.2
_ Revolving	0.6	-20.5	-0.1	1.2	-22.3	-0.3
_ Others	3.7	-19.7	-0.7	12.8	-19.8	-2.5
SME retail	1.8	-23.4	-0.4	5.8	-20.0	-1.3
Equity	3.2	5.3	0.2	3.2	-0.9	0.0
Purchase Receivables	0.3	-6.2	0.0	0.3	-3.4	0.0
Other assets	3.3	0.0	0.0	3.3	0.0	0.0
Securitization	3.0	7.4	0.2	1.7	30.6	0.5
Counterparty risk	1.2	35.1	0.4	0.1	42.4	0.1
Specific risk	1.3	5.4	0.1	0.3	1.7	0.0
Market Risk	1.6	0.6	0.0	1.2	0.0	0.0
Related entities	4.7	16.7	0.8	1.7	41.2	0.7
Other deductions	3.5	0.0	0.0	2.3	0.6	0.0
Partial use**, others	3.9	-1.1	0.0	4.2	1.3	0.1
Operational risk			5.6			8.3
Total	100.0		1.7	100.0		-1.3

* The large percentage change in capital for the sovereign portfolio arises because a significant part of the sovereign exposures are allocated a 0% risk weight under the current accord. Applying any risk weight under the new approach gives an infinite percentage increase in capital requirement for those banks with only such exposures, even if in absolute terms the change in capital requirements is small.

** This row includes standardized approach capital requirements for exposure subject to partial use under the IRB approaches for banks also providing data for at least one IRB approach.

Source: Bank for International Settlements www.bis.org

Appendix 6: Overall results: Standardized approach average by portfolio in percent.

Portfolio	Group 1			Group 2		
	size	Change in MRC	Contribution	size	Change in MRC	Contribution
Wholesale; of which:	22.1	7.7	1.7	40.8	40.2	16.4
_ Corporate	20.1	2.1	0.4	34.8	-0.5	-0.2
_ Bank	1.9	64.2	1.2	5.1	45.5	2.3
_ Sovereign*	0.1	80.5	0.1	0.9	1643.2	14.3
SME corporate	9.9	0.5	0.0	6.5	-1.2	-0.1
Specialized lending	1.7	-2.5	0.0	0.2	19.6	0.1
Retail; of which:	17.1	-24.1	-4.1	21.7	-14.9	-3.2
_ Mortgage	14.1	-28.9	-4.1	3.6	-3.3	-0.1
_ Revolving	1.3	-3.1	0.0	2.3	-24.5	-0.6
_ Others	1.7	-1.0	0.0	15.7	-16.3	-2.5
SME retail	0.0	72.8	0.0	3.7	-21.8	-0.8
Equity	0.1	-1.5	0.0	2.2	-1.1	0.0
Purchase						
Receivables	0.0	0.0	0.0	0.6	9.4	0.1
Other assets	2.0	0.0	0.0	8.1	0.0	0.0
Securitization	0.3	102.4	0.3	0.8	-18.2	-0.1
Counterparty risk	1.3	66.8	0.9	0	1739.2	0.6
Specific risk	0.9	12.4	0.1	1.6	306.1	5.0
Market Risk	1.8	0.0	0.0	6.3	22.1	1.4
Related entities	7.5	0.0	0.0	5.2	124.1	6.4
Other deductions	32.5	0.0	0.0	2.6	-24.9	-0.6
Partial use**, others	2.7	-19.7	-0.5	0.0	0.0	0.0
Operational risk			3.5			13.0
Total	100.0		1.8	100.0		38.2

* The large percentage change in capital for the sovereign portfolio arises because a significant part of the sovereign exposures are allocated a 0% risk weight under the current accord. Applying any risk weight under the new approaches gives an infinite percentage increase in capital requirement for those banks with only such exposures even if in absolute terms the change in capital requirements is small.

** This row includes standardized approach capital requirements for exposure subject to partial use under the IRB approaches for banks also providing data for at least one IRB approach.

Source: Bank for International Settlements www.bis.org

Appendix 7: Roadmap of Basel Capital convergence Pakistan

	Activity/Action	Description	Date of Completion
1	Finalization of Implementation Plan	Preparation and finalization of the Roadmap after consultation with the stakeholders for Implementation of Basel II.	31.03.2005
2	Communicating the implementation plan to Banks	Plan to Banks After the approval of this road map, the plan to implement Basel II in Pakistan will be communicated to the banks. The communication will include; Timeframe for the adoption of Basel II. Minimum requirements for the adoption of various approaches for credit and operational risk. This communication will enable banks to devise their internal plans and would gear up their efforts.	31.03.2005
3	Designation of coordinator at each bank	To serve as a focal point for coordinating activities internally and communicating with SBP. The coordinator could be CFO or Head of RM or Head of Credit.	31.05.2005
4	Banks to submit their individual plans containing specific approach (Standardized or IRB) they intend to adopt and their internal plans with respect to such implementation.	However the banks intending to adopt advance approaches will be subject to SBP's validation/approval.	30.06.2005

5	Approval of individual plans by SBP.	Finalization of specific approach to be adopted by each bank.	30.09.2005
6	Preparing eligibility criteria and rules for recognition of ECAIs	The eligibility criteria will be used for short listing of rating agencies	30.06.2005
7	Recognition of ECAIs and mapping of the ratings with the appropriate risk weight.	Inviting applications from the interested Ratings agencies. Assigning the risk weight for their particular ratings.	30.09.2005
8	Capacity Building at SBP.	Organizing various learning sessions.	2005-2008 (on-going)
9	Capacity building in banks	PBA to take lead.	2005-2008
10	Preparation and issuance of instructions/Circular	Issuing detailed instructions to banks for Implementation of Basel II.	31.12.2005
11	Parallel run of Basel II .Banks to continue meeting the existing MCR.	Simultaneously to calculate capital adequacy on the basis of Basel II	01.07.2006 to 31.12.2007
PILLAR 2 SUPERVISORY REVIEW PROCESS			
12	Prompt Corrective Measures by SBP	Deciding on the range of actions and standardizing them for different scenarios in case a bank is not meeting in whole or in part different aspects of capital adequacy as emerged during the supervisory review process.	31.12.2005
PILLAR 3 MARKET DISCIPLINE			
13	Reviewing existing disclosure	Compare the existing disclosure requirements with those required under Basel	30.09.2005

	Requirement for banks with respect to Basel II and assessing the gaps.	II and identify what additional disclosures would be required by banks	
14	Preparing / drafting new formats for disclosure by banks in order to meet the minimum disclosure requirements Under Basel II.	To be prescribed along with proposed circular to be issued by SBP for implementation of Basel II.	31.12.2005

Source: State Bank of Pakistan www.sbp.org.pk

Appendix 8: Group-wise composition of Banks of Pakistan

2008	2009	Sep-10
A. Public sector com. banks (4) National Bank of Pakistan First Women Bank Ltd The Bank of Khaiber The Bank of Punjab B. Local Private Banks(25) Askari Bank Ltd. Bank Alfalah Ltd. Bank Al Habib Ltd. Mybank Ltd. Faysal Bank Ltd. Habib Metropolitan Bank Ltd. KASB Bank Ltd. The Royal Bank of Scotland Ltd. Saudi Pak Commercial Bank Ltd. Sonari Bank Ltd. Standard Chartered Bank(Pakistan) Ltd. MCB Bank Ltd. Allied Bank Ltd. United Bank Ltd. Meezan Bank Ltd. NIB Bank Ltd SAMBA Bank Ltd. Habib Bank Ltd Atlas Bank Ltd Arif Habib Bank Ltd Dubai Islamic Bank Pakistan Ltd Bank Islami Pakistan Ltd JS Bank Ltd Emirates Global Islamic Bank Ltd Dawood Islamic Bank Ltd C. Foreign Banks (7) Albaraka Islamic Bank B.S.C. Bank of Tokyo -Mitsubishi UFJ, Ltd. Deutsche Bank AG. Citibank N.A. Oman International Bank S.A.O.G. Barclays Bank PLC. HSBC Bank Middle East Ltd. D. Specialized Banks (4) Zarai Taraquiti bank Ltd. Industrial Development Bank of Pakistan Punjab Provincial Co-operative Bank Ltd. SME Bank Ltd. All commercial Banks (36) Include A+B+C All Banks (40) Include A+B+C+D	A. Public sector com. banks (4) National Bank of Pakistan First Women Bank Ltd The Bank of Khaiber The Bank of Punjab B. Local Private Banks(25) Askari Bank Ltd. Bank Alfalah Ltd. Bank Al Habib Ltd. Mybank Ltd. Faysal Bank Ltd. Habib Metropolitan Bank Ltd. KASB Bank Ltd. The Royal Bank of Scotland Ltd. Saudi Pak Commercial Bank Ltd. Sonari Bank Ltd. Standard Chartered Bank(Pakistan) Ltd. MCB Bank Ltd. Allied Bank Ltd. United Bank Ltd. Meezan Bank Ltd. NIB Bank Ltd SAMBA Bank Ltd. Habib Bank Ltd Atlas Bank Ltd Arif Habib Bank Ltd Dubai Islamic Bank Pakistan Ltd Bank Islami Pakistan Ltd JS Bank Ltd Emirates Global Islamic Bank Ltd Dawood Islamic Bank Ltd C. Foreign Banks (7) Albaraka Islamic Bank B.S.C. Bank of Tokyo -Mitsubishi UFJ, Ltd. Deutsche Bank AG. Citibank N.A. Oman International Bank S.A.O.G. Barclays Bank PLC. HSBC Bank Middle East Ltd. D. Specialized Banks (4) Zarai Taraquiti bank Ltd. Industrial Development Bank of Pakistan Punjab Provincial Co-operative Bank Ltd. SME Bank Ltd. All commercial Banks (36) Include A+B+C All Banks (40) Include A+B+C+D	A. Public sector com. banks (4) National Bank of Pakistan First Women Bank Ltd The Bank of Khaiber The Bank of Punjab B. Local Private Banks(25) Askari Bank Ltd. Bank Alfalah Ltd. Bank Al Habib Ltd. Mybank Ltd. Faysal Bank Ltd. Habib Metropolitan Bank Ltd. KASB Bank Ltd. The Royal Bank of Scotland Ltd. Saudi Pak Commercial Bank Ltd. Sonari Bank Ltd. Standard Chartered Bank(Pakistan) Ltd. MCB Bank Ltd. Allied Bank Ltd. United Bank Ltd. Meezan Bank Ltd. NIB Bank Ltd SAMBA Bank Ltd. Habib Bank Ltd Atlas Bank Ltd Arif Habib Bank Ltd Dubai Islamic Bank Pakistan Ltd Bank Islami Pakistan Ltd JS Bank Ltd Emirates Global Islamic Bank Ltd Dawood Islamic Bank Ltd C. Foreign Banks (7) Albaraka Islamic Bank B.S.C. Bank of Tokyo -Mitsubishi UFJ, Ltd. Deutsche Bank AG. Citibank N.A. Oman International Bank S.A.O.G. Barclays Bank PLC. HSBC Bank Middle East Ltd. D. Specialized Banks (4) Zarai Taraquiti bank Ltd. Industrial Development Bank of Pakistan Punjab Provincial Co-operative Bank Ltd. SME Bank Ltd. All commercial Banks (36) Include A+B+C All Banks (40) Include A+B+C+D
* Descheduling of Albaraka Islamic Bank Pakistan Operations and merge into Emirates Global Islamic Bank Ltd with effect from October 29, 2010.		

Source: State Bank of Pakistan www.sbp.org.pk

Appendix 9: Stress Tests of Banks of Pakistan

September 30, 2010

		Number of Banks with CAR		
		< 0%	0% - 10%	> 10%
Pre- Shock		3	3	34
Post – Shock				
Credit Shocks				
C-1	15% of performing loans moving to substandard, 15% of substandard to doubtful, 25% of doubtful to loss.	4	7	20
C-2	Tightening of loan classification i.e. NPLs under substandard category downgraded to doubtful and all doubtful NPLs downgraded to loss category.	4	4	32
C-3	25% of loans to the textile sector directly downgraded to doubtful category.	4	5	31
C-4	25% of consumer loans (auto loans, personal loans & consumer durable only) classified into doubtful category.	3	3	34
C-5	Deterioration in performing loans of the SME sector (50%) and Agri sector (50%) directly downgraded to loss category of NPLs.	5	8	27
C-6	Critical Infection Ratio (The ratio of NPLs to loans where capital wipes out).	3	37	0
Interest Rate Shocks				
IR-1	An increase in interest rate by 300 basis points.	3	5	32
IR-2	Shift coupled with flattening of the yield curve by increasing 500, 300 and 200 basis points in the three maturities respectively.	3	4	33
Exchange Rate Shocks				
ER-1	Depreciation of Pak Rupee by 25% against all currencies.	3	6	31
ER-2	Appreciation of Pak Rupee by 5% against all currencies.	3	3	34
Equity Price Shocks				
EQ-1	Fall in the equity prices by 30%.	3	4	33
EQ-2	Fall in the equity prices by 50%.	4	4	32
Combined Credit & Market Shocks				
COMB-1	Interest rates increase(3%), deterioration of loans to the textile sector(25%) directly downgraded to doubtful category, and fall in equity prices by 30%.	4	7	29
COMB-2	deterioration in loans portfolio (performing to substandard: 15% substandard to doubtful: 15% doubt to loss: 20%), fall in the equity prices (50%).	4	7	29
Liquidity Shock		Number of Banks		
		Becoming Illiquid		
		after shock for		
		3Days	4Days	5Days
L-1	Withdrawal of customer deposits by 2%, 5%,10%, 10%, and 10% for five consecutive days respectively.	0	3	4

Source: State Bank of Pakistan www.sbp.org.pk

Appendix 10: Secondary Data Analysis

	CAR	CRR	GDPGR	IIPGR	LGTA	MRR	NPLR	ORR	ROE	ROA
CAR	1.000000									
CRR	-0.325907*	1.000000								
GDPGR	0.056018	0.118070	1.000000							
IIPGR	0.062262	0.130529	0.963131*	1.000000						
LGTA	-0.460541*	-0.108291	-0.017514	-0.016659	1.000000					
MRR	0.078297	-0.033401	-0.033134	-0.022710	0.023835	1.000000				
NPLR	-	0.149174**	0.118507	-0.209862*	-0.227881*	-0.066579	0.164299**	1.000000		
ORR	0.310825*	0.099675	0.173996**	0.204694*	-0.083891	0.056876	0.166908**	1.000000		
ROE	0.211641*	-	0.304882*	0.140440	0.131588	0.269757*	0.043842	-0.484342*	0.114902	1.000000
ROA	-0.021179	-	0.233170*	0.161150**	0.144926**	0.477169*	0.114001	-0.565564*	0.103309	0.783404*

	CAR	CRR	GDPGR	IIPGR	LGTA	MRR	NPLR	ORR	ROE	ROA
Mean	17.19503	50.85653	3.596250	3.372500	18.78101	4.162764	12.38750	7.841684	-1.559196	0.201558
Median	14.47000	47.90000	3.770000	3.515000	18.88000	2.880000	10.13500	6.495000	7.410000	0.660000
Maximum	65.43000	90.87000	5.540000	9.030000	21.35000	26.46000	91.11000	80.09000	28.57000	3.980000
Minimum	0.560000	10.41000	0.360000	-4.180000	15.74000	0.030000	0.220000	0.400000	-270.5500	-7.080000
Std. Dev.	10.86166	14.20106	1.486674	3.700637	1.306938	4.567547	10.28677	9.175587	35.94958	1.888551
Skewness	1.898491	0.392601	-0.947349	-0.567606	-0.168658	1.886415	2.924425	6.383892	-3.944495	-1.571557
Kurtosis	7.088175	2.990309	3.331503	2.946775	2.201025	7.368392	19.65877	46.36950	22.95257	5.751644
Jarque-Bera	258.1216	5.112942	30.83146	10.76282	6.236529	276.2543	2545.744	16692.09	3816.997	144.6955
Probability	0.000000	0.077578	0.000000	0.004601	0.044234	0.000000	0.000000	0.000000	0.000000	0.000000
Obs	199	199	200	200	199	199	196	196	199	199

Apply redundant fixed effects – likelihood ratio

Redundant Fixed Effects Tests

Equation: EQ01

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	23.196499	(24,160)	0.0000
Cross-section Chi-square	290.904129	24	0.0000

FIXED EFFECTS

Dependent Variable: CAR

Method: Panel Least Squares

Date: 11/18/15 Time: 11:52

Sample: 2007 2014

Periods included: 8

Cross-sections included: 25

Total panel (unbalanced) observations: 194

White diagonal standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	167.3917	31.66480	5.286365	0.0000
CRR	-0.264053	0.063532	-4.156235	0.0001
MRR	-0.079384	0.103639	-0.765962	0.4448
ORR	0.181179	0.072840	2.487358	0.0139
NPLR	-0.051907	0.045843	-1.132256	0.2592
LNTA	-7.323359	1.516714	-4.828438	0.0000
GDPGR	0.074524	0.599851	0.124237	0.9013
IIPGR	0.044211	0.239108	0.184898	0.8535

ROE	0.052732	0.021481	2.454794	0.0152
ROA	-0.959714	0.359391	-2.670387	0.0084

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.889358	Mean dependent var	16.73711
Adjusted R-squared	0.866538	S.D. dependent var	10.22208
S.E. of regression	3.734377	Akaike info criterion	5.630870
Sum squared resid	2231.291	Schwarz criterion	6.203588
Log likelihood	-512.1944	Hannan-Quinn criter.	5.862780
F-statistic	38.97281	Durbin-Watson stat	1.267990
Prob(F-statistic)	0.000000		

RANDOM EFFECTS

Dependent Variable: CAR

Method: Panel EGLS (Cross-section random effects)

Date: 11/18/15 Time: 11:55

Sample: 2007 2014

Periods included: 8

Cross-sections included: 25

Total panel (unbalanced) observations: 194

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	136.3107	14.70410	9.270250	0.0000
CRR	-0.228854	0.031096	-7.359523	0.0000
MRR	-0.039773	0.097454	-0.408118	0.6837
ORR	0.201769	0.033246	6.068888	0.0000
NPLR	-0.059094	0.045650	-1.294504	0.1971
LNTA	-5.789702	0.717929	-8.064450	0.0000
GDPGR	0.120555	0.699873	0.172253	0.8634
IIPGR	0.010784	0.284673	0.037881	0.9698
ROE	0.056857	0.014378	3.954368	0.0001
ROA	-0.979191	0.339120	-2.887446	0.0043

Effects Specification

S.D. Rho

Cross-section random	6.609223	0.7580
Idiosyncratic random	3.734377	0.2420

Weighted Statistics			
R-squared	0.493221	Mean dependent var	3.325764
Adjusted R-squared	0.468433	S.D. dependent var	5.229466
S.E. of regression	3.808652	Sum squared resid	2669.073
F-statistic	19.89750	Durbin-Watson stat	1.092704
Prob(F-statistic)	0.000000		
Unweighted Statistics			
R-squared	0.395782	Mean dependent var	16.73711
Sum squared resid	12185.10	Durbin-Watson stat	0.239350

HAUSMAN TEST

Correlated Random Effects - Hausman Test

Equation: EQ01

Test cross-section random effects

Test Summary	Chi-Sq.	Chi-Sq. d.f.	Prob.
	Statistic		
Cross-section random	16.465030	9	0.0578

Unit root tests

Panel unit root test: Summary

Series: CAR

Date: 04/27/16 Time: 14:49

Sample: 2007 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-22.8651	0.0000	25	165
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.83906	0.0000	25	165
ADF - Fisher Chi-square	111.243	0.0000	25	165
PP - Fisher Chi-square	93.3620	0.0002	25	174

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: CRR

Date: 04/27/16 Time: 14:49

Sample: 2007 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-28.4583	0.0000	25	164
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.56475	0.0000	25	164
ADF - Fisher Chi-square	145.254	0.0000	25	164
PP - Fisher Chi-square	117.392	0.0000	25	174

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: GDPGR

Date: 04/27/16 Time: 14:50

Sample: 2007 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-18.0635	0.0000	25	150
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.66361	0.0000	25	150
ADF - Fisher Chi-square	137.022	0.0000	25	150
PP - Fisher Chi-square	97.2884	0.0001	25	175

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: IIPGR

Date: 04/27/16 Time: 14:50

Sample: 2007 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

			Cross-	
--	--	--	--------	--

Method	Statistic	Prob.**	sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-12.9557	0.0000	25	150
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.99597	0.0000	25	150
ADF - Fisher Chi-square	125.710	0.0000	25	150
PP - Fisher Chi-square	90.6652	0.0004	25	175

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: LGTA

Date: 04/27/16 Time: 14:51

Sample: 2007 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.35444	0.0000	25	164
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	0.82540	0.7954	25	164
ADF - Fisher Chi-square	59.5647	0.1667	25	164
PP - Fisher Chi-square	46.8979	0.5986	25	174

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: MRR

Date: 04/27/16 Time: 14:51

Sample: 2007 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.79475	0.0000	25	168
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.41035	0.0080	25	168
ADF - Fisher Chi-square	85.6511	0.0013	25	168
PP - Fisher Chi-square	90.9259	0.0004	25	174

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: NPLR

Date: 04/27/16 Time: 14:52

Sample: 2007 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.36251	0.0000	25	162
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.55941	0.0052	25	162
ADF - Fisher Chi-square	83.8628	0.0019	25	162

PP - Fisher Chi-square	104.576	0.0000	25	171
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** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: ORR

Date: 04/27/16 Time: 15:17

Sample: 2007 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-72.8096	0.0000	25	160
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-19.7481	0.0000	25	160
ADF - Fisher Chi-square	139.873	0.0000	25	160
PP - Fisher Chi-square	134.894	0.0000	25	171

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: ROA

Date: 04/27/16 Time: 14:52

Sample: 2007 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-18.0855	0.0000	25	166
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.07683	0.0000	25	166
ADF - Fisher Chi-square	136.556	0.0000	25	166
PP - Fisher Chi-square	136.143	0.0000	25	174

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: ROE

Date: 04/27/16 Time: 14:52

Sample: 2007 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross- sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-10.1769	0.0000	25	165
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.37312	0.0004	25	165
ADF - Fisher Chi-square	100.130	0.0000	25	165
PP - Fisher Chi-square	110.869	0.0000	25	174

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Appendix 11: Questionnaire

The Principal Investigator

Shazaib Butt
B.S. 414
Royal Docks Business School
University of East London
Docklands Campus
University Way
London
E16 2 RD
Phone: 020 82237798
Email: s.butt@uel.ac.uk;
shahzeb@hotmail.com

Institution

University of East London

University Research Ethics Committee

If you have any queries regarding the conduct of the program in which you are being asked to participate, please contact:

Merlin Harries,
Quality Assurance and Enhancement (QAE)
External and Strategic Development Service (ESDS)
University of East London,
Docklands Campus,
London E16 2RD
Telephone: 020 8223 2009
Email: m.harries@uel.ac.uk

Consent to Participate in this Research Study

The purpose of this letter is to provide you with the information that you need to consider in deciding whether to participate in this study.

Research Project Title

Role and limitations of Basel II in Pakistani Banking Sector

Outline of Research

In the wake of frequent global financial crises caused by banking risks e.g. credit risk, market risk, operational risk, liquidity risk, risk of procyclicality etc. This research would attempt to contribute to mitigating such banking risks within Basel II compliant Banks in Pakistan.

Basel II is international capital regulation framework proposed by G-10 countries to promote effective risk management in banking in order to avoid risks in banking. Basel II recommended approaches for calculating and maintaining minimum capital adequacy ratios (CAR) for international banks. Basel II has been progressively introduced in the G-10 countries and the rest of the world. In keeping at par with the international regulatory compliance developments, State Bank of Pakistan initiated Basel II implementation in Pakistan in 2004.

Project Objectives

The objectives of the study are:

- Explore role and limitations of Basel II on capital adequacy of commercial banks in Pakistan.
- To establish whether impact of procyclicality on capital requirements can be measured
- Attempt to develop CAR formula incorporating impact of procyclicality on capital requirements of commercial banks in Pakistan.

Expected research contribution

In Basel II compliant banks Credit, Market and Operational risks are calculated using given models and incorporated in Capital Adequacy Ratio (CAR) of the institution. The conceptual framework of the study assumes that within the Basel II framework, risks (i.e. Credit, Market and Operational Risk) under Pillar 1 of the Basel II capital accord exert a collective impact on CAR of banks and exacerbate procyclicality. The impact of procyclicality then feeds back into these risks and further intensifies them for the bank prolonging given economic crises recovery period. Procyclicality of the capital requirements alone is more significant in dictating financial instability than mere individual sum of the three risks added together. Thus, the study attempts to measure that impact of procyclicality on capital requirements resulting from complex interaction of the Credit risk,

Market risk and Operational risk. The study furthermore, attempts to incorporate impact of procyclicality in Capital Adequacy Ratio (CAR) in Pakistani Banking.

Contribution required by the participants:

Please contribute to the study by completing the enclosed questionnaire and return it using the self-addressed envelope provided. The researcher sincerely appreciates your kind participation. Your contribution is considered an invaluable input towards achieving the objectives of the research and answering the research question. Thank you very much for cooperating.

General information for the participants:

There have been no risks or hazards identified in relation to this study. It is unlikely for the participants to experience any after affects, discomfort or distress.

Confidentiality of the Data

The study would strictly comply with Data Protection Act, 1998.

Personal data will be stored securely using provided secured network and lockers provided by University of East London. Personal data shall not be transferred or shared. Personal data will be securely disposed of once the final analysis is achieved. The information provided would remain anonymous and strictly confidential. The analysis would be presented only in aggregate form when published.

Location

Royal Docks Business School
University of East London
University Way
London
United Kingdom
E16 2RD

Disclaimer

You are not obliged to take part in this study, and are free to withdraw at any time during filling out the questionnaire. Should you choose to withdraw from the programme, discontinue filling out the questionnaire. Should you choose to withdraw from the participation, you may do so without any disadvantage to yourself and without any obligation to give a reason.

Questionnaire

Name of the bank

Section A: Demographic Profiling

Questions 1-4 relate to demographic profiling. Please tick (✓) the appropriate box.

1. Age range

- 20 - 25 ☐
- 26 - 30 ☐
- 31 - 35 ☐
- 36 - 40 ☐
- 41 and above ☐

2. Qualification (relevant)

- Diploma ☐
- Bachelor's Degree ☐
- Master's Degree ☐
- MPhil ☐
- PhD ☐
- Others (Please specify) _____

3. Years of experience as senior Pakistani banker

- 0 - 5 ☐
- 6 - 10 ☐

- 11 - 15 ☐
- 15 - 20 ☐
- Above 21 years ☐

4. Number of Basel Capital Accord Risk Management training courses attended

- 1 - 3 ☐
- 4 - 6 ☐
- 7 - 9 ☐
- 9 or more ☐
- None ☐

Section B: Basel Capital Regulation Compliance

The Basel Committee on Banking Supervision (BCBS), established in 1974 by the G-10 industrial countries released Basel II Capital Framework (Basel II) in year 2004. Basel II and then Basel III remain comprehensive upgrade versions of its predecessor Basel I Capital Framework. Basel Capital Regulation recommended approaches for calculating and maintaining minimum capital adequacy ratios (CAR) for banks.

Questions 5-7 in this section relate to understanding the extent of Basel II compliance in your bank. Please choose one response only by ticking (✓) the appropriate box.

5. Implementing Basel Capital Regulation is a matter of ‘regulatory compliance only’ for your bank

- Strongly disagree ☐
- Disagree ☐
- Neither disagree nor agree ☐
- Agree ☐
- Strongly agree ☐

6. Full compliance with Basel Capital Regulation is the most significant requirement for effective risk management in your bank

- Strongly disagree ☐
- Disagree ☐
- Neither disagree nor agree ☐
- Agree ☐
- Strongly agree ☐

7. To what extent Basel Capital Regulation is implemented in your bank

- Fully compliant (AIRB Approaches) ☐
- To large extent (i.e. calculate credit, market and operational risks) ☐
- To some extent (i.e. calculate credit risk only) ☐

Not compliant ☐
Don't know ☐

Section C: Active Risk Management under Basel Capital Regulation (ARM)

Questions (1 – 11) in this part relate to the 'Active risk management under modern methodologies' as understood and practiced by personnel on daily basis in your Bank. Please tick (✓) the most appropriate box or boxes (as instructed at the end of each question).

8. Basel Capital Regulation provides most sophisticated and advanced data analysis methodologies for risk management in banking (Please choose one response)

Strongly disagree ☐
Disagree ☐
Neither disagree nor agree ☐
Agree ☐
Strongly agree ☐

9. Risk management models developed by Basel Capital Regulation for Credit, Market and Operational risks are very complex (Please choose one response)

Strongly disagree ☐
Disagree ☐
Neither disagree nor agree ☐
Agree ☐
Strongly agree ☐

10. Credit risk has significant impact on Bank's Capital requirements

Strongly disagree ☐
Disagree ☐
Neither disagree nor agree ☐
Agree ☐
Strongly agree ☐

11. Market risk has significant impact on Bank's Capital requirements

Strongly disagree ☐
Disagree ☐
Neither disagree nor agree ☐

- Agree ☐
- Strongly agree ☐

12. Operational risk has significant impact on Bank's Capital requirements

- Strongly disagree ☐
- Disagree ☐
- Neither disagree nor agree ☐
- Agree ☐
- Strongly agree ☐

13. Liquidity has significant impact on Bank's Capital requirements

- Strongly disagree ☐
- Disagree ☐
- Neither disagree nor agree ☐
- Agree ☐
- Strongly agree ☐

14. Non-Performing Loans have significant effect on Bank's Capital Requirements.

- Strongly disagree ☐
- Disagree ☐
- Neither disagree nor agree ☐
- Agree ☐
- Strongly agree ☐

15. Bank's size significantly impacts Bank's Capital requirements

- Strongly disagree ☐
- Disagree ☐
- Neither disagree nor agree ☐
- Agree ☐
- Strongly agree ☐

16. Bank's profitability significantly impacts Bank's Capital requirements

- Strongly disagree ☐
- Disagree ☐
- Neither disagree nor agree ☐

- Agree ☐
- Strongly agree ☐

17. Economic fluctuations significantly impacts Bank's Capital requirements

- Strongly disagree ☐
- Disagree ☐
- Neither disagree nor agree ☐
- Agree ☐
- Strongly agree ☐

18. Which of the following are most important banking risks.

Please rank on a scale of 1 to 5 (where 1 = most UNIMPORTANT; through to 5 = most IMPORTANT)

	1	2	3	4	5
Credit Risk					
Market Risk					
Operational Risk					
Liquidity					
Procyclicality					

19. Which of the following is most important for regulating banks.

Please rank on a scale of 1 to 5 (where 1 = most UNIMPORTANT; through to 5 = most IMPORTANT)

	1	2	3	4	5
Capital requirements					
Non-performing loans					
Bank Profitability					
Bank size					
Sensitivity to economic activity					

20. Which of the following factors significantly impact effective risk management in banks?

Please rank on a scale of 1 to 5 (where 1 = most UNIMPORTANT; through to 5 = most IMPORTANT)

	1	2	3	4	5
International Bank Regulation					
Local Bank Regulation					
Globalization					
Economic factors					
Political factors					

-----End of questionnaire.

THANK YOU VERY MUCH FOR YOUR COOPERATION

If there is anything else that you would like to tell us about this survey or any other comments you wish to make that you think may help us understand the risk management practices of banks and issues arising thereof, please do so in the space provided below.

Appendix 12: Ethics Approval

EXTERNAL AND STRATEGIC DEVELOPMENT SERVICES

uel.ac.uk/qa

Quality Assurance and Enhancement



20 December 2012

Dear Shazaib,

Project Title:	Role and Limitations of Basel II in Pakistani Banking
Researcher(s):	Shazaib Butt
Principal Investigator:	Dr Christian Richter

I am writing to confirm that the application for the aforementioned proposed research study has now received ethical approval on behalf of University Research Ethics Committee (UREC).

Should any significant adverse events or considerable changes occur in connection with this research project that may consequently alter relevant ethical considerations, this must be reported immediately to UREC. Subsequent to such changes an Ethical Amendment Form should be completed and submitted to UREC.

Approved Research Site

I am pleased to confirm that the approval of the proposed research applies to the following research site.

Research Site	Principal Investigator / Local Collaborator
UEL Campus	Christian Richter

Docklands Campus, University Way, London E16 2RD
Tel: +44 (0)20 8223 3322 Fax: +44 (0)20 8223 3394 MINICOM 020 8223 2853
Email: r.carter@uel.ac.uk





Approved Documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Participant Information Sheet and Consent Form	1.0	1 November 2012
Questionnaire	1.0	1 November 2012

Approval is given on the understanding that the [UEL Code of Good Practice in Research](#) is adhered to.

With the Committee's best wishes for the success of this project.

Yours sincerely,

Merlin Harries
University Research Ethics Committee (UREC)
Quality Assurance and Enhancement
Telephone: 0208-223-2009
Email: researchethics@uel.ac.uk