



Risk Management in Banks: Determination of Practices and Relationship with Performance

Muhammad Ishtiaq

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**RISK MANAGEMENT IN BANKS:
DETERMINATION OF PRACTICES AND
RELATIONSHIP WITH PERFORMANCE**

MUHAMMAD ISHTIAQ

PhD

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Risk Management in Banks: Determination of Practices and Relationship with Performance

By

Muhammad Ishtiaq

A thesis submitted to the University of Bedfordshire in partial fulfilment of the requirements for the degree of Doctor of Philosophy

March 2015

Dedication

To my loving parents, caring brother, beloved wife, lovely children and other family members for supporting me to find the strength within and for giving me the confidence to attain this goal.

You all are great blessings of Allah and the joy of my life.

RISK MANAGEMENT IN BANKS: DETERMINATION OF PRACTICES AND RELATIONSHIP WITH PERFORMANCE

MUHAMMAD ISHTIAQ

Abstract

The issue of risk management in banks has become the centre of debate after the recent financial crises. Several efforts have been made to improve the risk management and performance of banks including introducing the Basel Accords as well as risk management guidelines by central banks. Consequently, the State Bank of Pakistan has issued risk management guidelines to strengthen the risk management system and to improve the performance of the local banks. However, the available literature in Pakistani context fails to explain the impact of these efforts on the performance of banks. The purpose of this study is to empirically examine the effectiveness of risk management processes and their relationship with the performance of banks. This study reviews the relevant literature on banking risk management from diverse methodological strands and synthesises its conclusions to make an addition to the available knowledge; particularly to address certain research gaps regarding risk management and performance of banks in developing countries, specifically in Pakistan.

Owing to its empirical nature, the current research adopts a deductive reasoning approach in terms of theory testing. This study applies a mixed method research strategy by taking the quantitative method as the major component, while the qualitative method plays a supplementary role. The sample is composed of twenty banks in Pakistan and the stratification is performed according to the bank category (public, private and foreign) in respect of different strata. The study collects and analyses primary as well as secondary data. This research is carried out in three phases. In the first phase a qualitative system dynamics model (Causal Loop Diagram) is developed based upon interview data analysis to understand and

document the behaviour of risk management systems of Pakistani banks. In the second phase, this research conducts questionnaire data analysis by using ordinary least-squares regression to assess the different aspects risk management practices of banks in Pakistan. Finally, two-stage data envelopment analysis technique has been adopted to examine the relationship between the risk management and performance of the selected banks.

This study results reflect that it is very important for Pakistani banks to formulate an active risk management process to identify, measure, monitor and control different risks. These results further reveal that formation of a comprehensive risk management system is not only a useful practice to meet the regulatory requirements but an effective exercise to improve the performance of Pakistani banks also. By employing a pragmatic, embedded, mixed method research strategy, this study has created a new insight into risk management in local banks and extends the existing theoretical literature in the field of banking in various ways.

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First of all, I thank Almighty Allah, the Most Merciful and the Most Gracious, Who gave me the courage and patience to achieve this milestone.

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I would also like to thank my dear colleague Muhammad Shahid Tufail who always helped me like a real brother. His advice, encouragement and support inspired me through difficult times.

My deepest and sincere gratitude to my family for their prayers and patience. I am hopeful that this work and degree would pay all of their sacrifices.

Finally, I want to say thank to everyone who helped me during the course of this study.

Declaration

I declare that this thesis is my own unaided work. It is being submitted for the degree of PhD, at the University of Bedfordshire.

It has not been submitted before for any degree or examination in any other University.

A rectangular box containing a handwritten signature in black ink. The signature is cursive and appears to read 'Muhammad Ishtiaq'.

Signature:

Muhammad Ishtiaq

Date: 04 November, 2015

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List of Abbreviations

ABL	Allied Bank Limited
ADB	Asian Development Bank
AKBL	Askari Bank Limited
BAHL	Bank Al Habib Limited
BAL	Bank Alfalah Limited
BCC	Banker, Charnes and Cooper
BCBS	Basel Committee on Banking Supervision
BOK	The Bank of Khyber
BOP	The Bank of Punjab
BTMU	The Bank of Tokyo-Mitsubishi UFJ Limited - Pakistan Operations
CBNA	Citibank N.A. - Pakistan Operations
CLD	Causal Loop Diagram
CLDs	Causal Loop Diagrams
CRS	Constant Returns to Scale
DBAG	Deutsche Bank AG - Pakistan Operations
DEA	Data Envelopment Analysis
DEAP	Data Envelopment Analysis Program
DMU	Decision Making Unit
DMUs	Decision Making Units
FBL	Faysal Bank Limited
HBL	Habib Bank Limited
HSBC	HSBC Bank Middle East Limited - Pakistan Operations
IBP	Institute of Bankers Pakistan
IMF	International Monetary Fund
KASB	KASB Bank Limited
MBL	Meezan Bank Limited
MCB	MCB Bank Limited
NBP	National Bank of Pakistan
NIB	NIB Bank Limited
RBI	Reserve Bank of India
SBL	Soneri Bank Limited
SBP	State Bank of Pakistan
SCBPL	Standard Chartered Bank (Pakistan) Limited
SD	Standard Deviation
SFA	Stochastic Frontier Analysis
SPSS	Statistical Package for Social Sciences
UBL	United Bank Limited
VIF	Variance Inflation Factor
VRS	Variable Returns to Scale

Chapter One Introduction and Context of Study

1.1 Introduction

This chapter intends to provide an overview of this research. It describes the background information, aim, objectives, research questions, rational and significance of this study. It also provides an overview of the methodology that is undertaken during the course of this research in order to drawing the final conclusions. Finally, the current chapter presents an outline of this thesis's structure.

1.2 Background of the Study

Pakistan is considered to be the second largest economy of the South Asia region (Shafiq and Nasr, 2010). The services sector plays a key role to augment the economic growth in the country and encompasses distributive services, financial services, personal services and social services (Ahmed and Ahsan, 2011). According to Pakistan Economic Survey (2014), the contribution of services sector has increased from 56.6 percent of GDP in 2008-09 to 58.1 percent in 2013-14 and indicates a higher growth rate than agriculture and industrial sectors of the economy. Moreover, a strong and significant contribution (about 9%) of the financial institutions towards overall performance of service sector as well as economy has also been witnessed in Pakistan (Pakistan Economic Survey, 2014).

The financial services sector in Pakistan comprises of banking institutions, insurance companies, stock markets and development finance institutions. As a matter of fact, Pakistani banks play pivotal role in overall productivity of financial services contributing around 95 percent in local market and prove one of the most important segments of the economy (Aurangzeb, 2012). In addition, the local banks

also provide the main sources of finance to other business sectors in Pakistan (Shafiq and Nasr, 2010). Therefore, the presence of an active banking system in Pakistan is a basic requirement for more efficient utilization of the available economic resources (Molyneux and Wilson, 2007; Ahmed and Ahsan, 2011).

1.2.1 Pakistan Banking System

The Pakistan banking system is a two-tier system. It consists of the State Bank of Pakistan (SBP), public sector banks, private banks, foreign banks, and specialized banks. The SBP is the central bank and regulates the banking sector.

1.2.1.1 State Bank of Pakistan

After the independence of Pakistan in 1947, there was no central bank in the country and the Reserve Bank of India (RBI) performed this functions (Ahmed, 2008). Afterwards, the SBP was established in July 1948 to take over the operations of central banking from the RBI. According to Arby (2004), the SBP performs a number of traditional as well as non- traditional functions to achieve the macro-economic goals and these functions are depicted in Figure 1.1.

According to the State Bank of Pakistan Act 1956, the SBP is an autonomous body and responsible to supervise the country credit system along with the monetary policy (Ahmed, 2008). The SBP also monitors the commercial banks and has a significant influence on the working of the banking system in Pakistan. The SBP has taken several important steps including formation of the risk management guidelines and a road map for the implementation of Basel Accords to maintain and strengthen the soundness of the banking institutions (see section 2.5.1).

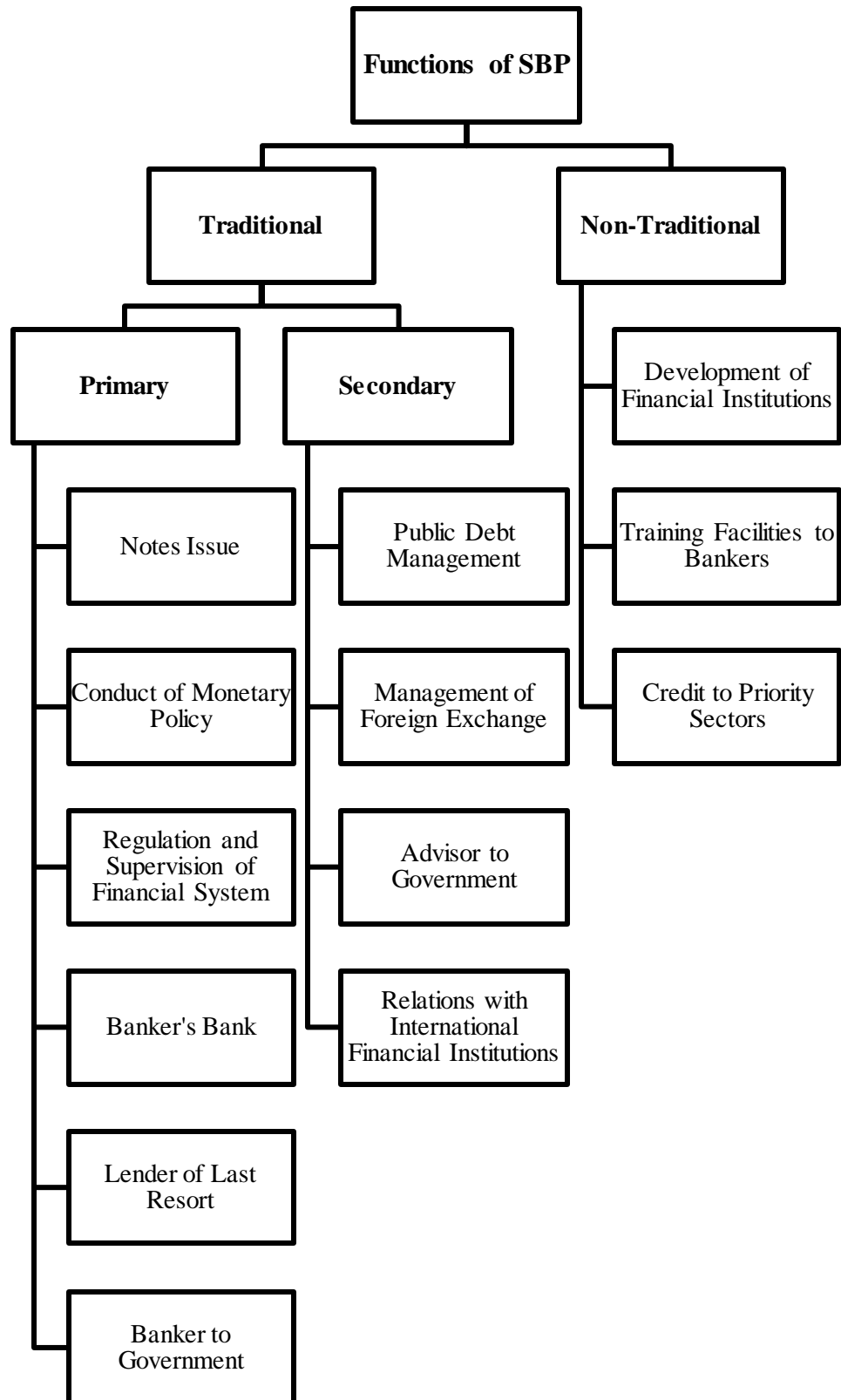


Figure 1.1 Functions of SBP

Source: Arby, 2004, p. 5

1.2.1.2 Scheduled Banks Operating in Pakistan

According to the Banking Statistics of Pakistan published by the SBP, the local banking sector comprised of 11551 branches of different banks including 2097 branches of public sector banks, 8852 branches of local private banks, 18 branches of foreign banks and 584 branches of specialized banks as on 31st December 2014. There are 34 commercial banks (including 5 public sector, 22 private sector and 7 foreign banks) and 4 specialized banks operating in Pakistan (The State Bank of Pakistan, 2013). The commercial banks in Pakistan perform a number of functions to individuals and companies and are presented in Figure 1.2. These banks provide intermediation services as well as offer a payment agency role. They also offer domestic and cross-border remittance services in shape of accepting cheques, issuing the letter of credit and providing such other guarantees. On the other hand, the specialized banks provide the credit requirements to different important sectors of the economy such as agriculture, housing, industry and SME (Small and Medium Enterprise). The specialized banks offer limited functions than the commercial banks in the country.

As mentioned earlier, banking institutions are playing an important role in the economy growth of Pakistan. Banks have shown remarkable growth in Pakistan in terms of the volume of assets, deposits and loans during the recent years. Consequently, the intermediation role of these banks in mobilizing savings has grown significantly. According to Banking Statistics of Pakistan published by the SBP, the total assets of local banks have increased from PKR 2,209 billion in December 2002 to 12,106 billion in December 2014. Likewise, the deposits in these banks have grown from PKR 1,662.6 billion in December 2002 to reach PKR 9,230 billion in December 2014. Simultaneously, the size of loans has risen from PKR 1068.8 billion in 2002 to PKR 4918.7 billion in 2014. At the same time, the relative shares of different Pakistani banks have also changed predominantly after the banking sector reforms initiated in the early 1990s. In recent years, the Pakistan banking system has experienced a considerable change in its structure, ownership and concentration after the privatisation of some public banks and the merger or acquisition of several private banks (Burki and Niazi, 2010). As a result, about 80

percent of market share is held by private sector banks as on December, 2014 based on Banking Statistics of Pakistan published by the SBP.

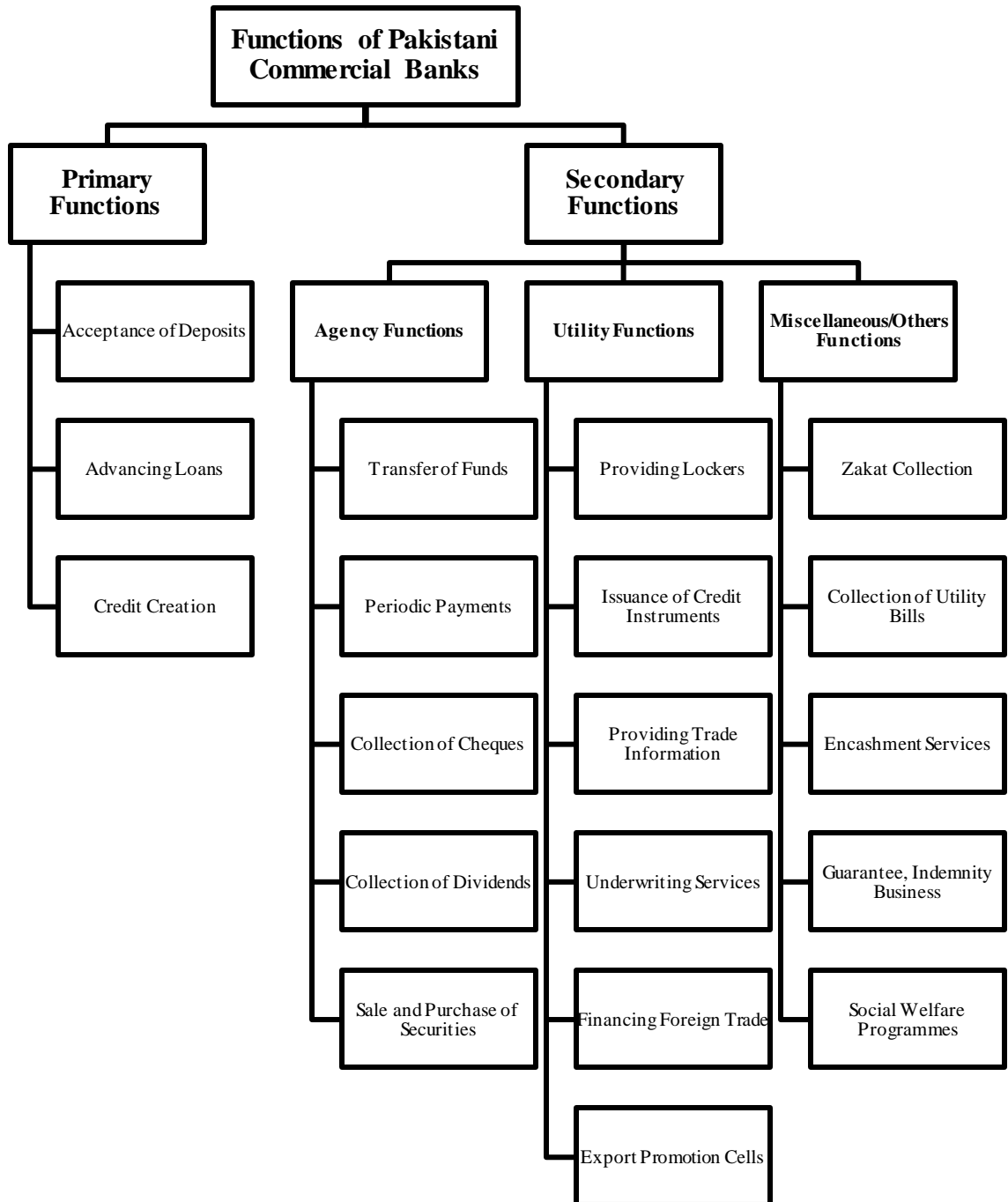


Figure 1.2 Functions of commercial banks in Pakistan

The Banking Statistics of Pakistan published by the SBP (reported earlier in the current section) clearly indicates that the Pakistani banks has shown considerable performance and their role has grown considerably in terms of the volume of assets, deposits and loans. However, Minsky (1982) highlights that several market participants including banks become inattentive to identify, assess, measure and control risk during periods of quiet. Because of a myopic focus towards short-term performance and lack of effective risk management, several potential risks are underestimated and under hedged. The result of ineffective risk management may be the collapse of a bank or ultimately the breakdown of the whole banking system (Kao et al., 2011; Aebi, Sabato and Schmid, 2012). Therefore, the management of different risks has become a keystone of sensible banking and its importance is increasing over time, especially after the recent Global Financial Crises (Scarborough, 2011).

Considering the above fact, the issue of risk management in Pakistani context has also gained much importance not only to maintain the competitiveness but also to sustain the economic growth of the country (Nazir, Daniel and Nawaz, 2012). Pastor (1999) suggests that banks as part of financial sector place more importance on risk management in the economy than any other sector due to their inherent nature of trade. Furthermore, it is imperative for banking institutions that they not only be efficient but also secure. Therefore, it is necessary for a bank to understand its risks exposures and to make sure that these risks are adequately managed (Al-Tamimi and Al-Mazrooei, 2007).

1.2.2 Risk Management in Pakistani Banks

Burki and Niazi (2010) argue that the rapid growth in the banking sector of Pakistan has made it more leveraged and risky due to modern technological, product innovations, financial deregulations and global market integration. The banks in Pakistan face a large number of financial and non-financial risk factors including interest rate, liquidity, credit, market, operational, reputation, legal and foreign exchange risks that may influence their survival and success (Shafique, Hussain and Hassan, 2013). The State Bank of Pakistan (SBP) has imposed risk management

guidelines on the banks in Pakistan to improve their ability to deal with competitive environment.

These guidelines contain a detailed explanation of key risks that banks may be exposed to and establish some fundamental principles concerning a risk management framework for all the banks, irrespective of their complexity and size. According to these guidelines, risk management comprises of identification, measurement, monitoring and controlling risks to make sure that: all the persons who manage or take risks clearly understand different risks; the risk exposures of the bank are within the limits set by the board of directors; all the risk taking decisions are aligned with the objectives and business strategies established by board of directors; the expected payoffs compensate for the risks taken by the bank; all the risk taking decisions are clear and explicit; and adequate capital is available as a buffer to take risk. Besides the issuance of these guidelines, the SBP has also established a road map for the implementation of Basel Accords so as to strengthen their risk management systems and to align the banks with best international practices.

However, the SBP risk management guidelines are limited to providing a brief overview of all the important actions and not intended to describing a detailed plan of actions for every control procedure that might be put in place by these institutions. Lopez (2003) argues that it is an important element in risk management to decide the tolerance and extent of risk. Therefore, it is important for banks to keep away from accepting any unnecessary risks for the smooth running and continuity of banking operations. For this purpose, different aspects are needed to be considered for assessing bank risk management approach (Abu Hussain and Al-Ajmi, 2012). Considering the fact, several studies have been conducted on the risk management practices of banks (Santomero, 1997; Al-Tamimi, 2002; Fatemi and Fooladi, 2006, Al-Tamimi and Al-Mazrooei, 2007; Sokolov, 2007; Richard et al., 2008; Ariffin, Archer and Karim, 2009; Hassan, 2009; Anderson, 2010; Alam and Maskujaman, 2011; Hassan, 2011; Abu Hussain and Al-Ajmi, 2012; Bilal, Talib and Khan, 2013; Selma, Abdelghani and Rajhi, 2013; Wood and Kellman, 2013).

A limited research work is available on the risk management practices of the banks operating in lower-middle-income economies specifically in Pakistan (Shafiq and Nasr, 2010). The research works regarding the risk management practices of banks in Pakistan have been carried out by different researchers (Shafiq and Nasr, 2010; Khalid and Amjad, 2012; Nazir, Daniel and Nawaz, 2012; Shafique, Hussain and Hassan, 2013). These studies focus on some common aspects such as risk understanding, risk identification, measurement and analysis of risk, risk monitoring and controlling and the risk management practices of banks in Pakistan. Considering the SBP risk management guidelines, the literature in hand do not address some other important aspects of risk management including managing credit risk, managing market risk, managing liquidity risk and managing operational risk in Pakistani banks.

1.2.3 Risk Management and Performance in Pakistani Banks

In addition to a regulatory requirement, the risk management is valuable and relevant in order to increase the value of firm (Santomero, 1995; Oldfield and Santomero, 1997). Gup and Kolari (2005) argue that risk management is important for the financial health of banks. The adoption of risk management in banks directs them to a better trade-off between risk and return (Fatemi and Fooladi, 2006). Essinger and Rosen (1991) recommend risk management as a useful technique to minimize the unfavourable effects of various risks and optimize the returns in uncertain situations. In a later study, Drzik (2005) supports this assertion and argues that the expenditure by banks in improving the risk management capabilities of credit, market and interest rate risks after the 1991 recession; made it possible to minimize the volatility of earnings and losses in the recession period of 2001. Cebenoyan and Strahan (2004) also conclude that the banks which have adopted more advanced techniques in risk management have greater availability of credit. This opportunity allows them to amplify their productive assets as well as profits.

Tandelilin et al. (2007) claim that the risk management is very essential to safeguard the bank's assets and for the protection of the shareholders' interests. They further point out that the banks with better risk management may have certain advantages including: (i) It is aligned with the compliance function toward the

regularity requirements; (ii) It improves bank reputation and increases the opportunity to attract more customers which enhanced bank portfolio of fund resources and; (iii) It increases the efficiency and profitability of the bank.

Available studies provide the empirical evidences that the implementation of risk management is important for the performance of banking institutions. Fernando and Nimal (2014) identify that the adoption of risk management is favourable to improve the efficiency of Sri Lankan banks. Ariffin and Kassim (2011) highlight a strong positive relationship between performance and risk management practices of selected banks in Malaysia. Similarly, Oluwafemi et al. (2013) find a significant relationship between performance and risk management in Nigerian banks. Kao et al. (2011) have explored the performance of Taiwan financial holding companies from the perspective of risk management and found a significant direct relationship between study variables.

However, the existing literature on the Pakistani banks often analyse the specific aspects of Pakistan banking such as capital management, privatization, banking reforms, financial liberalization, banking system and business, capital structure and efficiency but do not examine the risk management in detail and its relationship with the performance of banks (Nazir, Daniel and Nawaz, 2012). The above discussion highlights that an opportunity is available to conduct a dedicated study in the area of risk management of banks in Pakistan. Therefore, this research intends to explore the above potential research gaps by addressing the full range of risk factors and particularly in examining the relationship between risk management and performance.

1.3 Aim and Objectives of the Study

The aim of this study is to examine the risk management policies in practice of Pakistani banks and their impact on the banking performance. For this purpose, this study has the following objectives:

- To identify, understand and draw a chain of causality between risk management policies in practice of banks and different types of risk in Pakistan

- To assess the effectiveness of risk understanding within the staff of banks in Pakistan
- To assess the potency of risk identification, risk assessment and analysis, risk monitoring and controlling within the banks in Pakistan
- To examine the important aspects of risk management practices of banks in Pakistan.
- To investigate the relationship between the risk management and performance of the selected banks in Pakistan

1.4 Research Questions

1. How do the risk management systems of banks work to cope with different risks in Pakistan?
2. What is the level of understanding the different risks and risk management among the managers of Pakistani banks?
3. What is the level of risk identification, assessment, analysis, monitoring and controlling of different risks in Pakistani Banks?
4. What are the empirical evidences regarding risk management practices in Pakistani banks?
5. What is the relationship between risk management and performance of banks in Pakistan?

1.5 Rational and Significance of the Study

In recent years, the risk management in banking institutions has got substantial importance and become centre of debate after the Global Financial Crisis. As a result, there is an increased demand for the adoption of effective risk management frameworks to ensure the continuity and success of this sector. As discussed earlier in Section 1.2, Pakistan is a developing economy and the banking sector is playing an important role in the national development (Molyneux and Wilson, 2007; Ahmed and Ahsan, 2011). Whereas, the continuity and success of banks considerably depend upon risk management (Pastor, 1999; Kao et al. 2011; Scarborough, 2011). Therefore, this study aims to contribute to the on-going debate

of the effectiveness of the risk management in developing countries specifically in Pakistan in following ways.

The purpose of this thesis is to study the risk management practices of banks in Pakistan and their impact on the banking performance. In doing so, an in-depth understanding of the risk management practices is important to examine the relationship between the risk management and performance of banks (Ariffin and Kassim, 2011). Therefore, this study adopts systems thinking approach (which is a unique approach in the local banking context) to develop a qualitative system dynamics model to understand and document the cause and effect relationship between the various variables in the risk management systems of Pakistani banks. This approach supports this study in order to draw a chain of causality between risk management policies in practice of banks and different types of risk in Pakistan. Besides it, the adoption of this novel approach can be useful for academia as well as stakeholders of Pakistani banks in gaining improved understanding and holistic view of the risk management systems of local banks.

This study assesses the level of risk understanding and risk management in Pakistani banks. For this purpose, this research collects data from the managers of different divisions by considering the fact that that the risk management is not confined to the sole responsibility of the staff of risk management departments in banks, but everyone who works for the bank is responsible for it (State Bank of Pakistan, 2003 and KPMG International, 2009). Whereby, existing studies in Pakistani context have been conducted by taking responses directly from the managers of risk management divisions of different banks in Pakistan (Shafiq and Nasr, 2010; Khalid and Amjad, 2012; Nazir, Daniel and Nawaz, 2012). Therefore, this study can provide new insights in the existing literature by presenting a broader view of the level of risk understanding (focusing on staff) and the levels of risk identification, risk assessment and analysis, risk monitoring and controlling, managing credit risk, managing market risk, managing liquidity risk and managing operational risk (focusing on overall bank). Al-Tamimi and Al-Mazrooei (2007) conclude that good understanding about different risks and risk management among banking staff, improves the ability of the banking institution to manage its risks.

Similarly, this study conducts empirical analysis to examine the important aspects of risk management. In order to address the limitation of existing studies in the local context (Shafiq and Nasr, 2010; Khalid and Amjad, 2012; and Nazir, Daniel and Nawaz, 2012), this research covers some more important aspects such as managing credit risk, managing market risk, managing liquidity risk and managing operational risk. As all the banking institutions are required to develop an effective risk management system to deal with the major risks such as credit, market, liquidity, and operational risk (State Bank Pakistan, 2003). Therefore, this study makes an addition to the growing body of literature by delivering a more comprehensive view of the risk management practices of banks in Pakistan.

This study also analyses the impact of the efforts and initiatives taken by the local banks for the implementation of risk management frameworks to deal with different risks in compliance of the SBP risk management guidelines. For this purpose, this study intends to examine the relationship between risk management and performance of banks in Pakistan. Hence, this study can contribute to the available literature in banking field by providing the empirical verification of the risk management importance for the performance of Pakistani banks. The research can be useful for the shareholders as well as other stakeholders of the banking sector who need to assess the impact of the risk management on the performance of banks. In relation to a value enhancing strategy, a bank is engaged in risk management activities for a better performance and, by implication, the value of its shareholders (Santomero, 1995; Smithson, Smith and Wilford, 1995; Oldfield and Santomero, 1997).

Additionally, this study contributes to the available literature on using of institutional theory in banking field by examining the policy implications of the SBP risk management guidelines in the Pakistani context. This thesis tests the uniformity (homogeneity) assumption of institutional theory (DiMaggio and Powell, 1983) by which it is necessary for all the local banks to implement a system for risk management in order to fulfil the regulatory requirement of the SBP.

This thesis also expects to make a methodological contribution by adopting a unique combination of different data collection and analysis procedures to

conduct a full dedicated study on some important attributes of risk management in Pakistani banks.

In conclusion, this study is important as the current research not only makes an addition in the available academic knowledge in the field of banking but also offers significant methodological as well as practical contributions to this crucial area.

1.6 General Outline of Research Methodology

A mixed method research strategy is adopted to answer the research questions. The application and acceptance of mixed methods research has been increased in the field of business research (Bryman and Bell, 2011) and has several advantages: it reduces the problems related to the dependence on the sole research method (Saunders, Lewis and Thornhill, 2012); it facilitates in enhancing data by collecting both qualitative and quantitative evidences, hence maintains the credibility and validity of the research (Sarantakos, 2005); and it accommodates the best prospect of answering the research question(s) (Creswell, 2003). The current study uses a mixed method research strategy by taking the quantitative method as the major component, while the qualitative method plays a supplementary role. In order to realize the research aim and objectives, this research is undertaken in three phases.

Phase I: The study of current phase is carried out to obtain an in-depth understanding of the risk management system of banks in Pakistan. For this purpose, this research uses systems thinking approach which focuses on developing models to improve the understanding of how things interact and work together within a whole system (Sherwood, 2002; Maani and Cavana, 2007). In order to develop a qualitative system dynamics model (Causal Loop Diagram), this research is carried out in three steps. A preliminary causal loop diagram is developed based on the researcher's initial understanding gained from the literature of cause and effect relationship between the various variables in the risk management systems of Pakistani banks at first step. The Vensim Software package is used to build the causal loop diagram. At second step, ten face to face semi-structured interviews

from the managers of risk management departments of banks in Pakistan are conducted in order to refine, validate and add more detail in the preliminary causal loop diagram. Microsoft Excel 2010 software package is used to analyse the interview data. Based upon the interview data analysis, a final and revised version of causal loop diagram of the risk management systems of Pakistani banks is developed at the third step. The causal relationships documented in this phase facilitates in gaining a deeper and more specific understanding of the risk management practices of banks in Pakistan which is followed up by applying quantitative research on other two phases.

Phase II: The purpose of the second phase is to assess the different aspects of risk management practices in Pakistani banks including risk understanding, risk identification, measurement and analysis of risk, risk monitoring and controlling, managing credit risk, managing market risk, managing liquidity risk and managing operational risk. This research adopts the survey method using questionnaires to collect data from the managers of banks in Pakistan. This study employs stratified random sampling technique and 300 managers of twenty selected banks are approached to collect primary data. This phase uses different descriptive as well as inferential statistical techniques to analyse the questionnaire data. Mean as well as standard deviation measures are utilized to analyse the data and to make a broad argument to answer the particular research questions. Furthermore, this part of analysis employs Pearson correlation and the ordinary least square (OLS) technique to test the study hypotheses. Statistical Package for Social Sciences (SPSS 20.0) is applied to analyse descriptive statistics, correlation and regression analyses.

Phase III: The objective of third phase is to investigate the relationship between the risk management and performance of the selected banks in Pakistan. In doing so, this study collects a multiple-source secondary data from the Banking Statistics of Pakistan published by the SBP as well as from the annual reports of twenty selected banks for the duration of 2005-2012. A two-stage data envelopment analysis method is adopted to examine the above relationship. The performance of targeted banks in terms of efficiency scores is measured by using data envelopment analysis method at first stage. This study applies Data Envelopment Analysis

Program (DEAP Version 2.1) developed by Coelli in 1996 to estimate the efficiency scores of the banks. A Tobit regression model is developed at the second stage of analysis to investigate the relationship between the risk management and performance of the selected Pakistani banks. In order to perform descriptive as well as inferential statistical analysis Statistical Package for Social Sciences (SPSS 20.0) is used.

1.7 Structure of the Thesis

This thesis is structured into seven chapters as outlined in Figure 1.3. The overview of each chapter is presented below.

Chapter One: This chapter presents an overview of this research. It describes the background information of this study. It highlights the importance and challenges of the Pakistan banking industry. It provides description of the aim, objectives, research questions, rationale and significance of the study and also presents an outline of the methodology employed in this research.

Chapter Two: The purpose of second chapter is to undertake detailed literature review on risk management and its effectiveness for banks. It describes the functions and roles of banks, the different types of banking risks and possible classification of these risks. This chapter states the background and rationale for risk management by considering both banking regulation as well as bank management. A detail discussion on the risk management guidelines issued by domestic (SBP) and international bodies (Basel Committee) is also reported in the current chapter. It also presents the theoretical considerations for this study covering the relevance of banking risk management function and its relationship with the performance of banks. Different methods along with selected method to measure the performance of banks are also discussed in detail. Furthermore, this chapter provides an avenue to explore the potential gaps in the existing literature which serve the basis of this study.

Chapter Three: Third chapter intends to provide details about the research methodologies that are applied to achieve the objectives of the research. It describes the research philosophy, research approach, research strategies, research design and

time horizon of this study. A brief description of the study population and selected sampling technique is discussed in this chapter.

Chapter Four: This chapter describes a broad explanation of the systems thinking approach. A brief description on the purpose and use of systems thinking approach is provided in this chapter. This chapter explains interviews data collection procedures and analysis results. It also demonstrates the qualitative system dynamics model of the risk management system of Pakistani banks in terms of sub-system causal loop diagrams as well as a generic causal loop diagram.

Chapter Five: This chapter intends to examine relationship between risk management practices and different aspects of risk management. It provides a brief detail of the research instrument and study hypotheses. Different descriptive as well inferential statistics analysis results are reported in this chapter. Besides, a detail discussion of the questionnaire data analysis results is also presented in it to answer the particular research questions of this study.

Chapter Six: This chapter aims to examine the relationship between risk management and performance of banks in Pakistan. This chapter presents a thorough explanation of the particular study variables used to investigate the relationship between risk management and performance. This chapter provides the results of descriptive as well inferential statistics analysis. It also discusses the results of two stage data envelopment analysis in order to test the study hypothesis and to achieve the particular objective of this study.

Chapter Seven: The final chapter of this thesis presents a summary of findings and an overall conclusion from the analysis conducted in the preceding chapter. In order to draw down the final findings and discussion, the key results from the both qualitative (Chapter Four) as well as quantitative methods (Chapter Five and Six) are brought together in Chapter Seven. Various limitations of this study and several recommendations for the future research are also discussed.

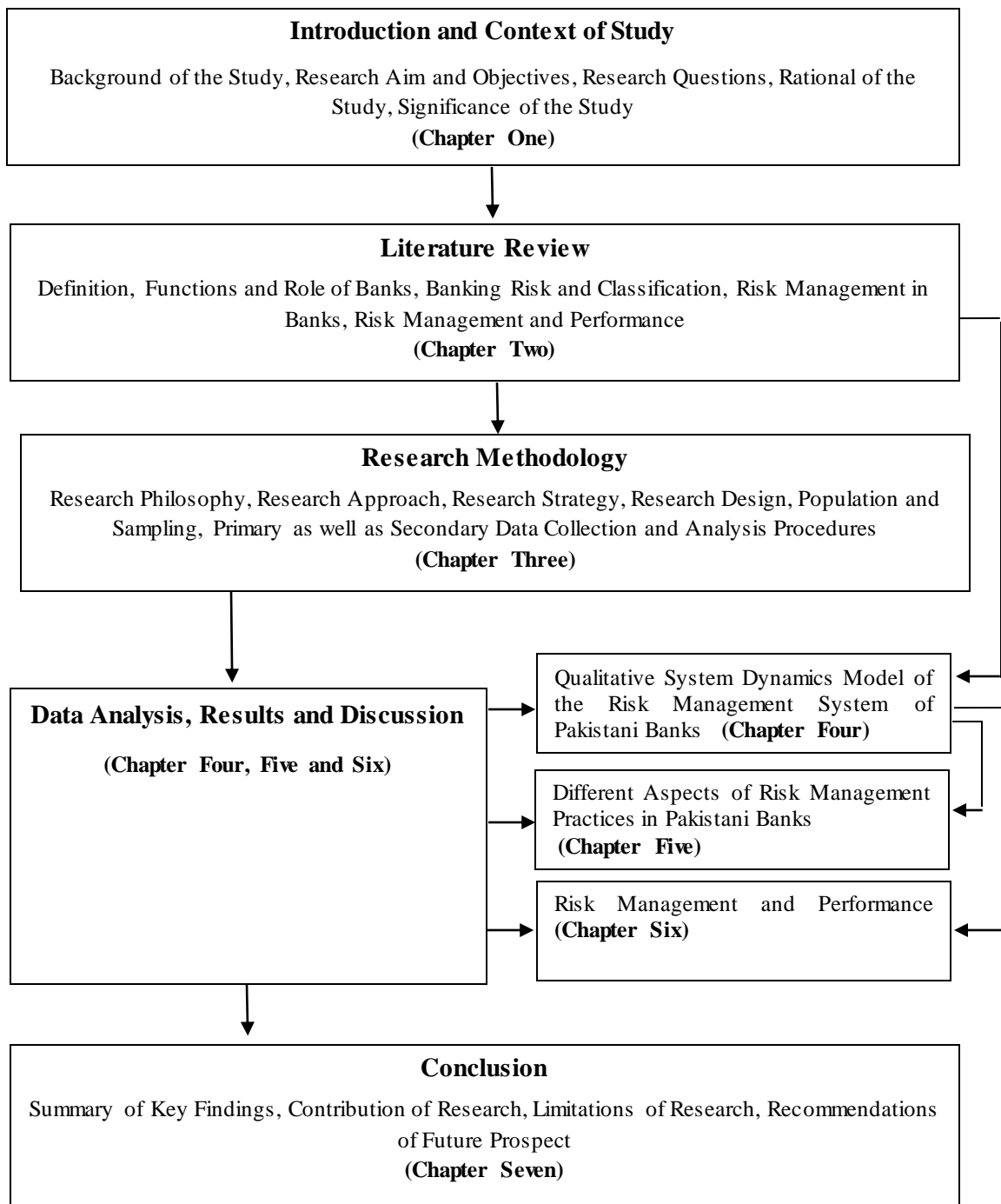


Figure 1.3: Structure of the thesis

Chapter Two Literature Review

2.1 Introduction

The initial search and review of existing literature help researchers to generate and refine their research ideas (Saunders, Lewis and Thornhill, 2012). Therefore, this chapter intends to provide a detailed literature review on risk management practices and their impact on the performance of banks. The available literature in banking field has been dominated by the design and adoption of different risk management frameworks and their implications on banks performance, using different theoretical perspectives and methodologies over the last two decade (Stan-Maduka, 2010). A detailed discussion on existing literature and the relative dearth of research on risk management and banking performance specifically in Pakistan is provided in this chapter. The current chapter of this thesis is presented in different key sections to cover the definition, functions and roles of banks, classification of different banking risks, risk management practices and their effectiveness for banks. In addition, the conclusion of this chapter in terms of a summary is also provided in Section 2.9.

2.2 Definition, Functions and Roles of Banks

Bank is a financial institution that principally links to the acceptance of deposits and advancing money to borrowers (Casu, Girardon and Molyneux, 2006). In Pakistan, The Banking Companies Ordinance 1962 defines:

Banking means the accepting, for the purpose of lending or investment, of deposits of money from the public, repayable on demand or otherwise, and withdrawable by cheque, draft, order or otherwise.

(The Banking Companies Ordinance, 1962, p.4).

Considering the above definition, the key role of a bank is to provide intermediation services between depositors and borrowers such as to take deposits that can be withdrawn on demand and to lend money to business organizations and individuals on request. Banking institutions appear to be superior in a number of aspects in comparison with other financial institutions. These organisations offer a wider variety of services to their clients than other financial institutions (Bhattacharya and Thakor, 1993). Banking institutions take deposits and lend money directly to their borrowers than some other financial institutions including the Pension Fund or Insurance Companies (Matthews and Thompson, 2008).

In addition to the intermediation services, banks also offer a payment agency role to their clients by providing additional services in shape of accepting cheques, issuing the letter of credit and providing such other guarantees (Heffernan, 2005; Matthews and Thompson, 2008). All these points indicate that banks facilitate business activities and play an important role in the economic development of a country. Molyneux and Wilson (2007) highlight, “banks are of central importance for economic growth, credit allocation, financial stability, and the competitiveness and development manufacturing and service firms” (Molyneux and Wilson, 2007, p. 1907).

Several studies highlight banking as one of the most complex endeavours in any economy that faces a large number of financial and non-financial risk factors (Anderson, 2010; Shafiq and Nasr, 2010; Shafique, Hussain and Hassan, 2013; Wood and Kellman, 2013). The nature and complexity of these risks have changed rapidly over time and become more ominous not only for banking operations but also bank’s survival (Bessis, 2002; Rahman, Abdullah and Ahmad, 2012). It is imperative that banking institutions should not only be efficient but also secure (Pastor, 1999). Hence, it is necessary for a bank to understand its risks exposures and to make sure that these risks are adequately managed (Al-Tamimi and Al-Mazrooei, 2007). Abu Hussain and Al-Ajmi (2012) point out that the understanding of different types of risks is very important for effective risk management in banks and these institutions ought to accept only those risks which are uniquely a part of their array of services. Therefore, all the risk management issues are not only

important for the banking sector but are also vital for the overall growth of the economy (Kao et al. 2011).

A detailed discussion on the different types of banking risks is reported in the next section.

2.3 Risk in Banking

The term *Risk in banking* has extensively been probed by different investigators (Bessis, 2002; Schroeck, 2002; Gallati, 2003; Fayyaz, 2006; Ghosh, 2012; Rahman, Abdullah and Ahmad, 2012) in recent years and does not have a universal definition. Different authors apply diverse approaches to describe the scope of this term. Risk in banking refers to an exposure to unpredictability of the outcome that contains a probability of variation in the desired or expected returns (Gallati, 2003; Fayyaz, 2006; Rahman, Abdullah and Ahmad, 2012). Ghosh (2012) defines risk in banks as a potential loss that may occur due to some antagonistic events such as economic downturns, adverse changes in fiscal and trade policy, unfavourable movements in interest rates or foreign exchange rates, or declining equity prices. Bessis (2002) and Schroeck (2002) interpret risk in banking as undesirable impacts on returns due to various distinct sources of uncertainties. Moreover, both have incorporated the limitation that the banking risks depend on the real world situations, also mainly comprising of amalgamation of situations in the external environment.

State Bank of Pakistan (2003) describes the risk in banking institutions as:

The possibility that the outcome of an action or event could bring up adverse impacts. Such outcomes could either result in a direct loss of earnings / capital or may result in imposition of constraints on bank's ability to meet its business objectives.

(State Bank of Pakistan, 2003, p.1)

According to the SBP, adverse impacts are classified into two groups such as expected losses and unexpected losses. All those losses which can be anticipated by the banks with reasonable certainty of occurrence are treated as expected losses; for instance loan losses. On the other hand, all losses which arise from unforeseen events are considered unexpected losses; for example losses faced by banks due to

an unexpected down turn in the economy or losses experienced because of decline in interest rates or foreign exchange rates. Statistically, the term risk is described as the probability of an adverse outcome, Standard Deviation (SD) or Variance around the predicted return, or as an imperfection probability; whereby a higher risk value is reported in terms of greater deviation and higher disparity in the probability of occurrence (Cade, 1997; Van Horne, 2002).

Finally, the term *risk in banking* can be summarised by keeping in view all the above definitions as a probability of any event or threat which has the potential to disturb the core earnings capacity of a bank, or to increase the volatility of earnings and cash flows caused by external or internal exposures.

The next section describes various types of banking risks.

2.3.1 Types of Risks in Banks

The available literature describes different types of banking risks including:

- Santomero (1997) identifies several types of risks in banks such as market or systematic risk, legal risk and operational risk;
- Bessis (2002) points out that credit risk, interest rate risk, market risk, liquidity risk, solvency risk operational risk, foreign exchange risk, country risk, settlement risk, and performance risk are the most important types of risks in banks;
- Crouhy, Galai and Mark (2006) formulate a different classification of risks in banks that encompasses credit risk, market risk, liquidity risk, operational risk, business risk, legal risk, reputation risk and strategic risk;
- Abu Hussain and Al-Ajmi (2012) claim that the importance of different types of risks in banks depends on their asset portfolios and the way different types of banks conduct their business lines subject to regulatory requirements. Several research studies find that banks face credit risk, liquidity risk, operational risk, legal risk, regulatory risk, reputation risk, strategic risk, solvency risk, interest rate risk, rate of return risk, settlement risk, concentration risk, price (equity) risk, foreign-exchange risk, country (political) risk and residual risk with varying degrees of exposures (Al-

Tamimi and Al-Mazrooei, 2007; Hassan, 2011; Abu Hussain and Al-Ajmi, 2012);

- According to Basel Committee (2013), banking risks are grouped mainly into credit risk, market risk, and operational risk;
- The SBP describes credit risk, market risk, liquidity risk, operational risk, reputation risk, and regulatory risk and legal risk as the important types of risk in Pakistani banks (State Bank of Pakistan, 2003).

A brief explanation of some important types of banking risks is provided as under:

Credit Risk: This risk is one of the most premier and the most important types of banking risk (Colquitt, 2007). Credit risk refers to the likelihood in which a contractual counterparty does not meet its obligations due to decline in repay ability or unwillingness to comply with the contract (Ammann, 2001; Bessis, 2002; Schroeck, 2002; Colquitt, 2007). Therefore, credit risk emerges when a bank is failed to recover the lending money from a borrower, counterparty, or an obligator. According to Hempel and Simonson (1999), credit risk is a threat that the bank may not be able to collect the principal or interest on loans and securities as promised. Generally, loans and advances are the biggest and the most obvious cause of credit risk in the majority of banks (Dhakan, 2006). Banks eliminate the credit risk through effective risk management that contains a comprehensive credit risk analysis based on scanning and monitoring of the most trustworthy loan applications, the degree of collateral, diversification of the loan portfolio, accurate loan pricing depending upon the borrowers' repay ability and intentions (Karim, 2006; Greuning and Bratanovic, 2009; Afriyie and Akotey, 2013).

Operational Risk: According to State Bank of Pakistan (2003), operational risk involves the direct or indirect losses suffered by a banking institution due to deficient or abortive internal processes, systems and people or from external environmental factors. This description is in line with several other opinions that the operational risk is related to the likelihood of inverse effects on the financial performance as well as the capital of bank that is the outcome of staff members' negligence, inadequate internal processes and inapt management information

systems or unpredictable and undesirable external events (Santomero, 1997; Bessis 2002; Crouhy, Galai and Mark, 2006; Fayyaz, 2006; Hameed, 2006; Tahir, 2006; Saunders and Cornett, 2008; Kanchu and Kumar, 2013). The operational risk mostly emerges from the inside activities of bank unlike some other forms of risks like market and credit risk. However, a number of sources of operational risk come from the external environment such as competitive actions, natural disasters (such as floods, earthquakes) and terrorist attacks which are largely unpredictable and uncontrollable by banks (Fayyaz, 2006; Crouhy, Galai and Mark, 2006). Banks take efforts in order to control and reduce operational risk by: initiating training and development programmes for employees (staff capacity building); making investment in advanced technology (systems capacity building); and developing backup systems and contingency plans (Hussain, 2006; Tahir, 2006; Saunders and Cornett, 2008).

Legal and Regulatory Risk: This risk comes from the non-fulfilment of regulatory requirements by banks. Bessis (2002) takes it as the risk of disputes emerging from the different laws at play in banking transitions. This risk arises from violations or negligence of, or non-fulfilment of legal requirements, regulations, procedure and ethical standards (Schroeck 2002; Fayyaz, 2006; Tahir, 2006). For instance, Sokolov (2007) explains that banks involved in e-banking can experience legal and regulatory risk with regard to customers' disclosures and their privacy protection issues. In case of failure to provide adequate privacy protection as per rules, banks may face financial losses in the form of fines, payments of damages, civil money penalties, and the rescinding of contracts. Furthermore, this risk has also the potential to create an adverse impact on the reputation which may lead to lower the business opportunities or reduce banks' growth and may generate liquidity issues within banks (Fayyaz, 2006; Sokolov, 2007; Crouhy, Galai and Mark, 2006).

Liquidity Risk: Saunders and Cornett (2008) define liquidity risk as the unexpected raise in withdrawals by depositors that may pursue banks to liquidate their assets in the shortest time period. According to State Bank of Pakistan (2003), this risk is the potential loss caused by a bank's inability to meet its obligations. The liquidity risk arises due to several reasons including a rapid increase in the

sudden demand of the bank's depositors and an inadequate market depth or market disruption (Santomero 1997; Basel Committee, 2008; Tahir, 2006; Saunders and Cornett, 2008). Crouhy, Galai and Mark (2006) argue that the insufficient liquidity can provoke a bank towards unexpected cash deficiencies which are needed to be covered at exorbitant costs and decrease profitability. They further highlight that the inadequate liquidity can induce a bank towards liquidity insolvency devoid of being capital insolvent. Hence, banks face liquidity risk when they are not able to meet their expected and contingent cash needs and borrow more funds when required (Fayyaz, 2006). On the other hand, the liquidity risk also incites several financial risks such as market risk, interest rate risk, credit risk, strategic risk (Bessis, 2002; Schroeck, 2002; State Bank of Pakistan, 2003; Fayyaz, 2006; Tahir, 2006). For instance liquidity risk provokes interest rate risk due to unknown rates of future funding and investment (Tahir, 2006).

Market Risk: This risk is linked to the change in assets value due to systematic factors. The market risk in banks emerges from different sources including securities portfolios, instruments and equities or in shape of interest rate or foreign exchange risk (Schroeck, 2002; State Bank of Pakistan, 2003; Crouhy, Galai and Mark, 2006; Ishfaq, 2006). For instance, this risk is associated with the unfavourable change in the market value of the trading portfolio, caused by market movements, over the transactions liquidation period (Bessis, 2002; Saunders and Cornett, 2008).

Foreign Exchange Risk: This risk arises due to an erratic transition in the foreign exchange rate resulted into a negative impact on the obligations of banks (Tahir, 2006). Several factors such as political stability, inflation, public debt, current-account deficits and market speculation may serve to drive the currency down (Ishfaq, 2006). All the foreign exchange transactions with counter-parties located outside the home country contain this risk. Saunders and Cornett (2008) describe foreign exchange risk as the threat that variation in foreign exchange rate could affect inversely on the value of assets or liabilities reported in foreign currencies. Similarly, Bessis (2002) defines foreign exchange risk as bearing losses due to unfavourable changes in the foreign exchange rates. These losses may arise because

of an imbalance between the market value of specific assets or liabilities in the local and foreign currency. Crouhy, Galai and Mark (2006) point out that the volatility in foreign exchange may disrupt the return of pricey on the overseas investments, and simultaneously involve a bank in a competitive disadvantage to its foreign competitors. They further explain that the adverse foreign exchange volatility may also generate immense operating losses and lead to inhibit investment.

Interest Rate Risk: This risk rises with the decline in the market value of banks assets, loans or securities because of increase in the interest rates. Bessis (2002) describes interest rate risk as the risk of deterioration in the earnings of a bank due to the change in the interest rates. Some authors believe that interest rate risk occurs due to mismatch between assets and liabilities of banks (Crouhy, Galai and Mark, 2006; Saunders and Cornett, 2008). Saunders and Cornett (2008) highlight that this risk is strongly connected to market risk and an increase in the rate of interest causes to fall in market values of assets and liabilities. As a result, banks use different derivative techniques including options, swaps, futures and forward contracts to control the interest rate risk (Bessis, 2002; Schroeck, 2002; Ishfaq, 2006, Tahir, 2006).

Counterparty Risk: This risk arises when the counterparty of a trade transaction potentially fails to meet its obligations (Fayyaz, 2006). Santomero (1997) considers counterparty risk as the non-performance risk of a trading party. The counterparty risk is more transient banking risk than typical default risk of creditors and is usually linked to credit derivatives in which each member of counterparty is sensitive to symmetrical two-way risk exposures (Besis, 2002; Crouhy, Galai and Mark, 2006).

Country (Political) Risk: This risk is related to cross border transactions. Crouhy, Galai and Mark (2006) describe country risk as the risk that an obligor may not be able to fulfil its obligations owing to cross-border constraints on the availability or convertibility of an agreed currency. Country risk also refers to the risk of a crisis in a country due to political instability, an economic downturn or a fall in the value of the home foreign currency in terms of the bank's base currency (Bessis, 2002).

Equity or Commodity Price Risk: This risk arises due to negative change in the market value of equities or commodities kept by banks (Bessis, 2002). State Bank of Pakistan (2003) characterises equity or commodity price risk as the loss to capital or earnings that occurs due to an adverse movement in the market value of equity related portfolios. This risk is either systematic or unsystematic in banking operations. The earlier is associated with the price volatility of portfolio's values due to change in the overall equity prices and the later refers to the sensitivity of portfolio's value based upon the bank specific characteristics.

Reputation Risk: This risk is associated with the trusts and beliefs of customers and other stakeholders of the banking institutions (Green, 1992; Arby, 2006). According to Basel Committee (2009), reputation risk is the possibility of losses emerging from a negative perception on the side of customers, depositors, counterparties, market analysts, investors, shareholders, regulators and other concerned parties. This risk can have an unfavourable impact on banks' ability to sustain existing or to develop new business affairs in order to maintain a continuous source of obtain funding (Ishfaq, 2006).

Strategic Risk: This risk is one of the most important types of risks in banking activities and related to the strategic decisions having implications for all other types of risks (Bessis, 2002). Crouhy, Galai and Mark (2006) define strategic risk as, "the risk of significant investments for which there is a high uncertainty about success and profitability" (Galai and Mark, 2006, p.33). For instance increased competition may lead a bank to offer loans to new subprime customers having poor credit history or a sudden increase in the interest rate generates a quick fall in the mortgage volumes of banks.

Technology Risk: Bessis (2002) describes the technology risk in banks as the imperfections of information systems and systems failures caused by virus attack, network failure, hacking, poor system integration and lack of skills. Crouhy, Galai and Mark (2006) point out that principally technology risk falls into the operational risk category.

Off-balance Sheet Risk: This risk is related to the financial transactions of banks. According to Saunders and Cornett (2008), off-balance sheet risk is the possibility of losses faced by banks owing to have the contingent assets and liabilities within the banking transactions. For instance a standby letter of credit guaranteed issued by a bank is a contingent liability and is interconnected with off-balance sheet risk.

Solvency Risk: The solvency of a bank is a joint product of its available capital and all risks. Bessis (2002) explains solvency risk as, “the risk of being unable to absorb losses, generated by all types of risks, with the available capital” (Bessis, 2002, p.20). Cornett and Saunders (2008) characterise it as the threat that a bank may not have adequate capital to compensate an abrupt decline in its assets value.

From the foregoing, it is obvious that banking institutions face a variety of risks that may influence their survival and success. Therefore, it is necessary for banks to comprehend with the concept of risk management in order to deal with different potential risks (Stan-Maduka, 2010).

The next section describes the concept of risk management in banks.

2.4 Risk Management in Banks

Schmit and Roth (1990) describe risk management as the accomplishment of different activities formulated to reduce the adverse effect of uncertainty regarding potential losses. Green (1992) explains risk management in banking institutions as a mixture of policies, procedures and persons, adopted to control the potential losses. This idea is supported by Santomero (1997) who mentions four steps of the risk management process which includes: standards and reports; position limits or rules; investment guidelines or strategies; and incentive contracts and compensations.

Bessis (2002) characterises risk management as the complete set of risk management processes and models permitting banking institutions to put in place different risk-based procedures and practices. According to him, risk management contains all the tools and methods necessary for measuring, monitoring and

controlling different risks. Schroeck (2002) describes the concept of risk management as:

An active, strategic, and integrated process that encompasses both the measurement and the mitigation of risk, with the ultimate goal of maximizing the value of a bank, while minimizing the risk of bankruptcy.

(Schroeck, 2002, p.28)

Schroeck (2002) further explains that the said process is comprised of various steps including the definition, identification, categorization, measurement, analysis, and mitigation of a bank's risk exposures.

According to State Bank of Pakistan (2003), risk management in banks comprises of identification, measurement, monitoring and controlling risks to make sure that:

- All the persons who manage or take risks clearly understand different risks;
- The risk exposure of the bank is within the limits set by the board of directors;
- All the risk taking decisions are aligned with the objectives and business strategies established by the board of directors;
- The wanted payoffs compensate for the risks taken by the bank;
- All the risk taking decisions are clear and explicit; and
- Adequate capital is available as a buffer to take risk.

All the above activities are generally taken to evaluate risk exposures, develop policies to deal with these exposures, limit positions in person to tolerable levels, and support decision makers to manage risk in order to achieve the goals and objectives of the banking institutions.

Form the above discussion, it can be summarised that risk management in banks is a complex process, beginning with the formulation of a framework to identify measure and analyse risks and then implementation of certain measures to minimise or control inevitable losses. It is important for any discussion about the risk management in banking to embark on why risk matters and what approaches can be taken for managing risk in these firms (Oldfield and Santomero, 1997). The

next section provides a brief description on the rationales of risk management in banks.

2.4.1 Rationales for Risk Management in Banks

The available literature provides many theoretical considerations to justify the adoption of risk management in banks including financial economic approach, institutional theory, agency theory and stakeholder theory (Stulz, 1984; Smith and Stulz, 1985; Cornell and Shapiro, 1987; Fite and Pfeiderer, 1995; Santomero, 1995; Smithson, Smith and Wilford, 1995; Oldfield and Santomero, 1997; Tufano, 1998; Fatemi and Luft, 2002; Klimczak, 2007; Collier and Woods, 2011; Hudin and Hamid, 2014). The following sub-sections discuss some important theoretical considerations in this regard.

2.4.1.1 Financial Economics Approach

Financial economics approach is based on the classic Modigliani-Miller paradigm (Miller and Modigliani, 1958) that proposes the conditions for irrelevance. In 1984, Stulz conducted a study on the *Optimal Hedging Policies* and is the first person to present a feasible economic reason for why managers involve themselves in both predicted profit as well as in the variability around their values (Santomero, 1995). He deduces the rationales for risk management in firms based on the irrelevance conditions. After that several alternative propositions as well as justifications have been developed to rationalize the risk management. From the past few decades, there is an increasing literature on the different reasons for risk management and some notable contributions are the research works of Santomero (1995), Smithson, Smith and Wilford (1995) and Oldfield and Santomero (1997).

A detailed review of the relevant literature has been presented by Santomero (1995) in his research work on *Financial Risk Management: The Whys and Hows* and points out different distinctive motives for risk management including (i) securing internal financing (ii) tax effects (the non-linearity of the tax structure); (iii) the cost of financial distress; and (iv) capital market imperfections. According to the first motive, the managers of a firm have limited resources and ability to spread out the investment in the firm because of limited capital as well as the

concentration of human capital returns. This promotes aversion to risk and a priority for stability in the firm. For instance, it is observed in the second motive that the conventional tax burden is decreased by controlled volatility in the disclosed taxable income due to the progressive tax schedules. Whereas, the third and fourth motives concentrate on the issue that a decrease in the profitability of a firm has an additional proportionate impact on its fortunes. Oldfield and Santomero (1997) advocate:

Any one of these reasons is sufficient to motivate management to concern itself with risk and embark upon a careful assessment of both the level of risk associated with any financial product and potential risk mitigation techniques.

(Oldfield and Santomero, 1997, p.4)

Smithson, Smith and Wilford (1995) has written a textbook on *Managing Financial Risk* and devoted a complete chapter to persuading risk management in financial institutions as a value boosting strategy by endorsing the arguments highlighted above. All the above cited studies indicate that one or more concerns, such as securing internal financing, tax effects, the cost of financial distress and the capital market imperfections, rationalise the adoption of risk management in banks. Hence, the ultimate goal of risk management activities (hedging) is to maximize the firm value.

2.4.1.2 Institutional Theory

Institutionalisation refers to, “the process through which components of formal structure become widely accepted, as both appropriate and necessary, and serve to legitimate organisations” (Tolbert and Zucker, 1983, p.25). A number of branches are involved in institutional theory (Collier and Woods, 2011). However, several studies work (Meyer and Rowan 1977; Tolbert and Zucker, 1983; DiMaggio and Powell, 1983; Scott, 1995 and Powell and DiMaggio, 1991; Collier and Woods, 2011; Hudin and Hamid, 2014) are more related to the business and organizational studies. Institutional theory focuses on the rules and regulations which are forced on institutions by the outsiders, particularly by the government regulatory bodies; and all the norms and values which are incorporated in roles by means a part of socialisation processes or procedures (Meyer and Rowan 1977; DiMaggio and Powell 1983; Scott 1995; Powell and DiMaggio 1991).

Several studies use the institutional theory in explaining the phenomenon of risk management implementation (Collier and Woods, 2011; Hudin and Hamid, 2014). They propose that institutionalization prevails when the risk management activities in the most of institutions becomes highly homogeneous. This homogeneity can be attained via the coercive isomorphic mechanism by which political, legitimacy or regulatory pressures are exercised on firms in the forms of persuasion, direction or invitation (DiMaggio and Powell, 1983; Powell and DiMaggio 1991; Scott 1995; Hudin and Hamid, 2014). For instance in Pakistani context, all the banks have been directed by the central bank to develop an active framework for risk management (see Section 2.5.1). Considering the homogeneity assumption of institutional theory, the fundamental principles relating to risk management are applied by every banking institution irrespective of their sizes and complexities. For that reason, the current theory provides an important insight into promising rationale for risk management in banks.

2.4.1.3 Agency Theory

Different researchers have used agency theory in their studies to provide theoretical base for risk management (Smith and Stulz, 1985; Fite and Pfeleiderer, 1995; Tufano, 1998; Fatemi and Luft, 2002). This theory helps to examine a social phenomenon from a principal-agent (investor-manager) perspective. Jensen and Meckling (1976) describe this agency relationship as:

A contract under which one or more persons (the principals)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent.

(Jensen and Meckling, 1976, p.308)

This theory has two fundamental assumptions (Jensen and Meckling 1976). Firstly, the principal as well as agent pursue to maximise their own interest. Secondly, the interest of agent may diverge from the interest of the principle and agent is not likely to perform in the best interest of the principal. Hence, a conflict of interests may emerge between principal and agent.

Smith and Stulz (1985) have applied agency issues in corporate risk management and indicate the managers (agents) attitudes toward risk taking and

hedging. Afterwards, Fite and Pfleiderer (1995) have also applied agency theory and describe the significance of hedging policies on firm value. Tufano (1998) has also made an argument for risk management based on agency theory. He argues that managers go for hedging as much as they can without considering the interest of their shareholders. The rationale behind such conduct is the difference between the levels of risk aversion of managers and shareholders. The level of managerial risk aversion is generally more advanced than the risk aversion level of the shareholders as managers have more exposure to the market threats (Tufano, 1998). However, the proponents of agency theory consider that wealth of shareholders transfers to managers because of much extensive hedging and oppose such risk management practices (Fatemi and Luft, 2002). Tufano (1998) states that the risk management in firms somewhat enhances agency problems and costs between its managers and shareholders.

2.4.1.4 Stakeholder Theory

The stakeholder theory (Freeman, 1984) focuses clearly on the symmetry of stakeholders' interests as the foremost determinant of the corporate policy. The most important contribution towards the risk management is an addition of implicit contracts theory from employment to other contracts (Cornell and Shapiro, 1987; Klimczak, 2007). In certain businesses, mainly services and high-tech industries, customer confidence on firms is very important to carry on offering their services in the future and can considerably contribute to firms' values. On the other hand, the value of such implied claims is extremely sensitive to estimated costs of bankruptcy and financial distress. Since the risk management practices in a company induce to a reduction in these estimated costs, its value increases (Klimczak, 2007).

Hence, the above discussion implies that the risk management can be seen in banking institutions: to fulfil the regularity requirements; to align the interests of managers with their shareholders interest; to reduce expected tax payments of the bank; to lower the probability of financial distress, business failures or bankruptcy; to safeguard specific investments of the organization; to help the banking business organization in developing financial plans and investment activities; and to

maximize the shareholders' value of the bank. In addition, it is also obvious from the above mentioned propositions that risk management is also useful within a bank to control different kinds of risks and to mitigate the possible negative effects of these exposures. However, Hudin and Hamid (2014) suggest that the adoption of a single theory is not sufficient to explain the rationale of risk management. Therefore, this study also takes two theoretical considerations such as institutional theory and financial economic approach to describe the implementation of risk management practices in Pakistani banks.

Besides the theoretical considerations for the implementation risk management mentioned above, a lot of efforts have been undertaken at international level to improve the risk management mechanism of banks (Basel Committee, 2013). A brief review of these efforts is discussed in following section.

2.4.2 Risk Management and Basel Accords

In order to improve the flexibility of banks against the financial crisis in the global banking system, the Committee on Banking Regulations and Supervisory Practices later named as Basel Committee on Banking Supervision (BCBS) was formulated by the central bank governors of the G10 countries (Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Sweden, Switzerland, the United Kingdom and the United States) after the breakdown of Bankhaus Herstatt in West Germany and *Franklin National Bank* in the United States in 1974 (Basel Committee, 2013).

The Basel Committee have established an internationally accepted set of principles to cope with the various risks, officially known as the Basel Accords (Basel I, Basel II and Basel III). Initially, the Basel Accords were mainly designed for the G10 Countries. However, these guidelines have been planned in such a way that they might be applicable in the developed countries as well as the developing countries (Al-Tamimi, 2008). According to these principles, banks are required to maintain a prescribed level of capital against the operational and other financial risks.

Van Rixtel, Alexopoulou and Harada (2004) propose that the implementation of the Basel Accords might have offer a positive impact on the risk management and amplify the financial solidity by providing risk-sensitive methodologies. Masood and Fry (2012) also suggest that the successful implementation of Basel Accord is certainly a crucial factor for the banking institutions and intends to help them to subsist and thrive in the new risky environment. Similarly, the supervisory bodies seem to expect that there would be a positive impact of the higher capital requirements on the risk taking behaviour of banks (Pasiouras, 2008b).

Al-Tamimi (2008) has conducted a research to view the association between the keenness for the Basel II implementation and the resources required for its endeavour in UAE. He suggests that it is crucial for the banks in UAE to take necessary actions for the implementation of Basel Accord for making sure their compliance with international standards and improving the risk management practices in the banking field. For this purpose, he has conducted a survey study and revealed that the UAE banks are familiar with the advantages, effect and challenges related to the implementation of Basel Accord. He has concluded that the UAE banks are well- prepared to implement the Basel II principles. This judgment shows that the banks in UAE have adequate resources for the implementation of Basel II. However, the results of his study have not showed any significant relationship between the UAE banks keenness for implementing Basel principles and the cost of implementation. Al-Tamimi (2008) also has not found any difference between the UAE national and foreign banks in their readiness for the implementation of Basel II. Hence, these results give a positive impression of the national banks over foreign banks. His study also supports an earlier argument reported by Rime (2001) that the practice to hold the prescribed capital level also protects banks against different risk exposures such as credit, market and operational risks.

Cai and Wheale (2007) have explored the implications of the Basel Accords on the banking industry in China. They have shown that the new Basel Accord II is helpful in improving risk management and decreasing instability. It has also been concluded that the adoption with advanced risk management systems under new

Basel Accord can be favourable for the large banks as well as the small banks in China. In a later study, Lee and Chih (2013b) have also explored the impact of financial regulation on the profit efficiency and risks of banks in China. The empirical results of their study have highlighted that the regulatory requirements regarding cost-to-income ratio and the provision coverage ratio, the loan-to-deposit ratio, leverage ratio, capital adequacy ratio and current ratio have different relevance with the large banks and the small banks in China. Similarly, Hakenes and Schnabel (2011) have also observed that the Basel II has offered a competitive advantage to the large banks in the selection of various approaches to improve their capital requirements which created a fiercer competition and forced the smaller banks to face higher risks.

Bunea-Bontas, Lazarica and Petre (2009) have studied the relationships between the capital adequacy and risk management and their impact on the stability of financial system in Romania. They have described that the primary objectives of a prudent assessment process of the internal capital adequacy involved: the identification and measurement of credit, market and operational risks; the establishment and assessment of internal capital adequacy goals related directly to these risks; and guarantee the reliability of the internal capital adequacy appraisals. They have suggested that the accomplishment of all the above objectives ought to contribute largely to improve the risk management at both the individual entity level and the consolidated level. They have concluded that the Basel II represented a genuine revolution and developed the uniform standards for the capital adequacy as well as the codes of best risk management practices internationally to improve the integrity and stability of financial system and to ensure the global banking health.

Barth, Caprio and Levine (2013) have examined the relationships between a wide range of banking regulations and the supervisory practices and their impact on the development, performance and stability of banks. They have identified that the severity of capital regulations is positively related to the development of banks. They have revealed that the stringent capital regulations are not strongly allied with the development and stability of banks while controlling the other bank's regulation

and supervision characteristics. They have also found a negative correlation between the capital regulations and nonperforming loans. They have recommended that the capital regulations are predominantly important in those countries only having ample the deposit insurance, the poor official supervisory bodies, or inadequate regulations relating to the monitoring of banks in private-sector.

The SBP has also established certain rules and regulation for the implementation of risk management framework and to maintain minimum capital requirement under the Basel Accords for the local banks in Pakistan (Tahir, 2006; Masood and Fry, 2012).

The next section provides a brief detail of these efforts.

2.5 Risk Management in Pakistani Banks

Banks in Pakistan offer a dual impact, firstly these institutions paly basic role in the economy through development activities. Secondly, banks provide resources to the other business units and general public (Shafiq and Nasr, 2010). Different types of banks are operating in Pakistan and the SBP regulates all these banks. These banks are segregated into diverse general categories such as public banks, private banks, foreign banks and specialized banks (Ahmed, 2008; Bagram, 2010). Public sector banks are the state owned banks. The government holds more than fifty percent (50%) shares of these banks. On the other hand, private banks are owned and run by individuals or a company for profit. Foreign banks are indebted to obey the rules and regulations of the two countries for instance the home country as well as Pakistan. While, specialized banks are also owned by the government and offer some specialized services focusing on the different sectors including the industrial sector, small and medium enterprises, house and buildings and the agricultural sector.

2.5.1 Risk Management Guidelines

Similar to other countries, the banks in Pakistan also face a very dynamic and compact environment (Burki and Niazi, 2010). The SBP has also acknowledged the fact that the local banks in Pakistan are exposed to different kinds of risks in

order to achieve their business objectives and an inadequate risk management may cause a negative impact on the continuity and survival of these banking institutions (Fayyaz, 2006). Consequently, the SBP has imposed risk management guidelines on the banking sector in 2003.

These risk management guidelines are arranged by the risk category and designed to give a brief overview of all the important actions which might be required from the banking institutions. The principles incorporated in this set of guidelines are intended to integrate the existing risk management standards released by the Basel Committee (Tahir, 2006). However, these guidelines are not designed to provide a detailed plan of actions for every control procedure that might be put in place by these institutions and offer only a broad outline of all the important actions.

A brief description of these guiding principles (based on the risk management guidelines issued by the SBP in 2003) is presented in the subsequent sections.

2.5.1.1 General Requirements

The risk management guidelines encompass a brief interpretation of the risk management and an extensive explanation of main risks that might have in different Pakistani banking institutions (State Bank of Pakistan, 2003). According to these guidelines, the risk management in banks comprises of risk identification, assessment, measurement, monitoring and controlling or mitigating all risks innate in the banking business. Every banking institution has been directed to apply the basic principles pertaining to risk management without considering its size and complexity. The themes of these fundamental guiding principles include:

- The overall obligation of risk management rests with the board of directors of banks and they are directed to formulate policies according to different areas of operations of their banks. The top management of bank are responsible for designing risk management strategies, explicit plans and procedures for controlling or mitigating risks and all these plans and actions should be duly approved by the board of directors.

- The assessment of risk is needed to make on the basis of portfolios or business lines at the operational level and the senior management are required to adopt a holistic approach in measuring and managing the risk profiles of banks.
- All the individuals heading different portfolios or the business lines in banks are also liable for the risk they take regardless to a separate management function or a risk review.
- All the potential risks are required to measure quantitatively, to report and to mitigate.
- An independent function is needed for the risk review irrespective of those who accept and endure risk. The review function involves stress tests revealing the portfolios to unexpected changes in the important variables or the key systemic shocks.
- Banks are directed to maintain contingency plans in order to deal with any unanticipated or catastrophe case scenarios.

Besides above, all the banking institutions are instructed to develop an effective risk management system to deal with the major risks such as credit, market, liquidity, and operational risk based on the principles explained in the guidelines (State Bank of Pakistan, 2003). A brief explanation of the same has been presented below:

2.5.1.2 Guidelines on Credit Risk

According to the credit risk guidelines, the boards of directors are declared responsible for developing an explicit credit policy. The boards are directed to accept the credit risk strategy of their banks and important policies regarding to credit risk management which are depended on the overall business strategy of their banking institutions. The top management of banks are not only instructed to establish policies, procedures and systems but also set up an approved organizational structure to evaluate, monitor and control the credit risk.

The banks in Pakistan are also required to develop an ingenious credit risk management unit consistent with the complexity and size of the bank's credit

portfolio. The function of loan origination is considered to be the most important task in credit risk management and emphasises are put on the appropriate analysis of lender's creditworthiness, ability, intention and financial health of the borrower.

This aspect is further strengthened by applying credit administration function. According to this function, the banks in Pakistan are required to: ensure the activities harmonize with their policies and procedures; maintain the loan documents, credit files; and observe the loan covenants compliance. Banks are also encouraged to develop internal credit ratings and to allocate them according to the credit exposures of each individual.

A regular monitoring and preparation of individual, aggregate and sector wise periodic reports of the loan portfolio are required from the banks operating in Pakistan. Finally, banks are advised to establish strategies or plans of action to cope with the problem loans.

2.5.1.3 Guidelines on Market Risk

The guidelines on market risk direct the board of directors and the top management of banks to establish an adequate framework for the market risk management in order to deal with the potential losses due to undesirable change in the foreign exchange rates, interest rates, and equity or commodity prices. This framework encompasses an organizational setup which is necessarily not only consistent with the size, scope and complexity of business, but also aligns with the strategies, systems and procedures to measure, monitor and control or mitigate market risk.

It is also recommended that Pakistani banks develop a middle office between the back and front office functions to accomplish an independent market risk management unit. According to the guidelines on market risk, the independent function needs to identify, measure and analyse market risks inherent in treasury operations of banks and requires to report these risk exposures directly to the top management.

It is also suggested that the banks in Pakistan can adopt different techniques ranging from the static gap analysis to the sophisticated risk models to estimate market risk according to their own requirements. Finally, the local banks are required to make sure that they have sufficient control mechanisms as well as pertinent setups such as periodic reviews or audits for the market risk to monitor it.

2.5.1.4 Guidelines on Liquidity Risk

The guidelines on liquidity risk emphasize that the top management of banks are required to develop a comprehensive mechanism to identify, evaluate and control liquidity risk. These guidelines suggest the key prerequisites of a competent liquidity risk management contain a well-informed board, qualified management and staff having the appropriate knowledge, and active systems and procedures. It is further directed that the top management are needed to set up an efficient organizational structure to regularly monitor the liquidity positions of banks.

All banking institutions are required to build a resourceful liquidity management framework considering their overall as well as separate liquidity exposures on the basis of different types of their account holders or deposits. For this purpose, banks are directed to identify their future liquidity shortfalls and assume periodical cash flow analysis under different market conditions and scenarios. These guidelines propose effective management information systems, contingency funding plan and risk limits as the important components of the strong liquidity management process.

2.5.1.5 Guidelines on Operational Risk

The guidelines on operational risk direct the banking institutions that they are needed to contemplate the broad line of material operational risks influencing the banking operations, containing the risk of loss caused by incompetent or poor internal processes, procedures, people, controls, and systems or from external events. The board of directors are required to make sure that the top management of their banks have established adequate process, procedures, controls and systems for all the major areas of operations in addition to setting up a tolerance level for the operational risk.

For this purpose, every banking institution is directed to apply six basic principles pertaining to the operational risk management regardless of its size and complexity. Furthermore, it is also required that the senior management of banking institutions forcefully communicate all the laid down procedures and guidelines down the line and make necessary arrangements to provide the essential training to their concerned staff. Finally, all the banking institutions are needed to disclose information on timely basis in order to provide a reliable structure for assessing their operational risk monitoring.

The risk management guidelines issued by the SBP have supported banking institutions to develop an adequate risk management system (Tahir, 2006). The banks have been encouraged to take necessary actions for the implementation of risk management guidelines (Fayyaz, 2006). Besides the issuance of these guidelines, the SBP has also established a road map for the implementation of Basel Accords in 2005 so as to strengthen their risk management systems and to align the banks with the best international practices (Masood and Fry, 2012).

The above description of risk management guidelines indicates that it is necessary for the banks to understand their risks exposures and to adopt a wide range of risk management practices for their survival and success. For this purpose, a number of studies have been conducted in the area of risk management practices and the next section provides a brief review of some relevant studies.

2.6 Previous Research on Risk Management Practices of Banks

Santomero (1997) examined the financial risk management systems in different banks in the United States. He reviewed both the philosophy and practices of financial risk management of selected banks and acknowledged that the complexity of the risk management techniques was very much dependent on the size of bank. He indicated that the banks which had a larger size tended to apply more superior and the scientific risk management practices. His study proposed that the credit risk techniques in banks were needed to be standardized for borrowers as well as institutions. Furthermore, he suggested that the credit losses were required

to be monitored carefully but the risk management systems were not sufficient to observe that activity.

Al-Tamimi (2002) conducted a study on the risk management practices of the UAE commercial banks. He used survey questionnaire technique to obtain data regarding different methods and techniques used for the management of important types of banking risks covering credit risk, market risk, liquidity risk and operational risk. He used descriptive statistics analysis and found that credit risk was the most critical type of risk for the selected banks. He identified that the most common methods used for risk identification were the inspection by branch managers and the financial statement analysis. He further observed that the UAE banks used many techniques including establishing standards, analysis of credit worthiness, risk rating, credit score and collateral for risk management. He found the adoption of a conservative credit policy as the most effective technique for the risk management in these banks.

Fatemi and Fooladi (2006) conducted a study to examine the credit risk management practices in the largest US-based financial institutions. They used survey questionnaires to collect primary data and observed that the identification of counterparty risk was the most important reason behind the utilization of the credit risk models.

Al-Tamimi and Al-Mazrooei (2007) carried out a comparative study to explore the risk management practices of the UAE national and foreign banks. They examined the extent to which the banks in UAE exercised risk management practices in coping with different kinds of risk. They obtained primary data by adopting a survey questionnaire method regarding different aspects of risk management in UAE banks including understanding risk; risk identification; risk assessment and analysis; risk monitoring; risk management practices; and managing credit risk. They applied different descriptive analysis and found that the banks of UAE were facing mainly foreign exchange risk, credit risk and operating risk. Their study results indicated that the banking staff in UAE had a common understudying of risk management in banks. They further revealed that the UAE banks were generally good in risk identification; risk assessment and analysis and

risk monitoring. Their study showed that the risk survey, audits, financial statement analysis and inspection by the bank risk managers were the important methods of risk identification in selected UAE banks. In order to assess the important aspects of risk management, they used a multiple regression model by adopting ordinary least square (OLS) technique and concluded that risk identification, assessment and analysis and risk monitoring had a significant influence on the risk management practices. In addition, the findings of their research indicated a significant difference between both national and foreign banks in risk assessment and analysis and in risk monitoring and controlling.

Sokolov (2007) studied the risk management practices of banks in Estonia with consideration in the field of e-banking. He conducted a survey study and distributed questionnaires to different local and foreign banks in Estonia. On the basis of the descriptive analysis, he found that the important risks connected with the field of e-banking were operational risk, legal risk, strategic risk and reputational risk. He concluded that the Estonian banks commonly complied with all Basel Committee guidelines in the e-banking risk management.

Richard et al. (2008) carried out a study to examine the credit risk management system of commercial banks in Tanzania in comparison to developing countries. Their study found that there was a significant difference in between the credit risk management of commercial banks operating in the developed countries and the less developed countries. Their study results indicated that the economic environment in which commercial banks operate had significant impact on their credit risk management.

Ariffin, Archer and Karim (2009) examined the risk management techniques of Islamic banks of fourteen countries. Their study results showed that the Islamic banks had also similar types of risks to the conventional banks. They further identified that the levels of some important risks such as credit risk, operational risk, market risk and liquidity risk might vary between the conventional banks and Islamic banks.

Hassan (2009) investigated the extent to which the Brunei Islamic banks adopted risk management practices and techniques in coping with different kinds of risk. A questionnaire survey technique was used to obtain data about understanding risk, risk assessment and analysis, risk identification, risk monitoring and managing credit risk. His study results showed foreign-exchange risk, credit risk and operational risk as the three most important types of risks in Brunei Islamic banks. His study results indicated that the selected banks were reasonably well-organized in risk identification, risk assessment and analysis and risk monitoring. They also employed a multiple regression model to examine the relationships of study variables and found risk identification and risk assessment and analysis as the most aspects for the risk management practices in Brunei Islamic banks. His study also concluded that the introduction of the Basel Accord had provided an opportunity for sound risk management practices in the banking system and selected banks had responded to that challenge by making a significant up gradation in their risk management systems.

Rosman (2009) proposed a research framework on risk management practices and the different aspects of risk management processes. His study found four key aspects of the risk management process such as understanding risk, risk identification, risk analysis and assessment and risk monitoring. He further explained the conceptual and empirical literatures in order to describe the relationship between risk management process and its different aspects.

Anderson (2010) examined the risk management system and its significance to the primary operations of UAE banks. He also considered the relevance of the Basel II agreement with the Global Financial Crisis 2007-08. His study was based on primary data and the questionnaire was designed to test 5 risk management techniques: (i) eliminating risks, (ii) using hedging to control risk, (iii) minimising the potential negative impact of any risks, (iv) transferring risks to partners or clients, (v) risk monitoring and (vi) diversifying operations to reduce the impact of any single risk. His study results found that the UAE banks were only facing a small range of risks. Consequently, these banks did not adopt a particularly diversified range of risk management procedures and practices. They identified that the risk

management approach in the selected UAE banks mainly focussed on soft tools of risk controlling or mitigation than a more superior strategic approaches.

Shafiq and Nasr (2010) studied the awareness of risk management in fifteen private and public banks in Pakistan. They found that credit risk, liquidity risk, interest rate risk, foreign exchange risk and operational risk were the most critical types of risks in Pakistani banks. Their study results indicated that there was a common understanding of risk among the staff working in the risk management department of selected commercial banks of Pakistan. Their study further revealed that the mostly daily operations of banks in Pakistan were risky by nature.

Alam and Maskujaman (2011) studied the risk management practices of commercial banks in Bangladesh. They collected primary data from the managers of selected banks through questionnaires and applied descriptive statistical techniques to analyse the data. Their study observed that the selected banks of Bangladesh were facing credit risk, market risk and operational risk. They also highlighted that the board of director of selected banks performed their responsibilities effectively. Furthermore, the executive committee also monitored the key risks actively and finally all the banking operations activities were overseen by the audit committee as per requirements. Their study revealed that the credit risk management also used the updated credit policies. Furthermore, they showed that the internal control as well as the compliance divisions of selected banks directly reported to the board of directors and audit committee. Finally, they concluded that both internal rating system and risk adjusted rate of return were the most important techniques adopted by banks for risk management.

Hassan (2011) conducted a comparative study of the risk management practices of Islamic and conventional banks across five countries of the Middle East. He used a questionnaire survey to collect data regarding different aspects of risk management practices. Their study results showed that the banking staff had a common understudying of risk management in the selected banks. They further identified that the targeted banks were good in risk identification; risk assessment and analysis and risk monitoring and managing different types of risks. A multiple regression model was applied to examine various aspects of risk management

practices. His study results highlighted positive significant relationships between the risk management practices and the understanding of risk, risk identification, risk assessment and analysis, risk monitoring and managing important risks in both the Islamic and conventional banks. He further endorsed the earlier the arguments of Greuning and Iqbal (2008) and highlighted that active framework of risk management was uniformly useful to conventional banks as well as Islamic banks.

Similarly, Abu Hussain and Al-Ajmi (2012) reported empirical evidence about the risk management practices of conventional and Islamic banks in Bahrain. A questionnaire survey approach was adopted to collect primary data from the managers of selected banks to examine the risk management practices and their association with understanding risk, risk management, risk identification, risk assessment analysis, risk monitoring and managing credit risk. Both descriptive as well as inferential statistics analysis techniques were applied. Their study results showed that the bank managers in Bahrain were well-aware of the significance of effective risk management in reducing costs. Their study highlighted that the selected banks in Bahrain had a clear understanding of risk and risk management and the other explanatory variables of the study. The multiple regression analysis results of their study showed a significant positive relationship between the risk management practices and all the independent variables. They revealed that credit, liquidity and operational risk were found to be the most significant risks faced by both the conventional and Islamic banks. They also concluded that the Islamic banks were facing more risks than the conventional banks in Bahrain.

Khalid and Amjad (2012) studied the risk management practices of Pakistani Islamic banks. They collected primary data from the managers of risk management through questionnaire survey. Both descriptive and inferential statistics analyses were used. Their study results showed that the banking staff had a common understanding of risk management and the selected Islamic banks in Pakistan were good in risk identification; risk assessment and analysis and risk monitoring. Based on a multiple regression analysis they found risk understanding and risk monitoring as the important aspects of risk management practices.

Nazir, Daniel and Nawaz (2012) also conducted a comparative study of risk management practices of Pakistani conventional and Islamic banks. They also used survey questionnaire technique to collect data from the managers of credit risk management departments. They revealed that the banking staff had a common understanding of different risks and risk management in banks. Their study results highlighted that the targeted banks were well-organized in risk identification, risk assessment and analysis and risk monitoring. In order to assess the important aspects of risk management, they applied a multiple regression model by adopting ordinary least square (OLS) technique and concluded that risk understanding and risk monitoring were the important aspects of risk management practices of banks in Pakistan.

Bilal, Talib and Khan (2013) carried out a study to probe the risk management practices of banks in emerging economies. They investigated the risk-averse mechanism and the significance of the Basel-III framework to deal with the post global financial challenges in the selected banks of sub-continent and gulf countries. They used twofold data collection techniques (questionnaires, personal interviews). Their study results showed that the selected banks had a deep concern about possible risk challenges. Furthermore, these banks were trying to advance their risk measurement frameworks in compliance with the latest regulatory obligations of Basel III. A multiple regression model was also used to assess the various aspects of risk management practices. Their study results confirmed positive significant relationships between the risk management practices and the understanding of risk, risk identification, risk assessment and analysis, risk monitoring and managing credit risk in the selected banks.

Selma, Abdelghani and Rajhi (2013) explored the risk management practices and techniques adopted by banks in Tunisia. They developed a questionnaire and surveyed it in 16 selected Tunisian commercial banks. The results of their study indicated that the bankers were well aware of the significance and the role of active risk management in Tunisia. They also concluded that the selected banks had implemented a number of effective risk strategies and the risk management frameworks in Tunisia. Furthermore, they highlighted that the

methods to measure the credit risk exposures had still not been used effectively by the selected banks. In order to mitigate the credit risk, both guarantees as well as collateral were the most common methods used by banks in Tunisia.

Shafique, Hussain and Hassan (2013) conducted a comparative study to examine the differences between the risk management practices of Islamic financial institutions and conventional financial institutions in Pakistan. Their research identified credit risk, liquidity risk, operational risk, equity investment risk, market risk and rate of return risk as the most important risk in the selected Pakistani financial institutions. They concluded that the overall risk management practices of both Islamic as well as conventional financial institutions were alike in Pakistan.

Wood and Kellman (2013) conducted a study on the risk management practices of six Barbadian banks. They highlighted that the bank managers in Barbados considered the adoption of risk management as an important and critical force for their banks' overall performance. They identified credit risk, operational risk, country risk, interest rate risk and market risks as the main types of risks in the selected Barbadian banks. They concluded that the risk management practices of the selected banks were efficient according to the changing business environment.

The current section of this chapter has described different types of risk exposures as well as ascertains the nature of management practices and techniques utilized by banks to deal with these risks in different countries including Pakistan. From the foregoing, significant positive relationships between risk management practices and different aspects such as risk understanding, risk identification, risk assessment and analysis, risk monitoring, managing credit risk and other such types of risks have been identified in different studies (Al-Tamimi, 2002; Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; Hassan, 2011; Abu Hussain and Al-Ajmi, 2012; Bilal, Talib and Khan, 2013). However, the available literature in the local context has identified the relationship of risk management practices with some common aspects such as risk identification; risk assessment and analysis, risk monitoring (Shafiq and Nasr, 2010; Khalid and Amjad, 2012; Nazir, Daniel and Nawaz, 2012).

As discussed in Section 2.4.1, the risk management in banks is also observed as value enhancing strategy to improve value creation of shareholders (Santomero 1995; Smithson, Smith and Wilford, 1995; Oldfield and Santomero, 1997). A number of empirical studies have been conducted to test this proposition and an extensive review of existing literature on it is reported in next section.

2.7 Risk Management and Performance

The risk management is valuable and relevant in order to increase the value of firm. Oluwafemi et al. (2013) and Tandelilin et al. (2007) argue that risk management is important to safeguard the bank's assets and for the protection of the shareholders' interests. They also point out that the bank which have better risk management might have certain advantages such as: (i) It is aligned with the compliance function toward the regularity requirements; (ii) It improves bank reputation and increases the opportunity to attract more customers which enhanced bank portfolio of fund resources and; (iii) It enhances the efficiency and profitability of the bank.

Stulz (1996) states that the risk management is not only important in minimizing insolvency costs but also helped to get extra possible benefits such as a reduction in taxes. These techniques help banks to achieve better returns in USA and reduced the profit variations. Essinger and Rosen (1991) recommend risk management as a useful technique to minimize the unfavourable effects of various risks and optimize the returns in uncertain situations.

Cebenoyan and Strahan (2004) conclude that the banks which have adopted more advanced techniques in risk management have greater availability of credit. This opportunity allows them to amplify their productive assets as well as profits. Hakim and Neami (2001) have investigated the impact of liquidity, credit and capital on the profitability of banking sector in Egypt and Lebanon. Their study results reflects that the return on equity in banks is a direct and an increasing function of their lending activities and finds a strong relationship between capital adequacy and the commercial banks return.

Berk (2005) has studied the determinants of risk that Slovene firms perceive as crucial to measure the impact of risk management practices on their financial performance. His study results highlight that firms which have more risk awareness have showed a better financial performance and effectiveness in assets management.

Tandelilin et al. (2007) have conducted a research to investigate the relationships among corporate governance, risk management and bank performance in the Indonesian banking sector. Their study mainly focuses on improving the understanding of the corporate governance practices in Indonesian banks and in what ways those banks can implement superior corporate governance that aligned with the performance of bank. Both corporate governance and risk management have been chosen as endogenous variables in the study. They have taken value at risk, non-performing loan, and business risk as proxy variables for risk management and used return on equity as a measure of the performance in the selected banks. They propose that different types of banks might have different patterns in taking risks due to difference in culture, management techniques and attitudes, resulting variations in their performance. Using both primary and secondary data they have found a significant relationship between risk management and bank performance.

A risk management survey has been conducted by the Central Bank of Kenya in 2010 to judge the impact of the 2005 risk management guidelines on the Kenyan banking institutions and to cope with the current business environment. This survey results point out that the banking institutions have shown an enhanced risk awareness as well as risk management which help them to reduce their financial losses. The risk management guidelines have also a positive impact on the overall decision making process in these institutions. Similarly, Gupta (2011) have looked at the motives behind a positive or negative response for the adoption of risk management in Indian companies and concluded that risk management is useful practice to improve the organizational performance.

Ariffin and Kassim (2011) have analysed the relationship between risk management practices and the financial performance in the Islamic banks of Malaysia. Both primary (survey questionnaires) as well as secondary data (annual

reports) have been used to assess the risk management practices and their relationships with the financial performance of Islamic banks. Their study results highlight a strong positive relationship between the performance of banks (Return on Assets) and risk management practices. They further point out that the Islamic banks on average have better risk management practices in Malaysia. Their findings show that the Malaysian Islamic banks are perceived to apply less technical advanced risk measurement practices. Furthermore, the most frequently adopted techniques are credit ratings, duration analysis, gap analysis, and maturity matching. However, several more technical advanced risk measurement techniques including value at risk, stress testing, and simulation techniques are observed not to be adopted by Malaysian Islamic banks in general due to lack of sufficient resources. They suggest that the adoption of an effective risk management culture would ensure the competitiveness and survival of Islamic banks in the dynamic business environment.

Oluwafemi et al. (2013) have found a significant relationship between performance and risk management in selected Nigerian banks. Their study results show that the financial performance of selected Nigerian banks have an inverse relationship with the cost of bad and doubtful loans. However, a positive and significant relationship of the capital asset ratio has been found with the performance. The performance of banks has been measured with the help of two profitability indicator e.g. the return on equity and return on asset. They conclude that the improved risk management in shape of better management of funds, bringing reduction in the cost of bad and doubt loans has increased the bank performance.

Fernando and Nimal (2014) have investigated the effect of risk management on the efficiency of banks in Sri Lanka for the period from 2005 to 2011. They point out that the technical efficiency of the large banks (having total assets more than 100 billion rupees) have increased from 83% to 93% whereas there is a reduction from 84% to 82% in the small banks (having total assets less than 100 billion rupees). They observe that the mean technical efficiency score of the Sri Lankan commercial banks was high as compared with the previous studies of different

countries such as UK, India, USA and Taiwan during 2005 to 2011. They conclude that the adoption of risk management is favourable to improve the efficacy of Sri Lankan banks.

Pastor (1999) has measured the efficiency of the Spanish banking based on credit risk. He highlights that the available studies have considered the credit risk as an input of the DEA process. Conversely, he argues that the credited loan amount can be decomposed into two parts e.g. internal (managerial control) and external (changing environment). He has measured the credit risk with the help of provision for loan losses. He has found that the risk management efficiency of the Spanish banking system has improved considerably over the period 1985-92. However, from 1992 after imposing the credit restrictions by the Banco de España, the risk management efficiency has started to reduce as an outcome of the rise in competition of the loan markets. He concludes that the deregulation forced by the Single Market Program (SMP) of the European Community has made a negative impact on the banks risk.

Later in 2000, Altunbas et al. have used the internal risk factors to estimate the efficiency of banks in Japan. They have used liquidity ratio and non-performing loan ratio to estimate the liquidity risk and quality respectively. Following the suggestions of Mester (1996) they have also confirmed that the optimal bank size tended to be overstated if the risk and quality factors are not considered. They have determined that both the smaller as well as the largest banks are scale inefficient with controlling internal risk factors. They further explain that the optimal size could not achieve by the largest banks to attain the optimal scale efficiency and these banks cost is higher than the required. However the smaller banks need to grow to attain the optimal efficiency level. It has also been identified in their study that the level of financial capital has the most significant influence on the scale efficiency measures.

Kao et al. (2011) have explored the performance of Taiwan financial holding companies from the perspective of risk management. They have measured the performance of fourteen Taiwanese financial holding companies during the period of 2001-2009 before and after the global financial crisis. They have used the

two-stage DEA model to investigate the impact of financial crisis and risk management on the performance of financial holding companies in Taiwan. Their findings show that the technical efficiency has been increased after financial crisis as compared to an earlier period. However, the banking-based financial holding companies have underperformed more after the global financial crisis than before. Different financial ratios such as liquidity ratio, capital adequacy ratio and bad debts ratio have been used to represent liquidity, capital and credit risks respectively in order to measure the risk management. Based on Tobit regression analysis, they also identify that the technical efficiency is related positively to the capital adequacy ratio as well as liquidity ratio and has a significant negative relationship with the bad debts ratio. They also highlight that the capital adequacy ratio and bad debts ratio have played important roles particularly to control the credit risk after the financial crisis. They suggest that the Taiwan financial holding companies could enhance their efficiency by increasing liquidity and capital adequacy and by controlling as well as decreasing the bad debts ratios.

Similarly, Banker, Chang and Lee (2010) have also conducted a study to investigate the effect of banking system reforms in Korean banking system. They have documented the differential impact of regulatory reforms on the productivity of selected banks in Korea over the period 1995 - 2005. In doing so, they have applied a non-parametric analysis technique to measure the performance of Korean banks. They have found that the average technical efficiency decreased during the financial crisis (1997-98) and subsequently improved during bank restructuring and continued to recover through 2005. In addition they have applied Tobit regression analysis to assess the impact of capital adequacy ratio and non-performing loans ratio. They have identified a significant positive relationship between capital adequacy ratio and performance of selected banks. However, a negative significant relationship between the non-performing loans ratio and performance has been found.

In an earlier study, Das and Ghosh (2006) have conducted DEA and Tobit regression analysis to observe a direct relationship between efficiency and soundness as determined by the capital adequacy ratio of banks. They have also

found that capital adequacy ratio has a significant positive impact on the efficiency. They observe that the increased emphasis of Indian banks on the achievement of standard capital adequacy ratio requirements has brought changes in their internal functioning, particularly in the systems of risk evaluation, assessment and management, corporate governance and the quality of internal control as well as the quality of human resources. Consequently, the financial soundness of Indian banks has decreased systemic risk and the uncertainties have contributed to improving efficiency during the post reform period. Similarly, Pasiouras (2008a and b) have also found a significant relationship between capital adequacy ratio and the efficiency of banks.

The above study results support the argumentations of several studies reporting that well-capitalized banking institutions would be encountered with less risk and have more flexibility to deal with different problems caused by the absence of unexpected and abrupt losses (Berger, 1995; Caprio and Klingebiel, 1996; Bernauer and Koubi, 2002; Berger and Bonaccorsi di Patti, 2006; Pasiouras and Kosmidou, 2007; Chortareas, Giradone and Ventouri, 2012; Bokpin, 2013; Olalekan and Adeyinka, 2013). For instance, Caprio and Klingebiel (1996) argue that a well-capitalized bank is likely to have superior risk management practices which help the bank to contain its loan loss provisioning.

Furthermore, the empirical evidences reported by Berger (1995) as well as Bernauer and Koubi (2002) suggest that there is a strong positive relationship between capital and earnings of U.S. banks between 1980s to 1990s. Bokpin (2013) has affirmed a strong relationship between bank profitability and capitalisation in the Ghanaian banking. He reports a statistically significant positive relationship between the capital adequacy ratio and the profit function of banks which leads to cost efficiency. Olalekan and Adeyinka (2013) suggest that the sufficient capital in banks can serve to decrease their risks by performing as a safeguard against their loan losses and offers arranged approach to financial markets in order to protect against liquidity problems and restricting their risk taking.

Karim, Chan and Hassan (2010) have investigated the relationship between non-performing loans and efficiency of banks in Malaysia and Singapore. The cost

efficiency has been measured by using the parametric (stochastic cost frontier) approach. They have identified that there are no considerable differences in the cost efficiency levels between the commercial banks of both countries. However, they determine that the commercial banks in Singapore have shown greater average cost efficiency than the Malaysian commercial banks. The Tobit regression analysis has been undertaken to explore the relationship between the non-performing loans and the cost efficiency of selected banks. By using six years (1995 to 2000) actual data they have identified a significant negative relationship between the non-performing loan and the cost efficiency of selected banks. They point out that effective credit management can increase cost efficacy by reducing the non-performing loans of the both countries' banks. Their study results are very much consistent with some relevant studies (Altunbas et al. 2000; Fan and Shaffer, 2004; Girardone, Molyneux and Gardener, 2004; Sufian and Majid, 2008; Noor and Ahmad, 2012), reporting technically more efficient banks have less non-performing loans.

In an earlier study, Berger and DeYoung (1997) also propose that the banks' efficiency might influence by the non-performing loans in banks. They have developed a bad management hypothesis to clarify the said relationship. They argue that the outcome of bad management in banking firms will be inefficiency and can affect the process of allocating loans. The management in banks may not vigilantly evaluate the credit application of their customers because of poor management evaluation skills. In addition, the management of banks may fail to manage their loan portfolios efficiently. Consequently, this poor management may lead to inferior credit ratings for the approved loans and probably may be resulted into the higher level of non-performing loans in banks.

Considering the above fact, a number of pertinent studies (Singla, 2008; Garza-Garcia, 2012; Nawaz et al., 2012) have been conducted to assess the influence of non-performing loan on the profitability by applying different indicators (return on assets and return on equity) and have identified a significant negative relationship between non-performing loan ratio and performance of banks.

Kolapo, Ayeni and Oke (2012) have investigated the quantitative impact of credit risk management on the performance of Nigerian commercial banks during

2000 to 2010. They have taken return on asset as a proxy variable for the performance of selected banks and three indicators, such as non-performing loan ratio, loan to deposit ratio and the loan loss provision ratio, used for credit risk management. They have found a significant relationship between return on assets and different credit risk management variables. They conclude that there is a considerable relationship between performance and risk management in the selected banks of Nigeria.

Tabari, Ahmadi and Emami (2013) have studied the impact of the liquidity risk management on the performance of fifteen commercial banks in Iran during the years 2003 to 2010. A multiple regression model having two types of macroeconomic variables and bank-specific variables have been used to study the impact of the liquidity risk on the performance of banks. Their study results show that gross domestic product, inflation, bank's size and bank's asset have a positive effect on the performance of banks. However, they have identified that both the credit risk (non-performing loans ratio) as well as the liquidity risk (current ratio) have negative impact on the performance of banks. They have found almost similar results by applying two different regression models and replacing two independent variables (return on assets and return on equity) as the criterion of the bank's performance. They conclude that the liquidity risk has declined the performance of selected banks in Iran. In a former study, Arif and Aness (2012) also have identified similar results and concluded that there is a negative relationship between the liquidity gap and non-performing loan ratio with the profitability of banks.

Similarly, Ariffin (2012) has conducted a study to examine the liquidity risk and disclosures as well as to identify the relationship between the liquidity risk and the financial performance of Islamic banks in Malaysia. Her study is based on a small sample comprising of the big six Malaysian Islamic banks and she has used return on assets and return on equity as the criterion of the bank's performance. She indicates that there is a common decline in the Return on equity of all the Islamic banks during 2006 to 2008. She further highlights that the global financial crisis have an adverse impact on the profitability of Malaysian Islamic banks. The findings of her study show that the liquidity risk and both return on assets as well

as return on equity have tended to behave in an opposite way during 2007. These findings indicate that the liquidity risk may cause to lower both the performance indicators (return on assets as well as return on equity). She further points out that the level of liquidity risk reporting is still at a minimum and the disclosures of banks risk management are crucial to enhance the corporate transparency for different market participants and to improve the corporate governance for Islamic banks in Malaysia.

Jha, Hui and Sun (2013) have measured the efficiency of commercial banks in Nepal by applying DEA and Tobit regression model. They determine that the banks in Nepal are unproductive due to poor inputs utilization and these banks have poor technical efficiency scores. They also point out that the public sector banks are less efficient than the local private banks and joint venture banks due to political interventions, poor management and high overhead costs. At the second stage of analysis, they have estimated the impact of risk management factors on the technical efficiency of banks in Nepal. They have taken capital adequacy ratio, credit to deposit ratio, non-performing loans ratio as the proxy variables for the risk management. They have identified a positive and significant relationship between the technical efficiency scores and the capital adequacy ratio as well as credit to deposit ratio. They suggest that the commercial banks in Nepal are not only required to reduce the cost of inputs but need to consider the importance of risk management in order to improve the performance of banks also.

Aebi, Sabato and Schmid (2012) have conducted a study on the risk management, corporate governance, and performance of banks during the financial crisis of 2007-2008. They have mainly investigated the impact of risk management-related to corporate governance mechanisms on the performance of banks. The performance of selected banks has been measured by return on equity along with some standard corporate governance variables such as ownership, board size, and board independence. Their findings show that all the selected banks in which the chief risk officer directly report to the board of directors instead of the chief executive officer, have showed a higher performance. They further indicate that effective risk governance played an important role to attain the performance during

the crises which indicate that the effective risk management has significant relationship with the performance of selected banks.

Musyoki and Kadubo (2012) have conducted a study to assess the different parameters relevant to credit risk management and their effects on the financial performance of banks in Kenya. The parameters for credit risk management are default rate, cost of debt collection and cost per loan asset. They have identified an inverse impact of all these parameters on the performance of banks. The findings of their study show that the credit risk management is a key predictor of Kenyan banks financial performances and the success of the selected banks performance significantly depends on risk management. They point out that the banks in Kenya need to put more emphasis on risk management to minimize the credit risk and to improve the performance of banks. They further suggest that the banks in Kenya require to spend more resources on the default rate management and to trim down the spending on the cost per loan asset.

Afriyie and Akotey (2013) have examined the risk management and profitability of the selected rural banks in Ghana limiting by limiting their focus on the credit risk. Their study has adopted return on equity and return on asset as profitability indicators while the non-performing loans ratio and capital adequacy ratio have been taken as credit risk management indicators. Based on their study results, they conclude that the selected banks have adopted poor risk management for credit risk and the ratio of non-performing loans has continued to rise during 2006-2010. They recommend that the rural banks in Ghana need to implement a sound and effective credit risk management by using best risk management practices to reduce the ratio of bad loans.

Al-Khouri (2011) has investigated the impact of different risk factors on the performance of selected commercial banks of six Gulf countries (GCC). He has taken the data of 43 commercial banks during the period 1998-2008. The performance of banks has been measured through the two common profitability indicators such as return on assets and return on equity. He has used two regression models and finds that the credit risk, capital risk and the liquidity risk are the main influencing factors on the performance of selected banks when it is symbolized by

return on assets. On the other hand, he reveals that only the liquidity risk has significant relationship with the second indicator of performance (return on equity).

Hsiao et al. 2010 have conducted a study to investigate the impact of financial restructuring on the operating efficiency of Taiwanese commercial banks. They have analysed data for 40 commercial banks over the 6-year period 2000 - 2005 by applying data envelopment analysis. They have taken the non-performing loan ratio and capital adequacy ratio as important indicators for the risk management of banks at second stage of analysis. Their study has found lower operating efficiency on average during the reform period (2002-2003) as compared to the pre-reform period (2000-2001) and improved operating efficiency of selected banks during post-reform period (2004 - 2005). They identify a significant relationship between the enhanced performances of banks and the risk management practices during the post-reform period in the country.

Poudel (2012) has studied the impact of various parameters, pertinent to credit risk management including capital adequacy ratio and non-performing loan ratio, on the financial performance of banks in Nepal. The return on assets ratio has been used as a proxy of financial performance and a liner regression model has been applied to examine the relationship between risk management and performance of selected banks. His study has identified default rate (non-performing loan ratio) and capital adequacy ratio as major predictors of financial performance in selected banks and concluded that success of bank depends on risk management. Similarly, in several studies (Singla, 2008; Naceur and Kandil, 2009; Ogboi and Unuafe, 2013), a significant relationship between capital adequacy ratio and performance of banks have also been also identified.

Maghyereh and Awartani (2014) have analysed the impact of market power, risk taking activities, and regulations on the performance of Gulf Cooperation Countries banking sector. In doing so, they have adopted a two stages analysis procedure and measure the performance of selected banks through the data envelopment analysis in the first stage. They have regressed different proxy variables for market power, risk taking activities, and regulations including Lerner

index, non-performing loans ratio, capital adequacy ratio and loans to total asset at second stage of analysis. They have identified that the ratio of non-performing loans to total loans is significantly adversely related to the efficiency in the selected banks. They have observed a significant positive impact of regulations (capital adequacy ratio) on the performance of selected banks. They conclude that improved performance of selected banking institutions is more likely to be related to effective risk management.

In conclusion, the above literature highlights that the risk management has proved an important and influencing predator for the performance of banks in different countries. It has also been observed in the above discussion that different methods have been used to measure the performance. A brief description of these methods is provided in the next section.

2.7.1 Measuring the Performance of Banks

In the context of a bank, performance means a capacity to generate sustainable profitability (European Central Bank, 2010). The profitability is very crucial for banks to maintain their on-going activities and for their shareholders to gain fair returns (Oral and Yolalan, 1990). The assessment of bank performance has received much attention and has been well researched over the past years (Seiford and Zhu, 1999; Maghyreh and Awartani, 2014). The performance of a commercial bank is often described with the help of efficiency analysis (Ahmed, 2008). Diverse methods are used to measure the performance of banks and some common methods include financial ratio analysis, CAMELS analysis, the parametric and the non-parametric analysis techniques (Ahmed, 2008; Kumbirai and Webb, 2010). Table 2.1 indicates a brief summary of diverse empirical studies have been undertaken by different researchers in order to measure the performance of banks in different countries. All these studies have applied diverse methodologies, considered various variables and taken different sample sizes and types of banks.

Table 2.1: Performance measurement techniques applied in the different studies

Sr. #	Author(s) and Date	Population of Study	Performance Measurement Tool
1	Yue (1992)	Missouri Banks	Data Envelopment Analysis
2	Miller and Noulas (1996)	US Banks	Data Envelopment Analysis
3	Yeh (1996)	Taiwan Banks	Data Envelopment Analysis
4	Ayadi, Adebayo and Omolehinwa (1998)	Nigerian Banks	Data Envelopment Analysis
5	Avkiran (1999)	Australian Banks	Data Envelopment Analysis
6	Pastor (1999)	Spanish Banks	Data Envelopment Analysis
7	Samad and Hassan (1999)	Malaysian Islamic Bank	Financial Ratio Analysis
8	Altunbas et al. (2000)	Japanese Banks	Stochastic Frontier Analysis
9	Jackson and Fethi (2000)	Turkish Commercial Banks	Data Envelopment Analysis
10	Iqbal (2001)	Islamic Banks of Different Countries	Financial Ratio Analysis
11	Noulas (2001)	Greek Banks	Data Envelopment Analysis
12	Grigorian and Manolc (2002)	Seventeen Transition Countries	Data Envelopment Analysis
13	Jemric and Vujcic (2002)	Croatian Banks	Data Envelopment Analysis
14	O'Donnell and Van der Westhuizen (2002)	South African Banks	Stochastic Frontier Analysis
15	Casu and Molyneux (2003)	European Banks	Data Envelopment Analysis
16	Sathye (2003)	Indian Banks	Data Envelopment Analysis
17	Ataullah, Cockerill and Le (2004)	Indian and Pakistani Banks	Data Envelopment Analysis
18	Fan and Shaffer, 2004	US Banks	Stochastic Frontier Analysis
19	Girardone, Molyneux and Gardener (2004)	Italian Banks	Stochastic Frontier Analysis
20	Ho and Zhu (2004)	Taiwan Commercial Banks	Data Envelopment Analysis
21	Samad (2004)	Bahrain Commercial Banks	Financial Ratio Analysis
22	Jaffry et al. (2005)	Indian Sub-continent Banks	Data Envelopment Analysis
<i>Continued on next page</i>			

Sr. #	Author(s) and Date	Population of Study	Performance Measurement Tool
23	Beck, Cull and Jerome (2005)	Nigerian Banks	Financial Ratio Analysis (Return on Assets)
24	Ataullah and Le (2006)	Indian Banks	Data Envelopment Analysis
25	Das and Ghosh (2006)	Indian Commercial Banks	Data Envelopment Analysis
26	Tarawneh (2006)	Omani Commercial banks	Financial Ratio Analysis (Return on Assets)
27	Ahmed (2008)	Pakistani Commercial Banks	Data Envelopment Analysis
28	Debnath and Shankar (2008)	Indian Banks	Data Envelopment Analysis
29	Pasiouras (2008a)	Greek Banks	Data Envelopment Analysis
30	Pasiouras (2008b)	Commercial Banks of Different Countries	Data Envelopment Analysis
31	Singla (2008)	Indian Banks	Financial Ratio Analysis
32	Sufian and Majid (2008)	Malaysian Islamic Banks	Data Envelopment Analysis
33	Kiyota (2009)	Commercial Banks of Sub-Saharan African Countries	Stochastic Frontier Analysis
34	Naceur and Kandil (2009)	Egyptian Banks	Financial Ratio Analysis
35	Al-Tamimi (2010)	UAE Islamic and Conventional National Banks	Financial Ratio Analysis (Return on Assets and Return on Equity)
36	Banker, Chang and Lee (2010)	Korean Banks	Data Envelopment Analysis
37	Burki and Niazi (2010)	Pakistani Banks	Data Envelopment Analysis
38	Hsiao et al. (2010)	Taiwanese Commercial Banks	Data Envelopment Analysis
39	Karim, Chan and Hassan (2010)	Commercial banks of Malaysia and Singapore	Stochastic Frontier Analysis
40	Kumbirai and Webb (2010)	South African Commercial Bank	Financial Ratio Analysis
41	Sangmi and Nazir (2010)	Indian Commercial Banks	CAMEL Analysis
42	Sarkar and Sensarma (2010)	Indian State-owned Banks	Stochastic Frontier Analysis
43	Aebi, Sabato and Schmid (2011)	US Banks	Financial Ratio Analysis
44	Ahmed (2011)	Jordanian Commercial Banks	Financial Ratio Analysis (Return on Assets)

Continued on next page

Sr. #	Author(s) and Date	Population of Study	Performance Measurement Tool
45	Al-Khouri (2011)	Gulf countries	Financial Ratio Analysis (Return on Assets)
46	Ariffin and Kassim (2011)	Islamic Banks of Malaysia	Financial Ratio Analysis (Return on Assets and Return on Equity)
47	Dincer et al. (2011)	Turkish Banks	CAMEL Analysis
48	Jaffar and Manarvi (2011)	Islamic and Conventional Banks of Pakistan	CAMEL Analysis
49	Kao et al. (2011)	Taiwan Financial Holding Companies	Data Envelopment Analysis
50	Reddy and Prasad (2011)	Regional Rural Banks of India	CAMEL Analysis
51	Shar, Shah and Jamali (2011)	Pakistani Banks	CAMEL Analysis
52	Siddiqui and Shoaib (2011)	Pakistani Commercial Banks	Financial Ratio Analysis (Return on Equity)
53	Abbas, Tahir and Rahman (2012)	Pakistani Commercial Banks	Financial Ratio Analysis (Return on Assets, Return on Capital and Return on Equity)
54	Afza and Yusuf (2012)	Pakistani Banks	Stochastic Frontier Analysis
55	Ariffin (2012)	Islamic Banks of Malaysia	Financial Ratio Analysis (Return on Assets and Return on Equity)
56	Choong, Thim and Kyzy (2012)	Islamic Commercial Banks in Malaysia	Financial Ratio Analysis (Return on Assets and Return on Equity)
57	Chortareas, Giradone and Ventouri (2012)	EU Commercial Banks	Data Envelopment Analysis
58	Garza-Garcia (2012)	Commercial Banks of Mexico	Data Envelopment Analysis
59	Glass, Kenjegalieva and Thomas (2012)	Kazakh banks	Stochastic Frontier Analysis
60	Jhamb and Prasad (2012)	Indian Banks	Financial Ratio Analysis
61	Kolapo, Ayeni and Oke (2012)	Nigerian Commercial Banks	Financial Ratio Analysis
62	Kouser and Saba (2012)	Pakistani Conventional and Islamic Banks	CAMEL Analysis

Continued on next page

Sr. #	Author(s) and Date	Population of Study	Performance Measurement Tool
63	Nawaz et al. (2012)	Nigerian Banks	Financial Ratio Analysis
64	Poudel (2012)	Nepalee Commercial Banks	Financial Ratio Analysis (Return on Assets)
65	Sharma, Sharma and Barua (2012)	Indian Banks	Data Envelopment Analysis
66	Afriyie and Akotey (2013)	Commercial Banks of Ghana	Financial Ratio Analysis
67	Barth, Caprio and Levine (2013)	Commercial Banks of Different Countries	Data Envelopment Analysis
68	Bokpin (2013)	Commercial Banks of Ghana	Stochastic Frontier Analysis
69	Jha, Hui and Sun (2013)	Commercial Banks of Nepal	Data Envelopment Analysis
70	Lee and Chih (2013a and b)	Chinese banks	Data Envelopment Analysis
71	Najjar (2013)	Bahraini Banks	Financial Ratio Analysis
72	Oluwafemi et al. (2013)	Nigerian Banks	Financial Ratio Analysis (Return on Assets and Return on Equity)
73	Soltani et. al (2013)	Iran Public and Private Banks	CAMEL Analysis
74	Tabari, Ahmadi and Emami (2013)	Commercial Banks of Iran	Financial Ratio Analysis (Return on Equity)
75	Alzorqan (2014)	Jordan Banks	Financial Ratio Analysis
76	Fernando and Nimal (2014)	Sri Lankan Banks	Data Envelopment Analysis
77	Maghyreh and Awartani (2014)	Gulf Cooperation Countries banks	Data Envelopment Analysis

Table 2.1 shows that the adaption of conventional ratios is one of the most popular methods to measure the performance of banks. The financial ratio analysis has been used in a large number of research studies (Samad and Hassan, 1999; Beck, Cull and Jerome, 2005; Singla, 2008; Naceur and Kandil, 2009; Kumbirai and Webb, 2010; Alzorqan, 2014). The most common ratios to measure the performance of banks are return on assets and return on equity (Al-Tamimi, 2010; Aebi, Sabato and Schmid, 2011; Ariffin and Kassim, 2011; Abbas, Tahir and Rahman, 2012; Choong, Thim and Kyzy, 2012; Oluwafemi et al., 2013). However,

several researchers have also used some other ratios including return on capital, cost to income ratio, net interest margin, profit expense ratio as a performance measurement technique for banks (Samad 2004; Kumbirai and Webb, 2010; Abbas, Tahir and Rahman 2012).

The CAMEL model analysis has been undertaken by several researchers in order to evaluate the performance of banks in different countries (Sangmi and Nazir, 2010; Dincer et al., 2011; Jaffar and Manarvi, 2011, Reddy and Prasad 2011; Shar, Shah and Jamali 2011; Kouser and Saba 2012; Rozzani and Rahman 2013 and Soltani et. al, 2013). The CAMEL model first has been introduced and applied by American regulatory agencies in 1980s as a framework of rating for on-site examinations of banks (Soltani et. al 2013). The CAMEL bank rating has been adopted by the management of banks to measure the financial health and performance of banks (Rozzani and Rahman, 2013). The CAMEL model is used by the World Bank, African Development Bank, Asian Development Bank, Federal Reserve Bank in U.S and several banking regularity bodies of different countries to measure the performance of banking institutions (Sangmi and Nazir, 2010; Soltani et. al 2013).

Initially the CAMEL model has been comprised of five components and another component added in the CAMEL model in the late 1990s to consider the market risk (Soltani et. al 2013). As a result of this extension, it is also known as CAMELS model. The key parameters of CAMELS model are (capital, asset quality, management, earnings, liquidity and sensitivity). Each of these performance evolution parameters is scored from 1 to 5. The score 1 shows the strongest rating and the score 5 indicates the weakest rating. A compound rating, varying from the fundamentally strong bank (1) to fundamentally weak bank (5), has been assigned as a compendium of the parameter ratings to indicate banks financial soundness. Different financial ratios regarding capital adequacy, assets quality, management soundness, earnings and profitability, liquidity and sensitivity to market risk are involved in CAMELS analysis to measure the performance and soundness of banks. The SBP also conducts regular on-site inspections on the basis of CAMELS framework to strive for the soundness and stability of the financial

system and safeguard the interest of stakeholders in Pakistan (Jaffar and Manarvi, 2011).

The use of financial ratio analysis has certain limitations. For instance, each ratio only indicates single aspect of bank activities which is already a complex organization to be studied (Burki and Niazi, 2010). A large number of ratios make analysis process too complex to interpret due to large number of financial indicators thereby often lead to complicated and contradictory results and may produce an unsuitable method to measure the general performance (Berger and Humphrey, 1997; Wozniowska, 2008; Kiyota, 2009).

In order to address these limitations, efficiency analyses are often undertaken to measure the performance of banks (Ahmed, 2008; Wozniowska, 2008). Chien and Danw (2004) and Wozniowska (2008) propose that it is valuable to supplement performance measurement analysis with more effective approaches such as parametric and non-parametric techniques. This argument is further supported in other studies (Sathye, 2003; Atullah and Le, 2006; Das and Ghosh, 2006) advocating that both approaches provide more conclusive estimates of the latent performance of banks. Table 2.1 also indicates that both parametric and non-parametric techniques have also been used extensively to measure the performance of banks.

The parametric technique has been developed by Aigner, Lovell and Schmidt (1977). The most extensively adopted parametric approach is Stochastic Frontier Analysis (SFA) (O'Donnell and Van der Westhuizen, 2002). The SFA approach measures the efficiency of banks by using cost efficiency, profit efficiency and alternative profit efficiency (Laeven, 1999). According to Girardone, Molyneux and Gardener (2004), the cost efficiency provides an estimate of how close the cost of a bank is with a best-practice (benchmark) bank's cost for generating the same amount of output under similar conditions. The profit efficiency estimates how close a firm is to generating the maximum potential profit within a specified level of input and output prices. In contrast with the cost efficiency function, the profit efficiency function permits for revenues consideration which can be produced by changing the inputs as well as outputs. The

alternative profit efficiency estimates how close a firm is in producing maximal profits inclined with the firm's outputs levels instead of output prices.

Charnes, Cooper and Rhodes (1978) have introduced a non-parametric programming that is Data Envelopment Analysis (DEA). It is the most widely non-parametric technique which is used to measure the performance of banks (Laeven, 1999). Several authors advocate that the DEA might be favoured over SFA (Yue, 1992; Jackson and Fethi, 2000; Casu and Molyneux, 2003; Sathye, 2003; Pasiouras, 2008a). DEA is one of the most extensive and popular methods to measure the performance of firms offering analogous services and using same set of resources (Oral and Yolalan, 1990; Grigorian and Manole, 2002). Cooper, Seiford and Tone (2000) highlight that DEA is very useful method to providing new intuition into entities and activities which have already been measured by some other techniques.

DEA measures the efficiency of banks through the ratio of weight sum of outputs to weighted sum of inputs (Yue, 1992; Miller and Noulas, 1996; Barth, Caprio and Levine, 2013; Jha, Hui and Sun, 2013). A detailed explanation of this performance measurement is reported in Chapter Three (see Section, 3.9.2.1)

In Pakistan, the performance and efficiency of banks are generally evaluated by using financial ratios. The SBP measured the performance of banking sector in its different assessment reports by using CAMELS analysis approach. Several studies (Atullah, Cockerill and Le, 2004; Jaffry et al., 2005; Ahmed, 2008; Burki and Niazi, 2010) have used DEA to estimate the effects of regulations, privatizations, economic reforms, financial liberalization, mergers and acquisitions on the performance but none of these studies has yet explored to observe the impact of risk management on the performance of banks in Pakistan.

2.8 Research Gap

The current section provides a brief discussion on the potential research gap regarding risk management and banking performance. The existing literature on the risk management in banks and its effectiveness, is critically reviewed which yields important findings beyond the available theoretical perspective and rationalises the aim and objectives of this study.

A review of literature indicates that risk management plays an important role in the success and continuity of banks. Therefore, a number of research studies have undertaken in order to explain the risk management in banks. The analysis of above literature review highlights that the majority of these studies have been conducted in the United States (Santomero, 1997; Fatemi and Fooladi, 2006), Gulf Countries (Al-Tamimi, 2002; Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; Anderson, 2010; Hassan, 2011; Abu Hussain and Al-Ajmi, 2012; Bilal, Talib and Khan, 2013), other countries (Sokolov, 2007; Richard et al., 2008; Ariffin, Archer and Karim, 2009; Alam and Maskujaman, 2011; Selma, Abdelghani and Rajhi, 2013; Wood and Kellman, 2013) and with a few from Pakistan (Shafiq and Nasr, 2010; Khalid and Amjad, 2012; Nazir, Daniel and Nawaz, 2012; Shafique, Hussain and Hassan, 2013).

Shafiq and Nasr (2010) indicate, “Few studies have been conducted on the risk management practices of banks in Pakistan in spite the importance of this topic” (Shafiq and Nasr, 2010, p. 310). In a later study, Shafique, Hussain and Hassan (2013) further highlight, “there is still much unknown about the risk management practices in Pakistani financial system, which still holds many secrets to itself creating a need for empirical studies to dig out all its secrets that are waiting to be discovered” (Shafique, Hussain and Hassan, 2013,p. 192). Hence, this study intends to create a new insight of risk management in Pakistani banks and further believes to extend the existing literature.

Besides, the available literature on risk management practices of banks in the local context has certain limitations. Firstly, majority of these studies have focused on four common aspects such as risk understanding, risk identification, risk assessment and analysis and risk monitoring and controlling. Whereby, the State Bank Pakistan has instructed to all banking institutions to develop a comprehensive risk management system covering some more important aspects, including managing credit risk, market risk, liquidity risk and operational risk based on the principles explained in the guidelines (see Section 2.5.1). Therefore, there is an opportunity for another research covering more important aspects, such as

managing credit risk, managing market risk, managing liquidity risk and managing operational risk.

Secondly, the majority of available studies in Pakistani context have been undertaken by obtaining responses directly from the staff of risk management divisions of different banks. However, the risk management is not confined to the sole responsibility of the staff of risk management departments in banks, but everyone who works for the bank is responsible for it (State Bank of Pakistan, 2003; KPMG International, 2009). Abu Hussain and Al-Ajmi (2012) also endorse this proposition and suggest that all the members of management staff should be aware with the bank's risk appetite. Consequently, an apparent potential research gap is available in the local context to explore a broader view of the phenomena by taking responses from the managers of different departments of the Pakistani banks. Therefore, this research aims to provide new insights on the risk management practices of Pakistani banks by collecting data from the managers of different divisions and covering some more important aspects such managing credit risk, managing market risk, managing liquidity risk and managing operational risk.

The risk management in banks is also observed as value enhancing strategy to improve value creation of shareholders (Santomero 1995; Smithson, Smith and Wilford, 1995; Oldfield and Santomero, 1997). Several studies have provided the empirical verifications of the importance of risk management for the performance of banks (Cebenoyan and Strahan 2004; Tandellin et al. 2007; Hsiao et al., 2010; Ariffin and Kassim, 2011; Kao et al., 2011; Poudel, 2012; Jha, Hui and Sun, 2013; Oluwafemi et al. 2013; Fernando and Nimal, 2014; Maghyereh and Awartani, 2014).

However, there is still lack of empirical evidence in the existing literature to confirm the effectiveness of the risk management in Pakistani context. Nazir, Daniel and Nawaz (2012) acknowledge a key limitation of their research and state that their study had cover some common aspects of risk management practices but it could not be able to explain fully the impact and of these efforts on the performance of banks in Pakistan (see Nazir, Daniel and Nawaz , 2012, p.121). As discussed in Section 2.5.1, the SBP has taken a number of initiatives including the

circulation of risk management guidelines and the issuance of a road map for the implementation of the Basel Accord in order to improve the performance of local banks. Therefore, this study aims to examine the relationship between risk management and performance of banks in Pakistan.

Furthermore, the above discussion clearly indicates that there is a need of dedicated study in the area of risk management of banks in Pakistan. Hence, this study intends to address the above potential research gaps by answering following research questions.

1. How do the risk management systems of banks work to cope with different risks in Pakistan?
2. Do the managers of Pakistani banks understand the different risks and risk management?
3. Do the banks in Pakistan effectively identify, assess, analyse, monitor and control risks?
4. What are the risk management practices and techniques adopted by the banks in Pakistan to deal with various risks?
5. What is the relationship between risk management and performance of banks in Pakistan?

2.9 Summary

The current chapter covers the literature review and discusses the theoretical foundation upon which the research is based. The literature review is guided by the research aim and objectives reported in the earlier chapter and provide the framework for this research. The review takes the form of a detailed discussion on role and function of banks, banking risk and its classifications, risk management in banks and it's rational and finally relationship of risk management with the performance, with focusing on what has been published, raising questions, probing areas of controversy and possibilities for future research (gaps). It also provides important insights about different theories, arguments and approaches to risk management in banks. A detail discussion on the research design and research methods necessary to undertake this study is presented in the next chapter.

Chapter Three Research Methodology

3.1 Introduction

A literature review has been conducted in the previous chapter. It shows that there is a gap in the published literature to conduct a dedicated study in the area of risk management of banks in Pakistan. The aim of this chapter is to describe the research methods and the procedures used to carry out the empirical part of this thesis. This chapter includes different sections covering research philosophy, research approach, research strategy, research design, study time horizon, population and sampling, primary as well as secondary data collection and analysis procedures. Finally, the last section concludes the summary of the whole research methodology of this study.

3.2 Research Philosophy

All types of research are based on assumptions such as how this world is perceived and understood by a researcher in a more sophisticated way (Bryman and Bell, 2011). These assumptions have a significant impact on the research activities such as; how a researcher comprehends research questions, methodology and interprets the findings (Crotty, 1998). A research philosophy refers to an idea or belief of a researcher concerned with the collection, investigation and interpretation of collected data (Saunders, Lewis and Thornhill, 2012). Johnson and Clark (2006) highlight that researchers need to be sensitive to their philosophical commitments in terms of research strategy choices as these are very important for the researchers' understanding as well as from investigation point of view.

There are two key traditions of selection regarding research philosophy: epistemological considerations and ontological considerations (Saunders, Lewis

and Thornhill, 2012). Each consideration underlines main differences which shape researcher's thinking approaches regarding the research process. Grix (2004) suggests that the epistemology (what is the admissible knowledge in a field), ontology (the reality is socially constructed) and methodology (data collection techniques and procedures) are mutually dependent. For instance, epistemology points of views are related to assumptions in the ontological and methodology frameworks. The following sections discuss these considerations in more detail.

3.2.1 Epistemological Considerations

Epistemology is concerned with the acquisition of knowledge. "An epistemological issue concerns the question of what is (or should be) regarded as acceptable knowledge in a discipline" (Bryman and Bell, 2011, p.15). Epistemology is involved in how a social researcher may obtain the admissible knowledge of a particular field. The disagreements about reality (what exists), knowledge (meaning of knowledge) and acquisition of knowledge (ways to acquire knowledge) are limited not only to business and management research but have also absorbed researchers, philosophers and theorists of different fields for more than one century (Sekaran and Bougie, 2013). The considerations of a social researcher about acceptable knowledge have two fundamental positions as positivism and interpretivism in business research (Gray, 2009; Bryman and Bell, 2011; Sekaran and Bougie, 2013).

Bryman and Bell (2011) describe positivism as "an epistemological position that supports the application of the methods of the natural sciences to the study of social reality and beyond" (Bryman and Bell, 2011, p. 15). Positivism argues that any knowledge that can be accumulated through the application of five senses (sound, sight, touch, smell and taste) is the reality. For this purpose, the inquiry needs to be based upon scientific research (as opposed to philosophical conjecture), and therefore empirical in nature. Both the natural and social sciences use logic along with methodological principles in common to deal with facts rather than values (Gray, 2009).

On the other hand, interpretivism argues that reality is socially constructed and the natural sciences and social sciences need different types of methods. It deals with individual actions in order to induce laws or theory (Gray, 2009; Saunders, Lewis and Thornhill, 2012).

Interpretivism is taken to denote an alternative to the positivist orthodoxy that has held sway for decades. It is predicated upon the view that a strategy is required that respects the differences between people and the objects of the natural sciences and therefore requires the social scientist to grasp the subjective meaning of social action.

(Bryman and Bell, 2011, p.15)

The choice of research philosophy follows a specific pattern of beliefs. For example, the positivist approach takes: reality as external (separate from the social actors) and objective; observable phenomena is only considered acceptable knowledge; and focuses on law-like generalization and causality (Saunders, Lewis and Thornhill, 2012). In contrast, interpretivist approach adopts a different set of beliefs. It argues reality is subjective and socially constructed. The social phenomena and its subjective meanings are considered as acceptable knowledge. The interpretivist approach concentrates on the particulars of a specific situation.

However, it has been suggested in the recent years that the adoption of a multi set of beliefs having different philosophical approaches (positions) is more useful for the social researcher in order to answer the required research question(s) (Niglas, 2010; Saunders, Lewis and Thornhill, 2012). Tashakkori and Teddlie (2010) propose that it is better for the researcher in a particular study to take the adapted philosophy as a continuum rather than opposite positions. This thinking induces to the emergence of a new philosophical approach which is known as pragmatic. This philosophical approach emphasizes on the adoption of more appropriate strategies for answering particular research questions. Sekaran and Bougie (2013) describes that:

Pragmatists do not take on a particular position on what makes good research. They feel that research on both objective, observable phenomena and subjective meanings can produce useful knowledge, depending on the research questions of the study.

(Sekaran and Bougie, 2013, p. 30)

Onwuegbuize and Leech (2005) and Robson (2011) highlight that pragmatic approach offers a number of advantages to the researchers including: offer flexibility in their investigation techniques; support to answer a wide range of research questions; and more likely, encourage collaboration among researchers having different philosophical orientations.

Saunders, Lewis and Thornhill (2012) state, “for pragmatists, the importance of the meaning of an idea (or a research finding) are its practical consequences” (Saunders, Lewis and Thornhill, 2012, p. 130). The pragmatist recognises that there are multiple traditions of describing the world as well as conducting the research study; that no sole viewpoint can ever provide the complete idea and may have many different realities. This recognition does not indicate that the pragmatist always employ multiple methods. Preferably the researcher can employ single or multiple methods that facilitate reliable, well-founded, pertinent and credible data to be congregated that proceed the study (Kelemen and Rumens, 2008; Saunders, Lewis and Thornhill, 2012).

Epistemological considerations have considerable theoretical importance. These epistemological aspects are inevitably related to ontological considerations of the research (Grix, 2004; Cunliffe, 2011). Ontological considerations are explained in the next section.

3.2.2 Ontological Considerations

Ontology is concerned with the actual world. Social ontological questions are concerned with social entities and their nature (Saunders, Lewis and Thornhill, 2012). Ontology is interested in how a social researcher may evaluate a phenomenon while being a neutral observer or in an unbiased manner (Bryman and Bell, 2011). Ontology has two key positions as objectivism and constructionism in business and management research. Both have their followers and are probably to be recognized as producing reliable knowledge (Bryman and Bell, 2011; Saunders, Lewis and Thornhill, 2012). The discussion about objectivism and constructionism is fairly analogous to the different methods in which the philosophical and useful

practices for organizational culture have been evolved in the last thirty years (Cunliffe, 2011).

Objectivism professes that the social phenomenon and its meaning have separate and independent existence from its social actors (Crotty, 1998; Saunders, Lewis and Thornhill, 2012). Bryman and Bell (2011) explain that an organisation is a tangible object under objectivism or objectivist position which has certain rules and regulations. It follows standardized procedures for getting things done and is also separate from individuals who manage it. For instance, a bank can be observed as a tangible object that has certain rules and also holds individuals who need to obey these rules. In essence: individual(s) are shaped by the organisation(s).

On the other hand, the constructionism or subjectivist position gives less importance to the objective features of organization management (Bryman and Bell, 2011; Saunders, Lewis and Thornhill, 2012). Constructionism argues that social phenomena and their meanings are continually being accomplished by social actors (Bryman and Bell, 2011). It shows that social phenomena and categories are not only produced through social interaction but they are also in a continual state of revision. Constructionism shows that it is important to review the details of the specific situation to develop an understanding of occurrence or the truth behind this occurrence (Saunders, Lewis and Thornhill, 2012). For example, a hospital in which individuals (doctors, nurses, patients and other personnel) continually shape their organisational boundary. In essence: organisation(s) are shaped by the individual(s).

3.2.3 Research Philosophy of this Study

Considering the research questions of this study (see Section 1.4), this thesis adopts a pragmatic philosophical position. The goal of this study is to examine the risk management practices and their relationship with the performance of banks in Pakistan. In this research, emphasis is laid on a focus on gaining a deeper and more specific understanding of the risk management system to confirm its effectiveness. Hence, this study is more likely to view research as a “holistic endeavour” and has a positive attitude to both qualitative and quantitative methods (Onwuegbuize and

Leech, 2005, p.383). This study has used qualitative techniques to provide contextual background and to inform new insights which are followed up by quantitative techniques.

In this study, Pakistani banks are observed as organisations holding a restraining force that applies to their managers. Pakistani banks formulate risk management policies and, simultaneously, force their staff (bank managers) according to their needs. The tendency of existence of such pressure varies from banks to bank, so, the researcher in this study is motivated towards the objectivism position that a bank (organisation) is a tangible entity and reality that is separate from managers (individuals) who manage it.

The next section gives the details about research approach.

3.3 Research Approach

There are primarily two types of research approaches named as deduction and induction. The deductive research approach is entirely divergent from the inductive approach. Babbie (2010) explains that both deductive and inductive approaches engage collaboration of acumen and observations. The deductive approach assists researchers to deduce a hypothesis based upon a particular theory. The researcher collects certain data to accept or reject the hypothesis to answer the research question (Gill and Johnson, 2010).

Bryman and Bell (2011) present the process of deduction to understand various steps of deductive approach. This process is shown in Figure 3.1 below.

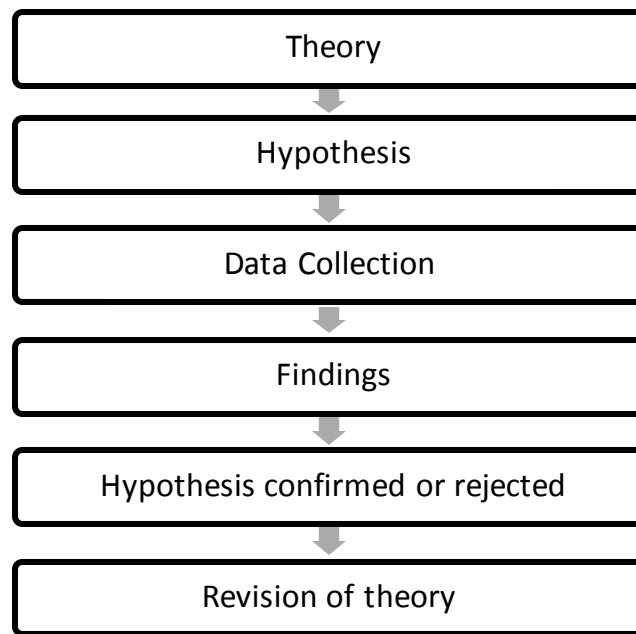


Figure 3.1: The process of deduction

Source: Bryman and Bell, 2011, p.9.

As mentioned above in Figure 3.1, researchers develop one or more hypotheses for their studies, based upon their theoretical considerations about particular fields. After that researchers deduce appropriate data collection method(s) according to the nature of their studies. In the findings stage, the collected data is statistically evaluated to confirm the acceptance or rejection of the hypotheses. Finally, researchers examine the implications of data analysis on social theory.

Whereas, the induction approach is the perfect reverse of the deduction approach. It follows a reverse process: starts with empirical observations, findings are made that are adopted as a source for developing new theories (Bryman and Bell, 2011). In this approach, researchers deduce the implications of their findings.

Gill and Johnson (2010) suggest that the understanding of these research approaches is crucial for investigators to choose a relevant approach for their research. Table 3.1 presents a brief summary and comparison of both the approaches.

Table 3.1: Deduction, induction: from reason to research

	Deduction	Induction
Logic	In a ductive inference, true premises are used to generate true conclusions	Conversily to a dective inference, known premises are used to generate untested conclusions
Generalisability	Generalisation is made from the general to the specific	Generalisation is made from the specific to the general
Use of data	Data is collected and examined to evaluate propositions or to test hypotheses linked to an existing theory	Data is collected and untized to explore a phenomenon, to detect patterns and themes or to create a conceptual framework
Theory	Theory verification or testing	Theory generation and building

Source: Saunders, Lewis and Thornhill, 2012, p.144

3.3.1 Research Approach of the Study

The nature of current research is empirical and this study adopts deductive reasoning. The research process of this study starts with an exhaustive review of literature in order to understand the background of research. Based upon this contextual understanding, research hypotheses are developed. Both primary and secondary data are collected to test the study hypotheses. The collected data is statistically assessed to confirm the acceptance or rejection of each hypothesis to prove or modify the theory.

3.4 Research Strategy

A research strategy refers to a general plan of actions formulated to conduct the business research. Bryman and Bell (2011) describe two fundamental categories of research strategy which are recognized as being quantitative and qualitative. According to them the quantitative research strategy accentuates quantification in data collection techniques and analysis procedures. It encompasses a deductive research approach and is associated with positivism philosophy. Furthermore, its ontological consideration is linked to objectivism.

In comparison, the qualitative research strategy generally emphasises words instead of quantification in data collection techniques and analysis (Bryman and Bell, 2011). It entails an inductive approach and is allied with interpretivism philosophy unlike the quantitative research strategy (Saunders, Lewis and

Thornhill, 2012). In addition, this strategy is incorporated with constructionism position in ontology (Sekaran and Bougie, 2013).

Nonetheless, this difference is not a conclusive one: many studies having extensive features of one strategy may contain an attribute of the other and are recognized as multi-strategy research or mixed methods research (Bryman and Bell, 2011). Creswell (2003) describes this concept (mixed methods research) and suggests that it can or should be practiced if, in combination, they accommodate the best prospect of answering the research question(s). Earlier to this, Cavana, Delahaye and Sekaran (2001) suggest that both quantitative and qualitative research methods can be exercised together and it is important for a researcher to know which combination of methods can provide best answers to research questions.

The use and acceptance of mixed methods research has increased in the field of business research as well as in social science more commonly (Bryman and Bell, 2011). A number of studies have been conducted by various researchers which found a significant use of the mixed methods research (Molina-Azorin and Cameron, 2010). A short summary of these articles based studies is presented in the following Table 3.2.

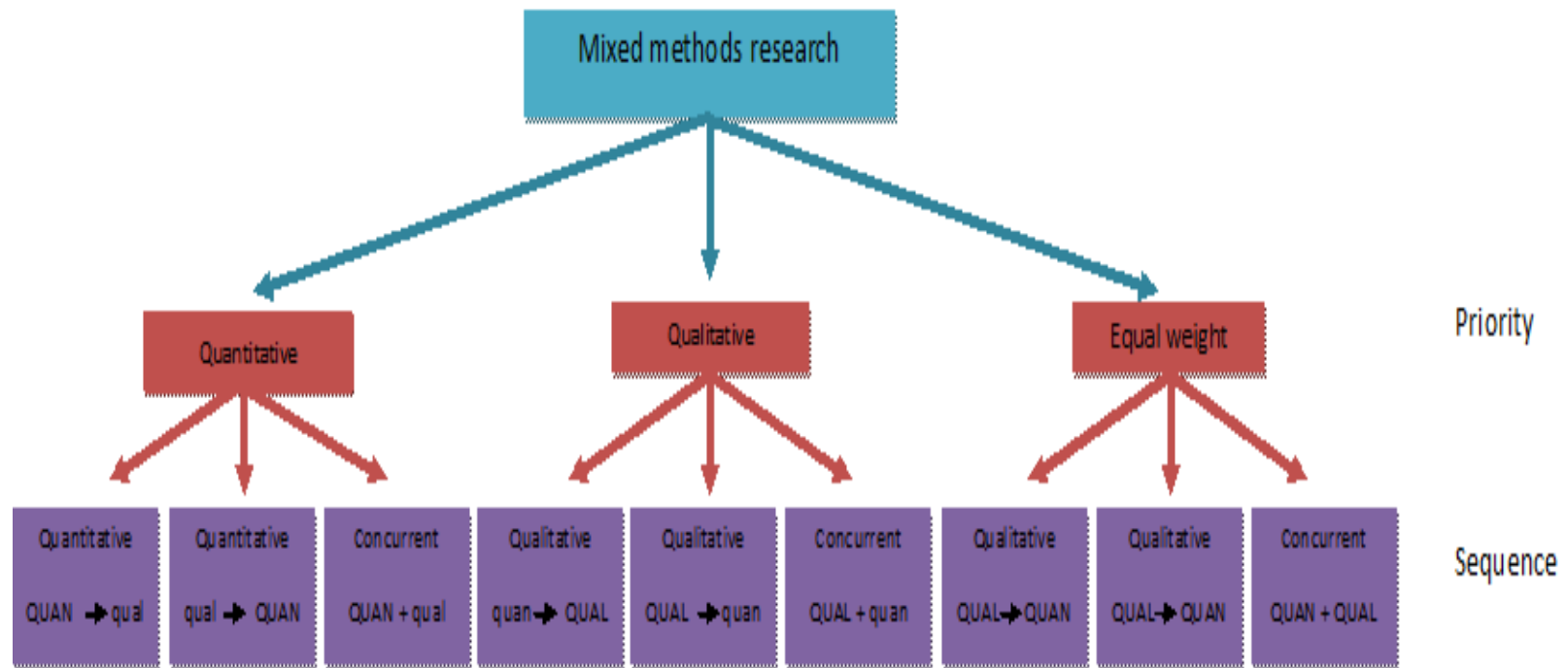
Table 3.2: Use of mixed method research in different fields

Sr. #	Researcher(s)	Field of Study	Portion of Mixed Method Research in Total Research
01	Hanson and Grimmer (2005)	Marketing	14 %
02	Hummerinta-Peltomaki and Nummela (2006)	International Business	17 %
03	Bryman (2008)	Business and Management	12-17%
04	Molina-Azorin (2008)	Operational Management	10%
		Entrepreneurship	8%
05	Molina-Azorin (2009)	Strategic Management	17%
06	Molina-Azorin and Lopez-Fernandez (2009)	Organizational Behaviour	7.5%
<i>Continued on next page</i>			

Sr. #	Researcher(s)	Field of Study	Portion of Mixed Method Research in Total Research
07	Grimmer and Hanson (2009)	Human Recourse Management	11 %
08	Alise and Teddlie (2010)	Psychology, Sociology, Nursing, and Education	11%

Table 3.2 indicates that there is significant use of the mixed method research in different fields. Bryman (2008) finds a significant use of the mixed methods research in Business and Management filed. He further reports that there is a threefold rise in the use of mixed methods research in business and management during 1994-2003. Bryman and Bell (2011) conclude, “Mixed methods research has acquired credibility in the field of business studies and that it is being employed on a fairly regular basis as a distinctive research strategy” (Bryman and Bell, 2011, p.631).

There are different approaches behind the conduct of mixed methods studies (Hammersley, 1996; Morgan, 1998; Bryman, 1988; Bryman, 1992; Bryman and Bell, 2011). Morgan (1998) classifies these approaches based upon the priority decision and the sequence decision. The priority decision refers to the weight and linkage of main data collection techniques (either the quantitative or the qualitative method) with the subsidiary collection approach (either the quantitative or the qualitative method). Whereas, the sequence decision indicates the role of each method in the approach (which method is in the leading role or each method is concurrent). From these criteria he constructs nine possible approaches (Figure3.2).



Capitals and lower case indicate priority

Arrows indicate sequence; + indicates concurrent

Figure 3.2: Classifying mixed methods research in terms of priority and sequence

Source: Bryman and Bell, 2011, p. 632

In the above Figure 3.2, upper case shows priority. For instance, QUAN (stands for quantitative method) specifies that the quantitative component is the major collection approach and lower case (quan; stands for qualitative method) highlights a more supplementary role. Arrows (→) indicate the sequence decision. For instance, QUAN → qual shows that the quantitative data (major collection approach) is collected prior to the qualitative data (subsidiary collection approach). The positive sign (+) points out that both (quantitative and qualitative) data collection approaches are conducted almost simultaneously. This classification is very helpful to think about the fundamental features for designing the mixed methods research (Bryman and Bell, 2011).

The current study uses a mixed method research by taking the quantitative method as the major component while the qualitative method plays a supplementary role. The next section presents more detail about the research strategy of the study.

3.4.1 Research Strategy of the Study

This thesis adopts a mixed methods research to provide more comprehensive results so as to answer the research questions as well as to meet the objectives of the study. This research conducts mainly quantitative research to test the hypothesis and also conducts qualitative research to document cause and effect relationship between the divergent variables in the risk management systems of the Pakistani banks. By keeping in view the priority and sequence discussed above, this study adopts (qual → QUAN) mixed methods research strategy. It indicates that the major part of this study is based upon quantitative research strategy. On the other hand, the qualitative research has a supplementary role to facilitate the main analysis. Furthermore, qualitative research is undertaken prior quantitative research.

The first objective, which deals with the identification, understanding and drawing a chain of causality between risk management policies in practice of banks and different types of risk in Pakistan, is dealt with qualitative research strategy based on semi-structured interviews. On the other hand, the quantitative part of this research is undertaken based on questionnaire data analysis as well as secondary

data analysis to achieve the remaining four objectives of this study. The research design of current study is discussed in the next section.

3.5 Research Design

A research design refers to a detailed plan for data collection and analysis depending upon the research question(s) of a particular study (Bryman and Bell, 2011; Saunders, Lewis and Thornhill, 2012; Sekaran and Bougie, 2013). It provides a bridge between the study objectives and all the activities (data collection and analysis) required to achieve these objectives (Hussey and Hussey, 1997). It is necessary to ensure that it will not only be related to the problem but will also adopt economical procedure(s) (Sekaran and Bougie, 2013). There are several categories of research designs such as to purpose, method, and application. Bryman and Bell (2011) describe five different research designs such as experimental design, survey design, longitudinal design, case study design and comparative design.

Experimental design studies the experimental groups and control groups to assess the causal relationship among study variables. For this purpose, different kinds of experiments including field experiments, laboratory experiments and quasi-experiments, are undertaken in the modern scientific research (Bryman and Bell, 2011; Sekaran and Bougie, 2013). Whereas, survey design involves in data collection for more than one case at single point of time and collected data is quantitatively examined to observe the pattern of association between dependent and independent variables for intended research (Sekaran and Bougie, 2013). Conversely, longitudinal design varies in terms of cost and time and targeted case is believed to be surveyed more than one point of time to collect data.

While, the case study design is very popular in modern research in spite of the problems of external validity and suits well with cross-sectional as well as longitudinal research designs (Sekaran and Bougie, 2013). Yin (2009) describes a case study as an empirical inquiry that examines a contemporary phenomenon within its real-life context, particularly when the boundaries between phenomenon and context are not clearly evident. The case could be a person, a family, a community, a firm, a sector or even a country. The case study investigation often

depends on multiple sources of evidence, with data needing to converge in a triangulating fashion and it can be based on any mixture of qualitative and quantitative evidences (Sekaran and Bougie, 2013). Furthermore, comparative design uses examining two contrasting cases applying approximately same methods for the comparison purpose. This type of design can be done qualitatively and quantitatively and assists the examiners to study the comparison between selected cases.

On the other hand, the research designs are also categorised into three broad types such as quantitative (fixed), qualitative (flexible) and multi-strategy (mixture of quantitative and qualitative) research design. The choice of a particular design strategy involves several issues such as the purpose of study and the procedures for enquiry (Creswell, 2003; Robson, 2011).

A quantitative research design is generally allied with a deductive approach. Nonetheless, the inductive approach may also be incorporated to develop a new theory. It uses numerical data collection and analysis to examine the associations between variables by applying different statistics techniques (Saunders, Lewis and Thornhill, 2012).

On the other hand, a qualitative research design is generally linked to inductive approach. However, the deductive approach is also initiated in several qualitative studies to test existing theory at the start of research (Yin, 2009). It generally uses non-numerical data (in the form of words) that is collected and analysed to inspect the relationships between participants of the study by adopting different analytical procedures.

Besides above two types, a multi-strategy (mixed methods) research design incorporates both quantitative and qualitative methods to collect or analyse data in single study (Creswell, 2003; Johnson and Onwuegbuzie, 2004; Williams, 2007; Tashakkori and Teddlie, 2010; Bryman and Bell, 2011). This type of research design may use either an inductive or deductive approach and is likely to combine both (see Saunders, Lewis and Thornhill, 2012, p.164). In a multi-strategy research design:

“Researchers collect or analyse not only numerical data, which is customary for quantitative research, but also narrative data, which is the norm for qualitative research in order to address the research question(s) defined for a particular research study. As an example, in order to collect a mixture of data, researchers might distribute a survey that contains closed-ended questions to collect the numerical, or quantitative, data and conduct an interview using open-ended questions to collect the narrative, or qualitative, data.”

(Williams, 2007, p.70)

Creswell (2003, pp.213-219) describes different types of multi-strategy designs based on the sequencing and status of data collection methods such as sequential explanatory design, sequential exploratory design, sequential transformative design, concurrent triangulation design, concurrent nested design and concurrent transformative design.

Saunders, Lewis and Thornhill (2012) describe important reasons to use a mixed methods design based upon some previous studies (Greene, Caracelli and Graham, 1989; Bryman, 2006; Molina-Azorin and Cameron, 2010). A brief summary of these reasons is presented in Table 3.3.

Table 3.3: Reasons for using a mixed methods design

Reason	Explanation
Initiation	Initial adoption of a qualitative or quantitative methodology may be made to explain the nature and scope of sequential quantitative or qualitative research. It may also be practices to give contextual background of the study in order to understand the research problem in better way. It may also be helpful in the development or revision of research questions, questionnaire items, interview questions and the selection of participants and cases.
Facilitation	One method either qualitative or quantitative may lead to the detection of new insights which communicate and are followed up through the adoption of other method (qualitative or quantitative) during the course of a particular research.
Complementarity	The use of mixed methods design may also permit the elaboration, clarification, confirmation, linkage, and illustration of the meanings and findings of the research
Interpretation	One method (either qualitative or quantitative) may be adopted to support to explain links between variables emerging from the other method (either qualitative or quantitative).
Generalizability	The mixed methods may be used to establish the relative importance of the study or its generalizability. Similarly, the use of mixed methods may also help to confirm the credibility of a particular research or to provide more complete knowledge.

(Continued on next page)

Reason	Explanation
Diversity	The mixed methods may be used for providing a greater diversity of views to inform and be followed in the research
Problem solving	An alternative method (either qualitative or quantitative) may be undertaken to help the initial method in to address the issues of insufficient data or revealing unexplainable results
Focus	Use of one method may help to focus on one attribute (e.g. qualitative on micro aspects), whereas the use of other method may help to focus on another attribute (e.g. quantitative on macro aspects).
Triangulation	Mixed methods may also be used for triangulation in which the outcomes of one method mutually corroborate with the findings of the other method.
Confidence	Mixed methods may also be used to improve the confidence on the study results and deal with method effect problem which indicates that the adoption of a single method can affect the findings of a study.

3.5.1 Study Research Design

Considering the research questions, this research discusses the Pakistani banking industry as a case study. This study is focused on enquiring how the risk management systems of banks work to cope with different risks and their impact on the banking performance in Pakistan. In this research, the “how” question aims at gaining an in-depth understanding and holistic view of the risk management systems of local banks in order to confirm their effectiveness with the aid of causal explanations. Furthermore, this study probes some more questions to provide the empirical evidences regarding risk management practices and their impact on the performance of banks by adopting a multiple method triangulation strategy. This study combines the research strategies and methods through developing sequential transformative design which is comprised of an initial phase of qualitative data collection and analyses followed by two phases of quantitative data collection and analyses.

This case study has used a multiple method triangulation strategy which is carried out in three phases in order to realize the research aim and objectives (see Figure 3.3). In the first phase of analysis, this study adopts systems thinking approach to develop a qualitative system dynamics model to understand and document the behaviour of the risk management system of the Pakistani banks. For this purpose, this study collects primary data through interviews and uses it for

validation purpose (see Chapter Four). The deduction of qualitative part of this research facilitates in gaining a deeper and more specific understanding of the risk management practices of banks in Pakistan which is followed up by applying quantitative research.

The purpose of the second phase is to assess the different aspects of risk management practices of banks in Pakistan. In doing so, this study adopts the survey method using questionnaires to collect data and performs quantitative analyses to answer the particular research questions of this research (see Chapter Five).

The objective of third phase is to investigate the relationship between the risk management and performance of the selected banks in Pakistan. A multiple-source secondary data is collected and analysed quantitatively in order to examine the said relationship (see Chapter Six).

Keeping in view the current study aim and objectives, the explained triangulation strategy with three phase research designs suits perfectly as it answers the proposed research questions significantly. Hence, this provides the better justification of adopting this triangulation research design with key focus on this case study based research.

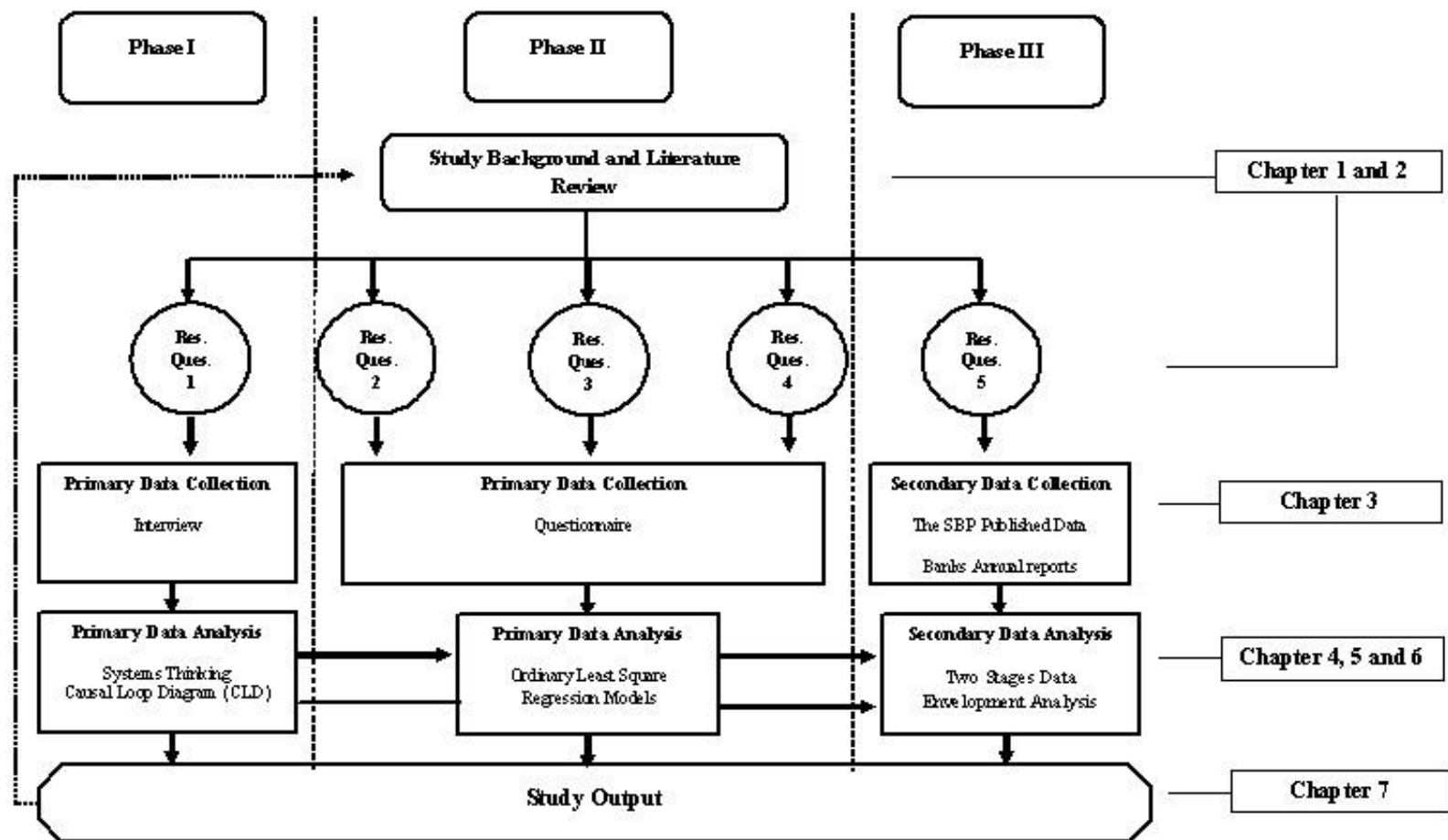


Figure 3.3: Study research design

3.6 Study Time Horizon

Two common types of studies are conducted based on available resources and time as cross-sectional studies and longitudinal studies (Cooper and Schindler, 2011). The researcher collects data only once at a particular time period (perhaps a couple of days or weeks or months), in order to address the research question(s) in a cross-sectional or one-shot study (Sekaran and Bougie, 2013). On the other hand, in longitudinal studies the data of dependent variable(s) is collected over a period of time by researchers (Sekaran and Bougie, 2013). The longitudinal studies incur more costs, time and efforts than cross-sectional studies (Cooper and Schindler, 2011; Sekaran and Bougie, 2013). Cross-sectional studies usually use different survey techniques to collect data and also employ various quantitative or multiple methods (Saunders, Lewis and Thornhill, 2012).

This research has undertaken a cross-sectional study and has collected data only once during the whole course of this research. In this thesis, the longitudinal study was not required or rather would be difficult owing to limited time, financial support and restricted access to the banks in Pakistan.

The following section discusses the population and sampling of this study.

3.7 Research Population and Sampling

This research uses sampling process owing to certain problems accompanied with studying the entire population. Sekaran and Bougie (2013) highlight important drivers of the sampling process including logistical, money and time constraints. They further point out that the selection of the right sample is very important element for a successful research which helps to generalise the results of the sample to the whole population. The subsequent sections provide detail about the population and selection of required sample for this study.

3.7.1 Study Population

The population of the study refers to, “the universe of units from which sample is to be selected” (Bryman and Bell, 2011, p. 176). The study population may be a literal population such as people or it may be a universe of nations, cities,

regions, firms and many more (Robson, 2011). The population of this study contains three different categories of Pakistani banks such as public banks, private banks and foreign banks.

Public sector banks are the state owned banks. The government holds more than fifty percent (50%) shares of these banks. Private banks are owned and run by individuals or a company for profit. Foreign banks are required to obey the rules and regulations of the two countries including the home country as well as Pakistan. These different categories of banks have been selected as population because of their broad range of banking products and services, large market-share and involvement in more risk management activities than other banking categories in Pakistan (Ahmed, 2008; Bagram, 2010). Hence, the whole population of this study is comprised of thirty four banks including five public banks, twenty two private banks and seven foreign banks (see Appendix One).

3.7.2 Sampling Procedures

The selected portion of a population for investigation purpose is called sample. It is also known as subset or subgroup of the population (Bryman and Bell, 2011; Saunders, Lewis and Thornhill, 2012; Sekaran and Bougie, 2013). The selection of sample (sampling process) is based upon two fundamental techniques including probability and non-probability. In probability sampling, each unit has been selected randomly from the population and has equal possibility of being selected as subject or representative sample (Bryman and Bell, 2011; Sekaran and Bougie, 2013). It is mostly associated with different strategies of survey research where the researcher needs to make deductions from the sample regarding a population to find answers to research question(s) in order to meet the study objectives (Saunders, Lewis and Thornhill, 2012).

On the other hand, the researcher chooses units from the population without considering any random selection technique in non-probability sampling. Therefore, some units have more possibilities of being chosen as a subject than others (Bryman and Bell, 2011; Sekaran and Bougie, 2013). Both sampling

techniques are further divided into different sub categories and are presented in Figure 3.4.

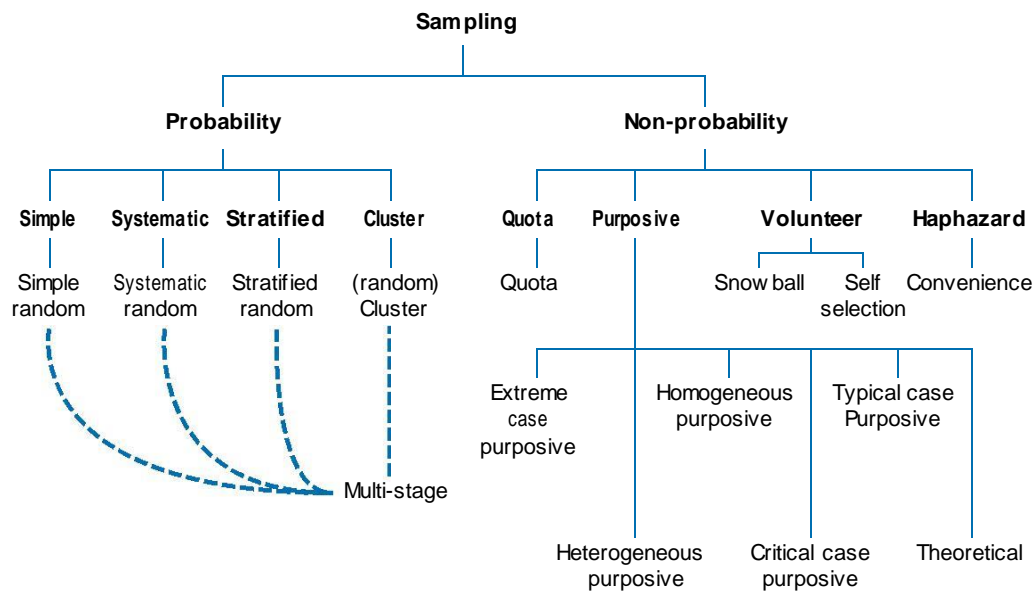


Figure 3.4: Sampling techniques

Source: Saunders, Lewis and Thornhill, 2012, p. 261

This study has used stratified random sampling technique to ensure that the selected sample is arranged in a systemic way and represents a specific proportion of total banks from each banking category such as public banks, private banks and foreign banks. The choice of banks (sampling) has been made based upon the following criteria:

- Banks having conspicuous business achievements
- Banks having bigger market share
- Banks with more diversified portfolios
- Banks with larger branch network in Pakistan
- Time, cost and other such resource constraints

Ruane (2005) suggests that sample size for 500 or less population should be 50% or more to infer statistically valid generalisations about a particular characteristic of the population. Considering the sampling criteria mentioned above, 20 banks (about 60%) have been selected including three public banks, thirteen private banks and four foreign banks. Table 3.4 presents a complete detail of the selected banks.

Table 3.4: List of selected banks for the study

Serial No.	Bank Name
Public Sector Banks	
01	National Bank of Pakistan (NBP)
02	The Bank of Punjab (BOP)
03	The Bank of Khyber (BOK)
Private Banks	
04	Habib Bank Limited (HBL)
05	United Bank Limited (UBL)
06	Allied Bank Limited (ABL)
07	MCB Bank Limited (MCB)
08	Bank Alfalah Limited (BAL)
09	Askari Bank Limited (AKBL)
10	Standard Chartered Bank (Pakistan) Limited (SCBPL)
11	Soneri Bank Limited (SBL)
12	Bank Al Habib Limited (BAHL)
13	Faysal Bank Limited (FBL)
14	Meezan Bank Limited (MBL)
15	KASB Bank Limited (KASB)
16	NIB Bank Limited (NIB)
Foreign Banks	
17	The Bank of Tokyo-Mitsubishi UFJ Limited - Pakistan Operations (BTMU)
18	Citibank N.A. - Pakistan Operations (CBNA)
19	Deutsche Bank AG - Pakistan Operations (DBAG)
20	HSBC Bank Middle East Limited - Pakistan Operations (HSBC)

Note: About 60 % of banks from each banking category (see Appendix One)

Although the proportionate representation of the selected banks in the population is about 60%, all these selected banks has covered a significant portion of total assets of all the banks included in the study population. The share of selected banks in the whole study population, based upon the total assets is reported in Table 3.5.

Table 3.5: Share of selected banks in the population

Sr. No	Stratum (Bank Category)	Total Banks (Population)		Selected Banks (Sample)		
		No. of Banks	Total Assets (Billions Rupees)	No. of Banks	Total Assets (Billions Rupees)	%
01	Public Banks	05	1845.230	03	1730.449	94
02	Private Banks	22	7644.197	13	6599.046	86
03	Foreign Banks	07	246.691	04	172.721	70
Total		34	9736.118	20	8502.216	87

Note: All calculation are based upon the total assets of banks as on 31st December, 2012

Source: The State Bank of Pakistan (2013)

Table 3.5 indicates that there were five public sector banks operating in Pakistan with the total assets of 1845.230 Billion Pakistani Rupees (PKR) as on 31 December 2012. This study selected three banks with total assets worth 1730.449 Billion PKR accounting for 94 percent of the total assets of all public banks in the country. The total assets of private banks in Pakistan were 7644.197 Billion PKR and the selected private banks had 6599.046 Billion PKR worth of assets as on 31 December 2012. This selection of banks held 86 percent of share in the total assets of the said category. Four foreign banks carrying 172.721 Billion PKR of assets were taken for this study. This selection covered 70 percent of the total assets (246.691 Billion PKR) of all the seven foreign banks, operating in the country as on 31 December 2012. This thesis selected 20 banks with total assets of 8502.216 Billion PKR as on 31 December 2012. Table 3.5 reveals that the sample banks had covered a significant share of 87 percent based upon total assets (9736.118 Billion PKR) of all the Pakistani banks included in the population. Therefore, the results of this study are considered as to be greatly representative of the whole study population.

As discussed in Section 3.5, this research is carried out in three phases by undertaking different techniques to collect primary as well as secondary data. Therefore, this study has adopted different combination of sample size for data collection during each phase considering the initial stratification reported above.

For interview data collection, this research has chosen one representative from each selected bank at first phase of analysis. Similarly, this study has selected fifteen representatives from each selected bank based on the initial stratification for questionnaire data collection in the second phase. This research has collected data from the managers of different divisions by considering the fact that the risk management is not confined with the sole responsibility of the staff of the risk management department in banks, but everyone who works for the bank is responsible for it (KPMG International, 2009; the State Bank of Pakistan, 2003). Abu Hussain and Al-Ajmi (2012) also highlight that the bank staff should comprehend the institutional risk appetite. Therefore, fifteen managers of diverse departments (covering treasury, operations, risk management, investment banking,

foreign exchange, audit, compliance and controls) have been randomly chosen to gauge their responses. Finally, this research has selected twenty banks based on the initial stratification for secondary data collection during the third phase.

The primary data collection techniques and procedures adopted for this study are discussed in the following section.

3.8 Primary Data Collection and Analysis Procedures

The first hand collected data is known as primary data. The researchers generally collect primary data when the available secondary data is insufficient, inappropriate or unavailable (Sekaran and Bougie, 2013). There are a number of methods for primary data collection including interviews, questionnaires and observations (Bryman and Bell, 2011). This study has adopted multi methods (interviews as well as questionnaires) to collect primary data. Both methods are discussed exhaustively in following sections.

3.8.1 Interviews

One general method to collect data is interviews in which the information regarding specific issue(s) is obtained through conversation with the respondents. Interviews can also be classified based upon the nature of interactions between the participant(s) and the researcher. Generally, interviews are classified into three broad categories such as structured, semi-structured and unstructured interviews (Bryman and Bell, 2011; Robson, 2011; Saunders, Lewis and Thornhill, 2012).

Structured or standardised interviews are conducted to obtain replies from the respondents using an identical framework of questioning by the researcher (Robson, 2011; Saunders, Lewis and Thornhill, 2012). The researcher reads very specific questions along with a fix range of answers often referred as close ended questions and records the interviewees' responses of each question during the structured interviews (Bryman and Bell, 2011; Saunders, Lewis and Thornhill, 2012).

The semi-structured interviews contain an elastic and fluid framework of questioning contrary to the structured interviews (Lewis-Beck, Bryman and Liao,

2004). This contains topics, themes, or areas to be covered during the course of the interview, instead of a sequenced script of standardized questions. The interviewer keeps a list of topics, areas or themes to be covered in the semi-structured interviews. “The interviewer usually has some latitude to ask further questions in response to what are seen as significant replies” (Bryman and Bell, 2011, p. 205). The researcher collects information based upon both close ended and open ended questions in the semi-structured interviews (Saunders, Lewis and Thornhill, 2012).

The unstructured interviews are completely informal (Robson, 2011; Saunders, Lewis and Thornhill, 2012). The interviewer only covers a list of issues or topics (known as interview guide) in the unstructured interviews. “The phrasing and sequencing of questions will vary from interview to interview” (Bryman and Bell, 2011: p. 205). Both semi-structured and unstructured interviews are considered non-standardised and also termed as qualitative interviews or in-depth interviews (King, 2004; Bryman and Bell, 2011; Rubin and Rubin, 2011; Saunders, Lewis and Thornhill, 2012).

On the other hand, the interviews can also be categorised based upon the mode of communication between the interviewer and the interviewees (see Figure 3.5).

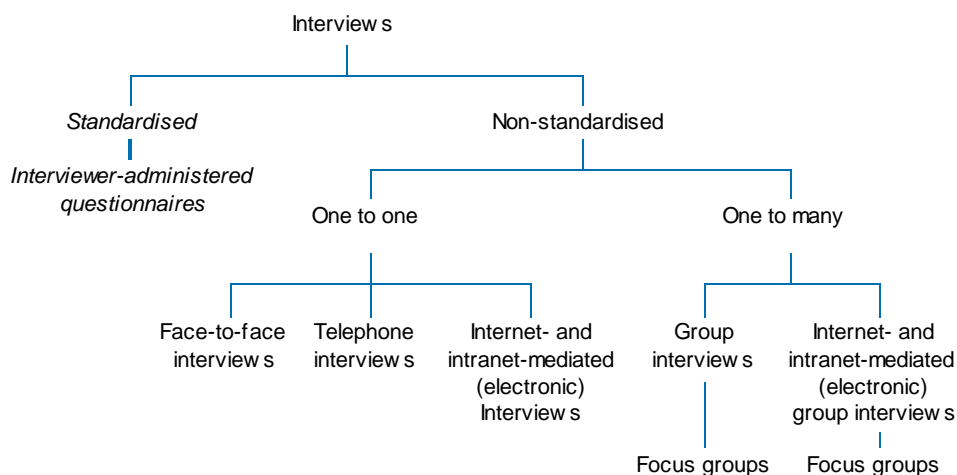


Figure 3.5: Interview categories

Source: Saunders, Lewis and Thornhill, 2012, p. 375

This study has made use of face to face semi-structured interviews to collect primary data and this approach has offered variety of advantages including:

- Helped to assist the respondents to understand the interview questions by giving extra information.
- Approached a number of respondents of different banks across the country.
- Offered greater anonymity to the respondents.
- Facilitated the study to obtain more information.

All the semi-structured interviews conducted for this study, are discussed in Chapter Four (see Section 4.3).

3.8.2 Questionnaires

A questionnaire refers to all the techniques for data collection in which every respondent is asked to respond against written series of questions, presented in a prearranged order (De Vaus, 2002; Saunders, Lewis and Thornhill, 2012). It is an efficient method to collect data when the investigator can specify what data is required and how the specific variables are computed (Sekaran and Bougie, 2013). The questionnaire is a very useful and a widely accepted method to collect precise data in a cost effective way from a large population in business and management research (Cooper and Schindler, 2011; Saunders, Lewis and Thornhill, 2012).

This study has adopted the survey questionnaire technique to collect required data for quantitative analysis and based on following important considerations:

- It is very helpful in the context of this research because firms generally publish few details about their risk management practices in the annual reports (Al-Tamimi and Al-Mazrooei, 2007; Abu Hussain and Al-Ajmi, 2012)
- It is the most efficient method to approach the target respondents within the banking sector of Pakistan, by remembering that it is possible to contact them more efficiently through a questionnaire;

- It offers sufficient time to the respondents (one to two weeks) and allows them to respond to the questionnaires with their ease and comfort.

There are various ways to collect primary data through a questionnaire survey. It can be self-administered, postal, or distributed electronically (see Figure 3.6). Each choice has some specific attributes, which must be considered by a researcher in order to make an appropriate selection (Saunders, Lewis and Thornhill, 2012).

Self-completion (Self-completed or self-administered) questionnaires are answered and completed directly by the participants (Bryman and Bell, 2011). These questionnaires are sent and collected in several ways. The web-based questionnaires are forwarded and collected through internet or intranet. Postal questionnaires are delivered and returned by post. The target respondents are commonly requested to send them back to the researcher. Self-delivery and collection of questionnaires is the most common type of self-completed questionnaires (Bryman and Bell, 2011). In this form, the researcher delivers questionnaires personally to the target respondents and collects them later.

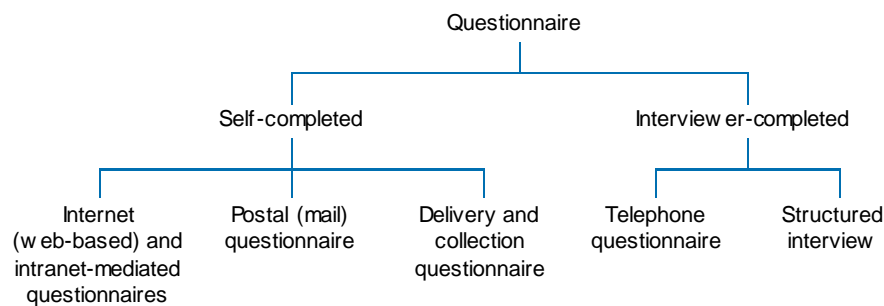


Figure 3.6: Types of questionnaire

Source: Saunders, Lewis and Thornhill, 2012, p 420

The interviewer- completed questionnaire is documented by an interviewer based on the answers of a single respondent on each question. In the telephone questionnaire, the telephone is used as the medium of communication between the interviewer and the respondent. On the other hand, in a structured interview, the interviewer physically approaches the target respondents and obtains answers to the questions in person. The structured interviews are different from non-standardised (semi-structured as well as unstructured interviews), as these include a predetermined agenda of questions, in which interviewers need to follow this agenda strictly (Saunders, Lewis and Thornhill, 2012).

This research has selected self-delivery and collection method as it offers certain advantages including:

- Helps to improve the response rate.
- Facilitates to gather required information within a limited time period.
- Enables to clarify and to address immediately the queries of target respondent (bank managers) regarding any question(s) of the questionnaire.
- Provides an opportunity to explain the theme of this research.
- Encourages the participants to give their unbiased responses.
- Offers extra time to the participants to think and answer the questions.

3.8.2.1 Questionnaire Design (Format)

The questionnaire format has an influence on the response, validity and reliability of the collected data. Therefore, the following points need to be considered while conducting a questionnaire based survey study to improve the response rate along with its validity and reliability (Oppenheim, 1992; Saunders, Lewis and Thornhill, 2012):

- Be careful in selecting each question;
- Be clear about information required, purpose, respondents;
- Make a clear as well as appealing draft of the instrument;
- Include an obvious description of the rationale of the survey;
- Conduct pilot study to determine the suitability of the questionnaire;
- Use simple language for clear and unambiguous understanding of instructions and questions;
- Plan carefully the execution of questionnaire distribution and return

By keeping in view the above points and objectives of the study, this research work has made the following considerations in order to adopt the various items contained within the questionnaire of this study:

- Includes clear, concise but purposeful close ended questions in the questionnaire to collect the specific data and to maximize the response rate;

- Makes sure that all the questions were transparent and coherent to maintain the interest of the respondents;
- Tries to maintain the courtesy and lucidity of each question; and
- Ensures that the privacy and confidentiality of the responses of each respondent were strictly maintained

Furthermore, all the questions have been written in English. The official language of banks in Pakistan is also English so this survey research does not face any issues of translation.

Bryman and Bell (2011) suggest that the adoption of existing questions allows the researcher to use questions that have in a sense been piloted for them. They further advocate

If any reliability and validity testing has taken place, you will know about the measurement qualities of the existing questions you use. A further advantage of using existing questions is that they allow you to draw comparisons with other research. Examining questions used by others may give you some idea about how best to approach your own questions, even if you decide not to make use of them as they stand.

(Bryman and Bell, 2011, p. 263)

By keeping the above points in view, the questions (items) used in the questionnaire of this study have been adopted from existing literature (Al-Tamimi, 2002; Al-Tamimi and Al-Mazrooei, 2007; Abu Hussain and Al-Ajmi, 2012). The questionnaire of this study is comprised of following three sections.

Section I: The first section is concerned with the demographic characteristics of the participant. The information regarding bank name, gender, age and work experience is obtained from the respondents in this section.

Section II: The second section is designed to assess the key variables such as risk understanding, risk identification, risk assessment and analysis, risk monitoring and controlling, managing credit risk, managing market risk, managing liquidity risk, managing operational risk and risk management practices. This part has sixty closed ended questions. Each item is measured by a five point Likert scales i.e. (strongly disagree = 1 to strongly agree =5). Respondents were required to select the

relevance of the specific item with their bank's risk management policies are currently being in practiced. A brief description of each scale is described in Table 3.6.

Section III: The third section is anticipated to obtain information regarding the various risks, methods and techniques used by the banks to manage them. This part contains six different questions. In most of the questions, the study used an ordinal scale to take response of the participant in terms of Yes or No. This section is intended to obtain information about the potential risks and adoption of specific methods and techniques by the particular bank for risk identification, risk assessment and analysis, risk monitoring and controlling and risk reporting.

Table 3.6: Description of five point Likert scale for assessing responses

Assigned Scale Value	Description
5	Strongly Agree: This scale reveals that the item or the particular statement is definitely appropriate, enormously favoured and very much important with the risk management practices, currently adopted by the respondents' bank based upon his/her understanding, working experience and expertise.
4	Agree: This scale reveals that the item or the particular statement is appropriate, favoured and important with the risk management practices, currently adopted by the respondents' bank based upon his/her understanding, working experience and expertise.
3	Neutral: This scale reveals that the respondent does not want to share his/her views on the particular item or the statement and shows an impartial attitude.
2	Disagree: This scale reveals that the item or the particular statement is inappropriate, not favoured and unimportant with the risk management practices, currently adopted by the respondents' bank based upon his/her understanding, working experience and expertise.
1	Strongly Disagree: This scale reveals that the item or the particular statement is definitely inappropriate, highly not favoured and very inessential with the risk management practices, currently adopted by the respondents' bank based upon his/her understanding, working experience and expertise.

3.8.2.2 Operationalization

Operational definitions or operationalization is necessary to collect data by using a questionnaire survey (Davis and Cosenza, 1993; Bryman and Bell, 2011).

Operationalization means, “The translation of concepts into tangible indicators of their existence” (Saunders, Lewis and Thornhill, 2012, p. 677). For measuring these variables or to translate the key concepts of this research namely risk understanding, risk identification, risk assessment and analysis, risk monitoring and controlling, managing credit risk, managing market risk, managing liquidity risk, managing operational risk and risk management practices, operationalization has been practiced. Operationalization of this study points out each variable and ought to have particular questions (items) to be enquired. A summary for the operational definitions of all these variables is given below in Table 3.7.

Table 3.7: Operationalization of the study variables

Variable Title	Items
<p>Risk Understanding (Based on research work by Al-Tamimi and Al-Mazrooei, 2007; Abu Hussain and Al-Ajmi, 2012)</p>	<ul style="list-style-type: none"> ▶ There is a common understanding of risk management across the bank ▶ There is a proper system for understanding various risks implemented in the bank ▶ Responsibility for risk management is clearly set out and understood throughout the bank ▶ Accountability for risk management is clearly set out and understood throughout the bank
<p>Risk Identification (Based on research work by Al-Tamimi and Al-Mazrooei, 2007; Abu Hussain and Al-Ajmi, 2012)</p>	<ul style="list-style-type: none"> ▶ The bank carries out a compressive and systematic identification of its risks relating to each of its declared aims and objectives ▶ The bank finds it difficult to prioritize its main risks ▶ Changes in risks are recognized and identified with the bank’s roles and responsibilities ▶ The bank is aware of the strengths and weaknesses of the risk management systems of other banks ▶ The bank has developed and applied procedures for the systematic identification of opportunities ▶ It is crucial for bank to apply the most sophisticated techniques for risk identification
<p>Risk Assessment and Analysis (Based on research work by Al-Tamimi and Al-Mazrooei, 2007; Abu Hussain and Al-Ajmi, 2012)</p>	<ul style="list-style-type: none"> ▶ This bank assesses the likelihood of occurring risks ▶ This bank’s risks are assessed by using quantitative analysis methods ▶ This bank’s risks are assessed by using qualitative analysis methods(e.g. high, moderate, low) ▶ The bank analyses and evaluates opportunities it has to achieve objectives ▶ The bank’s response to analysed risks includes an assessment of the costs and benefits of addressing risks ▶ The bank’s response to analysed risks includes prioritizing of risks and selecting those that need active management <p style="text-align: right;"><i>(Continued on next page)</i></p>

Variable Title	Items
<p>Risk Assessment and Analysis (Based on research work by Al-Tamimi and Al-Mazrooei, 2007; Abu Hussain and Al-Ajmi, 2012)</p>	<ul style="list-style-type: none"> ▶ The bank's response to analysed risks includes prioritizing risk treatments where there are resource constraints on risk treatment implementation ▶ The bank undertakes a credit worthiness analysis before granting credit or executing transactions ▶ Before granting capital or credit by bank undertakes specific analysis including the applicant's character, capacity, collateral and conditions ▶ The bank has a computer based support system to estimate the earnings and risk management variability ▶ The bank relies on the output of quantitative data with human judgment
<p>Risk Monitoring and Controlling (Based on research work by Al-Tamimi and Al-Mazrooei, 2007; Abu Hussain and Al-Ajmi, 2012)</p>	<ul style="list-style-type: none"> ▶ Monitoring the effectiveness of risk management is an integral part of routine management reporting ▶ The level of control by the bank is appropriate for the risks that it faces ▶ The bank has adopted a standard reporting system about the risk management from bottom to top management ▶ Reporting and communication processes within the bank support the effective management of risk ▶ The bank's response to risk includes an evaluation of the effectiveness of the existing controls and risk management responses ▶ The bank's response to risk includes action plans in implementation decisions about identified risk ▶ The bank effectively monitors the credit limit of everyone counterparty ▶ The bank reviews the country ratings on a regular basis for its international financing and investment ▶ The borrower's business performance is regularly observed by the bank following the extension of financing
<p>Managing Credit Risk (Based on research work by Al-Tamimi, 2002; Al-Tamimi and Al-Mazrooei, 2007 and Pilot Study)</p>	<ul style="list-style-type: none"> ▶ The credit risk strategy set by the Board of Directors are effectively transformed and communicated within the bank in the shape of policies and procedures by the top management ▶ The bank has an effective risk management framework (infrastructure, process and policies) in place for managing credit risk ▶ The bank has a credit risk rating framework across all type of credit activities ▶ The bank monitors quality of the credit portfolio on day-to-day basis and takes remedial measures as and when any deterioration occurs ▶ The bank regularly prepares periodic report of credit risk
<p>Managing Market Risk (Based on research work by Al-Tamimi, 2002; Al-Tamimi and Al-Mazrooei, 2007 and Pilot Study)</p>	<ul style="list-style-type: none"> ▶ The market risk strategy set by the Board of Directors are effectively transformed and communicated within the bank in the shape of policies and procedures by the top management ▶ The bank has an effective risk management framework (infrastructure, process and policies) in place for managing market risk

(Continued on next page)

Variable Title	Items
<p>Managing Market Risk (Based on research work by Al-Tamimi, 2002; Al-Tamimi and Al-Mazrooei, 2007 and Pilot Study)</p>	<ul style="list-style-type: none"> ▶ The bank's overall market risk exposure is maintained at prudent levels and consistent with the available capital ▶ The bank adopts multiple risk measurement methodologies to capture market risk in various business activities ▶ The bank regularly prepares periodic report of market risk
<p>Managing Liquidity Risk (Based on research work by Al-Tamimi, 2002; Al-Tamimi and Al-Mazrooei, 2007 and Pilot Study)</p>	<ul style="list-style-type: none"> ▶ There is a proper set of rules and guidelines, for managing liquidity risk, available in the bank ▶ The liquidity risk strategy set by the Board of Directors are effectively transformed and communicated within the bank in the shape of policies and procedures by the top management ▶ The bank has an effective risk management framework (infrastructure, process and policies) in place for managing liquidity risk ▶ The bank regularly prepares periodic report of liquidity risk ▶ Applications of liquidity risk management techniques reduce costs or expected losses
<p>Managing Operational Risk (Based on research work by Al-Tamimi, 2002; Al-Tamimi and Al-Mazrooei, 2007 and Pilot Study)</p>	<ul style="list-style-type: none"> ▶ There is a proper set of rules and guidelines, for managing operational risk, available in the bank ▶ Board and executive management of the bank recognizes, understands and has defined all categories of operational risk applicable to their institution ▶ Senior management of the bank transforms the strategic direction given by the board through operational risk management policy ▶ The bank has contingency and business continuity plans to ensure its ability to operate as going concern and minimize losses in the event of severe business disruption ▶ The bank regularly prepares periodic report of operational risk
<p>Risk Management Practices (Based on research work by I-Tamimi, 2002; Al-Tamimi and Al-Mazrooei, 2007; Abu Hussain and Al-Ajmi, 2012)</p>	<ul style="list-style-type: none"> ▶ The bank's executive management regularly reviews the organization's performance in managing its business risks ▶ The bank has highly effective continuous review/feedback on risk management strategies and performance ▶ The bank's risk management procedures and processes are documented and provide guidance to staff about managing risks ▶ The bank's policy encourages training programs in the area risk management ▶ This bank emphasizes the recruitment of highly qualified people in risk management ▶ Efficient risk management is one of the bank's objectives ▶ It is too dangerous to concentrate bank's funds in one specific sector of the economy ▶ The application of Basel capital Accord has improved the risk management effectiveness in the bank <p style="text-align: right;"><i>(Continued on next page)</i></p>

<p>Risk Management Practices (Based on research work by I-Tamimi, 2002; Al-Tamimi and Al-Mazrooei, 2007; Abu Hussain and Al-Ajmi, 2012)</p>	<p>▶ The bank's capital is adequate if the ratio of capital to total risk-weighted assets is equal to the capital adequacy ratio set by the State Bank of Pakistan</p> <p>▶ Overall, the level of risk management practices of the bank is considered to be excellent</p>
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Before going for main questionnaire data collect, this research work has also conducted a pilot study to determine the suitability of the instrument (questionnaire) and is discussed in the next section.

3.8.2.3 Pilot Study

It is evidently advisable to conduct piloting (pilot study or testing) prior to using a questionnaire with the target population or sample (Bryman and Bell, 2011). According to several authors (Oppenheim, 1992; Bryman and Bell, 2011; Saunders, Lewis and Thornhill, 2012; Sekaran and Bougie, 2013), a pilot study generally fulfils a number of substantial functions including:

- It is used to refine and improve the questionnaire for collecting more acceptable responses.
- It is also helpful in assessing the questions or items' reliability and validity before going for main data collection.
- It enables the researcher to verify that the instrument (questionnaire) is capable of answering the investigative questions of the study.
- It is very crucial to judge and remove any confusion in the questionnaire at an early stage of study.
- It is used to identify inappropriate questions (virtually every respondent answered in a similar way and are unable to shape a variable).
- It permits the investigator to adjudicate the competence of instructions for the respondents.
- It also assists in judging the adequacy of flow of questions in the questionnaire and identifies any margin for improvement.

Acknowledging all the valuable points cited above, this research has also conducted a pilot test of the study questionnaire and considered its findings.

The initial draft of questionnaire was reviewed and approved by the members of supervisory committee. The first part of the pilot study questionnaire was concerned with the demographic characteristics of the participant. The second section of this questionnaire contained items (questions) to assess the nine key variables. The third section was intended to obtain information regarding various potential risks as well as different methods and techniques adopted by the banks for risk management. In addition, a set of two open ended questions were also enclosed on a separate sheet along with the questionnaire to obtain additional comments or suggestions from the respondents. These feedbacks were used to bring refinement in the final instrument (questionnaire).

This study obtained prior participation consents from thirty managers of six different Pakistani banks via emails to carry out a pilot study. Afterwards, questionnaires were sent via emails to the responding participants in September, 2012. Fourteen participants from different banks responded. However, this response rate (about 47%) was acceptable in internet (web-based) questionnaires (see Saunders, Lewis and Thornhill, 2012, p.421), but it seemed low and might reduce further in future survey. Therefore, this study chose self-collection and delivery questionnaire method to enhance the response rate.

Cronbach's alpha was used to test the reliability of all the measures. Selltiz, Wrightsman and Cook (1976) have highlighted that it is the most effective and popular statistical tool to assess the reliability of different variables. A common heuristic is that the acceptable level of coefficient is more than 0.7 (Nunnally, 1978). In addition, a correlation analysis was also undertaken to assess the association between dependent variable and independent variables of this study. The results of reliability analysis of pilot study data are reported in Table 3.8.

Table 3.8: Reliability analysis of study variables based on pilot study data

Sr. #	Variable Title	Cronbach's Alpha Coefficient
01	Risk Understanding	0.72
02	Risk Identification	0.73
03	Risk Assessment and Analysis	0.71
04	Risk Monitoring and Controlling	0.73
05	Managing Credit Risk	0.74
06	Managing Market Risk	0.85
07	Managing Liquidity Risk	0.87
08	Managing Operational Risk	0.71
09	Risk Management Practices	0.78

Note: Accepted value of alpha coefficient is .70 or more

The pilot study results reflect that Cronbach's alpha of each variable was well over the benchmark 0.7 metric and showed high reliability and internal consistency of the measures. Based upon the reliability analysis of the pilot testing, this study developed confidence in the questionnaire which helped to form the main data collection instrument. The results of the main survey (questionnaire) study excluded the pilot study data.

Based upon pilot study results and comments received from the banking experts as well as academicians, this study found that the developed instrument (questionnaire) was capable of answering the investigative questions of this research and also achievable in the local context. In addition, the final version of the questionnaire (see Appendix Two) was discussed, reviewed and approved by the director of study before undertaking the main data collection.

3.8.2.4 Data Collection through Main Questionnaire Survey

As discussed in section 3.7.2, three hundred (300) managers of different divisions have randomly been chosen to obtain their responses from 20 selected banks. This study has decided to adopt self-delivery and collection method to collect main questionnaire data (see section 3.8.2).

A reference letter from the director of studies has also been obtained (See Appendix Three). This supporting letter has maintained the legitimacy of this study and encouraged the cooperation of banks. This research has requested for voluntary

participation and avoided inquiring into any confidential or sensitive information that the target participants (bank managers) might be reluctant to provide (See Appendix Two). In order to test the effectiveness of the questionnaire, a pilot study has also been conducted and discussed in the last section.

The required data has been gathered from managers working in different divisions of the selected banks situated in three major cities of Pakistan such as Faisalabad, Karachi and Lahore. Before initiating the main questionnaire survey, a database of the targeted banks has been developed. The required information about the surveyed banks has been collected from the official websites of respective banks. All responding banks have been contacted by phone during August, 2013 and September, 2013 to obtain pre-informed consent and to make an appointment for data collection. After updating all required information covering contact details, date and time of appointments, the main questionnaire survey has been conducted during 23 September 2013 to 10 January 2014.

3.8.2.5 Response Rate

As described earlier, this study has adopted a self-collection and delivery questionnaire method in order to maximize the response rate of the survey. Saunders, Lewis and Thornhill (2012) highlight that personally administered questionnaires have fewer issues with response rate. During the course of data collection through main questionnaire survey, two hundred and seventy six (276) questionnaires have received back out of which thirteen more questionnaires (13) found incomplete and have been excluded. The remaining 263 questionnaires have found useable and represented a good response rate of 88 %. Babbie (2010) proposes that a response rate of 70% or more is considered to be very good for questionnaire survey. Furthermore, this study has also achieved a higher response rate than previous studies (Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2011, and Abu Hussain and Al-Ajmi, 2012) as a result of self-administered questionnaire and effective follow up.

The next section describes a brief detail about the different analysis procedures used for the questionnaire data analysis.

3.8.2.6 Analysis Techniques for Questionnaire Data

Different statistical techniques have been applied to analyse questionnaire data. Descriptive statistics has been utilized to describe the data. This research has used inferential statistical analysis to test the study hypotheses. Statistical Package for Social Sciences (SPSS 20.0) has been run to perform various tools regarding descriptive statistics, reliability, multicollinearity, Pearson correlation and multiple regression analysis.

3.8.2.6.1 Descriptive statistics

Descriptive statistics facilitates to attain a border picture of data and supports to present the data in more orderly and user-friendly way (Bailey, 1987; Tabachnick and Fidell, 2007). Groebner et al. (2005) describe that descriptive statistics involves measures of central tendency (such as mean, median and mode) and measures of dispersion (for example standard deviation (SD), range and variance). Both mean and SD are two common methods used in descriptive statistical analysis to explain the basic features of the collected data in a research (Dancey and Reidy 2004; Tabachnick and Fidell, 2007). The larger value of SD indicates that the observations in a data set are dispersed widely about the mean and the smaller value of SD shows that mostly observations are close to the mean (Pallant, 2001). A broad argument can be made on the basis of higher mean value and smaller value of SD (Tabachnick and Fidell, 2007).

This study has employed descriptive statistics analysis to calculate means and standard deviation (SD) for dependent and independent variables in the study. Mean values have been measured to observe the average response and SD analysis has been used to measure the variability.

3.8.2.6.2 Reliability or Internal Consistency of Variables

“Reliability refers to the consistency of a measure or a concept” (Bryman and Bell, 2011, p.158). Cooper and Schindler (2011) describe that the objective of confirming reliability is to reduce the possibility of biased results. The reliability of measures is tested by employing an internal consistency statistic tool that is

Cronbach's alpha (Pallant, 2001; Gujarati and Porter, 2009). Internal consistency is involved in correlating the feedbacks to questions (scale items) in the instrument (questionnaire) with one another. "It thus measures the consistency of responses across either a subgroup of the questions or all the questions from your questionnaire" (Saunders, Lewis and Thornhill, 2012, p.430).

As mentioned in the pilot study section, Cronbach's alpha is one of the most common methods to gauge the internal consistency. Selltiz, Wrightsman and Cook (1976) argue that it is the most effective statistical tool to assess the reliability of different variables and its alpha value always lies between zero (0) to one (1). The higher alpha value shows higher reliability and vice versa. There is no single rule of thumb available in the literature that indicates the acceptable alpha value for internal reliability. Alpha value 0.70 or more has been considered to be reliable in many studies (Selltiz, Wrightsman and Cook, 1976; Nunnally, 1978; Al-Tamimi and Al-Mazrooei, 2007; Bryman and Bell, 2011; Hassan, 2011; Abu Hussain and Al-Ajmi, 2012; Saunders, Lewis and Thornhill, 2012). However, several writers have accepted a comparatively a lower alpha value that is 0.60 or above (Peter, 1979; Pallant, 2001; Gujarati and Porter, 2009; Sekaran and Bougie, 2013).

This research has also measured the reliability of used items with the internal consistency statistic tool. Table 3.9 shows a summary of Cronbach's Alpha values of all the variables.

Table 3.9: Reliability analysis of study variables

Sr. #	Variable Title	Cronbach's Alpha Coefficient
01	Risk Understanding	0.75
02	Risk Identification	0.71
03	Risk Assessment and Analysis	0.75
04	Risk Monitoring and Controlling	0.77
05	Managing Credit Risk	0.75
06	Managing Market Risk	0.80
07	Managing Liquidity Risk	0.73
08	Managing Operational Risk	0.79
09	Risk Management Practices	0.74

Note: Accepted value of alpha coefficient is .70 or more

Table 3.9 reports that the Cronbach's alpha coefficients of all variables are more than acceptable level (0.70). The coefficients of Cronbach alpha for the study

variables are also accordant with the results from several past research studies for instance 0.620 to 0.689 (Al-Tamimi and Al-Mazrooei, 2007); 0.621 to 0.688 (Hassan, 2011); 0.713 to 0.892 (Abu Hussain and Al-Ajmi, 2012).

Robson (2011) outlines some key aspects (subject error and subject bias) which could affect the reliability. He explains that the selection of time may create subject error in survey study. In order to deal with such type of issue, the researcher has avoided approaching the managers of Pakistani banks at inappropriate time such as at their busiest times or at banks early or closing times. Furthermore, the researcher has made an appointment and provided sufficient time (one to two weeks) to the participants (bank managers). All the participants has been asked to complete the study questionnaires as per their own ease and comfort to handle and to minimize the subject error issue. Consequently, it has provided extra time to the participants to think and answer the questions. This practice has helped to enhance the objectivity of their answers and eventually the reliability of these responses.

Sometimes, participants answer according to others' desire in preference to what he/she actually intended to reply which may create subject bias (Robson, 2011). In consideration of handling the subject bias issue, the researcher has obtained participation consent from each respondent and tried to abstain from any sensitive or confidential inquiry (see Appendix Two). Furthermore, the adoption of self-collection and delivery method has given an opportunity to explain the purpose of this study. This method has also helped to boost the confidence of managers by convincing them that the researcher will maintain strictly the privacy and confidentiality of the collected data. Furthermore, the respondents have been ensured that their personal information will not be disclosed without their prior permission in order to encourage them to give their fair responses. Therefore, all the personal identifiers have been omitted from the data throughout the research.

3.8.2.6.3 Multicollinearity

Multicollinearity indicates the liner relationship between two or more predictor variables. It is a common problem in regression models which leads to unstable and unreliable estimates of regression coefficients (Gujarati and Porter,

2009). Singularity is an extreme case of multicollinearity, in which two independent variable show a perfect correlation (coefficient of correlation = 1) and perfectly predict each other (Gujarati and Porter, 2009; Garson, 2012). In order to test the multicollinearity between predictor variables, two common methods such as correlation coefficient and variance inflation factor (VIF) with tolerance values are employed (Groebner et al., 2005).

There is no single rule of thumb available in the literature that specifies the standard coefficient value for multicollinearity. Gujarati and Porter (2009) suggest if the value of VIF is less than 10 then there is no problem of multicollinearity. On the other hand, Groebner et al., (2005) propose the value of VIF should be 5 or less to avoid multicollinearity problem.

This research has used both methods to test multicollinearity between independent variables. Table 3.10 shows the results of multicollinearity analysis and the values of VIF and the tolerance coefficients of each dependent variable.

Table 3.10: Multicollinearity test results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.156	.275		.568	.571		
Risk Understanding	.117	.036	.176	3.276	.001	.684	1.463
Risk Identification	.155	.044	.170	3.479	.001	.829	1.206
Risk Assessment and Analysis	.117	.048	.127	2.437	.015	.729	1.372
Risk Monitoring and Controlling	.080	.041	.094	1.982	.049	.879	1.137
Managing Credit Risk	.218	.039	.303	5.529	.000	.660	1.515
Managing Market Risk	.080	.029	.138	2.780	.006	.802	1.247
Managing Liquidity Risk	.102	.037	.134	2.767	.006	.841	1.189
Managing Operational Risk	.115	.032	.177	3.580	.000	.812	1.231

Note: Accepted value of VIF is 10 or less

Table 3.10 indicates that the values of tolerance are between .660 and .879. Similarly, the values of the variance information factor (VIF) are not greater than 1.515 in this study. Therefore, these results highlights that there is no problem of multicollinearity in the data (Groebner et al., 2005; Gujarati and Porter, 2009; Garson, 2012).

Beside above, the correlation coefficients between all the independent variables are reported in Table 5.14 of Chapter Five. All the values of correlation coefficients indicate that there are no problems with multicollinearity and confirm earlier results of VIF and Tolerance. A brief description of correlation analysis is discussed in next section.

3.8.2.6.4 Pearson Correlation

Correlation analysis shows the association between two or more variables (Pallant, 2001). Correlation coefficients report mathematical values to measure the strength of the linear relationships between variables and take values from -1 to +1 (Gujarati and Porter, 2009). The higher value of correlation coefficient indicates a stronger association between variables in general. There are three types of correlation measured in statistics such as Pearson correlation, Spearman correlation and Kendall rank correlation (Cohen, 1988; Groebner et al., 2005; Tabachnick and Fidell, 2007; Gujarati and Porter, 2009; Garson, 2012).

Pearson correlation is also known as linear correlation and is the most commonly used type of correlation coefficient (Pallant, 2001). It is assumed in Pearson correlation that two variables are measured on at least ratio or interval scales and it finds out the degree to which values of these variables are proportional to each other (Tabachnick and Fidell, 2007). Gujarati and Porter (2009) have mentioned that the correlation is only limited to determine the degree of association between the dependent and independent variables. It does not facilitate the prediction of one set of scores from another set of scores and for this reason, regression analysis has been used.

This study has used Pearson correlation (r) because of interval data (Tabachnick and Fidell, 2007). This study interprets correlation analysis based on the following criterion to deduce the size of correlation coefficient amongst different variables (Cohen, 1988; Dancy and Reidy 2004; Gujarati and Porter, 2009).

- +1 (-1) refers to perfect positive (negative) correlation
- .70 to .99 (-.70 to -.99) refers to very strong positive (negative) correlation

- .50 to .69 (-.70 to -.99) refers to strong positive (negative) correlation
- .30 to .49 (-.30 to -.69) refers to moderate positive (negative) correlation
- .10 to .29 (-.10 to -.29) refers to weak positive (negative) correlation
- 0 to .09 (0 to -.09) refers to no correlation or negligible correlation

Correlation analysis as well as regression analysis of the questionnaire data have been conducted in order to test the hypothesis and are reported in Chapter Five. The next section explains multiple regression analysis.

3.8.2.6.5 Multiple Regression Analysis

Regression analysis is utilized to measure the relationship between several independent variables and single dependent variable (Tabachnick and Fidell, 2007; Gujarati and Porter, 2009).

Following regression equation is formed in multiple regression analysis:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + e$$

Where, Y indicates the value of the dependent variable (what is being predicted or explained) and β_0 represents the constant or intercept. β_1 and β_2 are the regression coefficients indicate the contributions of each independent variable to the prediction of the dependent variable. X_1 and X_2 stand for the independent variables. e is the error term.

The study has used the ordinary least square (OLS) technique to test the significance of the relationship between dependent and independent variables. OLS technique has been applied in this research by considering the fact that this is a well-accepted method and has commonly been used in certain pertinent studies (Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2011, Abu Hussain and Al-Ajmi, 2012; Bilal, Talib and Khan, 2013).

It is important to mention that assumptions such as reliability and multicollinearity focusing on data screening and sorting have also been fulfilled successfully. Moreover, a detailed discussion on the multiple regression analysis and results is reported in section 5.4 of Chapter Five.

3.8.2.7 Validity Analysis for Survey Questionnaire Phase

Validity is related to the integrity of the study conclusions which are achieved from a research work (Bryman and Bell, 2011). This study has made use of the measurement validity as well as statistical validity which are discussed in later sections.

3.8.2.7.1 Measurement (Content) Validity

Content validity or measurement validity refers to the extent to which the selected measures in research are measuring what they are intend to (Bryman and Bell, 2011). This research has adopted measures (questions) from the existing studies and also tested through pilot study (see Section 3.8.2.3). In addition, it has also been measured through Cronbach's alpha to confirm that all the items contained by a variable (construct) correlated among themselves (Sekaran and Bougie, 2013). Cronbach's alpha values of all the variables are reported in Table 3.9.

Besides the above, the feedbacks from professional bankers who are working in the local environment as well as suggestions from pertinent subject experts of different Pakistani universities have also been taken to enhance the content validity of the questionnaire.

3.8.2.7.2 Statistical Validity

Statistical validity is linked to the proper adoption and utilization of appropriate statistical tests to draws conclusions of a research work (Saunders, Lewis and Thornhill, 2012; Sekaran and Bougie, 2013). The researcher has done extensive readings as well as attended a number of relevant workshops on different data analysis techniques and procedures. In addition, consultations with several data analysis experts have also been made to analyse data more efficiently for this research. This study has used different statistical techniques such as descriptive statistics, reliability, multicollinearity, Pearson correlation and multiple regression analysis (OLS) by following systematic procedures to draw proper conclusions of

main questionnaire data. A detailed description of questionnaire data analysis is presented in Chapter Five.

3.9 Secondary Data Collection and Analysis Procedures

The data which has been collected by the individual(s) or organization for some specific purpose(s) at any previous point of time other than the current research is regarded as secondary data (Cooper and Schindler, 2011; Sekaran and Bougie, 2013). The secondary data items are accessible in different qualitative (descriptive) and quantitative (numerical) forms through different print or electronic sources. Some important sources for secondary data in Pakistani context include:

- Past research (conducted by various researchers of different fields)
- Official statistics (various statistical, analytical and performance periodic reports issued by the Government of Pakistan)
 - Official publications (published by different Federal and Provincial Ministries of Pakistan)
 - Semi-official publications (issued by various autonomy bodies such as the SBP, economic enquiry boards, municipalities, district councils and many more.)
- Publication of miscellaneous institutions or trade organizations including the Institute of Bankers Pakistan (IBP), chambers of commerce and etc.
- County reports and publications of International Monetary Fund (IMF), World Bank, Asian Development Bank (ADB) and many more.
- Individual performance review journals of banks and other companies
- Companies websites
- Survey reports of various local and international surveyor organizations
- Companies annual reports and other historical data
- International and local financial databases
- Local as well as international newspapers and magazines

The researcher can combine various sources of secondary data based upon specific identical basis, to compose a new data set and it is generally drawn to

collect quantitative information or statistics (Hakim, 2000; Saunders, Lewis and Thornhill, 2012).

For some social research questions, it is possible to use data collected earlier by other researchers or for other purposes than research, such as official statistics, administrative records, or other accounts kept routinely by organizations. By virtue of being achieved and made available, any type of primary data can serve as secondary data.

(Hox and Boeije, 2005, p.596)

3.9.1 Secondary Data Collection for this Study

In order to investigate the relationship between risk management and performance of banks in Pakistan, a multiple-source secondary data has been collected from the Banking Statistics of Pakistan published by the SBP as well as from the annual reports of selected banks. The use of secondary data in this study has offered certain advantages.

- It is more cost and time effective than the primary data and provides more time to perform analysis.
- Numerous secondary data sets of high quality are available in Pakistani perspective. Vastly experienced and professional individuals generate these datasets in different public as well as private organizations For instance, the Statistics and Data Warehouse Department of the SBP in Pakistan produces a number of high quality secondary data sets such as different periodic performance reviews of the banking system, financial statement analysis of non-financial as well as financial sectors and etc.
- The secondary data sets provide an opportunity to conduct the quantitative analysis. Different government bodies regularly collect similar information over time to generate various periodic reports or reviews. For example the SBP publish performance reviews (quarterly and annually) of the banking system in Pakistan and provide time series data to perform the different quantitative analysis.

The use of secondary data has certain limitations (see Saunders, Lewis and Thornhill, 2012, p. 320) and the study has chosen official statistics (the SBP

published data) as a major source to maintain the quality of data for analysis purpose.

3.9.2 Secondary Data Analysis Procedures

In order to measure the performance of banks in Pakistan and to investigate the effect of risk management practices on it, the quantitative data analysis techniques have been employed. This research has examined the performance of selected banks from the risk management perspective by adopting a two-stage data envelopment analysis method for the duration of 2005-2012.

This study has used the data envelopment analysis (DEA) method to measure the performance of targeted banks at first stage by considering following points:

- It appears to be one of the most extensive methods to measure the performance of firms offering analogous services and using the same set of resources (Oral and Yolalan, 1990).
- It is the most widely used nonparametric technique to measure the performance of banks (Laeven, 1999).
- It has become a very popular method for efficiency and performance measurement in developing banking system countries (Grigorian and Manole, 2002).
- It is very useful to provide new acumens in activities or entities those have already been measured by other techniques and methods (Cooper, Seiford and Tone, 2000).
- It is one of the most widely accepted methods to measure the performance of banks in various countries and has been exercised commonly (Yue, 1992; Yeh, 1996; Ayadi, Adebayo and Omolehinwa, 1998; Grigorian and Manole, 2002; Ho and Zhu, 2004; Debnath and Shankar, 2008; Kao et al. 2011; Fernando and Nimal, 2014). (see Table 2.1 in Chapter Two for more details)

At the second stage of analysis, Tobit regression analysis has been utilized to explore the relationship between risk management and the performance of selected banks. A detail explanation of both stages is presented as under:

3.9.2.1 Data Envelopment Analysis

DEA uses linear programming technique to estimate the relative efficiency scores and banks are benchmarked based on these scores (Yue, 1992; Ayadi, Adebayo and Omolehinwa, 1998; Casu and Molyneux, 2003; Ahmed, 2008). These scores are always between 0 and 1 (Das and Ghosh, 2006; Banker, Chang and Lee, 2010). The score of 1 indicates that the bank is 100 percent efficient whereas 0 refers to the worst score of efficiency (Miller and Noulas, 1996). Two types of orientations, input and output are applied in the DEA model (Yue, 1992; Grigorian and Manolc, 2002; Coelli et al., 2005; Kao et al. 2011; Fernando and Nimal, 2014). The input orientation DEA model concentrates on the reduction of inputs with a given set of outputs, whereas, the DEA model concentrates on the enhancement of outputs with a given set of inputs in the output orientation (Coelli et al., 2005).

The two types of assumptions constant returns to scale (CRS) and variable returns to scale (VRS) are made in carrying out the DEA (Avkiran, 1999; Coelli et al., 2005). Initially in 1978, Charnes, Cooper and Rhodes have estimated the efficiency scores of the decision making units (DMUs) under input orientation and by assuming CRS. A CRS is a feature of a production function and is exhibited where a positive change in inputs has a same proportional effect on the change of outputs. However, the decision making unit (DMU) has either the decreasing or increasing returns to scale under the VRS. Later, in 1984 Banker, Charnes and Cooper, (BCC) has measured the efficiency scores under VRS. The BCC model under the assumption of VRS shows greater or equal technical efficiency scores than the CRS model (Fernando, 2014). Both models are discussed in following subsequent sections.

3.9.2.1.1 The CRS Model

Following the study of Coelli et al. (2005), it is assumed under the input oriented DEA model that there are B banks and each contains P inputs for the production of Q outputs. The X stands for an input matrix of the all selected banks and is obtained by $P*B$. Similarly, Y represents an output matrix of all the selected banks and is found by $Q*C$. For a specific n-th bank, X_n represents a column vector

of the estimated inputs of the n-th bank. Likewise, Y_n symbolizes a column vector of the estimated outputs of the n-th bank. According to Charnes, Cooper and Rhodes (1978), the efficiency of n-th bank is estimated through the maximization of the ratio of the weighted outputs to weighted inputs such as $U'Y_n/V'X_n$, where the $Q \times 1$ vector of the outputs weights are represented U and V stands for $P \times 1$ vector of the inputs weights. Whereas, U' and V' indicate the transpose of output weights matrix and input weights matrix respectively subject to the condition that the selected banks have similar ratios which are equal or less than 1. The most optimal weights are obtained by solving a mathematical linear programming problem for the n-th bank and is described as under:

$$\text{Max}_{u,v} (U'Y_n / V'X_n) \quad (1)$$

Subject to

$$(U'Y_s / V'X_s) \leq 1 \quad s = 1, 2, 3 \dots C$$

$$U, V \geq 0$$

The aim of the above linear programming technique is to estimate the efficiency of n-th bank by determining the values of U and V with a constraint that the selected banks have efficiency of less than or equal to 1.

This particular ratio formation has an issue that the infinite number of solution is provided for U and V . For avoiding this problem, the constraint $V'X_n = 1$ can be imposed, which provides:

$$\text{Max}_{u,v} (U'Y_n) \quad (2)$$

Subject to

$$V'X_n = 1 \quad s = 1, 2, 3 \dots C$$

$$U'Y_s - V'X_s \leq 0$$

$$U, V \geq 0$$

The above problem is a multiplier form of the DEA linear programming. It has the same variables as defined in the earlier formation (1).

An input oriented DEA problem can be derived by applying duality theorem in linear programming:

$$\text{Min}_{\lambda, \theta} (\theta) \quad (3)$$

Subject to

$$Y\lambda \geq Y_n$$

$$\theta X_n - X\lambda \geq 0$$

$$\lambda \geq 0$$

Whereas λ refers to a column matrix containing order $B \times 1$ and having the vector of constants only. θ stands for a scalar. This form is preferable for analysis as it has lesser constraints than the original one. The value of θ represents the efficiency score for the n -th bank. In order to estimate the efficiency score of each bank, this problem is solved B times.

The output oriented DEA problem can also be derived:

$$\text{Max}_{\lambda, \phi} (\phi) \quad (4)$$

Subject to

$$Y\lambda \geq \phi Y_n$$

$$X_n - X\lambda \geq 0$$

$$\lambda \geq 0$$

The sign of ϕ stands for a scalar and represents the efficiency score for the n -th bank. The rest variables are the same as defined in the earlier problem (3).

3.9.2.1.2 The VRS Model

The assumption of CRS is only appropriate when all the banks operate at their optimum scale levels. Practically, it is not feasible, as several financial constraints, government regulations and imperfect competition may prevent a bank from operating at an optimal level of scale. Consequently, an extended model of VRS has been proposed by Banker, Cooper and Charnes in 1984. The linear programming under CRS can be merely changed by adding the convexity constraint (the weights λ sum equal to 1) to deal for VRS.

The input oriented DEA problem can be derived:

$$\text{Min}_{\lambda, \theta} (\theta) \quad (5)$$

Subject to

$$Y\lambda \geq Y_n$$

$$\theta X_n - X\lambda \geq 0$$

$B1' \lambda = 1$

$$\lambda \geq 0$$

Similarly the output oriented DEA problem can be drawn as

$$\text{Max}_{\lambda, \phi} (\phi) \quad (6)$$

Subject to

$$Y\lambda \geq \phi Y_n$$

$$X_n - X\lambda \geq 0$$

$B1' \lambda = 1$

$$\lambda \geq 0$$

The $B1$ is a B^*1 vector of ones in the above problem. The technical efficiency score under VRS is equal to or greater than the score which is obtained under CRS model.

The Convexity constraint such as $N1'\lambda=1$ take care that an inefficient bank is only “benchmarked” in opposition to other bank of analogous size.

In previous years, many studies have been conducted by applying DEA models under the VRS assumption to estimate the efficiency scores (Miller and Noulas, 1996; Jackson and Fethi, 2000; Grigorian and Manole, 2002; Casu and Molyneux, 2003; Sathye, 2003; Ataullah, Cockerill and Le, 2004; Casu, Girardone and Molyneux, 2004; Ataullah and Le 2006; Pasiouras, 2008a; Sufian and Majid, 2008; Burki and Niazi, 2010; Sharma, Sharma and Barua, 2012; Jha, Hui and Sun 2013; Fernando and Nimal 2014). The researcher of these studies have argued that CRS assumption is only useful when the DMUs are operating at the optimal scale and it might not be rational due to restrictions in the finance and regularity requirements and imperfect competition. Several constraints and imperfect competition is also prevailing in the Pakistan banking sector (Ataullah, Cockerill and Le, 2004; Burki and Niazi, 2010). Therefore, this study has also applied DEA model under the VRS assumption as it is more suitable for practical scenarios (Miller and Noulas, 1996; Sathye, 2003; Ataullah, Cockerill and Le, 2004; Pasiouras, 2008a; Fernando and Nimal 2014).

3.9.2.1.3 Inputs and Outputs Specification

There is a considerable debate exists in the literature for the selection of inputs and outputs in order to measure the performance of banks through DEA (Avkiran, 1999; Noulas, 2001; Hsiao et al., 2010; Garza-Garcia, 2012; Lee and Chih, 2013a and b). “There have been almost as many assumptions of inputs and outputs as there have been applications of DEA” (Bergendahl, 1998: p. 235). The specification of inputs and outputs is based upon the researcher’s consideration about the role of the bank. There are generally two types of approaches to be considered by the researcher such as production approach and the intermediation approach (Berger and Humphrey, 1997). In the first approach, the role of the bank is considered as a producer of financial services, in the second approach the bank is taken as an intermediary between depositors and borrowers. The former approach considers deposits as output, while the latter one takes it as inputs of the bank.

Berger and Humphrey (1997) mention that not any single approach is ideal because it cannot cover the dual role of banks as producer of financial services and financial intermediary. They further specify that efficiencies of banks at branches level may be evaluated in a better way under the production approach. However, in order to evaluate the overall performance of banks, the intermediation approach may be more suitable. Considering the fact, this study has also intended to measure the performance of each selected bank as a whole, the intermediation approach has been adopted. Table 3.11 describes a brief summary of different combinations for inputs and outputs that have been used to measure the efficiency of banks by different researchers.

Table 3.11: Different inputs and outputs specifications of previous studies

Author(s) and Date	Country of Study	Inputs	Outputs
Miller and Noulas (1996)	United States	<ul style="list-style-type: none"> ▶ Total transactions deposits ▶ Total non-transactions deposits ▶ Total interest expenses ▶ Total non-interest expenses 	<ul style="list-style-type: none"> ▶ Commercial and industrial loans ▶ Consumers loans ▶ Real estate loan ▶ Investments ▶ Total interest income ▶ Total non-interest Income
Yeh (1996)	Taiwan	<ul style="list-style-type: none"> ▶ Interest expenses ▶ Non-interest expenses ▶ Total deposits 	<ul style="list-style-type: none"> ▶ Interest income ▶ Non-interest income ▶ Total loans
Ayadi, Adebayo and Omolehinwa (1998)	Nigeria	<ul style="list-style-type: none"> ▶ Interest expenses ▶ Non-interest expenses ▶ Total deposits 	<ul style="list-style-type: none"> ▶ Interest income ▶ Non-interest income ▶ Total loans
Avkiran (1999)	Australia	<ul style="list-style-type: none"> ▶ Interest expenses ▶ Non-interest expenses 	<ul style="list-style-type: none"> ▶ Interest income ▶ Non-interest income
Pastor (1999)	Spain	<ul style="list-style-type: none"> ▶ Financial costs ▶ Operating expenses 	<ul style="list-style-type: none"> ▶ Financial revenues and collected fees ▶ Stock and bond portfolio returns
Jackson and Fethi (2000)	Turkey	<ul style="list-style-type: none"> ▶ Number of employees ▶ Non-labour operating expenses, direct expenditure on buildings and amortisation expenses 	<ul style="list-style-type: none"> ▶ Loans ▶ Demand deposits ▶ Time deposits
Noulas (2001)	Greece	<ul style="list-style-type: none"> ▶ Interest expenses ▶ Non-interest expenses 	<ul style="list-style-type: none"> ▶ Interest revenue ▶ Non-interest revenue
Grigorian and Manolc (2002)	Transition Countries	<ul style="list-style-type: none"> ▶ Labour ▶ Fixed Assets ▶ Interest expenditures 	<ul style="list-style-type: none"> ▶ Revenues ▶ Net Loans ▶ Liquid Assets
<i>(Continued on next page)</i>			

Author(s) and Date	Country of Study	Inputs	Outputs
Sathye (2003)	Indian	▶ Interest expenses ▶ Non-interest expenses	▶ Interest income ▶ Non-interest income
Atullah, Cockerill and Le (2004)	India and Pakistan	▶ Operating expenses ▶ Interest expenses	▶ Interest income ▶ Non-interest income
Ho and Zhu (2004)	Taiwan	▶ Sales ▶ Deposits	▶ Net income ▶ Interest income ▶ Non-interest income
Jaffry et al. (2005)	India, Pakistan and Bangladesh	▶ Interest expenses ▶ Non-interest expenses	▶ Interest income ▶ Non-interest income
Ataullah and Le (2006)	India	▶ Interest expenses ▶ Operating expenses	▶ Interest income ▶ Operating income
Pasiouras (2008a)	Greece	▶ Fixed Assets ▶ Customer deposits and short term funding ▶ Number of employees	▶ Loans ▶ Other earning assets ▶ Off balance items
Burki and Niazi, (2010)	Pakistan	▶ Labour ▶ Physical capital ▶ Operating cost ▶ Financial Capital	▶ Loans and advances ▶ Investments ▶ Contra accounts
Hsiao et al. (2010)	Taiwan	▶ Interest expenses ▶ Non-interest expenses ▶ Total deposits	▶ Interest revenue ▶ Non-interest revenue ▶ Total loans
Kao et al. (2011)	Taiwan	▶ Interest and non-interest expenses ▶ Operating expenses ▶ Fixed assets	▶ Operating income ▶ Investment
Sharma, Sharma and Barua (2012)	India	▶ Interest expenses ▶ Non-interest expenses ▶ Deposits ▶ Personnel expenses	▶ Loans and advances ▶ Interest income ▶ Non interest income
Jha, Hui and Sun (2013)	Nepal	▶ Deposits ▶ Interest expenses	▶ Loans and advances ▶ Interest income
Fernando and Nimal (2014)	Sri Lanka	▶ Labour ▶ Deposits ▶ Fixed assets	▶ Total amount of loans ▶ Total investment ▶ Non-Interest revenue

All the studies presented in Table 3.11 reports that different researchers have used varied combination of inputs and outputs. However, this study has used the combination of two inputs and two outputs (Avkiran 1999; Noulas, 2001; Sathye, 2003; Atullah, Cockerill and Le, 2004; Jaffry et al. 2005; Atullah and Le, 2006). The inputs are interest expenses(X_1) and non-interest expenses(X_2). On the other hand, interest income(Y_1) and non-interest income (Y_2) have been taken as outputs.

In order to measure the performance of selected Pakistani banks, this study has followed an intermediation approach and measured the technical efficiency

scores by applying an output oriented VRS model of DEA. Table A-2 in Appendix Five reports the technical efficiency scores of the selected banks.

3.9.2.2 Tobit Regression Analysis

In stage I, the performance of banks (dependent variable) has been measured through the technical efficiency scores which is a range variable, having values between 0 and 1 (Das and Ghosh, 2006; Banker, Chang and Lee, 2010). Therefore, depending upon the nature of the dependent variable, a censored Tobit model has been applied (Hsiao et al. 2010; Kao et al. 2011; Barth, Caprio and Levine, 2013; Jha, Hui and Sun, 2013; Lee and Chih, 2013 a and b). A censored Tobit regression model can be described as follows for n-th bank:

$$Y_n^* = \beta X_n + \mu_n \quad (1)$$

Subject to

$$Y_n = Y_n^* \quad \text{and}$$

$$Y_n^* \geq 0 \text{ otherwise } Y_n^* \leq 1$$

β refers to the set of parameters to be measured and X_n represents a vector of explanatory variables. μ_n is showing the error term and the Y_n^* is a latent variable.

Y_n represents the efficiency scores for the n-th bank.

This study has used the Tobit regression model procedure having zero (0) as a left censored bound and one (1) as a right censored bound to regress technical efficiency scores against the set of risk management factors including loan to deposit ratio, non-performing loan ratio and the capital adequacy ratio (see Section 6.3) to examine the relationship between risk management and the performance of banks in Pakistan. This study has used the Data Envelopment Analysis Program (DEAP Version 2.1) to estimate the efficiency of the banks at first stage of analysis. At second stage of analysis Statistical Package for Social Sciences (SPSS 20.0) has been run to perform descriptive as well as inferential statistical analyses. A detailed explanation of secondary data analysis and results is presented in Chapter Six.

3.10 Gathering Third Parties (Non-Respondents) Information

This study has also gathered information regarding the risk management activities of banks in Pakistan from various external sources besides collecting them via interviews and survey questionnaires. This supporting data is very helpful to obtain and document the initial understanding of cause and effect relationship between the different variables in the risk management systems of Pakistani banks.

Useful information has been obtained through personal correspondence from the internet and email to the individuals in charge. This research has considered the following reliable secondary data sources for the said purpose.

- Ministry of Finance, Government of Pakistan.
- Reports and articles published in different local newspapers and magazines
- Published data of different individual performance review journals of selected banks as well as from their websites.
- Different research articles, periodic performance reviews and statistics reports issued by the SBP.
- Various independent survey reports on banking prepared by different organizations such as ADB, IBP and IMF.

3.11 Summary

This chapter indicates the pathway by which the study research questions have been addressed. It describes the research philosophy of this thesis. It includes the research approach, research strategies and a brief description of research design of this study. It provides detail about the study population and describes the sampling procedures. This chapter also explains and justifies different data collection methods and analysis techniques and procedures have been adopted during the course of this research.

In summary, this research has embraced a pragmatic philosophical position and is motivated towards the objectivism. This thesis has adopted deductive reasoning and used mixed methods research strategy in which the qualitative research has a supplementary role to facilitate the quantitative research. This study

has developed a sequential transformative research design. This research has selected three different categories of banks (public, private and foreign banks) as population and the stratified random sampling technique has been applied. A cross sectional data has been collected from the managers of twenty selected banks in Pakistan with the help of interviews and questionnaire survey. The secondary data has been collected for twenty targeted banks operating in Pakistan during the period 2005-2012. Different descriptive and inferential statistics techniques have been employed to analyse the different sets of data.

The next chapter describes a broad explanation of the qualitative system dynamics model which has been developed to capture and document the behaviour of the risk management system of Pakistani banks.

Chapter Four Qualitative System Dynamics Model of the Risk Management System of Pakistani Banks

4.1 Introduction

The previous chapter has outlined a description of the research methodology adopted for this research. This chapter discusses the adoption of the systems thinking approach and describes the development of a qualitative system dynamics model (Causal Loop Diagram), to capture and document the behaviour of the risk management systems of Pakistani banks. This chapter highlights the purpose and use of the systems thinking approach in this particular research study. It also reports on the interviews data collection and analysis that have been used for the validation and revision of the preliminary CLD. The final and revised version of qualitative system dynamics model of the risk management systems of Pakistani banks in terms of sub-system Causal Loop Diagrams (CLDs) as well as a generic CLD are presented in it. Section 4.6 provides the summary of this chapter.

4.2 Systems Thinking

Systems thinking is an approach which focuses on developing models to improve the understanding of how things interact and work together within a whole system (Sherwood, 2002; Maani and Cavana, 2007). It encompasses a set of tools and principles to deal with ambiguity, complexity and mental models underlying the modern economic, political, social and ecological challenges. It is a useful way of probing the reality that focuses on the relationships between a system's components, rather than the components themselves (Mai and Bosch, 2010). The adoption and application of systems thinking approach has increased significantly

in different fields including Business and Management (Winch, 1993; Sterman, 2000; Sherwood, 2002; Jackson, 2003; Andrew and Petkov, 2003; Campbell and Avison 2004; Maani and Maharaj, 2004; Quatro, Waldman and Galvin, 2007; Elias, 2008; Wuryandani, 2011), Education (Moscardini and Loutfi, 2003; Moscardini and Vlasova, 2003; Evagorou et al., 2009) and Health (Cavana et al., 1999; Maani, 2002). According to Mai and Bosch (2010) the key objectives of this approach include to:

- focus on the entire system, its constituent parts and their interactions;
- supply a structure for managing complexity and change by virtue of the understanding of dynamic feedback embedded in complex systems;
- facilitate decision makers to predict the consequences of their policies and strategies in the long-run; and
- offer a common language for deep dialogue and consensus building for diverse stakeholders

Moscardini and Loutfi (2003) highlight that the systems thinking approach sees the world as a mutually dependent interconnecting network of relationships whose interactions have generally more importance than the things themselves. The fluctuation in one variable brings change in the whole picture. Moscardini and Vlasova (2003) describe the three major schools of systems thinking as system dynamics, cybernetics and evolutionary systems.

According to Sterman (2001), the system dynamics is a comprehensive modelling approach, having the ability to construct a complex model with the aim of developing an in depth understanding and taking more efficient policy actions. The system dynamics approach was originally developed by Forrester in the 1940s for military purposes as well as use in production and business management, to improve the efficiency of the system (Wuryandani, 2011). The system dynamics has qualitative as well as quantitative form (Moscardini and Vlasova, 2003). The qualitative form of system dynamics is CLDs. These diagrams are an effective method of capturing mental models (Wolstenholme, 1990; Sherwood, 2002). This method depends largely on feedback loops. The analysis of these feedback loops can divulge important insights into possible long term behaviour of the system

(Moscardini and Vlasova, 2003). On the other hand, the quantitative approach of system dynamics allows conducting dynamic simulations in shape of stock and flow diagrams (Wolstenholme, 1990; Richmond, 1993; Moscardini and Vlasova, 2003).

A CLD is composed of a number of variables which can be qualitative or quantitative (Maani, 2013). The qualitative or soft variables, for example confidence, collaboration and trust, do not normally lend themselves to direct measurement. However, the inclusion of these qualitative variables in the CLD adds significant realism and power to the model (Maani, 2013). On the other hand, the quantitative or hard variables are generally measureable, such as income, expense and loan amount. In a CLD, the variables are interconnected through the cause-effect relationships that are represented as directional links (arrows) (see Figure 4.1).

Each link connects two variables and shows the relationship between them in terms of polarity signs (positive / '+' or negative / '-'). The positive (+ or S for Same) shows that the change in variable A leads to change in the variable B in same direction, while the negative (- or O for Opposite) shows a change in an opposite direction in the variable B because of the change in variable A. For example, in Figure 4.1 below the link between 'Bank Balance' and 'Interest Earned' indicates movement (or change) in the same direction. On the other hand, in Figure 4.2 an increase in 'Cash Balance' reduces the 'Cash Gap'; hence it is a change in opposite direction. Richardson (1997) indicates that CLD uses one symbol for two ideas. According to him an arrow can symbolize a causal influence (that is an information link or a policy) and secondly an arrow can stand for an increase to or decrease from an accumulation (for example a physical process).

The CLD is organized in one or more feedback loops and each loop indicates a specific dynamic (pattern) which offers deeper insights into the behaviour of a system (Maani, 2013). Each feedback loop indicates either a reinforcing or a balancing process. The reinforcing feedback loop (R) represents the mechanism of growth and fall down as it compounds change in one direction with even more changes in the same direction (see Figure 4.1). In contrast, the balancing feedback loop (B) moderates change in one direction by producing

change towards an objective or target (Sterman, 2000; Sherwood, 2002), hence the alternate name of a “goal seeking”. This feedback loop is concerning with stability and reaching targets (see Figure 4.2).

Every feedback loop shows closed, continuous loop without any beginning and end. However, several causal loop diagrams also comprise of components outside the closed loops which are linked to them. For instance, in Figure 4.1 ‘Interest Rate’ and in Figure 4.2 ‘Desired Cash Balance’, both are connected with the feedback loops. These components are called dangles. Sherwood (2002) classifies these dangles into two categories such as input dangles and output dangles. According to him, an input dangle serves as goal or target to be accomplished; or specific parameter that determines particular external value; or driver of the system. On the other hand, output dangles indicates the overall results of the system operations.

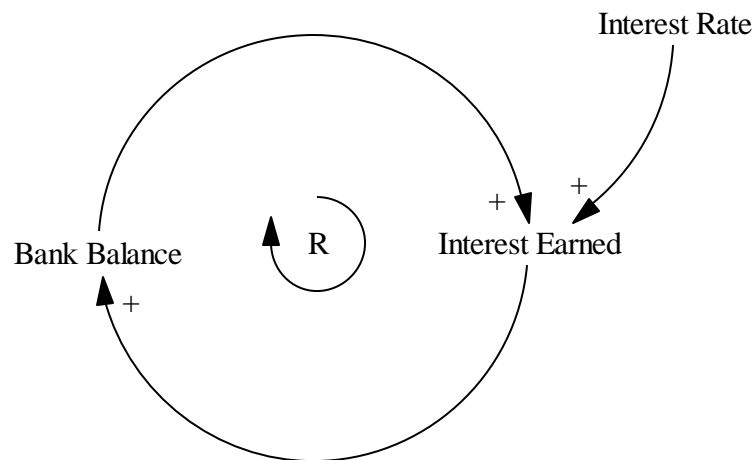


Figure 4.1: Reinforcing feedback loop

To illustrate a reinforcing feedback loop (R), Figure 4.1 specifies that ‘Bank Balance’ increase the amount of ‘Interest Earned’ which leads to a growth in the ‘Bank Balance’. This feedback loop represents that the structure reinforces itself and the bank balance produces an exponential growth (or decline in other loops) towards the earned amount.

On the other hand, Figure 4.2 indicates that the increase in the ‘Cash Balance’ reduces the ‘Cash Gap’. Based on the ‘Desired Cash Balance’ the ‘Cash

Gap' is assessed. This assessment causes to control 'Borrow Funds' and increase in the 'Cash Gap' leads to increase in 'Borrow Fund'. Consequently, due to the increase in 'Borrow Funds', the 'Cash Balance' also increases which reduces the 'Cash Gap'. Hence, the overall goal of this balancing loop is to maintain the cash balance.

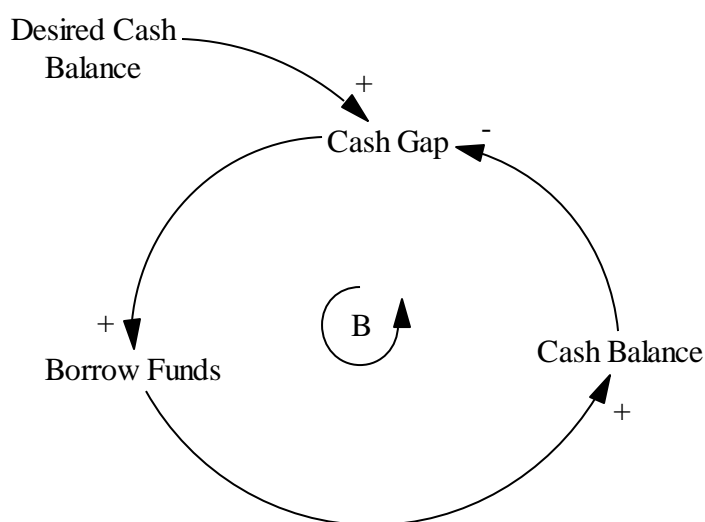


Figure 4.2: Balancing feedback loop

The CLD creates an advantage for managers and other participants, as they can understand and manage the relationships and the overall systems better. Systems become implicit and visible with the help of CLD, rather than being assumed and invisible (Wolstenholme, 1990; Vennix, 1996; Sterman, 2000; Maani and Maharaj, 2004; Quatro, Waldman and Galvin, 2007; Elias, 2008). Consequently, many scholars, policy makers, managers and planners of diverse fields have applied systems thinking to understanding complexity and change (Winch, 1993; Jackson, 2003; Andrew and Petkov, 2003; Maani and Cavana, 2007).

The available literature on banking field highlights that risk management is a complicated system in banks and contains various interacting components and engages different stakeholders having diverse management objectives (Santomero, 1995; Schroeck, 2002; Stan-Maduka, 2010). Considering this fact, this study adopts systems thinking as a methodological approach to identify, understand and draw a chain of causality between risk management policies in practice of banks and

different types of risks in Pakistan. Consequently, this research has used a qualitative system dynamic method and drawn a CLD to document the behaviour of risk management systems of Pakistani banks in order to:

- understand the actual workings of the risk management system of banks (how the outcomes of this system are made in the circular shape of the cause and effect relationships)
- document the interrelationships between the variables of the risk management system of banks in Pakistan
- apply this knowledge for enhanced decisions making (how one can achieve better results by making important changes in the system)

In addition, the use of the qualitative system dynamic approach has facilitated in gaining a deeper and more specific understanding of the risk management practices of banks in Pakistan which is followed up by applying quantitative research techniques in the later phases of this study.

The utility of a CLD depends upon its ability to capture the system behaviours in a similar manner as it does in real world and interprets this understanding in the shape of a power graph (Campbell and Avison, 2004). For this purpose, Burns and Musa (2001) state that some CLDs are better than others and may not completely be validated but possess a superior degree of authenticity. They further explain that the purpose of building a CLD is an important factor in the validation of a particular diagram. In case of a qualitative model building approach (CLD only), not very much detail is required to capture and communicate the dynamics to others, however, in case of a quantitative approach, an extensive detail is required that will allow model builders to convert the CLD into stock and flow diagram (Wolstenholme, 1990; Sterman, 2000; Burns and Musa, 2001).

It is important to mention it again that the use of systems approaches in this study is limited to the development of a qualitative system dynamic model to appreciate the dynamic cycles of influence and does not need extensive detail to capture and communicate the dynamics to others. However, Burns and Musa (2001) assume that the modeler often indicates cause and effect relationships that are

intuitive to due to some common reasons such as: (i) intermediate quantities appear to be missing; (ii) there may be cause insufficiency; (iii) the effect could be created by additional causes not considered by the modeler; (iv) still, other instances of cause-effect reversal may surface. Therefore, in order to present an improved CLD, the modeler often goes for affirmation as well as constructive advice regarding their constructions in a non-threatening way.

By keeping the above points in view, firstly this study has developed a preliminary CLD (see Figure 4.3) based on the initial understanding gained from the literature of cause and effect relationship between the various variables in the risk management systems of Pakistani banks. Afterwards, an interview schedule has been developed for the validation and the refinement of the preliminary CLD and is discussed in the next section.

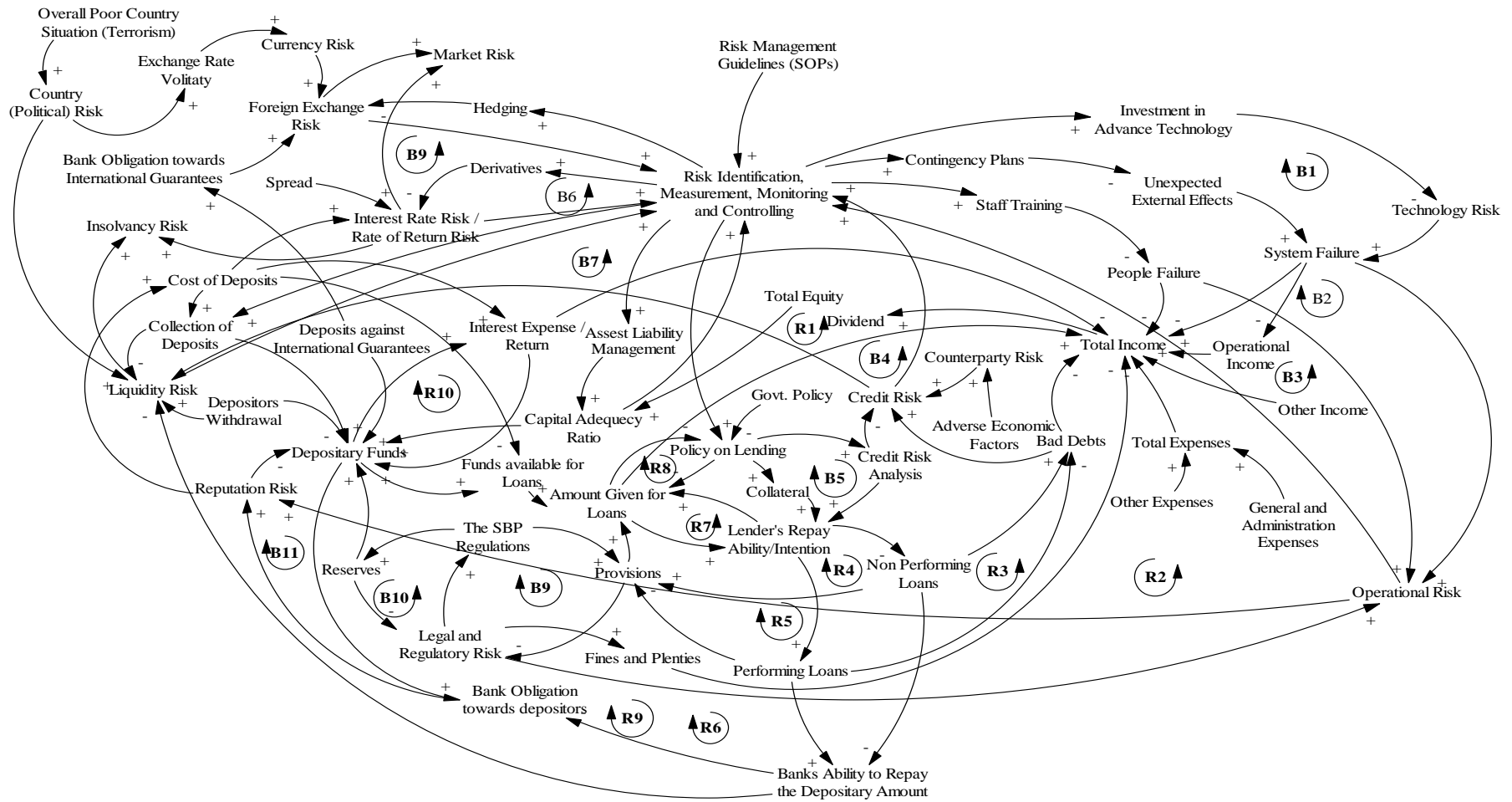


Figure 4.3: Preliminary causal loop diagram of the risk management system of Pakistani banks based upon the literature

4.3 Interviews Data Collection

As discussed in section 3.8.1, this research conducted face to face semi-structured interviews to refine, validate and add more detail in the preliminary CLD. The researcher's target was to acquire responses from the banking professionals who had an in-depth knowledge about the whole philosophy of risk management in banks. Consequently, all the interviewees were at responsible positions (belonged to top and middle management). By keeping in view their seniority role, the researcher developed a very precise list for interview questions. For this purpose, this study developed an interview schedule (Appendix Four) that used a combination of both closed ended as well as open ended questions. The close ended questions were designed to record the responses by using five points Likert scale to rank the choices. The interview schedule was comprised of eight close ended question and two open ended questions. A brief detail of the interview questions is provided in the Table 4.1.

Table 4.1: List of interview questions

Sr. #	Question Description	Type of Question	Question's purpose
1	Based on the CLD presentation, please assess the clarity of the diagram	Close-Ended	To assess the degree of acknowledgment of the respondents on the clarity of the diagram (Clarity refers to the extent to which the diagram clearly communicates the implied theme)
2	Based on the CLD presentation, please assess the logical structure of the diagram	Close-Ended	To assess the degree of acknowledgment of the respondents on the logical structure of the diagram (Logical structure refers to the extent to which relationship of different variables within the diagram are consistent with the system)

Continued on next page

Sr. #	Question Description	Type of Question	Question's purpose
3	Based on the CLD presentation, please assess the practical relevance of the diagram	Close-Ended	To assess the degree of acknowledgment of the respondents on the practical relevance of the diagram (Practical relevance refers to the extent to which the diagram is successful or be effective in the real circumstances)
4	Based on the CLD presentation, please assess the comprehensiveness of the diagram	Close-Ended	To assess the degree of acknowledgment of the respondents on the comprehensiveness of the diagram (Comprehensiveness refers to the extent to which the diagram is covering all the important causal factors of the system).
5	Based on the CLD presentation, please assess the intelligibility of the diagram	Close-Ended	To assess the degree of acknowledgment of the respondents on the intelligibility of the diagram (Intelligibility refers to the extent to which the diagram has the ability to make complex system intelligible to the common reader)
6	Based on the CLD presentation, please assess the applicability of the diagram	Close-Ended	To assess the degree of acknowledgment of the respondents on the applicability of the diagram (Applicability refers to the extent to which the diagram is applicable in banks according to the real world situation)
7	Please indicate diagram's point of weakness	Open-Ended	to identify the weaken points of the diagram

Continued on next page

Sr. #	Question Description	Type of Question	Question's purpose
8	Please highlight diagram's point of strength	Open-Ended	To assess the diagram's points of strength
9	Does this diagram meticulously demonstrate the risk management practices of the banks in Pakistan? Please add any further comments	Close-Ended	To assess the degree of agreement of the respondents on the portrayed accuracy of the diagram
10	Does the CLD represent all the cause and effect relationships between the variables in an appropriate manner? Please add any further comments.	Close-Ended	To assess the degree of agreement on the suitability of the diagram.

In addition, all the interview questions were discussed, reviewed and approved by the director of study before undertaking the interviews data collection.

4.3.1 Interview Participants

The researcher sent participation requests (Appendix Four) to twenty potential respondents of the selected banks (see Section 3.7.2) for interviews via e-mails and gave them a brief introduction and purpose of the interview. Rubin and Rubin (2011) indicate that it is very important to select a respondent for an interview who will be voluntarily ready to share information. Fourteen persons responded out of which ten individuals showed their willingness for participation. However, all the respondents appreciated the theme of the research work. After that the researcher sent e-mails to the willing participants for making appointments (date and time for interviews) as per their ease and comfort.

The researcher collected data from two major cities Karachi and Lahore. The main reason to select these two cities for this study is that most of the offices for senior staff members of risk management departments of banks in Pakistan are located in these cities. The interviewer promised all the respondents that the data would be taken for research purposes only and their personal details would not be disclosed to anyone (except their prior permission) to motivate them to speak openly. Most of the interviews lasted between 60 to 70 minutes, except one

interview, which lasted for about 90 minutes. The interviewer gave a 30 minute presentation on the interview objectives and a description of the preliminary CLD to every participant. Even though most of the interviewees were not well familiar with the qualitative system dynamics model however, they were interested in and inspired with the logic of the diagram.

All the interviews were recorded through mp3 audio recording device and only important field notes were documented during the interviews. However, irrelevant discussion and topics were not recorded. In addition, all the interviews were recorded in English and verified by the member of supervisory team. Hence, it did not face any issues of translation. This research used Microsoft Excel, 2010 software package to analyse the interview data. Interview data analysis and results are discussed in following section.

4.4 Interview Data Analysis and Results

As described in the previous section, this study conducted interviews to refine, validate and add more detail in the preliminary CLD. For this purpose, this research work provided a number of important attributes for the validation of preliminary CLD, covering: clarity, logical structure, practical relevance, comprehensiveness, intelligibility, applicability, portrayed accuracy and suitability of casual relationships between the variables (see Table 4.1). Additionally, this research's target was to obtain responses from the banking professionals who had an in-depth knowledge about the whole philosophy of risk management in banks. Table 4.2 gives a brief overview of the ten interviews conducted with the participants of top and middle management of different category of banks. In order to maintain the anonymity of the participants in the current study, the interviewees' identifications, for instance their names and other similar identifiers, have been omitted from the data in throughout the research.

Table 4.2: Demographics characteristics of the interviews participants

Sr. No.	Bank Type	Participant	Participant Experience (Years)		Positions
			Overall	Risk Management	
01	Public Bank	P_A	26	8	Senior Vice President
02		P_B	23	7	Senior Vice President
03	Private Bank	P_C	18	7.5	Vice President
04		P_D	21	8	Senior Vice President
05		P_E	15	5	Vice President
06		P_F	18	6	Vice President
07		P_G	23	5	Senior Vice President
08		P_H	22	6	Senior Vice President
09	Foreign Bank	P_I	19	4	Vice President
10		P_J	22	7	Senior Vice President

Table 4.2 shows the demographic characteristics of all the interviewees. The backgrounds of the participants such as their rich work experiences (between 15 to 26 years in current case) and in-depth knowledge of the risk management department provide an appropriate ground to extract pragmatic and useful information from these interviews. A detail discussion of these interviews is reported in following sections.

4.4.1 Clarity of the Diagram

This study has asked questions to determine the degree of acknowledgment on the clarity of the diagram by using the five point Likert scale. Figure 4.4 shows the summary of responses to what extent the respondents have acknowledged the clarity of the diagram.

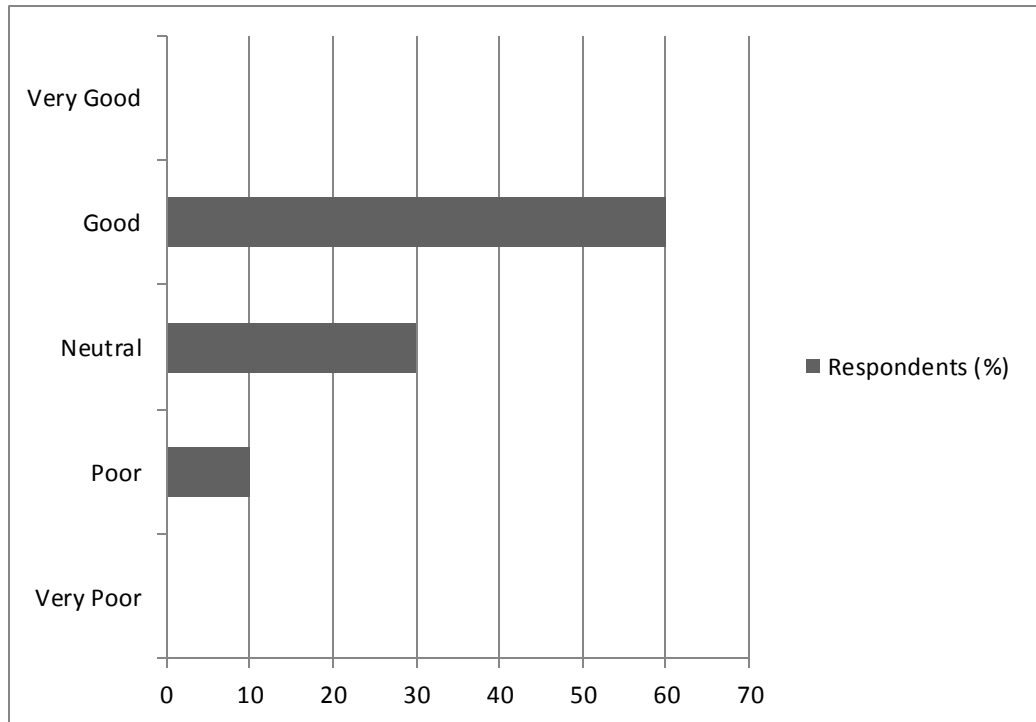


Figure 4.4: Clarity of the diagram

Figure 4.4 indicates the responses of the participants to the extent to which the diagram clearly communicates the implied theme. Most of the participants, (60%), have responded that the clarity of the CLD is good. However, thirty percent of the participants have given neutral responses in this regard. The remaining ten percent have thought that the clarity of the diagram is poor.

4.4.2 Logical Structure of the Diagram

A question to judge the degree of acknowledgment of the respondents on the logical structure of the diagram has been asked. A brief summary of all responses based upon the five point Likert scale, to what extent the respondents have supported the logical structure of the diagram, is reported in Figure 4.5.

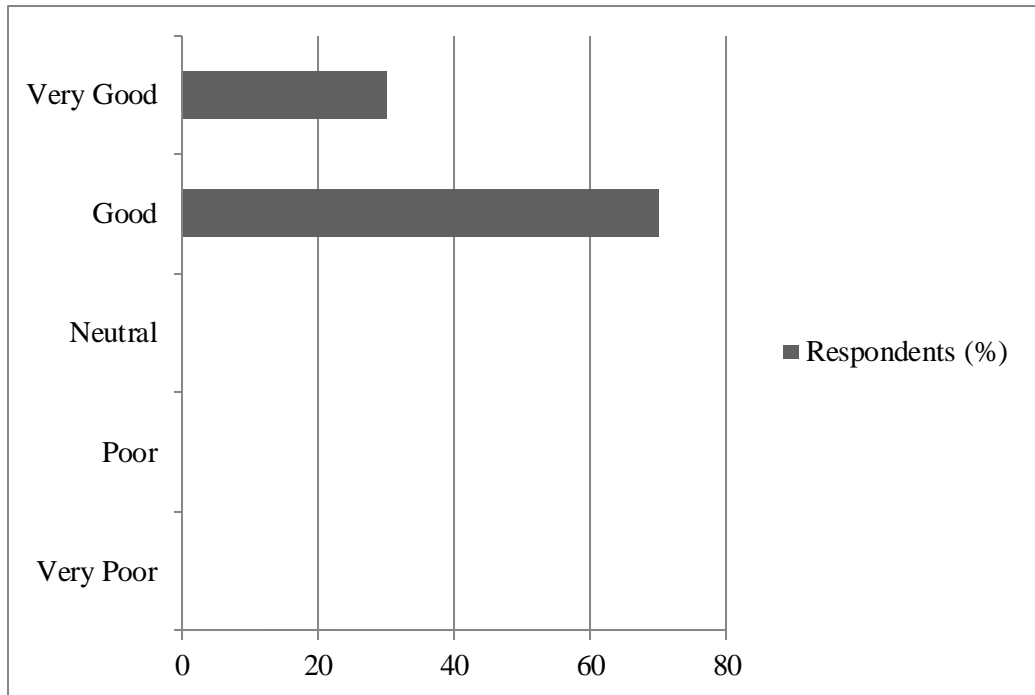


Figure 4.5: Logical structure of the diagram

The feedbacks of the interview participants considering the extent to which relationship of different variables within the diagram are consistent with the system are shown in Figure 4.5. All the respondents have accepted the logic of the CLD. Thirty percent of the respondents have strongly supported its logical structure and the remaining seventy percent have found that connection of various variables within the diagram is good.

4.2.3 Practical Relevance of the Diagram

In order to assess the practical relevance of the diagram, the degree of acceptance in terms of five point Likert scale has been obtained. A short review of these responses is presented in Figure 4.6.

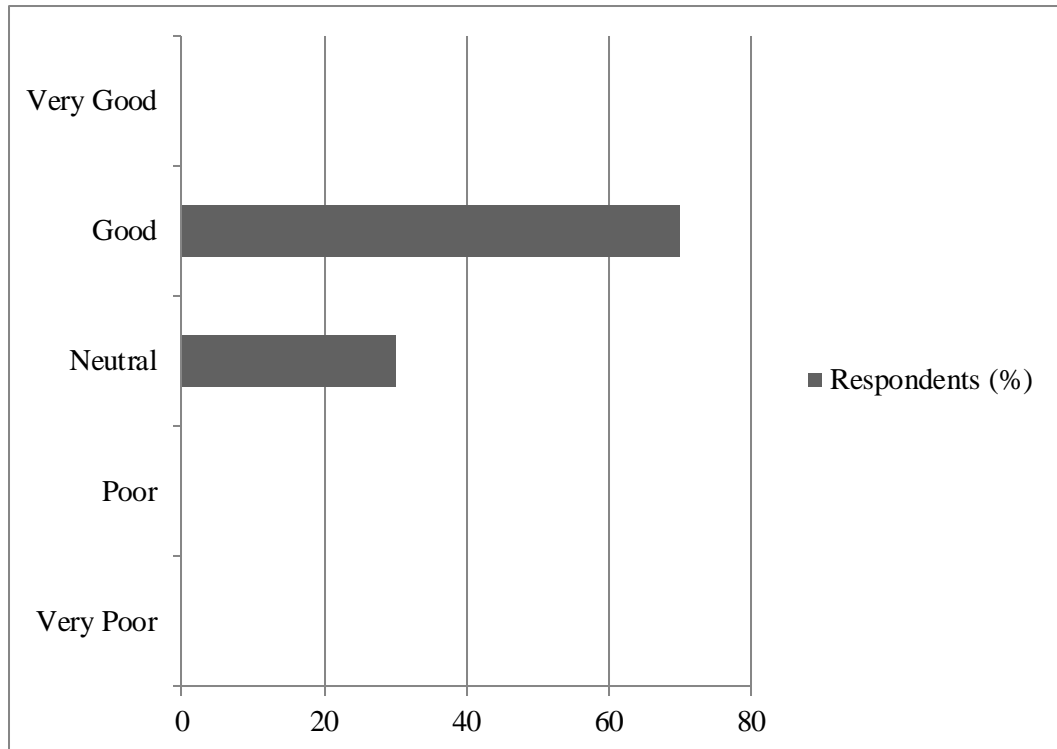


Figure 4.6: Practical relevance of the diagram

Figure 4.6 describes the views of the interviewees concerning the extent to which the diagram is successful or be effective in the real circumstances. Majority of the participants are agreed with the theme. Seventy percent of the respondents have acknowledged that the current diagram is practically relevant to the risk management system of banks in Pakistan and the remaining thirty percent have given a neutral response.

4.2.4 Comprehensiveness of the Diagram

The comprehensiveness of the CLD has been validated by taking responses to what extent the respondents believed that the diagram is covering all the important causal factors of the system. Figure 4.7 provides a summary of all the answers regarding comprehensiveness of the diagram.

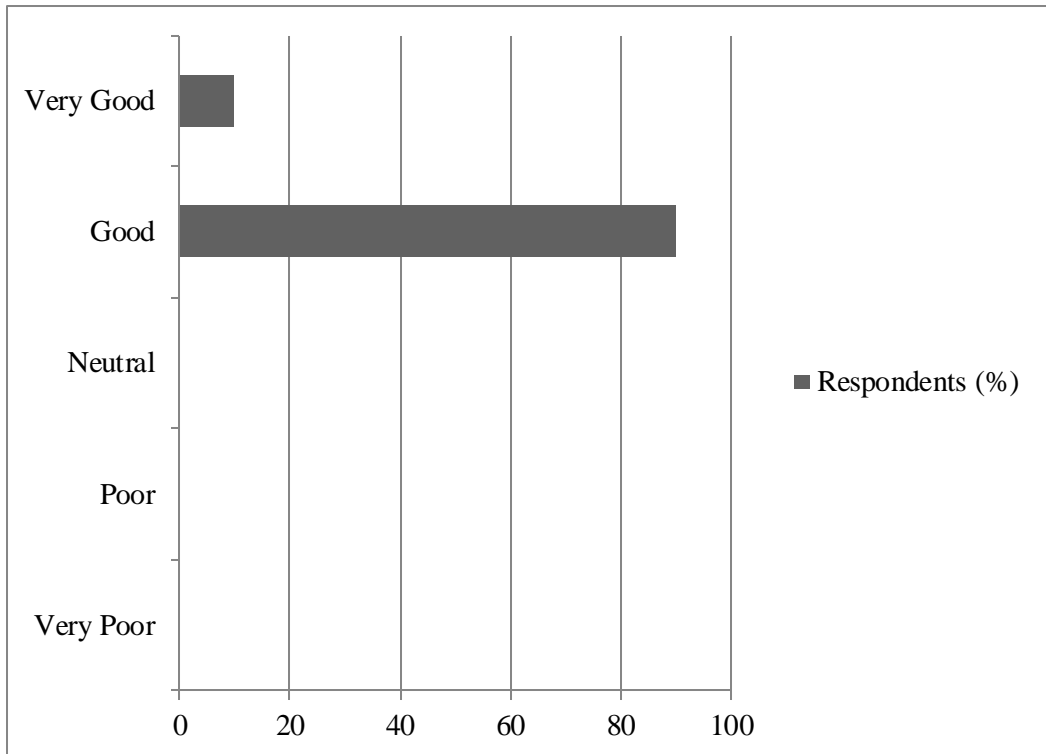


Figure 4.7: Comprehensiveness of the diagram

The responses of the interviewees relating to the extent to which the diagram is covering the important causal factors of the system are presented in Figure 4.7. All respondents have marked that a broad coverage has been given in order to document the risk management system of banks in Pakistan. Ten percent of the respondents have ranked the diagram at the highest possible response (very good) and ninety percent have recognized that the current diagram is good in terms of comprehensiveness.

4.2.5 Intelligibility of the Diagram

The intelligibility of the diagram has been evaluated by asking a close-ended question from the participants of interview using the five point Likert scale. Figure 4.8 presents the summary of responses to what extent the respondents have supported the intelligibility of the diagram.

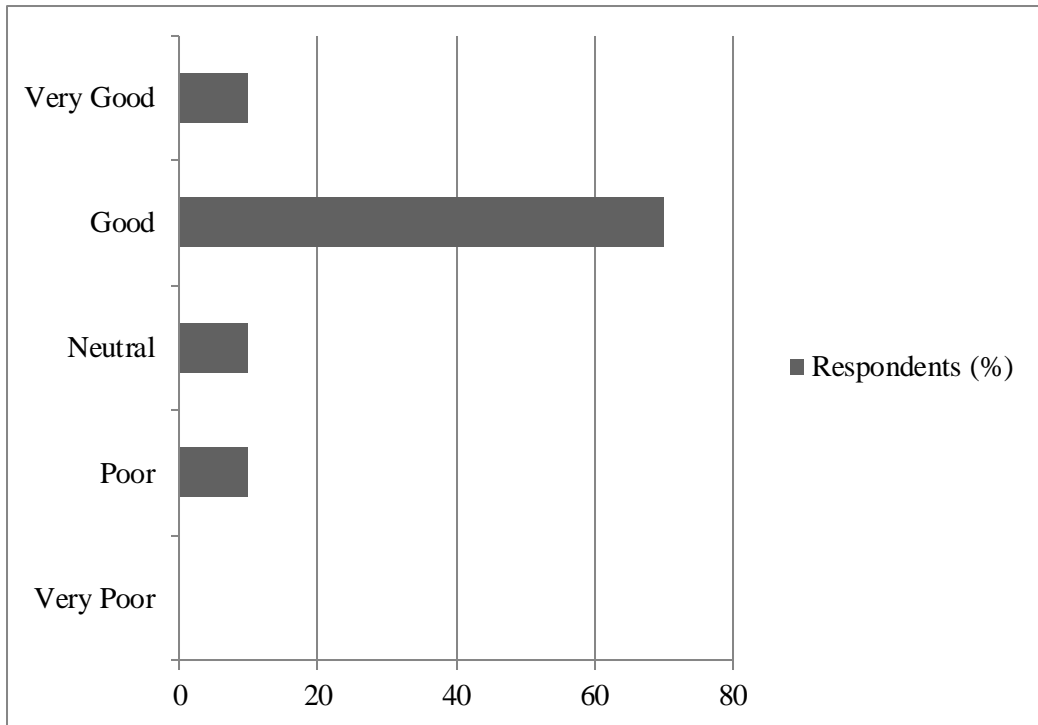


Figure 4.8: Intelligibility of the diagram

Figure 4.8 exhibits the answers of the respondents regarding the extent to which the diagram has the ability to make complex system intelligible to the common reader. Most of the responses (70 %) have pointed out that the intelligibility of the preliminary CLD is good. However, the remaining thirty percent participants have reported mixed answers.

4.2.6 Applicability of the Diagram

The degree of acknowledgment in terms of five point Likert scale has been taken from the interview participants to assess the applicability of the diagram. A summary of feedbacks to what extent the respondents have acknowledged the applicability of the diagram is reported in Figure 4.9.

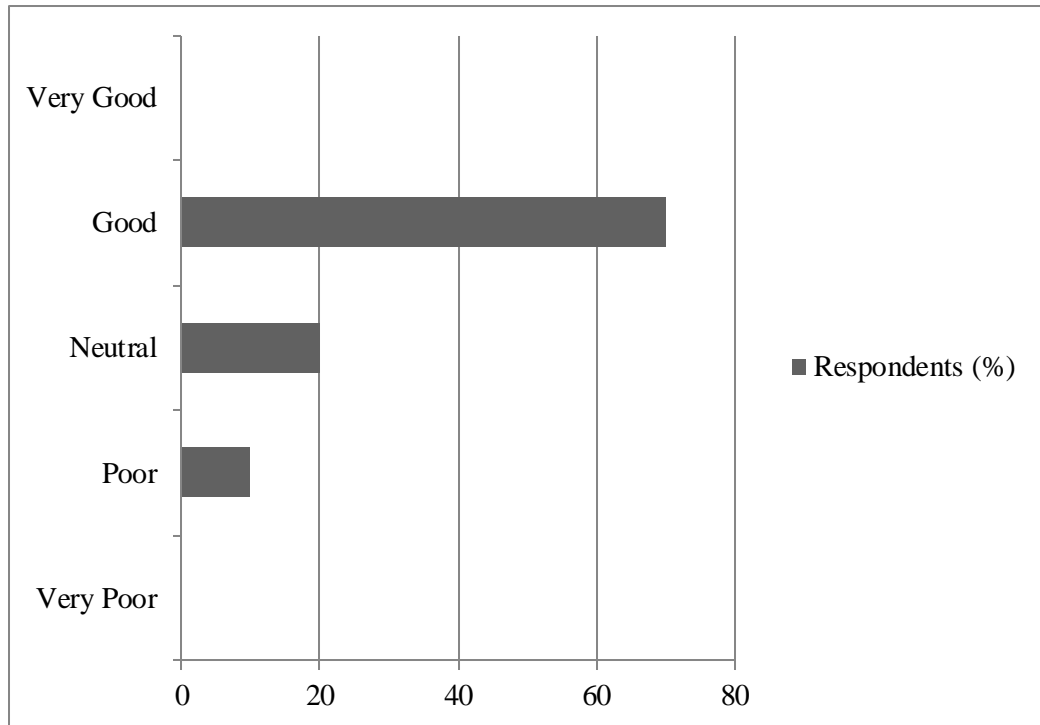


Figure 4.9: Applicability of the diagram

All the responses regarding to the extent to which the diagram is applicable in banks according to the real world situation are described in Figure 4.9. According to the results, majority of participants (70%) have believed that the applicability of the diagram is good. However, twenty percent have given neutral responses in this regard and the remaining ten percent have thought that the usefulness of the diagram is poor.

4.2.7 Diagram's Points of Weakness

The interview participants have been asked to identify weak points of the CLD. They have highlighted few unimpressive points of the diagram.

The participant P_B has pointed out, *“It looks very complex diagram and comprises of a lot of interactions. In my opinion, every person who will try to read this diagram may face some difficulties at first glance. Therefore, the complexity in presentation can be considering weakness of this diagram.”*

Similarly, the participant P_H has indicated, *“This diagram is very complicated to understand at first glance. No definitions of nodes and edges are given below the diagram.”*

The participant P_J has highlighted, *“While trying more elaborative some unnecessary information’s seems to be provided. For example the total Income is break down in operation income and other income like presented in financial statements profits. It makes diagram complicated to understand.”*

However, the following common points have been revealed as the weakest points about the diagram during the course of data analysis.

Complex Presentation: Most of the respondents have highlighted the fact that this diagram is very complicated to understand at first glance. As discussed earlier, Burns and Musa, (2001) have also pointed out that the causal diagram was generally presented without definition of what the causal connections mean and consequently some complications regarding the understanding the diagram might arise among respondents. Moreover the participants have suggested that it is better to present the whole diagram in several sub-diagrams.

Unnecessary Information: Several respondents have replied during the course of the interview that some unnecessary information has also been provided in the diagram. Therefore, it has been decided that attention should be given to the border headings rather than breaking down into sub headings.

4.2.8 Diagram’s Point of Strength

In addition to previous question, another open ended question has been asked to assess the diagram’s points of strength. Participants have pointed out several encouraging points of the diagram.

The participant P_A has commented, *“The diagram is well versed and depicts nearly all major; globally accepted risks that the bank incurs starting from deposit of customer funds to income generation utilizing the various financing lines. Further, the diagram also manages to present the flow and transfer of risk at each level”.*

The participant P_D has stated, *“Diagram is quiet comprehensive covering all possible risks and their causes and effects.”*

The participant P_E has highlighted, *“Researcher has used very simple terminology which is understandable internationally rather using cliché/Jargons which make diagram familiar to risk management people.”*

The participant P_I indicated, *“Researcher has not only attempt historically risk management techniques, but also incorporated all latest development in Pakistan regarding same.”*

During the course of interview data analysis, following common valuable points have been identified.

Comprehensive Diagram: The majority of the respondents have appreciated the comprehensiveness of the preliminary CLD. They have identified that the model is quite comprehensive and covering most of the possible risks.

Latest Research: All the interview participants have acknowledged that this research work has, not only used established risk management techniques, but also has incorporated all the latest developments in Pakistan covering the SBP regulations.

Simple Terminology: Several respondents have also admitted that the developer of the diagram has used a very simple terminology which is understandable in general banking practices.

4.2.9 Portrayed Accuracy of the Diagram

This study has obtained responses on the five point Likert scale from the interview participants to assess the portrayed accuracy of the diagram. Figure 4.10 reports a brief summary of responses to what extent the respondents have backed the portrayed accuracy of the diagram.

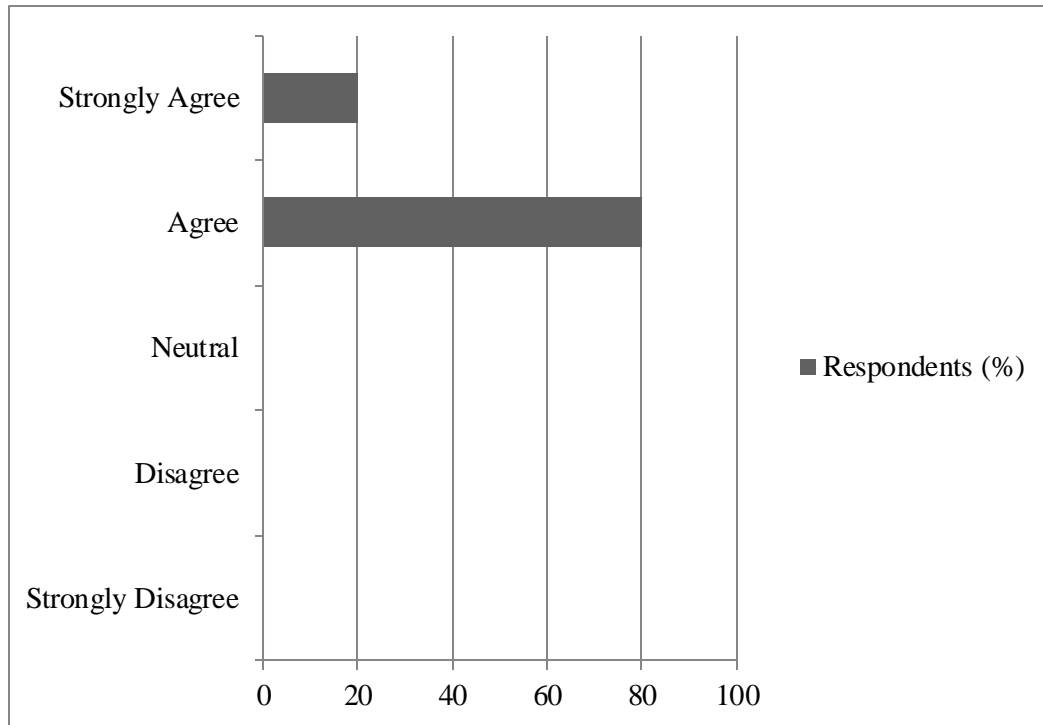


Figure 4.10: Portrayed accuracy of the diagram

Figure 4.10 shows the responses of the interview participants considering the extent to which the diagram is meticulously representing the risk management practices of the banks in Pakistan. All the participants have accepted its portrayed accuracy and endorsed that the diagram has covered important risk management policies in practices of the banks in Pakistan in order to manage the main potential risks. Twenty percent of respondents have highly supported the portrayed accuracy of the diagram and remaining eighty percent have given modest feedback about the portrayed accuracy.

This study has also obtained additional comments from the participants regarding the portrayed accuracy of the diagram. Most of the respondents have suggested some minor but important modifications, for instance inclusion of some important variables and conversely exclusion of several unnecessary variables.

The participant P_J has recommended, *“The researcher has included some unnecessary information like other income, income tax, administrative expenses and etc. In my opinion, variables having broader scope for instance total income and total expense are needed to be included owing to the nature of this research.”*

This study has acknowledged all the valuable suggestions and a further refinement has been made in the diagram and the revised CLD is demonstrated in subsequently section 4.5.

4.2.10 Suitability of Casual Relationships between the Variables

A question to determine the degree of agreement of the respondents on the suitability of casual relationships between the variables of the diagram has been asked by using the five point Likert scale. A brief summary of responses to what extent the respondents have acknowledged the suitability of the casual relationships between the variables of the risk management system of banks in Pakistan is shown in Figure 4.11.

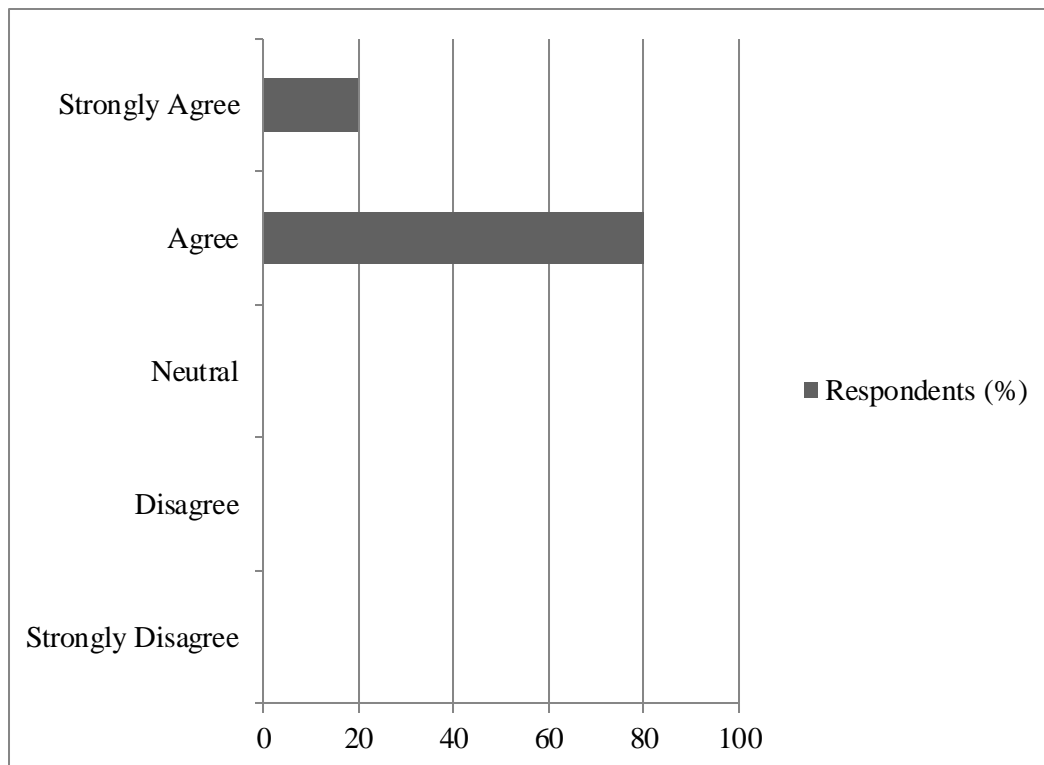


Figure 4.11: Suitability of casual relationships between the variables

According to Figure 4.11, all the participants have agreed that the majority of relationships between the variables of the diagram have been reported correctly considering the local banking environment. However, some important discrepancies have been highlighted, for example few relationships were identified with wrong priorities and some important casual relationships were also missing.

Hence, further modifications have been made in the diagram to capture the system behaviours based upon these valuable recommendations of the interview participants. The next section describes the final version of this diagram.

4.5 Final Casual Loop Diagram of the Risk Management System of Pakistani Banks

As a result of valuable feedbacks and suggestions of the interview participants discussed in the above section, this study has made further refinement in the preliminary CLD in order to produce a revealing and full picture of the reality. The Vensim software package has been used to build all the CLDs demonstrated in this chapter. The final and revised version of qualitative system dynamics model of the risk management system of Pakistani banks in terms of sub-system CLDs as well as a generic CLD, is presented below.

4.5.1 Managing Operational Risk

Figure 4.12 demonstrates the sub-system CLD regarding managing operational risk. The current sub-system CLD for operational risk displays five balancing loops (B1, B2, B3, B4 and B5) along with one reinforce feedback loop (R1).

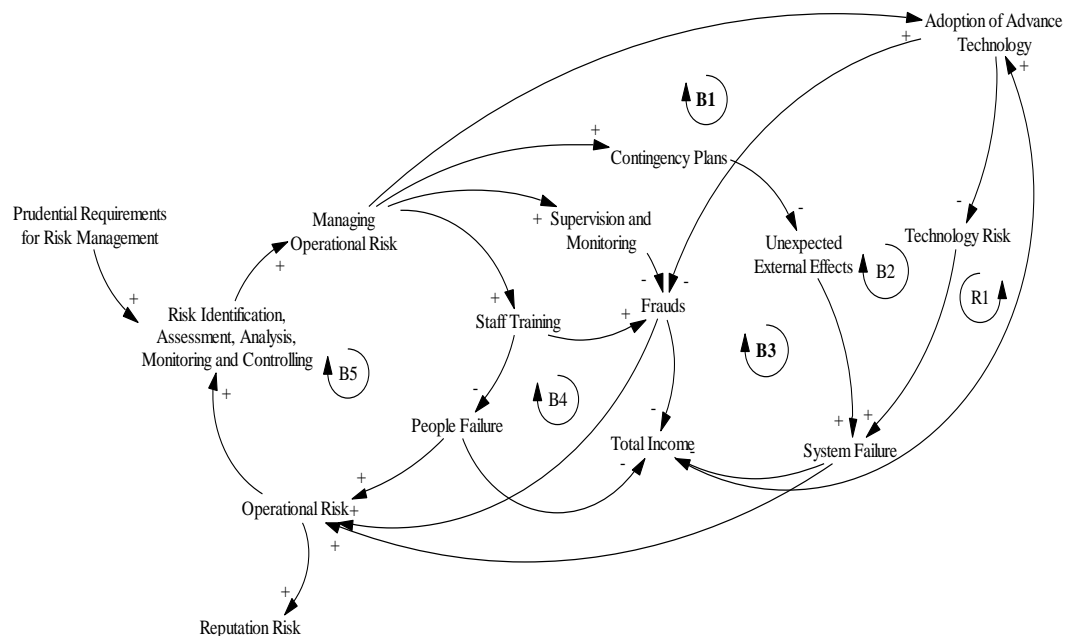


Figure 4.12: Managing Operational Risk

In Figure 4.12, the B1 loop (Comprising: Managing Operational Risk → Adoption of Advanced Technology → Frauds → Operational Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling) shows that the local banks usually make investment in advanced technology projects to minimize the chances of frauds which leads to increase in the operational risk (Fayyaz, 2006). Similarly, the B2 loop (Comprising: Managing Operational Risk → Adoption of Advanced Technology → Technology Risk → System Failure → Operational Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling) loop indicates that the adoption of advanced technology reduces the technology risk which is an increasing source of system failure within the bank (Crouhy, Galai and Mark, 2006). Consequently, the rise in the likelihood of system failure increases the operational risk in banks. Therefore, the risk management division of the bank invest in advanced technology projects in order to manage the operational risk and other associated risks. The management of banks regularly make investments in advanced technology to improve the effectiveness of their IT systems, in order to reduce the possibilities of system failures caused by virus attack, network failure, hacking and poor system integration (Saunders and Cornett, 2008). The banks in Pakistan heavily rely on the adoption of advanced technology, not only to manage its complex business processes but also to handle the critical information and failure of which may result significant disruption into its banking operations or substantially impact the services of banks to its customers (Hussain, 2006).

The B3 loop (Comprising: Managing Operational Risk → Contingency Plans → Unexpected External Events → System Failure → Operational Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling) represents the risk that unexpected external events such as natural disasters (for example floods, earthquakes) and terrorist attacks also increase the probability of system failures and operational risk in banks. Therefore, banks develop different types of contingency plans in order to deal with such events (Fayyaz, 2006). Besides it, Mehtabdin et al. (2013) has conducted economic analysis of the business climate in Pakistan and has indicated that the business environment of Pakistan is very risky in nature and is facing a number of random threats including terrorism. Therefore, the contingency planning is an important tradition of the risk management division

in the Pakistani banks to efficiently resume business operations and to handle the unexpected external events.

The B4 loop (Comprising: Managing Operational Risk → Supervision and Monitoring → Frauds → Operational Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling) reports that the effectiveness of supervision and mentioning decreases frauds in the banks which is an important source of their operational risk (Fayyaz, 2006). The B5 loop (Comprising: Managing Operational Risk → Staff Training → People Failure → Operational Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling) illustrates that the increase in the working capacity of banking staff through staff training reduces the people failure in banks, which is also another potential source of operational risk in banks (Santomero, 1997; Bessis 2002; Tahir, 2006). The risk management divisions in of Pakistani banks usually identify and arrange internal and external training sessions on a regular basis in order to improve the working skills and abilities of their banking staff to minimise the operations losses (Hameed, 2006). The Institute of Bankers (IBP) in Pakistan is the prime recognized institute devoted to supporting the technical training services for bankers in Pakistan (Tahir, 2006).

The R1 loop (Comprising: Total Income → Adoption of Advanced Technology → Technology Risk → System Failure) highlights that the increase in total income facilitate the local banks to spend more in the adoption of advanced technology that decrease their technology risk which may have negative impact on the total earnings of these banks (Hameed, 2006). R1 behaviour indicates that the banks in Pakistan invest more money out of their income in the adoption of advanced technology and vice versa.

Figure 4.12 shows that an increase in operational risk usually requires the expansion of risk management activities (identification, measurement, monitoring and controlling risks) in banks to meet the prudential requirements. This leads to enhancement of more corrective actions for managing operational risk in banks. The sub-system CLD shows that operational risk in the local banks mostly emerges from frauds, systems' and people's failures in Pakistan (Tahir, 2006). Therefore, the local banks take more initiatives in terms of investment in advanced technology,

contingency plans, supervision and staff training to deal with the operational risk (Santomero, 1997; Bessis 2002; Fayyaz, 2006; Hussain, 2006; Tahir, 2006; Saunders and Cornett, 2008).

The above sub-systems (loops) within the CLD also highlights that both system failures as well as people failures also decrease the total income of the banks. On the other hand, the increase in operation risk also leads to an increase in the reputation risk of banks. Therefore, the management of operational risk is very common practice and is not a new exercise, as it has constantly been valuable for banks to strive for preventing frauds, maintaining the stability of internal supervisions and minimising transaction processing errors with the aim of maintaining not only the best quality of financial services for their customers but also avoiding huge losses (Ebnother et al. 2003; Harmantzis, 2003; Saunders and Cornett, 2008).

4.5.2 Managing Credit Risk

The sub-system CLD regarding managing credit risk is presented in Figure 4.13. This CLD is comprised of three balancing feedback loops (B6, B7 and B8) and one reinforce feedback loop (R2).

The B6 loop (Comprising: Managing Credit Risk → Credit Risk Analysis → Credit Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling) shows a goal seeking loop and indicates the conduct of banks in Pakistan in order to minimize the credit risk. The increase in credit risk stimulates the risk management division to take more corrective actions in order to formulate policies and procedures for managing credit risk (Karim, 2006). This leads to increases the effectiveness of credit risk analysis. Credit risk analysis conducted by the banking staff reduces the level of credit risk (Tahir, 2006). These analyses are used to measure the credit quality of the counterparty. Furthermore, in the B7 loop (Comprising: Managing Credit Risk → Credit Risk Analysis → Borrowers Repay Ability/Intention → Performing Loans → Bad Debts → Credit Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling), and the B8 loop (Comprising: Managing Credit Risk → Credit Risk Analysis → Borrowers Repay

Ability/Intention → Non-Performing Loans → Bad Debts → Credit Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling) all the information about the counterparty are reviewed in order to judge the borrowers' ability to repay and intentions in more efficient manners. These practices also helps to judge effectively the borrowers' repay ability and intentions. It involves financial statement analysis, the current economic environment and recent trends in its industry (Fatemi and Fooladi 2006; Fayyaz, 2006; Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2011, and Abu Hussain and Al-Ajmi, 2012; Bilal, Talib and Khan, 2013; Shafique, Hussain and Hassan, 2013). Consequently, the level of performing loans is increased by efficient measurement of borrowers' ability to repay the loan and conversely decreases the level of nonperforming loans in the banks. The credit risk also increases due to the counterpart risk that indicates the contractual counterparty does not meet its obligations as per agreement.

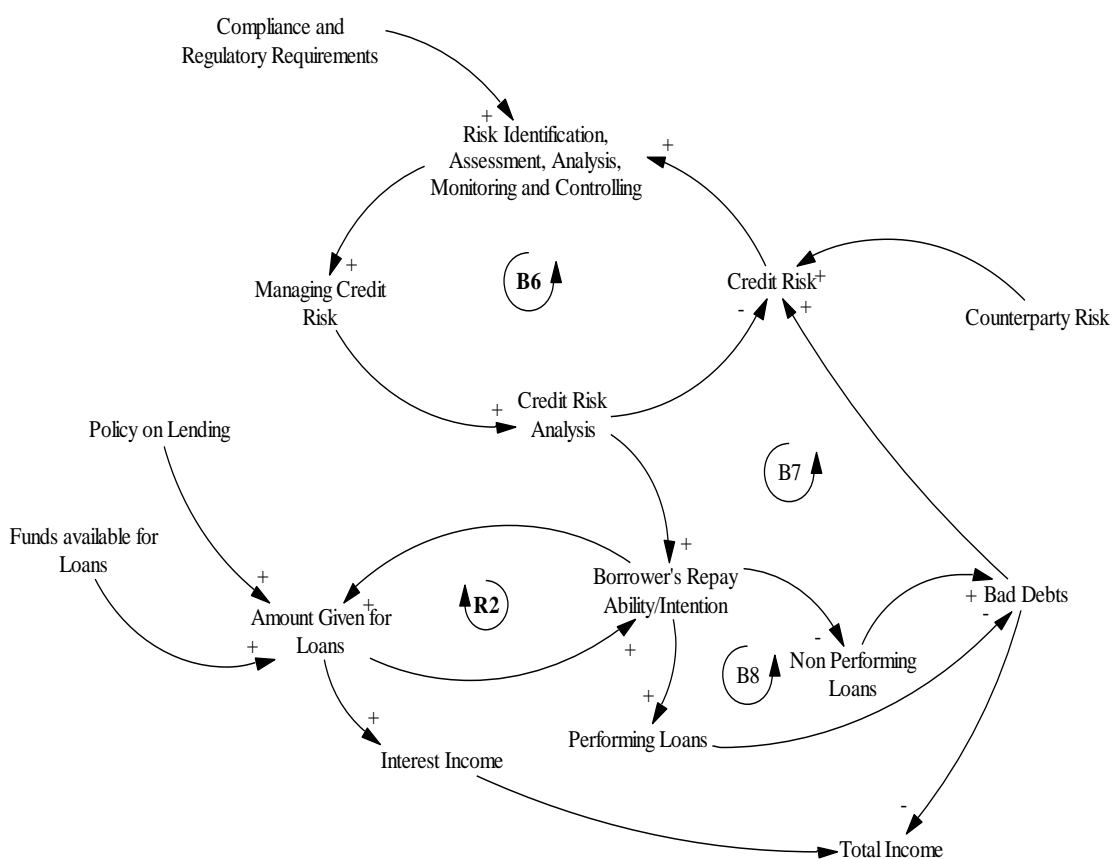


Figure 4.13: Managing Credit Risk

The R2 loop (Comprising: Amount Given for Loans → Borrowers Repay Ability/Intention) indicates that banks offer more loans to their borrowers following an increase in the borrower's repay ability and intentions. It indicates that the structure reinforces itself and the borrower's repay ability or intentions produces an exponential growth or decline towards the amount given for the loan. This loop behaviour shows that banks in Pakistan lend money to their borrowers based upon their sound financial health and credibility (Tahir, 2006). The policy on lending has also a positive impact on the amount given for loan which is often influenced by the government policy in Pakistan. For instance, the Government of Pakistan sometimes directs and encourages the banks in Pakistan to lend a specific portion of money to a definite economic sector such as agriculture, SMEs (small medium enterprises) and energy that sometimes disturb the lending policy of these banks (Hameed, 2006).

Figure 4.13 highlights that banks in Pakistan under the SBP risk management guidelines, managing and coping with the credit risk through effective credit risk analysis that contains scanning and monitoring of the most trustworthy loan applications, the degree of collateral, diversification of the loan portfolio and accurate loan pricing depending upon the borrowers' repay ability and intentions (Dhakan, 2006; Greuning and Bratanovic, 2009). All these exercises have a positive impact on the total income of banks by increasing the ratio of performing loans and reducing the loss of bad debts (Fatemi and Fooladi 2006; Shafique, Hussain and Hassan, 2013).

4.5.3 Managing Liquidity Risk

Figure 4.14 reports another sub-system of the CLD linking with managing liquidity risk. This sub-system CLD has two balancing feedback loops (B9 and B10) and one reinforcing feedback loop (R3).

Both the B9 loop (Comprising: Managing Liquidity Risk → Collection of Deposits → Bank Deposits → Bank Solvency → Reputation Risk → Depositors Withdrawal → Liquidity Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling), and the B10 loop (Comprising: Managing Liquidity

Risk → Collection of Deposits → Bank Deposits → Bank Solvency → Liquidity Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling) loops indicate that an increase in the liquidity risk enhances the need of effective risk management. This action leads to increase in liquidity risk management activities. Consequently, banks collect more deposits that increase the level of deposits, which in turn has a positive impact on the solvency of banks and reduce the liquidity risk as well as reputation risk (Tahir, 2006). The B9 loop further highlights that reputation risk increase the depositors' withdrawals which lead to increase in the liquidity risk of banks (Santomero, 1997). The R2 loop (Comprising: Bank Deposits → Bank Solvency → Reputation Risk → Depositors Withdrawal) shows that deposits increase the solvency of banks (Fayyaz, 2006). As a result, the reputation risk of banks diminishes. However, the reputation risk has a positive impact on the depositors' withdrawals that leads to decreases the level of bank deposits.

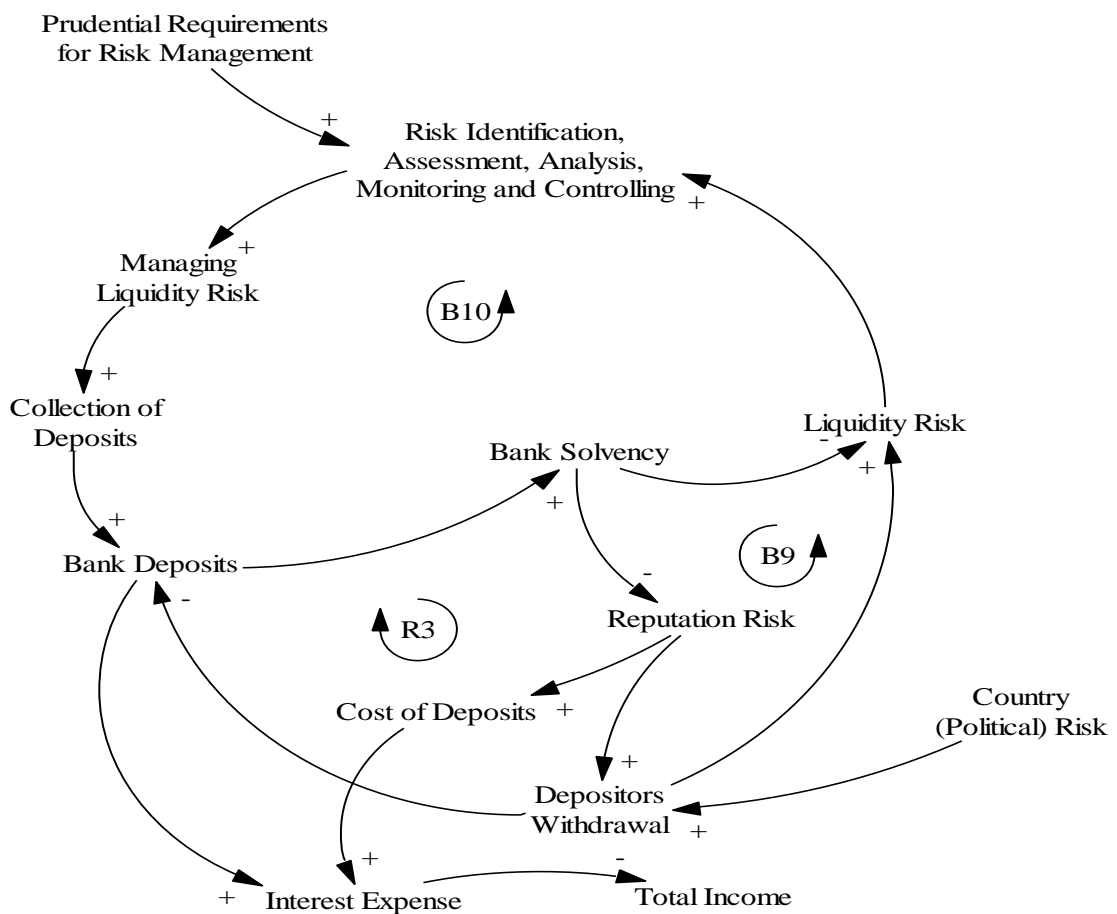


Figure 4.14: Managing liquidity risk

Figure 4.14 describes that banks in Pakistan involve in risk management to comply with the prudential requirements concerning with managing liquidity risk. The liquidity risk rises due to an unexpected raise in withdrawals by depositors, caused by bad reputation. Banks face liquidity risk when they are not able to meet their expected and contingent cash needs and borrow more funds when required at high cost. This collection needed to be obtained at exorbitant cost which decreases profitability of the bank.

4.5.4 Managing Market Risk

Managing market risk is described in terms of a sub-system CLD in Figure 4.15. This diagram displays two balancing feedback loops (B11 and B12).

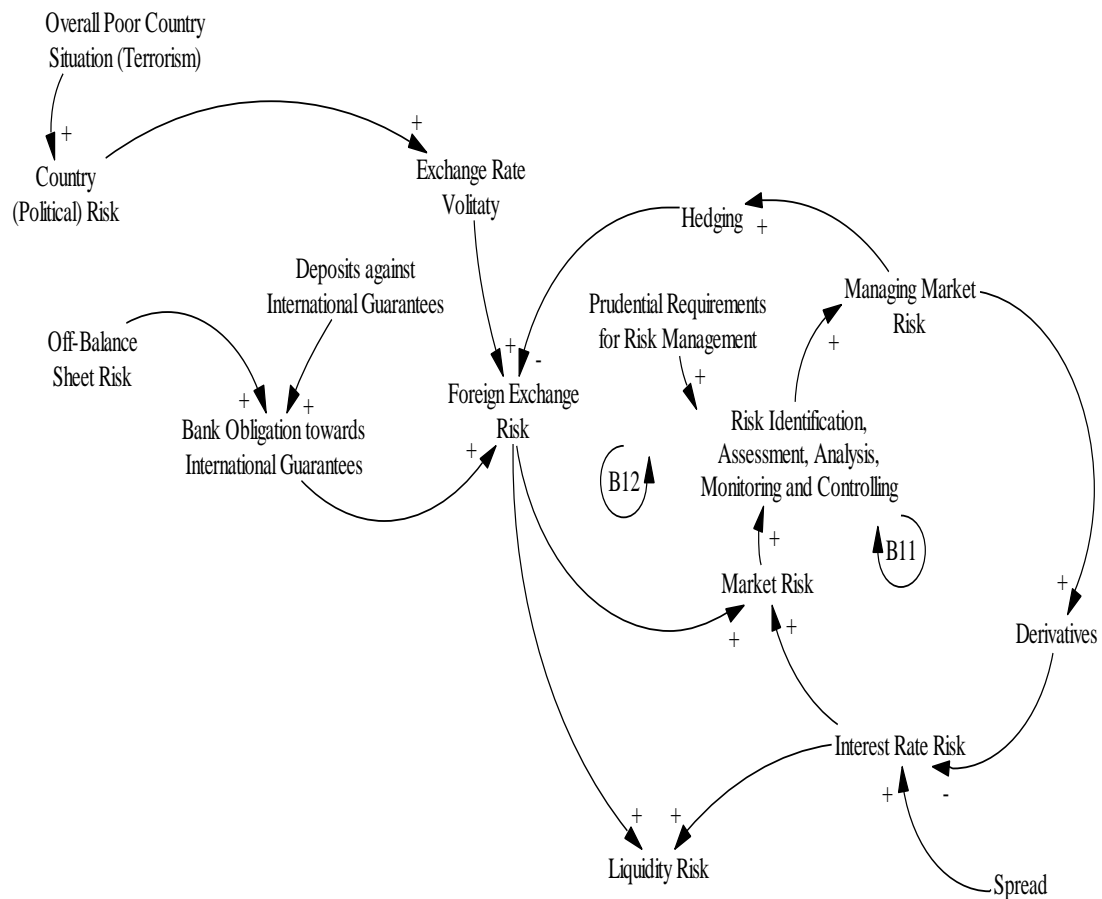


Figure 4.15: Managing market risk

This sub-system of the CLD shows that market risk mostly emerges from interest rate risk and foreign exchange risk in Pakistan (Tahir, 2006). The B11 loop

(Comprising: Managing Market Risk → Derivatives → Interest Rate Risk → Market Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling) as well as the loop B12 (Comprising: Managing Market Risk → Hedging → Foreign Exchange Risk → Market Risk → Risk Identification, Assessment, Analysis, Monitoring and Controlling) indicate that the increase in the interest rate risk and foreign exchange risk enhances the level of market risk in Pakistani banks. Therefore, the increase in the market risk prompts the risk management division of the bank in Pakistan to take initiatives for managing market risk. As a result, it requires expansion in the use of derivatives and hedging which leads to decreasing the interest rate risk and foreign exchange risk in banks.

Figure 4.15 points out that the local banks adopt different procedures to manage the market risk in Pakistan to obey the SBP regulations. Both interest rate risk and foreign exchange risk are the two major sources of market risk in Pakistan. The banks in Pakistan deal in a variety of currencies as assets and liabilities and several factors such as bank obligations towards international guarantees and exchange rate volatility augment their foreign exchange risk. As a result, the local banks use hedging techniques to reduce such risk exposures. Similarly, different derivative techniques such as options, swaps, futures and forward contracts risk have also been utilized to control the interest rate risk. The acceptance of the derivative approach to decrease the interest rate risk of Pakistani banks has been increased since 2004 after the issuance of Financial Derivatives Business Regulations by the State Bank of Pakistan (Ishfaq, 2006).

Figure 4.16 provides a range of potentially joint dependencies of different variables and loops that has captured the overall system behaviour. The final CLD (Figure 4.16) has 12 balancing loops and 3 reinforcing feedback loops. These loops are labelled in sequence, starting with the B1 for the first balancing loop and the R1 for the first reinforcing loop etc. The basic task in establishing the systems approach to modelling the risk management system of banks in Pakistan is to develop a broad level causal loop diagram that contains the main elements.

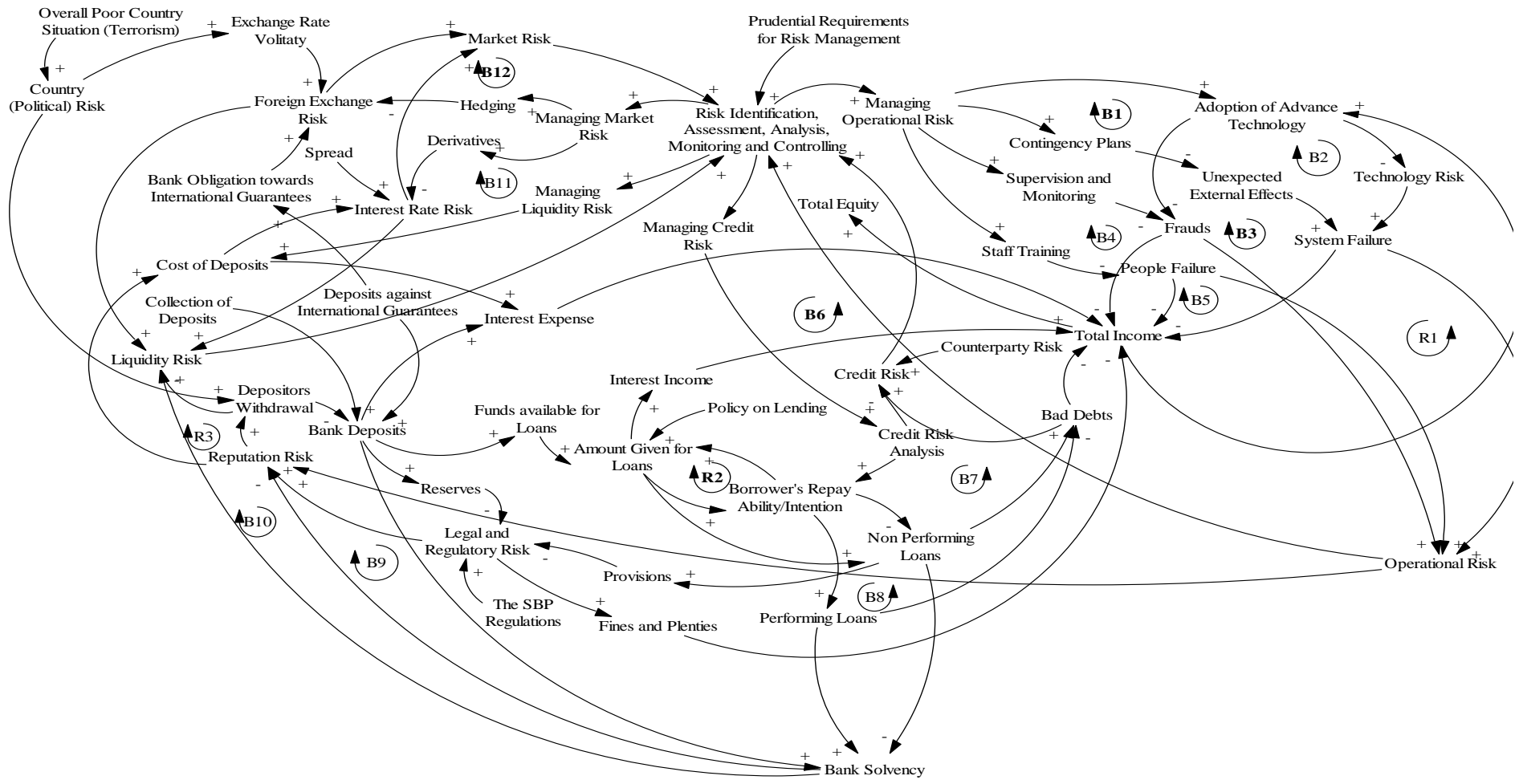


Figure 4.16: Final causal loop diagram of the risk management system of Pakistani banks

The above diagram explains the causality between the important variables of banks risk management system in Pakistan. The generic CLD looks likely that a continuous effort, containing the merging of all the sub system diagrams (Figure 4.12, to Figure 4.15) could support in developing understanding and clarifying the way in which risk management system works or ways in which it can be limited.

Over the last two decades, the SBP has also realized the importance of risk management. This can be evidenced by the shift in the regulatory approach which is more risk based now. To ensure the presence of a minimum level of risk management practices at Pakistani commercial banks, the SBP has issued risk management guidelines. The generic CLD demonstrates that the selected banks have adopted a broad range of policies and procedures for risk identification, assessment, analysis, monitoring and controlling to deal with important types of risks including operational risk, credit risk, liquidity risk and market risk as per these guidelines to avoid different kind of losses and to improve the profitability of local banks. The implementation of such risk management practices in local banks under the directions of the SBP support the homogeneity assumption of institutional theory (DiMaggio and Powell, 1983; Collier and Woods, 2011; Hudin and Hamid, 2014). In addition, an important output dangle this diagram ‘total income’ highlights that all the risk management activities are ultimately linked to the total income of banks which lead to increase in their total equity. This indication supports the certain assertion of financial economic approach that the risk management in banks is also observed as value enhancing strategy to improve value creation of shareholders (Santomero 1995; Smithson, Smith and Wilford, 1995; Oldfield and Santomero, 1997).

4.5.5 Identification of Key Variables

The generic CLD has supported this study in order to obtain an in-depth understanding of the risk management system of banks in Pakistan and to identify important aspects of risk management such as risk identification, measurement and analysis of risk, risk monitoring and controlling, managing operational risk, managing credit risk, managing liquidity risk and managing market risk. Furthermore, this research work has developed hypotheses in order to provide

empirical evidences based upon the knowledge gained from the above diagram as well as literature review, and these hypotheses have been tested through quantitative data analysis techniques. The subsequent Chapters Five and Six present comprehensive details of these analyses.

4.6 Summary

The current chapter has adopted a systems thinking approach and has developed a qualitative system dynamics model (CLD) of the risk management system of Pakistani banks. In doing so, this study initially has drawn a preliminary CLD based upon the detailed literature review already presented in Chapter Two. In addition, ten face to face semi-structured interviews have been conducted covering the important attributes for the validation of preliminary CLD such as: clarity, logical structure, practical relevance, comprehensiveness, intelligibility, applicability, portrayed accuracy and suitability of casual relationships between the variables. Based upon a detailed interviews data analysis, some important modifications have been made to the preliminary CLD and a final diagram has been developed. This final diagram has asserted that the risk management divisions of Pakistani banks identify, measure, monitor and control different important types of risks including operational risk, credit risk, liquidity risk and market risk in order to meet the regulatory requirements which have also a positive impact on the total income of banks. The causal relationships documented in this chapter as well as the literature review have supported this study to develop hypotheses which have been presented and tested in the subsequent Chapters Five and Six.

Chapter Five Different Aspects of Risk Management in Pakistani Banks

5.1 Introduction

The study has documented and described a detailed explanation of the risk management system of banks in Pakistan in the previous chapter. For this purpose, a qualitative system dynamics model (Figure 4.16) demonstrates that the banks in Pakistan adopt a wide range of policies and techniques to deal with different kinds of risks to meet the regularity requirements. However, the SBP risk management guidelines provide a broad outline of all the important actions and do not intend to describe a full plan of actions for every control procedure that might be adopted by banking institutions in Pakistan.

Lopez (2003) indicates that it is an essential element in risk management to decide the tolerance and extent of risk. For this purpose, the personnel who prepare and use the risk management information and methodologies must have sufficient understanding of what they mean, their potential impact on the business, and when and how to escalate issues and bring concerns to the attention of senior management and the board (Tahir, 2006). Therefore, it is important for these banks to commit sufficient resources for gathering information and developing methodologies needed to identify, monitor and control risks, and for taking appropriate action on timely basis in order to manage these risks effectively (Fayyaz, 2006; Hassan, 2011; Abu Hussain and Al-Ajmi, 2012). Considering the above fact, this study has also collected primary data through questionnaire to assess the different aspects of risk management of banks in Pakistan such as risk understanding, risk identification,

measurement and analysis of risk, risk monitoring and controlling, managing credit risk, managing market risk, managing liquidity risk and managing operational risk.

The current chapter intends to analyse the questionnaire data in order to examine the different aspects of risk management of banks in Pakistan. Section 5.2 describes a brief detail of the research instrument. Descriptive statistics analysis is reported in Section 5.3. Whereas, Section 5.4 presents a brief description of hypotheses development and the results of inferential statistics analysis to test these hypotheses in order to examine different aspects of risk management. A detailed discussion of results is reported in Section 5.5. Finally, Section 5.6 concludes the whole chapter with a summary.

5.2 Research Instrument

The study has adopted the survey method using questionnaires to collect data from the managers of banks in Pakistan. As discussed in Section 3.8.2.1, items included in the questionnaire have been adopted from the current available literature (Al-Tanimi, 2002; Al-Tanimi and Al-Mazrooei, 2007; Abu Hussain and Al-Ajmi, 2012). For measuring variables of the current research study, namely risk understanding, risk identification, measurement and analysis of risk, risk monitoring and controlling, managing credit risk, managing market risk, managing liquidity risk, managing operational risk and risk management practices, operationalisation has been done and presented in Table 3.7 in Chapter Three. As described in Section 3.8.2.1, the questionnaire comprises of three sections and a detailed analysis of each section is reported below. This study has used Statistical Package for Social Sciences (SPSS 20.0) to perform descriptive statistics, correlation and regression analyses.

Section I

5.3 Descriptive Statistics Analysis

The current section presents descriptive statistical analysis of the questionnaire data. This analysis covers various demographical characteristics of the respondents such as gender, age and work experience. Reference to the Section 3.7.2, this study has applied the stratified random sampling technique and the stratification has been performed according to the bank category in respect of different strata such as public, private and foreign banks. This research has selected 20 banks covering a specific proportional about 60 % of total banks from each banking category.

From each selected bank, 15 managers of different divisions have been randomly chosen to obtain their responses. It is worth mentioning (as explained earlier in Section 3.7.2), that risk management is not the sole responsibility of the staff of risk management department in banks, but everyone who works for the bank is responsible for it (State Bank of Pakistan, 2003; KPMG International, 2009). Therefore, the researcher has collected data from the managers of diverse departments such as treasury, operations, risk management, investment banking, foreign exchange, audit, compliance and controls in order to take more border view of the phenomena. Hence, total 300 managers have been approached to obtain primary data regarding risk management practices of banks. A self-collection and delivery questionnaire method has been used and 263 questionnaires have been finalised for further analysis which represents a good response rate of 88 % (see Section 3.8.2.5). Table 5.1 reports different demographical characteristics of the respondents such as their gender, age and work experience.

Table 5.1: Demographical characteristics of questionnaire respondents

Demographics	Respondents	Percentage	Cumulative Percentage
Gender			
Male	212	80.6	80.6
Female	51	19.4	100
Age (Years)			
29 and below	43	16.3	16.3
30-34	50	19.0	35.4
35-39	74	28.1	63.5
40-44	44	16.7	80.2
45-49	29	11.0	91.3
50 and Above	23	8.7	100
Work Experience (Years)			
04 and below	38	14.4	14.4
05-09	70	26.7	41.1
10-14	65	24.7	65.8
15-19	45	17.1	82.9
20-24	29	11.1	94.0
25-29	08	3.0	97.0
30 and Above	08	3.0	100

Table 5.1 describes a brief summary of different demographical characteristics such as gender, age and work experience of the participants. The majority of respondents are male. The age range of the participants lies between 26 years to 55 years. Most of the respondents are between 35 to 39 years old and this

group accounts for 28.1 percent of respondents. The work experience of the respondents ranges between 3 years to 33 years. The majority of the participants have a work experience between 5 to 9 years and the current group has 70 respondents with a share of 26.7 percent in the total data.

Section II

5.3.1 Descriptive Analysis for Study Variables

As described in Section 3.8.2.6.1, this chapter has used two measures of descriptive analysis such as means and standard deviation (SD). The study makes a broad argument on the basis of higher mean value and smaller value of SD. The current study implies the different variables to investigate risk management practices in local contexts as risk understanding (focusing on staff), risk identification, risk assessment and analysis, risk monitoring and controlling, managing credit risk, managing market risk, managing liquidity risk and managing operational risk (focusing on overall bank). These analyses are aimed at answering specific research questions focusing on the evaluation of the level of risk understanding, identification, assessment, analysis, monitoring and controlling of different risks (See Section 1.4). The descriptive analysis results of these variables are discussed in subsequent sections.

5.3.1.1 Risk Understanding

The study has incorporated four items to measure the risk understanding. A brief summary of mean and SD of responses is reported in Table 5.2.

Table 5.2: Participants' responses on risk understanding

Risk Understanding			
No	Items	Mean	SD
1	There is a common understanding of risk management across the bank	4.18	.717
2	There is a proper system for understanding various risks implemented in the bank	4.08	.750
3	Responsibility for risk management is clearly set out and understood throughout the bank	3.89	.839
4	Accountability for risk management is clearly set out and understood throughout the bank	3.84	.916
Overall scale values		4.00	.611
<i>N</i> = 263			

The mean responses of all items range between 3.84 and 4.18, with an overall average of 4.00 in Table 5.2. Item one has the highest mean (4.18), in which the participants have been viewed to assess a common understanding of risk management across their bank. It is evident that the managerial staffs of Pakistani banks have a common understanding of risk management. It may provide an important indication regarding the ability and effectiveness of the selected bank to manage their potential risk exposures in future. Item four has the lowest mean (3.84), in which respondents' understanding about the accountability for risk management throughout their banks has been judged. This indicates that the understanding regarding the accountability for risk management in selected banks is relatively diminishing as compared to understanding.

However, the average mean score of all four items have exceeded the midpoint that is 3 on the five-point Likert scale and reports that the staffs of selected Pakistani banks have a good risk understanding in general. The results for risk understanding are qualitatively compatible to those reported in existing literature (Al-Tamimi, 2002; Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2011; and Abu Hussain and Al-Ajmi, 2012). Eventually, the average response of the above four items about risk understanding has facilitated the researcher to answer the second research question investigating the level of risk understanding among the staff of selected banks in Pakistan.

5.3.1.2 Risk Identification

In order to measure the risk identification, six questions have been asked. Table 5.3 shows the summary of responses results in terms of mean and standard deviation (SD).

Table 5.3: Participants' responses on risk identification

Risk Identification			
No	Items	Mean	SD
1	The bank carries out a compressive and systematic identification of its risks relating to each of its declared aims and objectives	4.17	.628
2	The bank finds it difficult to prioritize its main risks	3.96	.687
3	Changes in risks are recognized and identified with the bank's roles and responsibilities	4.15	.686
4	The bank is aware of the strengths and weaknesses of the risk management systems of other banks	4.14	.744
5	The bank has developed and applied procedures for the systematic identification of opportunities	4.05	.691
6	It is crucial for bank to apply the most sophisticated techniques for risk identification	3.99	.741
Overall scale values		4.07	.444
N = 263			

All the values reported in Table 5.3 indicate that there is a very little variance between responses given by bank managers. The overall mean of all responses is 4.07. However, the average response of each item shows different values and varies between 3.96 and 4.17. The first item of the risk identification has the highest mean (4.17), in which the participants have been asked to give their feedback if the banks have successfully identified their potential risks in response to their declared aim and objectives. The high mean reveals that the selected banks have adopted a compressive and systematic risk identification mechanism. Conversely, the second item has the lowest mean (3.96), which indicates that the selected banks face difficulties to prioritize their key risks in Pakistan.

Moreover, the average mean score of all six items is greater than the midpoint and indicates that the staffs of selected Pakistani banks are good in risk identification. This result supports the findings of risk understanding section 5.3.1 that the higher risk understanding improves the risk identification in Pakistani banks. Furthermore, these results for risk identification are quite similar to those

reported by Al-Tamimi and Al-Mazrooei (2007), Hassan (2011), Abu Hussain and Al-Ajmi (2012), Hassan (2011) and Nazir, Daniel and Nawaz (2012)

In addition, this study has taken responses by using the ordinal scale (Yes or No) to obtain information about the different techniques used by the local banks for risk identification. Based upon these feedbacks (chosen by more than 90 per cent of the respondents), some important techniques are currently used by the Pakistani banks for risk identification have been presented in Figure 5.1.

5.3.1.3 Risk Assessment and Analysis

This study questionnaire has included eleven questions about the risk assessment and analysis. Table 5.4 shows the results of means and SD of the responses to these questions.

Table 5.4: Participants' responses on risk assessment and analysis

Risk Assessment and Analysis			
No	Items	Mean	SD
1	This bank assesses the likelihood of occurring risks	3.92	.862
2	This bank's risks are assessed by using quantitative analysis methods	3.95	.716
3	This bank's risks are assessed by using qualitative analysis methods(e.g. high, moderate, low)	3.94	.856
4	The bank analyses and evaluates opportunities it has to achieve objectives	4.17	.673
5	The bank's response to analysed risks includes an assessment of the costs and benefits of addressing risks	4.05	.705
6	The bank's response to analysed risks includes prioritizing of risks and selecting those that need active management	4.06	.789
7	The bank's response to analysed risks includes prioritizing risk treatments where there are resource constraints on risk treatment implementation	3.94	.801
8	The bank undertakes a credit worthiness analysis before granting credit or executing transactions	4.15	.766
9	Before granting capital or credit, my bank undertakes specific analysis including the applicant's character, capacity, collateral and conditions	4.15	.766
10	The bank has a computer based support system to estimate the earnings and risk management variability	4.00	.798
11	The bank relies on the output of quantitative data with human judgment	3.96	1.217
Overall scale values		4.03	.440
<i>N</i> = 263			

The mean responses of all items range between 3.92 and 4.17, with an overall average of 4.03 in Table 5.4. Item four has the highest mean (4.17), which indicates that the Pakistani banks analyse and evaluate opportunities in order to achieve their objectives. On the other hand, the first item has the lowest mean (3.92), which shows that the selected Pakistani banks assess the possibility of occurring risks is relatively diminishing as compared to overall assessment and analysis of risk in selected Pakistani Banks.

The midpoint on the five-point Likert scale in this study is also less than the average mean score of eleven items and highlights that the selected Pakistani banks are generally good in risk assessment and analysis. These results for risk assessment and analysis are consistent with certain pertinent studies (Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; Abu Hussain and Al-Ajmi, 2012). Eventually, the average response of the above eleven items about the risk assessment and analysis has facilitated the researcher to answer the third research question, investigating the level of risk assessment and analysis among the selected banks in Pakistan.

This study has also obtained information about the different methods adopted by selected Pakistani banks for the risk assessment and analysis by using ordinal scale (Yes or No). Figure 5.1 presents some common methods in practiced by the selected banks for risk assessment and analysis.

5.3.1.4 Risk Monitoring and Controlling

This research has used nine questions to measure the risk monitoring and controlling. The mean and SD results of all these responses are presented in Table 5.5.

Table 5.5: Participants' responses on risk monitoring and controlling

Risk Monitoring and Controlling			
No	Items	Mean	SD
1	Monitoring the effectiveness of risk management is an integral part of routine management reporting	4.03	.807
2	The level of control by the bank is appropriate for the risks that it faces	4.05	.718
3	The bank has adopted a standard reporting system about the risk management form bottom to top management	4.16	.746
4	Reporting and communication processes within the bank support the effective management of risk	4.17	.665
5	The bank's response to risk includes an evaluation of the effectiveness of the existing controls and risk management responses	3.70	.940
6	The bank's response to risk includes action plans in implementation decisions about identified risk	3.77	.906
7	The bank effectively monitors the credit limit of everyone counterparty	3.94	.801
8	The bank reviews the country ratings on regular basis for its international financing and investment	3.99	.796
9	The borrower's business performance is regularly observed by the bank following the extension of financing	3.95	.724
Overall scale values		3.97	.473
<i>N</i> = 263			

All the values reported in Table 5.5 indicate that the respondents have quite similar responses. The mean response of each item shows values between 3.70 and 4.17, with an overall average value 3.97 of all the five items. The fourth item of the risk monitoring and controlling has the highest mean (4.17), in which the participants have been asked to give their feedback if the effective management of risk is supported by the reporting and communication processes within their bank. The high mean reveals that the reporting and communication processes help to improve the effective risk management of selected banks.

The average mean score of all nine items is 3.97, which is more than the midpoint on the five-point Likert scale and reports that the selected Pakistani banks are good in risk monitoring and controlling. These results for risk monitoring and controlling are quite similar to those reported by Al-Tamimi and Al-Mazrooei (2007), Hassan (2011) and Abu Hussain and Al-Ajmi (2012). The third research question (investigating the level of risk monitoring and controlling among selected Pakistani banks) has been addressed based upon the overall mean score of the nine items regarding risk monitoring and controlling.

Additionally, the questionnaire respondents have been requested to highlight key methods and techniques for the risk monitoring and controlling in the Pakistani banks by using ordinal scale (Yes or No). Based upon these feedbacks, this study has revealed some important methods and techniques utilised for the risk monitoring and controlling in the local banks and are presented in Figure 5.1.

5.3.1.5 Managing Credit Risk

Five questions have been included in the study questionnaire in respect of the managing credit risk. Table 5.6 summarises the results of these responses in terms mean and SD.

Table 5.6: Participants' responses on managing credit risk

Managing Credit Risk			
No	Items	Mean	SD
1	The credit risk strategy set by the Board of Directors are effectively transformed and communicated within the bank in the shape of policies and procedures by the top management	4.22	.733
2	The bank has an effective risk management framework (infrastructure, process and policies) in place for managing credit risk	3.89	.839
3	The bank has a credit risk rating framework across all type of credit activities	3.84	.916
4	The bank monitors quality of the credit portfolio on day-to-day basis and takes remedial measures as and when any deterioration occurs	4.08	.750
5	The bank regularly prepares periodic report of credit risk	4.18	.717
Overall scale values		4.04	.560
<i>N</i> = 263			

Table 5.6 shows that the overall mean of all the questions is 4.04 and the mean value of each item varies from 3.84 to 4.22. The first item has the highest mean (4.22), which indicates that the credit risk strategy is effectively transformed and communicated within the selected Pakistani banks by the top management. On the other hand, the third item shows the lowest average score 3.84 and specifies that the banks in Pakistan have a credit risk rating framework across all types of credit activities. However, the average mean score (4.04) of all items is more than the midpoint and highlights that the selected Pakistani banks are generally good in credit risk management.

5.3.1.6 Managing Market Risk

This study questionnaire has comprised of five items in order to assess the managing market risk. The following Table 5.7 shows the mean and SD results of all the responses in this regard.

Table 5.7: Participants' responses on managing market risk

Managing Market Risk			
No	Items	Mean	SD
1	The market risk strategy set by the Board of Directors are effectively transformed and communicated within the bank in the shape of policies and procedures by the top management	3.80	1.016
2	The bank has an effective risk management framework (infrastructure, process and policies) in place for managing market risk	3.79	.961
3	The bank's overall market risk exposure is maintained at prudent levels and consistent with the available capital	4.03	.738
4	The bank adopts multiple risk measurement methodologies to capture market risk in various business activities	3.73	1.003
5	The bank regularly prepares periodic report of market risk	3.78	.931
Overall scale values		3.82	.694
<i>N</i> = 263			

There is no big difference between responses taken from the bank managers in Table 5.7. The mean response of individual item is between 3.73 and 4.03, with an overall average of 3.82. The third item of the managing market risk shows the highest average value (4.03) and reveals that the overall market risk exposure of Pakistani banks are maintained at prudent levels and consistent with their available capital. Whereas, the fourth item keeps the lowest mean value 3.70 which indicates the adoption of multiple risk measurement methodologies to capture market risk in various business activities within the selected Pakistani banks. Moreover, the average mean score (3.82) of all five items is more than the midpoint and reports that selected Pakistani banks are good in managing market risk.

5.3.1.7 Managing Liquidity Risk

This study questionnaire has contained five questions to capture the managing liquidity risk. A brief summary of the mean and SD results of all the responses in provided in Table 5.8.

Table 5.8: Participants' responses on managing liquidity risk

Managing Liquidity Risk			
No	Items	Mean	SD
1	There is a proper set of rules and guidelines, for managing liquidity risk, available in the bank	3.84	.841
2	The liquidity risk strategy set by the Board of Directors are effectively transformed and communicated within the bank in the shape of policies and procedures by the top management	4.00	.794
3	The bank has an effective risk management framework (infrastructure, process and policies) in place for managing liquidity risk	3.91	.730
4	The bank regularly prepares periodic report of liquidity risk	4.02	.693
5	Applications of liquidity risk management techniques reduce costs or expected losses	3.83	.757
Overall scale values		3.92	.532
<i>N</i> = 263			

According to Table 5.8, the overall mean of all responses is 3.92. However, the average response of each item shows different values and varies between 3.83 and 4.02. The fourth item indicates the highest mean score (4.02). While, the fifth item has the lowest mean value (3.83) within the group of managing liquidity risk and intends to take responses on the effectiveness of liquidity risk management in Pakistani banks. Whereas, the average mean (3.92) highlights a greater value than midpoint and indicates that the selected Pakistani banks are good in liquidity risk management.

5.3.1.8 Managing Operational Risk

This study has obtained responses of five questions from the selected respondents to evaluate the managing operational risk. The mean and SD results of all these responses are presented in Table 5.9.

Table 5.9: Participants' responses on managing operational risk

Managing Operational Risk			
No	Items	Mean	SD
1	There is a proper set of rules and guidelines, for managing operational risk, available in the bank	4.06	.718
2	Board and executive management of the bank recognizes, understands and has defined all categories of operational risk applicable to their institution	4.10	.742
3	Senior management of the bank transforms the strategic direction given by the board through operational risk management policy	3.78	.903
4	The bank has contingency and business continuity plans to ensure its ability to operate as going concern and minimize losses in the event of severe business disruption	3.70	.947
5	The bank regularly prepares periodic report of operational risk	3.81	.902
Overall scale values		3.89	.621
<i>N</i> = 263			

The mean responses of all items range between 3.70 and 4.10, with an overall average of 3.89 in Table 5.9. The second item has the highest mean (4.10) and specifies that board and executive management of the Pakistani banks recognize, understand and has defined all categories of operational risk applicable to their institutions. On the other hand, the fourth item has the lowest mean (3.70) and assesses the availability of contingency and business continuity plans to ensure Pakistani banks abilities to operate as going concerns and minimize losses in the event of severe business disruptions. The average mean score of all nine items is (3.89) and also is more than the midpoint. This result reveals that the selected Pakistani banks are good in managing operational risk.

5.3.1.9 Risk Management Practices

This study has included ten items in the questionnaire to compute the risk management practices. Table 5.10 provides a summary of mean and SD of the responses.

Table 5.10: Participants' responses on risk management practices

Risk Management Practices			
No	Items	Mean	SD
1	The bank's executive management regularly reviews the organization's performance in managing its business risks	4.34	.686
2	The bank has highly effective continuous review/feedback on risk management strategies and performance	4.31	.699
3	The bank's risk management procedures and processes are documented and provide guidance to staff about managing risks	4.32	.680
4	The bank's policy encourages training programs in the area risk management	3.95	.828
5	This bank emphasizes the recruitment of highly qualified people in risk management	3.80	.766
6	Efficient risk management is one of the bank's objectives	4.04	.746
7	It is too dangerous to concentrate bank's funds in one specific sector of the economy	3.84	.810
8	The application of Basel capital Accord has improved the risk management effectiveness in the bank	4.00	.680
9	The bank's capital is adequate if the ratio of capital to total risk-weighted assets is equal to the capital adequacy ratio set by the State Bank of Pakistan	4.23	.662
10	Overall, the level of risk management practices of the bank is considered to be excellent	3.89	.816
Overall scale values		4.07	.404
<i>N</i> = 263			

All the values shown in Table 5.10 indicate that there is a very little variance between feedbacks received from the respondents. The mean response of each item shows values between 3.84 and 4.34, with an overall average value 4.07 of all the five items. The first item of the risk management practices displays the highest mean 4.34 and reports that the executive management of Pakistani banks regularly reviews their organizations' performance in managing their business risks. Based on the mean value score (3.84), the seventh item is at the lowest side in the group of risk management practices.

Section III

5.3.2 Different Types of Risks and Methods for Risk Management

As described in Section 3.8.2.1, the third part of the questionnaire has been intended to obtain information regarding the recognition as well as ranking important types of risks are faced by the banks in Pakistan, different methods and techniques adopted by these banks for the risk identification, the risk assessment and analysis, the risk monitoring and controlling and the risk reporting. For this purpose, this study has taken responses by using ordinal scale (Yes or No) to identify the potential risks and different approaches and techniques used for the management of these risks. A brief description of all the results based upon these feedbacks is reported in Table 5.11, Table 5.12 and Figure 5.1.

Table 5.11: Different types of risks in Pakistan

No	Risk Type	Degree of Acceptance (Yes or No) in percentage			
		Public Banks	Private Banks	Foreign Banks	Overall
01	Counterparty Risk	90.91	96.38	89.47	94.30
02	Country (political) Risk	93.18	90.58	89.47	90.49
03	Credit Risk	100.00	100.00	100.00	100.00
04	Equity/Commodity Price Risk	45.45	73.91	92.11	67.68
05	Foreign-Exchange Risk	97.73	98.55	94.74	97.34
06	Interest Rate Risk	90.91	95.65	89.47	93.92
07	Legal and Regulatory Risk	90.91	99.28	97.37	97.34
08	Liquidity Risk	95.45	98.55	97.37	97.72
09	Market Risk	97.73	98.55	100.00	96.96
10	Off-balance Sheet Risk	95.45	95.65	100.00	95.06
11	Operational Risk	100.00	98.55	100.00	98.86
12	Reputation Risk	56.82	95.65	94.74	88.59
13	Solvency Risk	0.00	3.62	5.26	3.42
14	Strategic Risk	52.27	57.97	52.63	56.27
15	Technology Risk	90.91	94.20	84.21	92.02

Table 5.11 indicates fifteen different kinds of risks in local banks which have been recognised during the course of analysis. These results are consistent with the findings of pertinent studies in Pakistani context (Shafiq and Nasr, 2010; Khalid and Amjad, 2012; Nazir, Daniel and Nawaz, 2012; Shafique, Hussain and Hassan, 2013) and have identified similar types of risks in Pakistani Banks.

Table 5.12: The top five most important risks

No	Risk Type	Frequency	Percentage
01	Credit Risk	258	98.10
02	Operational Risk	241	91.63
03	Foreign Exchange Risk	233	88.59
04	Legal and Regulatory Risk	219	83.27
05	Liquidity Risk	214	81.37

The above table 5.12 shows the five most important types of risks in Pakistan banking institutions. The overall weak economic and market situations for instance political uncertainty, long hours load-shedding and other such factors have enhanced the level of all these risks in Pakistani banks (Khalid and Amjad, 2012; Shafique, Hussain and Hassan, 2013).

Figure 5.1 demonstrates some common methods and techniques adopted by the selected Pakistani banks for risk identification, risk assessment and analysis, risk monitoring and controlling, and risk reporting. All these methods and techniques have been selected based on the frequency of acceptance (accepted by more than 90 percent of the respondents).

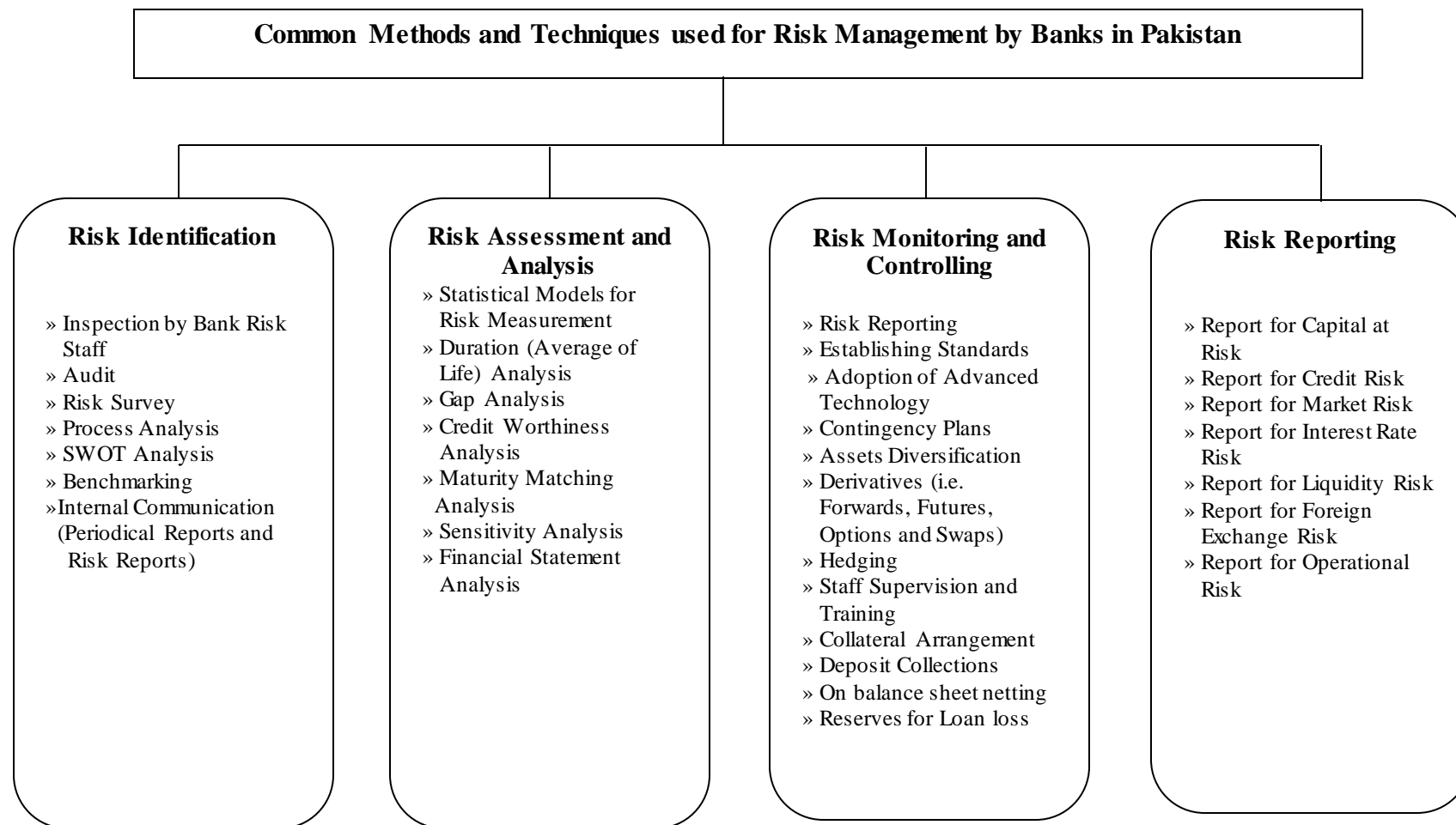


Figure 5.1: Important methods and techniques for risk management

5.4 Relationship between Risk Management Practices and Different Aspects of Risk Management (Study Hypotheses)

The literature review and the Causal Loop Diagram (Figure 4.16) show that banks adopt a wide range of risk management practices to deal with the different risks. The theoretical justification on why banks may adopt these risk management practices is lined to meet the regulatory requirements. Collier and Woods (2011) and Hudin and Hamid (2014) use the institutional theory (DiMaggio and Powell, 1983) in explaining the phenomenon of risk management implementation. They propose that institutionalization prevails when the risk management activities in the most of institutions become highly homogeneous. This homogeneity can be attained via the coercive isomorphic mechanism by which political, legitimacy or regulatory pressures are exercised on firms in the forms of persuasion, direction or invitation (DiMaggio and Powell, 1983; Powell and DiMaggio 1991; Scott 1995).

The current research intends to study risk management aspects based on existing literature, theories and practices. In Pakistani context, it is expected that the banks in Pakistan are needed to implement a comprehensive and rigorous structure of risk understanding, risk identification, measurement and analysis of risk, risk monitoring and controlling, managing credit risk, managing market risk, managing liquidity risk, managing operational risk to meet the regulatory requirements of the SBP. Considering the results of previous studies, significant relationships have been expected between risk management practices and all these aspects (Al-Tamimi and Al-Mazrooei, 2007, Hassan, 2011, and Abu Hussain and Al-Ajmi, 2012; Bilal, Talib and Khan, 2013; Shafique, Hussain and Hassan 2013). Therefore, the following hypotheses have been developed to test relationship between risk management practices and different aspects of risk management.

H1: There is a significant relationship between risk understanding and risk management practices

H2: There is a significant relationship between risk identification and risk management practices

H3: There is a significant relationship between risk assessment and analysis and risk management practices

H4: There is a significant relationship between risk monitoring and controlling and risk management practices

H5: There is a significant relationship between managing credit risk and risk management practices

H6: There is a significant relationship between managing market risk and risk management practices

H7: There is a significant relationship between managing liquidity risk and risk management practices

H8: There is a significant relationship between managing operational risk and risk management practices

5.4.1 Testing of Association among Study Variables (Correlation Analysis)

This study has conducted correlation and regression analyses to assess the relationship between study variables. A key of all these variables is presented in Table 5.13.

Table 5.13: Variables included in analysis

Independent Variables		
1	Risk_Und	Risk Understanding
2	Risk_Ident	Risk Identification
3	Risk_AA	Risk Assessment and Analysis
4	Risk_MC	Risk Monitoring and Controlling
5	Mag_CrRisk	Managing Credit Risk
6	Mag_MktRisk	Managing Market Risk
7	Mag_LqtRisk	Managing Liquidity Risk
8	Mag_OptRisk	Managing Operational Risk
Dependent Variable		
1	Risk_MgtPracs	Risk Management Practices

As described in the section 3.8.2.6.4, this research has used Pearson correlation coefficient (r) to estimate the association between study variables and is reported in Table 5.14.

Table 5.14: Correlation Matrix

Variable	1	2	3	4	5	6	7	8	9
1. Risk_Und	(.75)								
2. Risk_Ident	.18**	(.71)							
3. Risk_AA	.07	.33**	(.75)						
4. Risk_MC	-.05	-.02	.21**	(.77)					
5. Mag_CrRisk	.56**	.26**	.12*	-.05	(.75)				
6. Mag_MktRisk	.02	.07	.21**	.29**	.03	(.80)			
7. Mag_LqutRisk	-.02	.16**	.34**	.14*	.03	.26**	(.73)		
8. Mag_OptRisk	.08	.18**	.34**	.13*	.10	.32**	.19**	(.79)	
9. Risk_MgtPracs	.40**	.38**	.39**	.17**	.48**	.31**	.30**	.38**	(.74)

Coefficient alphas are reported in parentheses along the diagonal

*** Correlation is significant at the 0.01 level (2-tailed)*

** Correlation is significant at the 0.05 level (2-tailed)*

Key: Risk_Und (Risk Understanding), Risk_Ident (Risk Identification), Risk_AA (Risk Assessment and Analysis), Risk_MC (Risk Monitoring and Controlling), Mag_CrRisk (Managing Credit Risk), Mag_MktRisk (Managing Market Risk), Mag_LqutRisk (Managing Liquidity Risk), Mag_OptRisk (Managing Operational Risk) and Risk_MgtPracs (Risk Management Practices)

The correlation coefficients between Risk_MgtPracs and all the other variables Risk_Und, Risk_Ident, Risk_AA, Risk_MC, Mag_CrRisk, Mag_MktRisk, Mag_LqutRisk and Mag_OptRisk indicate a positive association. Besides, Pearson correlation has also been performed on the empirical data to test multicollinearity between independent variables (see Section 3.8.2.6.3). The above results show that all the values of correlation coefficients (r) between independent variables are less than 0.33 and indicate that there is no problems with multicollinearity in the data (Groebner et al., 2005; Gujarati and Porter, 2009; Garson, 2012).

5.4.2 Testing of Relationship between Risk Management Practices and Different Aspects of Risk Management (Regression Analysis)

As described in Section 3.8.2.6.5, this study has adopted the Ordinary Least Square (OLS) technique to test the significance of the relationships between dependent and independent variables. This regression technique has been applied in this chapter by keeping in view the fact that this is a well-accepted method and has commonly been used in certain pertinent studies (Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2011, Abu Hussain and Al-Ajmi, 2012; Bilal, Talib and Khan, 2013).

In this chapter, the decision about the acceptance or rejection of the study hypotheses (H1 to H8) has been made primarily based on the multiple regression analysis. The following multiple regression model has been applied in order to evaluate the relationship among variables of this study.

$$\mathbf{Risk_MgtPracs = f (Risk_Und, Risk_Ident, Risk_AA, Risk_MC, Mag_CrRisk, Mag_MktRisk, Mag_LqutRisk, Mag_OptRisk)}$$

Table 5.15: Results of multiple regression analysis

Dependent Variable: Risk_MgtPracs				
Independent Variables	Coefficient (β)	Std. Error (e)	t	Significance (p)
Risk_Und	.176	.036	3.276	.001***
Risk_Ident	.170	.044	3.479	.001***
Risk_AA	.127	.048	2.437	.015**
Risk_MC	.094	.041	1.982	.049**
Mag_CrRisk	.303	.039	5.529	.000***
Mag_MktRisk	.138	.029	2.780	.006**
Mag_LqutRisk	.134	.037	2.767	.006**
Mag_OptRisk	.177	.032	3.580	.000***
$R^2 = .48$, F Value = 31.275 ($p = .000$) N = 263 Level of Acceptance: ***Significant at $p \leq .001$, **Significant at $p \leq .05$, *Significant at $p \leq .01$, No differentiation in Significance Key: Risk_Und (Risk Understanding), Risk_Ident (Risk Identification), Risk_AA (Risk Assessment and Analysis), Risk_MC (Risk Monitoring and Controlling) Risk_MC (Risk Monitoring and Controlling), Mag_CrRisk (Managing Credit Risk), Mag_MktRisk (Managing Market Risk), Mag_LqutRisk (Managing Liquidity Risk), Mag_OptRisk (Managing Operational Risk) and Risk_MgtPracs (Risk Management Practices)				

Table 5.15 reports the results of the OLS regression analysis. Regression analysis results show that all the independent variables are significantly related to the Risk_MgtPracs and the individual relationship of each independent variable is described onwards.

Besides above, Table 5.15 reports that the overall model is significant ($R^2 = .48$, $p < .001$). The value of R^2 shows that the eight independent variables explain 48 percent of the variation in the dependent variable. According to Collinearity Statistics analysis, the values of tolerance are between .660 and .879. Similarly, the values of the variance inflation factor (VIF) are not greater than 1.515. Therefore, both results indicate that there is no problem of multicollinearity in the data (Gujarati and Porter, 2009; Garson, 2012). In current regression analysis, the Durbin-Watson is 1.735, approximately close to 2 and shows that there is no problem of serial correlation (Gujarati and Porter, 2009; Pearson, 2010; Garson, 2012). A detail discussion on these results has been reported in the next section.

5.5 Discussion of Results

This section aims to provide a detailed discussion about all the empirical results reported in Section 5.4.

5.5.1 Relationship between Risk_Und and Risk_MgtPracs

The first hypothesis is about to test the relationship between Risk_Und and Risk_MgtPracs of banks in Pakistan. This relationship has been tested with the help of multiple regression analysis. According to the results, a positive significant impact of Risk_Und ($\beta = .176$, $p = .001$) has been found on the Risk_MgtPracs in selected Pakistani banks. Furthermore, Pearson correlation analysis has also endorsed these findings and has shown a positive association between Risk_Und and Risk_MgtPracs. Therefore, an inference can be drawn that risk management practices in the banking industry are significantly influenced by risk understanding. These results also indicate that understanding of different risks and their management is a key aspect of risk management practices in Pakistani banks.

These results are in line with the findings of certain pertinent studies in the local context (Nazir, Daniel and Nawaz, 2012; Khalid and Amjad, 2012) and in the international context (Hassan, 2011; Abu Hussain and Al-Ajmi, 2012; Bilal, Talib and Khan, 2013). These findings endorse the certain assertions of institutional theory (DiMaggio and Powell, 1983) that posit the view primarily about professionalization such as the uniformity of organisational rules and regulations designed in view of regulatory and political pressures (Collier and Woods, 2011; Hudin and Hamid, 2014). For instance according to the risk management guidelines issued by the SBP in Pakistan, it is essential for banking employees that they have clear understanding of different risks and risk management.

It is worth mentioning here that proper understanding of different risks and risk management by employees of banks tends to add value in effective risk management perspectives particularly in dealing with different aspects of various risks; inherent and exposed in the banking operations in Pakistan. Furthermore, the improved understanding of risk management can also play a significant role in the intermediation activities of banks where management of different risks is

considered to be one of the most important activities. Hence, a direct relationship between variables indicates that it is crucial for the management to give more importance and attention to risk understanding among employees to improve the risk management practices of local banks.

5.5.2 Relationship between Risk_Ident and Risk_MgtPracs

The relationship between Risk_Ident and Risk_MgtPracs of banks in Pakistan has been tested by the hypothesis H2. The results of multiple regression analysis have confirmed the current hypothesis highlighting that Risk_Ident has a positive impact on the Risk_MgtPracs. Correlation analysis has also supported these findings and has shown a positive association between Risk_Ident and Risk_MgtPracs. These results reveal that risk identification is an important aspect of risk management in Pakistani banks. These findings are also consistent with the results of relevant studies (Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; Abu Hussain and Al-Ajmi, 2012; Bilal, Talib and Khan, 2013).

Furthermore, these findings support the homogeneity assumption of institutional theory (DiMaggio and Powell, 1983) which may be achieved through the coercive isomorphic mechanism whereby regulatory pressures are exerted on banks in terms of persuasion and direction (Collier and Woods, 2011; Hudin and Hamid, 2014). In the local context, this result supports the policy implications of the SBP risk management guidelines that proper identification and recording of different risks is critical to manage risks effectively in Pakistani banking institutions. According to these guidelines, all the banking institutions are needed to implement a comprehensive and rigorous structure of risk identification to cover all potential risks, irrespective of whether or not these risks are within the direct control of banks. Consequently, a positive significant relationship between Risk_Ident and Risk_MgtPracs reflects the need of an active mechanism of risk identification to improve the effectiveness of the risk management practices of banks in Pakistan.

5.5.3 Relationship between Risk_AA and Risk_MgtPrCs

This study has developed the hypothesis H3 to test the relationship between Risk_AA and Risk_MgtPrCs of banks in Pakistan. Based upon regression analysis results, a positive significant influence of the Risk_AA has been reported on the Risk_MgtPrCs in selected Pakistani banks. The analysis results of Pearson correlation has also shown a positive association between these variables and endorses the findings highlighting that Risk_MgtPrCs in the banking industry are significantly related to the Risk_AA. Therefore, these results confirm Risk_AA as an influential aspect of Risk_MgtPrCs in Pakistani banks. These findings are also compliant with the results of (Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; Hassan, 2011; Abu Hussain and Al-Ajmi, 2012; Bilal, Talib and Khan, 2013) indicating a significant relationship between Risk_AA and Risk_MgtPrCs of banks.

The uniformity assumption of institutional theory (DiMaggio and Powell, 1983) is also endorsed by these finding, according to which it is necessary for all the local banks to implement a system for risk assessment and analysis in order to fulfil the regulatory requirement of the central bank. For example in Pakistani context, all the banks have been directed by the SBP via BSD Circular No.07, dated August 15, 2003 to formulate compact approaches for the risk assessment and analysis in order to provide a solid framework for risk management in these financial institutions. Therefore, a direct significant relationship between Risk_AA and Risk_MgtPrCs indicates that an improvement in risk assessment and analysis mechanism increases the effectiveness of the risk management practices of banks in Pakistan.

5.5.4 Relationship between Risk_MC and Risk_MgtPrCs

The hypothesis H4 has been drawn to test the relationship between Risk_MC and Risk_MgtPrCs of banks in Pakistan. Considering the results of regression analysis, a significant direct impact of the Risk_MC on the Risk_MgtPrCs has been reported. These findings have also been supported by the Pearson correlation in which a positive association between Risk_MC and Risk_MgtPrCs is reported. Based upon these empirical facts, these results indicate

that Risk_MC is an important aspect of risk management in Pakistani banks. Besides, the results are in line with findings of (Al-Tamimi and Al-Mazrooei, 2007; Hassan, 2009; Abu Hussain and Al-Ajmi, 2012; Khalid and Amjad, 2012; Nazir, Daniel and Nawaz, 2012; Bilal, Talib and Khan, 2013).

These finding also endorse the assumptions of institutional theory (DiMaggio and Powell, 1983) that postulate homogeneity in the formation of organisational policies and procedures in order to comply with rules and regulation of regulatory bodies (Collier and Woods, 2011; Hudin and Hamid, 2014). Considering the said assumption of institutional theory, the fundamental principles relating to risk management in Pakistani banks framed by the central bank are applicable to every financial institution and all these institutions have been directed to apply these basic principles irrespective of their sizes and complexities. According to these principles, all the banking institutions are required to implement a comprehensive and rigorous mechanism of risk monitoring and controlling in Pakistan. Considering a significant direct relationship of Risk_MC with Risk_MgtPrs, an inference can be drawn that the management can improve the risk management practices of banks in Pakistan by giving more importance and attention on risk monitoring and controlling.

5.5.5 Relationship between Mag_CrRisk and Risk_MgtPrs

The relationship between Mag_CrRisk and Risk_MgtPrs of banks in Pakistan has been tested by the H5 hypothesis stating that *there is a significant relationship between managing credit risk and risk management practices*. The multiple regression analysis has identified a significant positive effect of the Mag_CrRisk on Risk_MgtPrs. These findings have further been supported by Pearson correlation analysis and report a positive association between both variables. Therefore, an inference can be drawn that the Mag_CrRisk considerably influences the Risk_MgtPrs. As a matter of fact, this result reveals that managing credit risk is an important aspect of risk management in Pakistani banks. These results endorse the earlier argumentations reported in existing literature that the potency of managing credit risk is a substantial component of a comprehensive approach to risk management in banking institutions (Basel Committee, 2000;

Hennie, 2003; Al-Tamimi and Al-Mazrooei, 2007; Abu Hussain and Al-Ajmi, 2012; Musyoki and Kadubo, 2012).

The current results support the homogeneousness assumption of institutional theory (DiMaggio and Powell, 1983) under which regulatory pressures are employed on banking institutions in shape of direction and obligations (Collier and Woods, 2011; Hudin and Hamid, 2014). For instance in Pakistan, the SBP has issued a complete set of instructions for the implementation of a typical credit risk management framework in banks broadly categorized into three main components such as: oversight of board and top management; organizational structure; and finally policies and procedures for credit risk identification, acceptance, measurement, monitoring and controlling. Hence, the current results endorse the role of managing credit risk in the whole banking risk management approach and a positive relationship between *Mag_CrRisk* and *Risk_MgtPrs* postulates that an active mechanism of managing credit risk is important to improve the effectiveness of the risk management practices of banks in Pakistan.

5.5.6 Relationship between *Mag_MktRisk* and *Risk_MgtPrs*

The hypothesis H6 has been developed to test the relationship between *Mag_MktRisk* and *Risk_MgtPrs* of banks in Pakistan. The regression analysis results have highlighted that the *Mag_MktRisk* has a significant direct impact on the *Risk_MgtPrs*. This positive relationship between *Mag_MktRisk* and *Risk_MgtPrs* has also been supported further in Pearson correlation which reveals a positive association between these variables. These results point out that *Risk_MgtPrs* are considerably inclined by *Mag_MktRisk*. Consequently, these findings confirm managing market risk as an important aspect of risk management practices in Pakistani banks. These findings support the affirmations of previous studies (Pyle, 1997; Christie, 2000; Mehta et al., 2012; Ayoub, 2013) that the management of market risk need to be considered as an important component in the overall risk management framework of banks.

The certain assertion of institutional theory (DiMaggio and Powell, 1983) are also endorsed by these findings that postulates the uniformity of organisational

rules and regulations formulated considering the regulatory or political pressures (Collier and Woods, 2011; Hudin and Hamid, 2014). Considering the business environment for banks in Pakistan, the current findings support the policy implications of the SBP risk management guidelines and endorse the active role of market risk management in the whole banking risk management approach in Pakistan. Whereas, a significant direct relationship between Mag_MktRisk and Risk_MgtPrs observed in this study reflects that the management can enhance the overall effectiveness of the risk management practices of banks in Pakistan by giving more importance and attention to managing market risk.

5.5.7 Relationship between Mag_LqutRisk and Risk_MgtPrs

This study has formulated the hypothesis H7 to confirm the relationship between Mag_LqutRisk and Risk_MgtPrs of banks in Pakistan. The results of multiple regression analysis have shown a positive significant influence of the Mag_LqutRisk on the Risk_MgtPrs in selected local banks. In addition, Pearson correlation analysis has also substantiated these findings and reports a positive association between Mag_LqutRisk and Risk_MgtPrs. These results accept that managing liquidity risk is an important aspect of risk management in Pakistani banks. These findings also endorse the arguments presented in earlier studies (Ali, Akhtar and Sadaqat, 2011; Arif and Anees, 2012; Shafique, Hussain and Hassan, 2013) that an active system of liquidity risk management is a valuable aspect of comprehensive risk management approach in banking institutions.

The homogeneity assumption of institutional theory (DiMaggio and Powell, 1983) is also endorsed by these results. According to this assumption it is required for all the banks in Pakistan to implement a system for liquidity risk management in order to fulfil the regulatory directions of the central bank. For instance, the certain fundamental principles relating to deal with liquidity risk in Pakistani banks outlined by the SBP are applicable to all banking institutions irrespective of their sizes and complexities. According to risk management guidelines, every bank is required to implement a broad mechanism of managing liquidity risk in Pakistan. A positive relationship between Mag_LqutRisk and Risk_MgtPrs indicates that an

effective mechanism of managing liquidity risk is important to improve the usefulness of the risk management practices of banks in Pakistan.

5.5.8 Relationship between Mag_OptRisk and Risk_MgtPrs

The relationship between Mag_OptRisk and Risk_MgtPrs of banks in Pakistan has been tested by the hypothesis H8 which tests a significant relationship between these variables. Based upon multiple regression results, the hypothesis H8 has been confirmed showing that Mag_OptRisk has a significant impact on the Risk_MgtPrs. These findings have also been supported by the Pearson correlation in which a positive association between these variables has been reported. Thus, these results indicate that managing operational risk is considered to be as an important aspect of risk management practices in Pakistani banks. These findings support the recommendations of past studies in the local context (Shafique, Hussain and Hassan, 2013) and in the international context (Chapelle et al., 2007; Stan-Madduka, 2010) that the management of operational risk is an important part of an exhaustive risk management framework in banks.

Additionally, these findings also support the certain assumption of institutional theory (DiMaggio and Powell, 1983) that postulates the view primarily about the uniformity of organisational policies and procedures formulated in view of regulatory or political pressures (Collier and Woods, 2011; Hudin and Hamid, 2014). For example in Pakistani context, all the banks have been directed by the SBP to formulate compact approaches for managing operational risk in order to provide a solid framework for risk management. This study has identified a significant direct relationship between Mag_OptRisk and Risk_MgtPrs which shows that the overall utility of the risk management practices of banks in Pakistan can be upgraded by improving the effectiveness of systems and procedures for managing operational risk.

5.5.9 Identification of Key Variables

The previous section has provided empirical evidences based upon the questionnaire data analyses. This chapter has facilitated the current study to assess important aspects of risk management practices in Pakistani context such as

managing operational risk, managing credit risk, managing liquidity risk and managing market risk. All these key aspects (variables) have been considered to examine the impact of risk management on the performance of banks in Pakistan. A comprehensive details of these analyses has been reported in the following Chapter Six.

5.6 Summary

This chapter analyses the questionnaire data collected on the risk management practices of selected banks in Pakistan. It has identified the degree of risk understanding among banking staff along with the levels of risk identification, risk assessment and analysis, risk monitoring and controlling, managing credit risk, managing market risk, managing liquidity risk and managing operational risk in the selected banks. This chapter also recognises the different key aspects of risk management practices of selected Pakistani banks in the local environment by using correlation and regression analysis techniques to achieve the research objectives. Furthermore, a detailed discussion of results is reported to test the certain asserations of the institutional theory. The findings of this chapter endorse the uniformity assumption of institutional theory (DiMaggio and Powell, 1983) according to which the selected banks in Pakistan have adopted a wide range of risk management practices in order to fulfil the regulatory requirement of the central bank.

In addition to above questionnaire data analysis, the current study undertakes secondary data analysis to examine the relationship between risk management and performance of selected banks in Pakistan. A detailed explanation of these analysis and results is provided in the next chapter.

Chapter Six Risk Management and Performance

6.1 Introduction

The last two chapters have examined the risk management practices of Pakistani banks through primary data analysis. The Causal Loop Diagram (CLD) presented in Chapter Four (Figure 4.16) demonstrates that the Pakistani banks have implemented a wide-ranging risk management systems which encompass a broad range of policies and procedures to deal with different important types of risks including operational risk, credit risk, liquidity risk and market risk. This diagram further describes that these risk management systems have been developed under the risk management guidelines issued by the SBP to avoid different kind of losses and to improve the profitability of local banks.

Whereas, Chapter Five shows that there is a common understanding of risk management across the selected Pakistani banks and these banks are good in risk identification, measurement and analysis of risk, risk monitoring and controlling, credit risk analysis, market risk analysis, liquidity risk analysis and operational risk analysis in general. Chapter Five also highlights the risk management practices of banks in Pakistan and its findings further endorse the policy implications of the SBP risk management guidelines.

Moreover, the adoption of risk management in banks is also observed as value enhancing strategy to improve value creation of shareholders (see Section 2.4.1.1). Therefore, this chapter aims to study the relationship between risk management and performance of banks in Pakistan. This study has undertaken secondary data analysis in order to answer the particular research question probing, what is the relationship between risk management and performance of banks in

Pakistan? For this purpose, a multiple-source of secondary data has been collected from the Banking Statistics of Pakistan published by the SBP as well as from the annual reports of selected Pakistani banks. As described in Section 3.7.2, the stratified random sampling technique has been applied and a sample size of 20 banks including public, private and foreign banks has been taken.

This research has applied Data Envelopment Analysis (DEA) and Tobit regression analysis to investigate the relationship between risk management and performance. The performance of selected banks has been measured at the first stage of analysis in terms of technical efficiency scores for the year 2005 to 2012. At the second stage of analysis, this study has performed Tobit regression analysis to regress the performance of selected Pakistani banks, with the proxy variables of risk management (loan to deposit ratio, non-performing loan ratio and the capital adequacy ratio). A detailed explanation of both stages is presented in following sections.

Stage I- (Data Envelopment Analysis)

6.2 Performance of Banks

Different methods have been used to measure the performance of banks in the existing literature including:

- Financial ratio analysis (Singla, 2008; Naceur and Kandil, 2009; Ariffin and Kassim, 2011; Jhamb and Prasad, 2012; Kolapo, Ayeni and Oke, 2012; Nawaz et al., 2012; Poudel, 2012; Oluwafemi et al., 2013; Tabari, Ahmadi and Emami, 2013; Alzorqan, 2014);
- CAMELS analysis (Sangmi and Nazir, 2010; Dincer et al., 2011; Jaffar and Manarvi, 2011, Reddy and Prasad 2011; Shar, Shah and Jamali 2011; Kouser and Saba 2012; Rozzani and Rahman 2013 and Soltani et. al, 2013);
- The parametric analysis techniques (Altunbas et al., 2000; Fan and Shaffer, 2004; Girardone, Molyneux and Gardener, 2004; Karim, Chan and Hassan, 2010; Bokpin, 2013); and
- The non-parametric analysis techniques (Yue, 1992; Miller and Noulas, 1996; Yeh, 1996; Ayadi, Adebayo and Omolehinwa, 1998; Avkiran, 1999;

Jackson and Fethi, 2000; Noulas, 2001; Grigorian and Manolc, 2002; Casu and Molyneux, 2003; Sathye, 2003; Ataulah, Cockerill and Le, 2004; Jaffry et al., 2005; Ataulah and Le, 2006; Das and Ghosh, 2006; Ahmed, 2008; Pasiouras, 2008a and b; Sufian and Majid, 2008; Banker, Chang and Lee, 2010; Hsiao et al., 2010; Kao et al., 2011; Chortareas, Giradone and Ventouri, 2012; Garza-Garcia, 2012; Barth, Caprio and Levine, 2013; Jha, Hui and Sun, 2013; Lee and Chih, 2013a and b; Fernando and Nimal, 2014; Maghyereh and Awartani, 2014).

A brief summary of the different performance measurement techniques applied in the different studies has already been presented in Table 2.1 (see Chapter Two). However, this study has used a non-parametric technique DEA to measure the performance of selected Pakistani banks in terms of efficiency scores. For this purpose, the technical efficiency scores of the selected banks for the years 2005-2012 are calculated and presented in Appendix Five.

Stage II

6.3 Relationship between Risk Management and Performance (Study Hypothesis)

Both literature review (Section 2.4.1.1) as well as the CLD (Figure 4.16) highlight that risk management in banking institutions is helpful to enhance the value of its shareholders investments. The financial economic approach also asserts risk management as a driving force for shareholder value maximization (Santomero 1995; Smithson, Smith and Wilford, 1995; Oldfield and Santomero, 1997). The previous research studies conducted in different countries describe that risk management is an important force to improve the performance in order to maximize the shareholder value (Cebenoyan and Strahan 2004; Tandilililn et al. 2007; Hsiao et al., 2010; Ariffin and Kassim, 2011; Kao et al., 2011; Poudel, 2012; Jha, Hui and Sun, 2013; Oluwafemi et al. 2013; Fernando and Nimal, 2014; Maghyereh and Awartani, 2014). Therefore, it is also expected in the local context that risk management plays an important role in the performance of banks. Consequently,

the following hypothesis has been developed to test relationship between risk management and performance of banks in Pakistan.

H9: There is a significant relationship between risk management and performance of banks

In order to test the hypothesis H9, this chapter has applied a Tobit regression model at the second stage of analysis. As described in the Section 3.9.1.2, the performance of selected banks has been measured in terms of technical efficiency scores and the range of all the values is between 0 and 1. Therefore, a censored Tobit model has been applied owing to the nature of the dependent variable (Hsiao et al. 2010; Kao et al. 2011; Barth, Caprio and Levine, 2013; Jha, Hui and Sun, 2013; Lee and Chih, 2013 a and b). Furthermore, this study has used the following variables to examine the relationship between risk management and performance of banks in Pakistan.

6.3.1 Performance of Banks (Dependent Variable)

The performance of banks (Bank_Perf.) has been tested as a dependent variable in the model and is measured with the help of DEA in shape of technical efficiency scores. A detailed explanation of the construction of this variable has already been described at the first stage in Section 6.2.

6.3.2 Risk Management (Independent Variables)

Considering the key variables of Chapter Four and Chapter Five (such as managing operational risk, managing credit risk, managing liquidity risk and managing market risk), this study has selected different proxy variables for risk management in Pakistani banks. A detailed explanation of each variable has been presented as follows

6.3.2.1 Managing Operational Risk

This study has applied capital adequacy ratio (CA_R) as a proxy variable for managing operational risk to measure the risk management in Pakistani banks. CA_R is a ratio of capital to risk weighted assets. Capital adequacy is an important

measure for the financial strength of a bank and indicates bank's ability to cope with operational and abnormal losses (Lee and Chih, 2013b). Olalekan and Adeyinka (2013) suggest that sufficient capital in banks can serve to decrease their risks by performing as a safeguard against their loan losses, offering arranged approach to financial markets in order to protect against liquidity problems and restricting their risk taking. The SBP has also taken substantial steps for the implementation of the Basel Accords to strengthen the risk management and the capital related regulations (Masood and Fry, 2012). The capital of this ratio is comprised of Tier 1 capital (main capitalA) and Tier 2 capital (secondary capital). The SBP determines and requires a minimum level of the CA_R (10%) which needs to be maintained by all the banks in Pakistan in 2013. The CA_R has been estimated by taking on following procedures:

$$CA_{R_{nt}} = \frac{\text{Tier 1 Capital} + \text{Tier 2 Capital}}{\text{Risk Weighted Assets}}$$

The CA_R shows the level of the banks compliance functions toward the regularity requirements. Additionally, the higher CA_R number indicates better sensitivity of the bank towards the risk management. The implementation of the minimum capital adequacy requirement in banks has reduced their risk taking (Konishi and Yasuda, 2004). This ratio has been used as a proxy for risk management, regulatory or corporate governance in a number of studies (Das and Ghosh, 2006; Pasiouras, 2008a and b; Singla, 2008; Naceur and Kandil, 2009; Banker, Chang and Lee, 2010; Hsiao et al. 2010; Kao et al. 2011; Poudel, 2012; Barth, Caprio and Levine, 2013; Jha, Hui and Sun, 2013; Ogboi and Unuafé, 2013; Maghyereh and Awartani, 2014). Consequently, the CA_R has been applied as a proxy variable for the risk management in this research. This study estimates a direct relationship of CA_R with the performance of selected Pakistani banks based on the reviewed literature (see Section 2.7).

6.3.2.2 Managing Credit Risk

Two proxy variables such as non-performing loan ratio (NPL_R) and loan loss provision ratio (LLP_R) have been used for managing credit risk to estimate the risk management in Pakistani banks.

The NPL_R is the proportion of loan losses amount in relation to total loan amount. Kolapo, Ayeni and Oke (2012) highlight that loan and advances are the most obvious and major cause of credit risk in banking institutions. Berger and DeYoung (1997) point out that poor management increases the bad quality loans. On the other hand, effective risk management is useful to reduce the amount of non-performing loans in banking institutions (Jha, Hui and Sun, 2013). Considering the SBP risk management guidelines, all the banks in Pakistan are required to implement an effective credit risk management framework in order to strengthen their overall risk management systems and reduce the cost of bad and doubtful loans. Hence, the NPL_R has been chosen as an indicator for risk management owing to its ability to show how the selected banks are efficient in managing their credit risk and loan portfolios. The NPL_R has been calculated by adopting following procedures:

$$\text{NPL_R}_{nt} = \frac{\text{Non Performing Loans of Individual Bank}}{\text{Gross Advances}}$$

A higher value of NPL_R shows that there is more risk involved in banks investment and operations. This ratio has been used as an indicator for risk management, credit risk and management quality in several studies (Berger and DeYoung, 1997; Das and Ghosh, 2006; Banker, Chang and Lee, 2010; Hsiao et al. 2010; Chortareas, Giradone and Ventouri, 2012; Garza-Garcia, 2012; Jha, Hui and Sun, 2013; Maghyereh and Awartani, 2014). Accordingly, this document has also taken it as a proxy variable for the risk management. Based on the existing literature review (see Section 2.7), this study expects an inverse relationship between non-performing loans and performance of selected banks in Pakistan.

LLP_R is a percentage that shows accumulated provision expenses (minus write-offs). LLP_R provides an indication of the management's expectation of future loan losses. It reflects the amounts of loan loss reserve created by the local banks to offset the default credit risk in their total (outstanding) loan portfolios. LLP_R has been calculated as:

$$\text{LLP_R}_{nt} = \frac{\text{Written off Principal Amount of Individual Bank}}{\text{Average Outstanding Loan Portfolio}}$$

Bank depositors are protected against unanticipated losses by capital adequacy reserves and covered against predicted losses through the loan loss provision reserves. According to Basel II, the local banks includes loan loss provisions under their capital (Tahir, 2006). For it, the basic assumption is that the managers in Pakistani banks reflect their belief toward the bank's asset quality. However, managers use this reserve for different purposes like income soothing and earning management (Fayyaz, 2006). In this study LLP_R is utilized as proxy for risk management by ascertaining the level of selected banking staff expectations about their asset quality in Pakistan. The increased amount represents a decreased quality of the assets and vice versa.

6.3.2.3 Managing Liquidity Risk

The loan to deposit ratio (LTD_R) has been utilized as proxy variable for managing liquidity risk to estimate the risk management in Pakistani banks.

LTD_R is the ratio of total loans to total deposits. This ratio shows the liquidity as well as the management aggressiveness of banks. According to the SBP risk management guidelines, the board of directors is required to establish a sound framework for liquidity and funds management. The loan to deposit ratio is an important ratio and is used to convey the typical guidelines and policies for risk tolerance in Pakistani banks in response to the SBP directions (Akhtar, 2007; Ali, Akhtar and Sadaqat, 2011). Hence, the loan to deposit ratio is considered to be a good indicator for risk management in banks in the local context.

Van den End (2013) also advocates that the loan to deposit ratio complements the important liquidity ratios (the liquidity coverage ratio and net stable funding ratio) of the Basel III framework for effective liquidity risk management. He further argues that the loan to deposit ratio comprises of the intrinsic characteristics of loans and deposits and includes all the stressed values of liquid assets and liabilities which are taken into account for both the liquidity coverage ratio as well as net stable funding ratio. Therefore, this ratio is not only less prone to interpretation but also simpler to understand and is predominantly beneficial in times of stress when the market participants mainly reliance on

straightforward indicators. Ali, Akhtar and Sadaqat (2011) state that the liquidity of the banks is considered one of the most important factors of risk management and LTD_R is commonly used by several studies to estimate the liquidity of banks. The LTD_R has been estimated by taking the following measures:

$$LTD_R_{nt} = \frac{\text{Loans and advances of Individual Bank}}{\text{Deposits of Individual Bank}}$$

The higher value of LTD_R signifies that the bank might not have an adequate amount of liquidity to manage any unexpected fund requirements. This ratio has been used as an indicator for risk management or liquidity in several studies (Kolapo, Ayeni and Oke, 2012; Jhamb and Prasad, 2012; Jha, Hui and Sun, 2013; Lee and Chih, 2013 a and b; Alzorqan, 2014). Consequently, this study has taken LTD_R as a proxy variable for the risk management and a significant positive relationship between LTD_R and performance of banks is expected based on the review of existing studies (see Section 2.7).

6.3.2.4 Managing Market Risk

This study has applied value at risk ratio (VAR_R) as a proxy variable for managing market risk to measure the risk management in Pakistani banks. The risk managers use value at risk in order to estimate and manage the risk levels which are undertaken by their banks. VAR_R refers the value at risk of the individual bank divided by the mean cross section value at risk of all selected banks (Tandelilin et al. 2007). This ratio is illustrated by 5% annually profit and loss measure.

According to Jorion (2001), the value at risk estimates the expected loss within a particular time period at a given level of confidence. The value at risk can be described more formally as the quintile of the projected distribution of profits and losses over a particular time period (Tandelilin et al. 2007). In the current study 95 percent level of confidence is used as a result the value at risk should be more than 5 percent of the aggregate number of the observations. Following the study of Tandelilin et al. (2007), the researcher has estimated VAR_R by adopting following steps.

- i. Ascend ten yearly data of the profits or losses of the each bank from 2003-2012. For the observation at the first year (2005), the current study has used yearly data from the years 2003 to 2005. For the observation at the second year (2006), the current study has used yearly data from the years 2004 to 2006. In the same manners, the values of profits or losses have been used for overlapping yearly data.
- ii. The average net profit (ANP) of has been calculated (containing yearly data for the current year as well as last two years profits or losses). For instance to calculate the ANP for the year 2005, the arithmetic mean of three years (2003, 2004 and 2005) has been calculated. This procedure has been adopted for all the eight years (2005-2012).
- iii. The standard deviation of profits or losses (σ_{NP}) has been computed (containing yearly data for the current year as well as last two years profits or losses). For instance to calculate σ_{NP} for the year 2005, the standard deviation of three years (2003, 2004 and 2005) has been computed. This procedure has been adopted for all the eight years (2005-2012).
- iv. The absolute number of the value at risk (Var_{abs}) for each bank for every year (2005-2012) by using 95 percent confidence level of interval ($2\sigma_{NP}$) has been calculated as under:

$$Var_{abs} = ANP - 2\sigma_{NP}$$
- v. In order to eliminate size-effect bias of absolute number of VAR, the VAR will be deflated by mean cross section VAR of all banks (based on all samples). The following calculation procedure has been applied to eliminate size-effect bias of the absolute number of Var_{abs} .

$$VaR_{R_{nt}} = \frac{VaR_{abs} \text{ for individual bank}}{\text{Mean Cross Section } VaR_{abs}}$$

The higher VaR_R indicates that the bank addresses a greater problem in the risk exposure and vice versa.

Furthermore, the Tobit regression model includes a control variable that is considered to affect either on the performance or risk management of selected banks. Following previous studies (Banker, Chang and Lee, 2010; Hsiao et al. 2010; Kao et al. 2011; Lee and Chih, 2013a; Maghyereh and Awartani, 2014), the size of bank (B_Size) has been held constant in order to assess the relationship between the risk management and the performance of banks in Pakistan. The B_Size has been estimated by taking natural logarithm of total assets (Banker, Chang and Lee, 2010; Hsiao et al. 2010; Kao et. al, 2011). The larger banks have a greater ability to diversify their risks across different products and services which brings improvement in their risk management skills than the smaller banks (Garcia-Marco and Roles-Fernandez, 2008; Nguyen, 2011; Srairi, 2013).

Besides above independent variables, this study has also taken the dummy variables for the public bank (DUMI_PUB) and private bank (DUMI_PVT) in this study. Dummy (indicator) variables are artificial variables constructed to indicate attributes with two or more different categories or levels (Gujarati and Porter, 2009). Generally, such types of variables are assigned the numbers of '0' and '1' to represent association in a mutually exclusive and exhaustive category (Ahmed, 2008).

Descriptive statistics of the second stage, dependent and independent variables are reported in Table 6.1.

Table 6.1: Summary statistics of second stage variables

Variables	Mean	Standard Deviation	Maximum	Minimum
B_Size	8.2870	.6898	9.4569	5.6047
CA_R	.2056	.2395	1.5124	.0105
NPL_R	.08849	.0801	.4800	.0000
LLP_R	.0615	.0536	.2895	0.0295
LTD_R	.7176	.3228	2.6777	.2380
VAR_R	4.4632	0.9999	20.2452	-16.8761
Bank_Perf.	.7355	.2017	1.0000	.3100
N = 160				

6.3.3 Testing of Relationship between Risk Management and Performance

This study has applied a Tobit regression model to measure the relationship between risk management and performance of banks in Pakistan. As specified in the earlier section, this study has used the Tobit model instead of OLS due to censored dependent variable (Hsiao et al. 2010; Kao et al. 2011; Barth, Caprio and Levine, 2013; Jha, Hui and Sun, 2013; Lee and Chih, 2013 a and b). The following Tobit regression model has been applied in order to evaluate the relationship risk management and performance.

$$\begin{aligned} \text{Bank_Perf}_{nt} = & \beta_0 + \beta_1 \text{B_Size}_{nt} + \beta_2 \text{CAR_R}_{nt} + \beta_3 \text{NPL_R}_{nt} + \beta_4 \text{LLP_R}_{nt} \\ & + \beta_5 \text{LTD_R}_{nt} + \beta_6 \text{VAR_R}_{nt} + \beta_7 \text{DUMI_PUB}_{nt} + \beta_8 \text{DUMI_PVT}_{nt} \\ & + e_{nt} \end{aligned}$$

Where

Bank_Perf_{nt} = Performance of n-th bank has at time t

B_Size_{nt} = Size of the n-th bank has at time t

CA_R_{nt} = Capital adequacy ratio which n-th bank has at time t

NPL_R_{nt} = Non-performing loans ratio which n-th bank has at time t

LLP_R_{nt} = Loan loss provision ratio which n-th bank has at time t

LTD_R_{nt} = Loan to deposit ratio which n-th bank has at time t

VAR_R_{nt} = Value at risk ratio which n-th bank has at time t

DUMI_PUB_{nt} = 1 if n-th bank in time period t is a public bank otherwise zero

$DUMI_PVT_{nt} = 1$ if n-th bank in time period t is a private bank otherwise zero
 e_{nt} = Error term which n-th bank has at time t

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ and β_8 are the coefficients to be measured by employing the Tobit regression model. Some multicollinearity tests, such as tolerance and the variance information factor (VIF) has also been performed. Results of Tobit regression analysis after controlling the size of banks have been presented in Table 6.2.

Table 6.2: Tobit regression analysis results

Dependent Variable: Bank_Perf.				
Independent Variables	Coefficient (β)	Std. Error (e)	t	Significance (p)
B_Size		.0262	2.015	.046
CA_R	.174	.062	2.379	.019**
NPL_R	-.300	.178	-4.299	.000***
LLP_R	-.159	.063	2.258	.025**
LTD_R	.249	.045	3.470	.001***
VAR_R	-.070	.003	-1.115	.267
DUMI_PUB	.654	.052	7.142	.000***
DUMI_PVT	.496	.045	4.515	.000***
$R^2 = .501$ F Value= 16.226 ($p = .000$)				
$N = 160$				
<i>Level of Acceptance: ***Significant at $p \leq .001$, **Significant at $p \leq .05$, *Significant at $p \leq .01$, No differentiation in Significance</i>				
<i>Key: B_Size (Bank Size), CA_R (Capital Adequacy Ratio), NPL_R (Non-performing Loan Ratio), LLP_R (Loan Loss Proviiont Ratio), LTD_R (Loan to Deposit Ratio), VAR_R (Vale at Risk Ratio), DUMI_PUB (Dummy for Public Banks), DUMI_PVT (Dummy for Private Banks)</i>				

Table 6.2 reveals the results of the Tobit regression analysis. These analyses have been conducted to measure the relationship of the independent variable (risk management) with the performance of selected Pakistani banks.

The coefficients of the proxy variables for risk management such as CA_R ($\beta = .174, p = .019$), NPL_R ($\beta = -.300, p = .000$), LLP_R ($\beta = -.159, p = .025$) and LTD_R ($\beta = .249, p = .001$) are significantly related to the Bank_Perf. These results reveal that the CA_R and LTD_R have positive and significant relationships with

the Bank_Perf at 5% level of significance, whereas the NPL_R and LLP_R has a negative significant relationship with the Bank_Perf. These findings indicate that the Bank_Perf increases with the increase in the CA_R and the LTD_R in the meantime it decreases with the increase in the NPL_R and LLP_R. Hence, an inference can be drawn that the Bank_Perf is significantly influenced by risk management. Therefore, these results facilitate this study to fully accept the hypothesis H9, stating that *there is a significant relationship between risk management and performance of banks*. The dummy variables representing public banks and private banks have also shown a statistically significant influence on the performance of banks.

Table 6.2 reports that the overall model is significant ($R^2 = .501, p < .001$). The value of R^2 shows that the independent variables explain 50 percent of the variation in the dependent variable. The values of tolerance were between .390 and .739 and the values of the variance information factor (VIF) were not greater than 2.567, reporting no problem of multicollinearity in the data (Gujarati and Porter, 2009; Garson, 2012). The Durbin-Watson value was 2.151 and showed that there was no problem of serial correlation. A detail discussion on these results is reported in the next section.

6.4 Discussion of Results

In the previous section, the impact of risk management on the performance of selected banks in Pakistan has been tested by the hypothesis H9 stating that there is a significant relationship between risk management and performance of banks. For this purpose, the risk management of banks has been measured using different alternative proxy variables: CA_R for Managing Operational Risk; NPL_R and LLP_R for Managing Credit Risk; LTD_R for Managing Liquidity Risk and VAR_R for Managing Market Risk. A details discussion of results is presented below.

CA_R: The results of Tobit regression analysis ($\beta = .174, p = .019$) shows that the CA_R has a positive relationship with Bank_Perf. These findings reveal that increase in the capital base of banks during 2005 to 2012 has a direct impact on the

performance of selected banks in Pakistan. These results support the earlier argumentations in the existing literature that well-capitalized banking institutions would be encountered with less risk and have more flexibility to deal with different problems caused by the absence of unexpected and abrupt losses (Berger, 1995; Caprio and Klingebiel, 1996; Bernauer and Koubi, 2002; Berger and Bonaccorsi di Patti, 2006; Pasiouras and Kosmidou, 2007; Chortareas, Giradone and Ventouri, 2012; Bokpin, 2013; Olalekan and Adeyinka, 2013). The current study results also support the findings of several studies (Singla, 2008; Nanceur and Kandil, 2009; Poudel, 2012; Ogboi and Unuafé, 2013) have been conducted to assess the influence of capital adequacy ratio on the profitability by applying different indicators (return on assets and return on equity).

Similarly, the results of this research are consisted with the findings of certain relevant studies (Das and Ghosh, 2006; Pasiouras, 2008a and b; Banker, Chang and Lee, 2010; Hsiao et al. 2010; Kao et al. 2011; Barth, Caprio and Levine, 2013; Jha, Hui and Sun, 2013; Maghyereh and Awartani, 2014) showing the effect of CA_R on the Bank_Perf. by using two stage DEA.

Hence, a direct relationship between CA_R and Bank_Perf. indicates that capital adequacy is crucial for the performance of selected Pakistani banks.

NPL_R and LLP_R: Based upon results ($\beta = -.300$, $p = .000$), a negative significant relationship has been identified between NPL_R and Bank_Perf. Similarly, the results of Tobit regression analysis ($\beta = -.159$, $p = .025$) shows that the LLP_R has a negative relationship with Bank_Perf. These findings indicate that both ratios have negative effect on the performance of selected banks in Pakistan. These results endorse the certain assertion of bad management proposed by Berger and DeYoung (1997) that poor loan management in banks increases the bad quality loans and consequently reduces the cost efficiency of banks.

Furthermore, the findings of the current study support the relevant literature that technically more efficient banks have less non-performing loans (Fan and Shaffer, 2004; Sufian and Abdul Majid, 2008; Noor and Ahmad, 2012). Likewise, several studies have found that increase in non-performing loans reduces the cost

efficiency of banks (Altunbas et al., 2000; Girardone, Molyneux, and Gardener, 2004; Karim and Gee, 2008; Karim, Chan and Hassan, 2010). For instance, Karim, Chan and Hassan (2010) have evidently indicated that the rise in non-performing loans of banks have inverse impact on the cost efficiency of banks in Malaysia and Singapore during 1998-2007.

Similarly, the findings of the current study also support the statistical results of a number of studies conducted to assess the influence of non-performing loan on the profitability by applying different indicators return on assets and return on equity (Singla, 2008; Kolapo, Ayeni and Oke, 2012; Nawaz et al., 2012; Poudel, 2012; Tabari, Ahmadi and Emami, 2013). All these studies have identified a significant negative relationship between non-performing loan ratio and performance of banks.

Besides above, this study results are in line with the findings of certain pertinent studies (Das and Ghosh, 2006; Banker, Chang and Lee, 2010; Hsiao et al. 2010; Chortareas, Giradone and Ventouri, 2012; Garza-Garcia, 2012; Jha, Hui and Sun, 2013; Maghyereh and Awartani, 2014) showing the effect of non-performing loans on the technical efficiency in banking sectors of different countries by applying DEA and Tobit regression analysis.

Hence, the statistical findings and above discussion indicate that the better risk management can lead to lower non-performing loans by adequate loan underwriting, monitoring and control of credit risk and consequently improves the performance of banks in Pakistan.

LTD_R: According to the Tobit regression analysis results, a positive and significant relationship between Bank_Perf. and LTD_R has been found ($\beta = .199$, $p = .006$). These results reveal that LTD_R is an influencing factor in determining greater performance of selected Pakistani banks during the period of analysis. These findings support the results of earlier studies (Kolapo, Ayeni and Oke, 2012; Jhamb and Prasad, 2012; Alzorqan, 2014) in which a positive relationship between performance indicators (return on assets and return on equity) and loan to deposit ratio has been reported. Additionally, these statistical results are consistent with the

findings of several pertinent studies (Jha, Hui and Sun, 2013; Lee and Chih, 2013 a,b). Jha, Hui and Sun (2013) have taken loan to deposit ratio as a proxy variable for risk management and have found a significant positive relationship between LTD_R and technical efficiency scores. Similarly, Lee and Chil (2013 a and b) have also used this ratio as a measure of liquidity and have established a statistically significant direct relationship between loan to deposit ratio and efficiency of China's commercial banks.

As the LTD_R has been used as a proxy of risk management in the current study and a direct significant relationship between both variables indicates that the lending practices of banking institutions in terms of quantum of loan disbursed in a particular period aids in boosting the performance of banks in Pakistan.

Risk Management and Performance: The overall findings of the Tobit regression analysis report that the performance of selected Pakistani banks has been affected by the risk management during the period of analysis. Both loan to deposit ratio as well as capital adequacy ratio have proved important predictors of the selected banks performance to the extent of 19.9% and 16.9% respectively. However, a negative and significant relationship of non-performing loan ratio have been reported with the performance and contributes up to 33.3% towards the performance of banks. Therefore, an inference can be drawn that the performance of Pakistani banks is significantly influenced by risk management in the banking industry.

The results of this study endorse the evidence that improved performance of financial institutions is more likely to be related to an effective risk management and vice versa (Cebenoyan and Strahan 2004; Tandellin et al. 2007; Ariffin and Kassim, 2011; Poudel, 2012; Oluwafemi et al. 2013; Maghyereh and Awartani, 2014).

Similarly, these findings are in line with Hsiao et al. (2010), Kao et al. (2011), Jha, Hui and Sun (2013) and Fernando and Nimal (2014) among others, all reporting a significant direct relationship between risk management and performance of banks by utilizing two-stage DEA model. The certain assertion of

financial economics approach, that posits risk management practices as a driving force for shareholder value maximization (Stulz, 1984; Santomero, 1995; Smithson, Smith and Wilford, 1995; Oldfield and Santomero, 1997), is also supported by the current results showing a significant relationship between risk management and performance of banks in Pakistan. Hence, these findings indicate that improved risk management in terms of managing funds, reduction in non-performing loans and maintaining the optimum level of capital adequacy, results in superior performance of banks in Pakistan.

Furthermore, a significant relationship of Bank_Perf with DUMI_PUB and DUMI_PVT has been reported in the Tobit regression analysis. These results show that public banks have contributed positively and are efficient banking institutions. According to State Bank of Pakistan (2013), public banks had the second largest portion in terms of total assets and captured about 15% of market share in terms of deposits during 2005-12. Furthermore, these institutions offer large provision of services to the federal as well as local government in the country (Burki and Niazi, 2010). Similarly, private banks tend to be efficient as showed a statistically significant positive relationship with the performance of banks. The private banks in Pakistan had the largest portions of assets and seized more than 75% of market share in terms of deposits during 2005-12.

6.5 Summary

This chapter conducts DEA and Tobit regression analysis to examine the relationship between risk management and performance. The performance of selected banks is measured through DEA and regressed with the proxy variables of risk management by employing Tobit regression analysis. This chapter reports that all selected risk management variables (loan to deposit ratio, non-performing loan ratio and the capital adequacy ratio) are important predictors of the selected banks performance. The deduction of the current chapter results facilitates this study to achieve the important objective focusing on examining the relationship between the risk management and performance of the selected banks in Pakistan. The overall conclusion of this research study is reported in the next chapter.

Chapter Seven Conclusion

7.1 Introduction

The previous chapters present data analysis and discussion of results to answer the research questions. This chapter intends to summarise the study's findings. It provides a short overview of risk management practices and performance of banks in relation to its aim and objectives. It also shows a brief recap of the conduct of this research and a summary of key findings. The original contributions of the current study in terms of methodological, theoretical and practical contributions are discussed in it. This chapter also highlights the limitations and some ideas for further research. Finally, this chapter ends with describing some concluding considerations.

7.2 Risk Management Practices and Performance of Banks

Risk management in banks has developed into an important concern for both the management of banks as well as their regulatory bodies because of the complexities and dynamism of the business environment (Bunea-Bontas, Lazarica and Petre, 2009; Maghyreh and Awartani, 2014). Over the last two decades, significant developments have been made at the international level in order to improve the risk management practices of financial institutions (Cai and Wheale, 2007; Al-Tamimi, H., 2008; Chortareas, Giradone and Ventouri, 2011). For this purpose, the Basel Committee on Banking Supervision has established an internationally recognised set of principles to cope with the various risks, officially known as the Basel Accords (Basel I, Basel II and Basel III). Central banks and

other regulators of different countries have taken rigorous steps including the implementation of Basel Accords in their respective banking sectors to strengthen their risk management systems (Masood and Fry, 2012).

Similarly, the State Bank of Pakistan (SBP) has imposed the risk management guidelines and directs all the banking institutions in Pakistan to implement the fundamental principles pertaining to risk management without considering their size and complexity. Consequently, all the banking institutions have taken rigorous steps to develop an active risk management system to deal with the major risks such as credit, market, liquidity, and operational risk. Besides these guidelines, all the banks in Pakistan have also been advised to establish an adequate setup for the adoption of the Basel Accord. Hence, the subject of risk management has become crucial for different stakeholders pertaining to the proposal of the SBP; requiring further an adequate risk management framework to achieve the business objectives and the successful continuity within Pakistani banks.

However, a limited number of studies are available on the risk management in the local context (Shafiq and Nasr, 2010; Khalid and Amjad, 2012; Nazir, Daniel and Nawaz, 2012; Shafique, Hussain and Hassan, 2013) and have a limited focus on the risk management practices of banks in Pakistan (see Section 2.8). Therefore, a detailed research work has been conducted to explain the risk management practices and their impact on the performance of Pakistani banks. This study has focused on two specific aspects of banking risk management in Pakistan. Firstly, this study has undertaken an in-depth exploration of the risk management practices of Pakistani banks. Secondly, this research has examined the influence of risk management on the performance of local banks. By keeping the aim of this study in view, concentrating to examine the risk management policies in practice of Pakistani banks and their impact on the banking performance, this study has addressed following objectives:

- To identify, understand and draw a chain of causality between risk management policies in practice of banks and different types of risk in Pakistan
- To assess the level of risk understanding within the staff of banks in Pakistan

- To assess the level of risk identification, risk assessment and analysis, risk monitoring and controlling within the banks in Pakistan
- To examine the important aspects of risk management practices of banks in Pakistan.
- To investigate the relationship between the risk management and performance of the banks in Pakistan

In order to attain the study objectives, this research has developed a multi-strategy research design in which the qualitative research has a supplementary role to facilitate the quantitative research (see Section 3.5.1). Therefore, this study has adopted mainly the quantitative research methods. However, a part of this research has been conducted by using the qualitative method to address the particular research objective accordingly. A brief overview of the different techniques and procedures for data collection and analysis is presented in the next section.

7.3 Conduct of Research

This study has examined the risk management practices and their impact on the performance by taking three different categories of Pakistani banks covering public banks, private banks and foreign banks. In order to achieve the study objectives, both primary as well as secondary data have been collected.

This research has collected primary data from the managers of diverse departments in Pakistani banks by using two instruments such as from interviews and survey questionnaires. This study has collected data from the managers of banks from diverse departments owing to their involvement in risk identification, assessment, monitoring and controlling activities those form the foundations of risk management in banks. Moreover, this study has also made use of secondary data obtained from multiple sources such as the Banking Statistics of Pakistan published by the SBP as well as from the annual reports of selected Pakistani banks.

This study has been conducted in three phases. In first phase, this research has used a systems thinking approach and developed a qualitative system dynamics model (Causal Loop Diagram) in order to diagnose and draw causal relationships between risk management policies in practice and different types of risks in

Pakistani banks. This phase has established the fact that the risk management divisions of banks in Pakistan have adopted a wide range of policies and techniques to deal with different kinds of risks according to the guidelines of the SBP (see Section 4.5). The deduction of this part has facilitated in gaining a deeper and more specific understanding of the risk management practices of banks in Pakistan which is followed up by quantitative research in subsequent phases of this research.

In second phase, this study has collected and analysed questionnaire data to assess the different aspects of risk management practices of Pakistani banks. This phase has helped the researcher to answer specific research questions investigating the level of risk understanding, effectiveness of risk identification, risk assessment and analysis and risk monitoring and controlling practices of selected banks in Pakistan (see Section 5.3.1). Furthermore, this phase has helped this study to test the particular hypotheses to examine the important aspects of risk management practices in Pakistani banks (see Section 5.4).

Finally, this research has investigated the relationship between risk management and the performance of selected banks in Pakistan in third phase. For this purpose, this study has implemented two stages data analyses (see Chapter Six). The results of this phase have helped this study to address the particular research objective concentrating on assessing the relationship between risk management and the performance of banks in Pakistan.

7.4 Summary of Key Findings

This study has been undertaken to address some important research gaps regarding risk management and performance of banks (see Section 2.8). In doing so, a full dedicated study has been conducted in the local context that provides a more holistic view of the risk management practices of Pakistani banks in terms of a Causal Loop Diagram (CLD) and presented in Chapter Four (see Figure 4.16). The results of this study also reveal some key aspects to improve the overall risk management practices of banks in Pakistan. Additionally, it has also employed the quantitative data analysis to examine the impact of risk management on the performance of local banks and provides valuable empirical evidences in this

regard. A brief summary of some important findings of this study is reported in the following sub-sections.

7.4.1 Qualitative System Dynamics Model of the Risk Management System of Pakistani Banks

This study has developed a qualitative system dynamic model (Figure 4.16) to document the risk management systems of banks in Pakistan. This qualitative system dynamic model delivers an extensive range of potentially joint dependencies of different risk variables and loops which capture the behaviour of the overall risk management systems of targeted banks in Pakistan. This CLD indicates that the Pakistani banks face diverse kinds of risks such as operational risk, credit risk, reputation risk, liquidity risk, market risk, interest rate risk, legal and regulatory risk and foreign exchange risk from internal as well as external business environments. These findings are further supported by the questionnaire data analysis (see Section 5.3.2), where similar types of risks have been identified in the local context.

This study has identified that the risk management divisions of local banks formulate diverse range of strategies according to the nature and type of particular risk. The system dynamic model has indicated that the operational risk arises from different sources in the Pakistani banks including: from the system failures caused by unexpected external events; from frauds caused by poor supervision; and people failures caused by individuals' incompetence. In order to minimize system failures and to reduce the operational risk in banks, the risk management divisions of Pakistani banks make investments in advanced technology projects, develop contingency plans, provide training to their staff and improve the supervision and monitoring. Similarly, the local banks also conduct credit risk analysis aiming to reduce the credit risk. Likewise, the risk management departments use different derivative and hedging techniques to deal with the market, foreign exchange and interest rate risk in banking operations. All these policies and procedures for managing different kinds of risks are required and aligned with the SBP risk management guidelines for the local banks. The adoption of such risk management practices under the recommendations of the SBP supports the homogeneity assumption of institutional theory (DiMaggio and Powell, 1983) and have been

endorsed further by applying quantitative research on the second phases of analysis (see Chapter Four).

The development of a qualitative system dynamics model (CLD) has assisted the progress of this research in order to achieve the first objective, concentrating to identify, understand and draw a chain of causality between the risk management policies in practice of banks and the different types of risks in Pakistan, in an effectual manner.

7.4.2 Different Aspects of Risk Management in Pakistani Banks

Based on the descriptive and analytical analyses results of the questionnaire data, this study has identified fifteen different types of risks (see Table 5.11). This research has further revealed the credit risk, operational risk, foreign exchange risk, legal and regulatory risk and liquidity risk as the important types of risks in Pakistan banking institutions (see Table 5.12). This study has ascertained that the persons who manage or take risks have common understanding of various risks and risk management across the selected Pakistani banks. The results of this research have provided empirical evidence that the targeted banks are generally good in risk identification, risk assessment and analysis, risk monitoring and controlling and managing important types of risks such as credit risk, liquidity risk, market risk and operational risk. Furthermore, this study has identified different common techniques and methods used by these banks in order to identify, assess, measure, monitor and control risks and have been reported in Chapter Five (see Figure 5.1).

The Pearson correlation and Ordinary Least Square regression analysis results have showed a positive significant relationship between risk understanding and risk management practices in selected Pakistani banks. These results confirms that proper understanding of different risks and risk management by employees of banks tends to add value in effective risk management perspectives particularly in dealing with different aspects of various risks; inherent and exposed in the banking operations in Pakistan.

Similarly, this research also acknowledges that an active mechanism of risk identification is key aspect to improve the effectiveness of the risk management

practices of banks in Pakistan and has found a positive direct relationship of risk identification with the risk management practices during questionnaire data analysis. Furthermore, a positive significant relationship has been identified between the risk assessment and analysis and the risk management practices that highlights the risk assessment and analysis as an influential aspect of the risk management practices in local banks. Considering this fact, the Pakistani banks can improve the risk management practices by giving more importance and attention on risk assessment and analysis. This study also confirms a significant positive relationship between the risk monitoring and controlling and the risk management practices. These results reveal that an improvement in the risk monitoring and controlling increases the effectiveness of the risk management practices of banks in Pakistan.

Likewise, this research also establishes that the overall effectiveness of the risk management practices of banks in Pakistan is strongly influenced by the managing credit risk based on the empirical data analysis. This thesis unveils a positive relationship between the managing market risk and the risk management practices. These results indicate that the managing liquidity risk is also another valuable aspect to improve the usefulness of the risk management practices of banks in Pakistan. Furthermore, a significant direct relationship of managing liquidity risk with the risk management practices has been found and endorses that it is important for the management to give more consideration to deal with the liquidity risk in order to bring improvement in the risk management practices of local banks. This study further confirms the role of managing operational risk in the whole banking risk management approach and has found a positive relationship between the managing operational risk and the risk management practices.

Considering all findings described above, a broad conclusion can be drawn that risk understanding, risk identification, measurement and analysis of risk, risk monitoring and controlling, managing credit risk, managing market risk, managing liquidity risk, managing operational risk are the important aspects of risk management practices in Pakistan. These results support the policy implications of the SBP risk management that all the banking institutions are needed to implement

a comprehensive and rigorous structure of risk management which encompasses all the activities that affect their risk profiles and comprises of identification, assessment, analysis, monitoring and controlling key risks such as credit risk, market risk, liquidity risk and operational risk. Hence, the current findings also support the homogeneity assumption of institutional theory under which regulatory pressures are employed on the banking institutions in shape of direction and obligations (DiMaggio and Powell, 1983; Collier and Woods, 2011; Hudin and Hamid, 2014).

Considering of the results of questionnaire data analysis, these findings tend to achieve the study objectives successfully focusing on: assessing the level of risk understanding within the staff of banks in Pakistan; evaluating the level of risk identification, risk assessment and analysis, risk monitoring and controlling within the banks; and examining the important aspects of risk management practices of banks in Pakistan.

7.4.3 Relationship between Risk Management and Performance in Pakistani Banks

This study has made use of a multiple-source secondary data to examine the relationship between risk management and performance of selected banks by applying DEA and Tobit regression analysis. The DEA results indicate that the selected public banks have performed better during 2005 to 2012 than other category of banks (private and foreign) except in 2010 in which the private banks have showed a superior performance in terms of average technical efficiency score than the public and foreign banks.

This study has provided empirical evidences to establish that the risk management has significant relationships with the performance of banks. This research work confirms that all the proxy variables for managing operational risk, managing credit risk and managing liquidity risk are important predictors of the selected banks performance. This research finds that the risk management in banks plays a critical role in their performance and improved risk management in terms of managing funds, decrease in non-performing loans and maintaining the optimum

level of capital adequacy results in superior performance of the banks in Pakistan. This study results further endorse the certain assertion of financial economics approach (Stulz, 1984; Santomero, 1995; Smithson, Smith and Wilford, 1995; Oldfield and Santomero, 1997), in the local context and confirm risk management as an important force to improve the performance of banks and shareholder value maximization. Hence, the findings of secondary data analysis facilitate this research to achieving an important study objective concentrating to investigate the relationship between risk management and performance of the selected banks in Pakistan in an effective and efficient manner.

Furthermore, this study finds a significant relationship between the performance of banks and dummy variables for public banks and private banks. These results indicate that both public as well as private banks have contributed positively and are the efficient banking institutions in Pakistan.

Based on the overall results of this study, a broad conclusion can be drawn that the rationales for risk management practices in Pakistani banking institutions are seen both ways as to meet the SBP regulatory requirements and to improve the performance of banks in order to maximize the value of shareholder wealth.

7.5 Contribution of Research

This research study makes addition to a growing body of literature in several ways and its contributions are grouped into three different categories according to their nature, which are:

- Methodological contributions
- Theoretical contributions
- Practical contributions

7.5.1 Methodological Contributions

The current study is unique in its methodology adopted particularly in the local context; comprising of three important phases namely; the development of Causal Loop Diagram; the assessment of different aspects of risk management practices; finally, probe the link of risk management with banking performance.

In first stage, this study has adopted the systems thinking approach for its proficiency in providing more comprehensive understanding of an important area of banking business (risk management) and in facilitating the achievement of the study aim and objectives. This research has developed and documented a collective understanding in terms of a CLD from the literature that has been further validated through the interviews data analysis results keeping in view its novelty in the local context (see Chapter Four, Section 4.4). In second stage, this study has conducted self-delivery and collection method to collect data and applied different descriptive as well as inferential statistical techniques for analysis in order to examine important aspects of the risk management practices. In third stage, this study has collected secondary data for the duration of 2005-2012 and used two-stage data envelopment analysis to test the relationship between risk management and performance of banks in Pakistan.

Hence, this thesis encompasses with different combination of data collection and analysis procedures provides methodological contributions in the field of banking by conducting a thorough study to investigate some important attributes of risk management in Pakistani banks.

7.5.2 Theoretical Contributions

This study intends to create a new insight of risk management in Pakistani banks and further believes to endorse or extend the existing theoretical literature in the banking field in following ways.

Firstly, this study has examined the relationship of some more aspects (managing credit risk, managing market risk, managing liquidity risk and managing operational risk) in the local context with risk management practices; consequently, this research presents a more holistic view of the risk management practices of banks in Pakistan in comparison of previous studies (Shafiq and Nasr, 2010; Khalid and Amjad, 2012; and Nazir, Daniel and Nawaz, 2012). Hence, this research contributes to the existing theoretical literature by examining the relationships of some additional aspects within the risk management practices specifically in local banks.

Secondly, this study has provided broader views on the banking risk management practices in Pakistan, by analysing the data collected from different departments of Pakistani banks in comparison to certain previous studies (Shafiq and Nasr, 2010; Khalid and Amjad, 2012; and Nazir, Daniel and Nawaz, 2012) which focused their studies only on data obtained from risk management departments.

Thirdly, this study has also underpinned the homogeneity assumption of institutional theory (DiMaggio and Powell, 1983) by focusing on the risk management policies in practices in Pakistani banks for the first time; hence makes a significant contribution to the available literature.

Finally, an important contribution of this study is related to the fact that it explores the relationship between risk management and performance of banks in Pakistan to test certain propositions of the financial economic approach observing risk management as value enhancing strategy (Stulz, 1984; Santomero, 1995; Smithson, Smith and Wilford, 1995; Oldfield and Santomero, 1997). Considering the important initiatives taken by the local banks to strengthen the risk management system in Pakistan, this research provides an opportunity to make an addition in the current literature by validating the significant role of risk management in generating sustainable profitability in order to maximize shareholders' value in Pakistani banks.

7.5.3 Practical Contributions

This study not only offers methodological and theoretical contributions but provides important practical contributions also. This thesis covers a contemporary area of research which is very critical to the success of banking institutions and is crucial to regulatory bodies (Maghyereh and Awartani, 2014).

The present study stands as the first full dedicated study in the local context which purely focuses on this important research area, with a keen interest in different aspects of risk management in Pakistani banks. This study mainly concentrates on the Pakistan banking environment; however its findings will have important implications at international level too due to the augmented boundary for data collection and analysis. Along with considering the fact that Basel Accords

(recognized as best international practices) has been reviewed as an important part of the theoretical framework for the current research.

In addition, the CLD (Figure 4.16) intends to contribute towards a broader understanding of risk management in Pakistani banks where these institutions are under a lot of regulatory pressure to formulate effective risk management frameworks to demonstrate good corporate governance (Shafiq and Nasr, 2010; Masood and Fry, 2012). Therefore, the current qualitative system dynamics model is believed to be useful for scholars, policy makers, managers and planners in capturing the behaviour and improving the understanding of the risk management systems of Pakistani banks holistically.

This study expects to provide support to the management of Pakistani banking institutions to formulate effective risk management frameworks. The current research offers valuable information in shape of CLD and by identifying the key aspects of risk management practices which aim to facilitate the Pakistani banking institutions. Furthermore, this study intends to support the local regulatory bodies in order to develop or review of their risk management supervisory programs.

This study provides valuable information to different stakeholders of the banking sector in Pakistan on the key role of risk management in the continuity and success of the local banks. The current study suggests that an improved risk management in terms of better management of funds, reduction in non-performing loans and maintaining the optimum level of capital adequacy is helpful to increase the performance of banks in Pakistan.

In conclusion, this research work has a great importance as this thesis not only contributes towards the existing academic literature in the field of banking but also offers some valuable practical contributions to this crucial area.

7.6 Limitations of Research

Though the current research has revealed meaningful findings in order to add valuable contributions towards the available banking literature by successfully

testing the hypotheses, answering the research questions; hence, accomplishing the aim and objectives of the study. However, no research work is considered to be completed without explaining its limitations. Similarly, the current study has also faced some limitations as well as challenges during the course of its execution and are discussed below.

The existing literature reflects a combination of CLD and Stock flow diagram that has been used in system dynamics methodology (Sterman, 2000; Campbell and Avison, 2004; Wuryandani, 2011). However, the use of systems approaches in this study has been limited to the development of a qualitative system dynamic model and used to document and understand the interrelationships between the variables of the risk management systems of banks in Pakistan. Therefore, the current study has only adopted qualitative approach and another technique of system dynamics methodology that is stock flow diagram has not been applied.

This research has limited its questionnaire analysis only to assess the relationship between risk management practices and different aspects of risk management such as risk understanding, risk identification, risk assessment and analysis, risk monitoring and controlling, managing credit risk, managing market risk, managing liquidity risk and managing operational risk. However, some other aspects such as management quality, board size, and board composition could have been investigated as well.

The population of this study has comprised of and limited to three types of banking categories such as public banks, private banks and foreign banks in Pakistan. Whereas, some other categories such as specialized banks and micro finance banks have not been covered being out of the scope of this research. For that reason, the results of current study may not be generalized on these two categories of banks in Pakistan. Furthermore, all the interviews and questionnaires data were limited to the collection from the banks operating in three major cities of Pakistan, namely: Karachi, Lahore and Faisalabad. Nevertheless, this study was able to obtain data from the majority of the banking staff working at head offices as well as regional offices of the selected banks in the above mentioned cities.

Another shortcoming of the current research regarding secondary data is linked to the number of observations comprised of the data sample, owing to comparatively small number and limited history of Pakistani banking institutions. Furthermore, this research is also subject to limitations related to examine the relationship between risk management and performance of selected banks; this study has employed a non-parametric method (DEA) to measure the performance of banks, as opposed to other performance measurement techniques which have also been used in existing studies (see Chapter Two, Section 2.7.1).

Finally, the risk management in targeted banks has been estimated in terms of proxy variables such as loan to deposit ratio, non-performing loan ratio and capital adequacy ratio only in order to deduce the relationship between risk management and performance of selected banks in Pakistan. Some other potential proxy variables such as capital asset ratio, cost of bad and doubt loans, current ratio and loan to asset ratio could have been examined as well.

7.7 Recommendations of Future Prospects

The limitations of this research report that several areas of risk management in banks have been partially addressed during the course of this research and suggest some possible extensions for the future research. There is an opportunity for future research to extend this study by translating the CLDs to stock flow diagrams further through simulation, which can facilitate the management in the formulation of more effective and reliable risk management policies, procedures and systems.

As described in limitations, the current study has undertaken three types of banks (public, private and foreign banks) in Pakistan. However, the risk management is equally important and influences on the other categories of financial institutions such as specialized banks and micro finance banks regardless of their size and nature of banking operations. Therefore, a research work similar in nature will be helpful in determining key aspects of risk management and its significance towards the performance of these organizations in developing countries. Besides, this study has collected data from 20 banks out of 34 banks in three cities of

Pakistan; future research can be extended to enlarge the sample and covering more cities to come up with more comprehensive results.

Since this study has examined the relationship of certain aspects with the risk management practices but still several potential aspects including management quality, board size, and board composition have not been studied. Therefore, a valued prospect for future research is available to explore further these aspects such as management quality, board size, and board composition in order to improve the risk management practices of banks in Pakistan.

This study has used a non-parametric method (DEA) to measure the performance of banks among different performance measurement techniques including parametric methods and ratio analysis. Hence, a potential scope for future research is available to measure the relationship between risk management and performance of banks by employing other performance measurement methods in order to support and validate the results of this study.

Furthermore, the Tobit regression analysis suggests that the other influencing factors have not been examined in the current study and highlighted a substantial contribution of about 58% to the performance of selected banks (see Table 6.2). Hence, future research can be undertaken to explore such valuable factors including capital asset ratio, cost of bad and doubt loans, current ratio and loan to asset ratio in order to enhance the risk management and to improve the performance of banking institutions.

Last but not the least, the current study might be extended in future by including the banks of other countries or conducting a comparison between developing and advanced countries in order to come up with more diversified results. It can also be useful to understand the risk management systems of banks in different countries. By using similar methodology, interesting and diverse results could be expected owing to some specific elements such as economic conditions, regulations and competition in the market.

7.8 Final Conclusion

This study focuses on examining the risk management practices and their relationship with the performance of selected banks in Pakistan. These results indicate that an effective risk management framework of a bank in Pakistan depends upon a number of important factors. The effectiveness of the risk management practices significantly depends upon the proper understanding of risk and risk management among bank employees in Pakistan. Furthermore, it is very important for banks to formulate an active risk management process to identify, measure, monitor and control different risks including credit, market, liquidity and operational and also hold capital against these risks. By considering the SBP guidelines, formation of a comprehensive risk management system in Pakistani banks is not only a useful exercise to meet the regulatory requirements but an effective practice to improve the performance of banking institutions also. Consequently, the results of this research study evidently support the assertion that risk management significantly contributes towards the performance of selected banks in Pakistan.

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Appendices

Appendix One: List of the study population banks

Serial No.	Bank Name
Public Sector Banks	
01	First Women Bank Limited
02	National Bank of Pakistan
03	Sindh Bank Limited
04	The Bank of Khyber
05	The Bank of Punjab
Private Banks	
06	Allied Bank Limited
07	Askari Bank Limited
08	Bank Alfalah Limited
09	Bank Al Habib Limited
10	Faysal Bank Limited
11	Habib Bank Limited
12	Habib Metropolitan Bank Limited
13	JS Bank Limited
14	KASB Bank Limited
15	MCB Bank Limited
16	NIB Bank Limited
17	AlBaraka Bank (Pakistan) Limited
18	BankIslami Pakistan Limited
19	Burj Bank Limited
20	Dubai Islamic Bank Pakistan Limited
21	Meezan Bank Limited
22	SAMBA Bank Limited
23	SILKBANK Limited
24	Soneri Bank Limited
25	Standard Chartered Bank (Pakistan) Limited
26	Summit Bank Limited
27	United Bank Limited
Foreign Banks	
28	Barclays Bank PLC
29	Citibank N.A. - Pakistan Operations
30	Deutsche Bank AG - Pakistan Operations
31	HSBC Bank Middle East Limited - Pakistan Operations
32	Industrial and Commercial Bank of China Limited – Pakistan Branches
33	HSBC Bank Oman S.A.O.G - Pakistan Operations
34	The Bank of Tokyo-Mitsubishi UFJ Limited - Pakistan Operations

Source: The State Bank of Pakistan, 2013, p.246

Appendix Two: Consent form for survey research

Research Title: Risk Management in Banks: Determination of Practices and Relationship with Performance

Researcher: Muhammad Ishtiaq, PhD Student, Business and Management Research Institute, University of Bedfordshire, United Kingdom

Contact Details: muhammad.ishtiaq@beds.ac.uk

Research Purpose: This study intends to empirically examine the risk management practices and their relationship with the performance of banks in Pakistan. This study is based on some conceptual aspects of different risk management practices adopted by the local banks and to what extent these efforts are successful in achieving their objectives in Pakistan.

What is required in participation?

I shall need your participation in the questionnaire survey. If you are willing then please complete this form and return it.

Your participation in this survey is voluntary and you can refuse to give answer of any question or even to withdraw your involvement at any point from this research project. Your all responses to this survey will be kept strictly confidential and will only be attributed to you with your prior permission. All the information will be reported in a systematic way as to make direct association with yourself impossible.

Confidentiality will also be maintained by coding and storing all the questionnaires in such a way that it will be impossible to identify them directly with any individual. For this purpose, these questionnaires will be organized by numbers rather than by names.

Consent: (If you want to participate, please tick on the appropriate boxes below)

I have read all the above information

I am willing to participate in this research study

Participant's Signature: _____ Date: _____

Dear Sir/Madam,

THE RESEARCH SURVEY ON THE RISK MANAGEMENT PRACTICES OF BANKS IN PAKISTAN

I am working as a regular faculty member at GC University, Faisalabad. Moreover, I am doing my PhD in Banking and Finance at University of Bedfordshire in United Kingdom and my area of research is to study the risk management practices and their relationship with the performance of banks in Pakistan

Risk management is a keystone of sensible banking and its importance is increasing over the time. The issue of risk management in the banking institutions is a topic of interest not only to the industry players, but also the policy makers. This study will help different stakeholders of banks to understand the importance and effectiveness of risk management.

This ground breaking research in Pakistani banking sector will be conducted by adopting questionnaire survey technique. Your esteemed organization have been short listed owing to its size, performance, credibility and qualified human resource. We would like to request you to fill the enclosed questionnaire in order to accomplish our goal of data collection.

I would appreciate your point of view regarding the risk management applications at your bank. Your specific response to the questions here will facilitate me in completing my project. I assure you that all responses to this survey will be kept **STRICTLY CONFIDENTIAL** and used for academic research purpose only.

I thank you in advance for your valuable time and participation in this research. Your valuable contribution to this study will open new horizons for the development of banking sector in Pakistan.

For further queries, please do not hesitate to contact the researcher or the director of studies.

Kind regards,

Muhammad Ishtiaq

Contacts:

Mr. Muhammad Ishtiaq(muhammad.ishtiaq@beds.ac.uk) + 44 7466822911
(Researcher)

Professor Michael Kennedy (michael.kennedy@beds.ac.uk) (Director of Studies)
University of Bedfordshire, United Kingdom.

QUESTIONNAIRE

Part I

- The purpose of this section is to obtain general information related to your bank and yourself as an anonymous participant in this study

Bank Name: _____

Demographics:

Gender: _____ **Age:** _____

Work Experience (YY: MM) _____

Part II

- The second section has been designed to obtain information regarding various aspects of risk management practices.
- Kindly read the questions carefully and tick (✓) the selected choice clearly.
- Please be honest in your responses as these are important and valuable for the study.

Sr. #	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<u>Risk Understanding:</u>						
01	There is a common understanding of risk management across the bank	()	()	()	()	()
02	There is a proper system for understanding various risks implemented in the bank	()	()	()	()	()
03	Responsibility for risk management is clearly set out and understood throughout the bank	()	()	()	()	()
04	Accountability for risk management is clearly set out and understood throughout the bank	()	()	()	()	()
<u>Risk Identification:</u>						
05	The bank carries out a compressive and systematic identification of its risks relating to each of its declared aims and objectives	()	()	()	()	()
06	The bank finds it difficult to prioritize its main risks	()	()	()	()	()
07	Changes in risks are recognized and identified with the bank's roles and responsibilities	()	()	()	()	()
08	The bank is aware of the strengths and weaknesses of the risk management systems of other banks	()	()	()	()	()
09	The bank has developed and applied procedures for the systematic identification of opportunities	()	()	()	()	()
10	It is crucial for bank to apply the most sophisticated techniques for risk identification	()	()	()	()	()
<u>Risk Assessment and Analysis:</u>						
11	This bank assesses the likelihood of occurring risks	()	()	()	()	()
12	This bank's risks are assessed by using quantitative analysis methods	()	()	()	()	()
13	This bank's risks are assessed by using qualitative analysis methods(e.g. high, moderate, low)	()	()	()	()	()

14	The bank analyses and evaluates opportunities it has to achieve objectives	()	()	()	()	()
15	The bank's response to analysed risks includes an assessment of the costs and benefits of addressing risks	()	()	()	()	()
16	The bank's response to analysed risks includes prioritizing of risks and selecting those that need active management	()	()	()	()	()
17	The bank's response to analysed risks includes prioritizing risk treatments where there are resource constraints on risk treatment implementation	()	()	()	()	()
18	The bank undertakes a credit worthiness analysis before granting credit or executing transactions	()	()	()	()	()
19	Before granting capital or credit by bank undertakes specific analysis including the applicant's character, capacity, collateral and conditions	()	()	()	()	()
20	The bank has a computer based support system to estimate the earnings and risk management variability	()	()	()	()	()
21	The bank relies on the output of quantitative data with human judgment	()	()	()	()	()
<u>Risk Monitoring and Controlling:</u>						
22	Monitoring the effectiveness of risk management is an integral part of routine management reporting	()	()	()	()	()
23	The level of control by the bank is appropriate for the risks that it faces	()	()	()	()	()
24	The bank has adopted a standard reporting system about the risk management from bottom to top management	()	()	()	()	()
25	Reporting and communication processes within the bank support the effective management of risk	()	()	()	()	()
26	The bank's response to risk includes an evaluation of the effectiveness of the existing controls and risk management responses	()	()	()	()	()
27	The bank's response to risk includes action plans in implementation decisions about identified risk	()	()	()	()	()
28	The bank effectively monitors the credit limit of everyone counterparty	()	()	()	()	()
29	The bank reviews the country ratings on a regular basis for its international financing and investment	()	()	()	()	()
30	The borrower's business performance is regularly observed by the bank following the extension of financing	()	()	()	()	()

<u>Managing Credit Risk:</u>						
31	The credit risk strategy set by the Board of Directors are effectively transformed and communicated within the bank in the shape of policies and procedures by the top management	()	()	()	()	()
32	The bank has an effective risk management framework (infrastructure, process and policies) in place for managing credit risk	()	()	()	()	()
33	The bank has a credit risk rating framework across all type of credit activities	()	()	()	()	()
34	The bank monitors quality of the credit portfolio on day-to-day basis and takes remedial measures as and when any deterioration occurs	()	()	()	()	()
35	The bank regularly prepares periodic report of credit risk	()	()	()	()	()
<u>Managing Market Risk:</u>						
36	The market risk strategy set by the Board of Directors are effectively transformed and communicated within the bank in the shape of policies and procedures by the top management	()	()	()	()	()
37	The bank has an effective risk management framework (infrastructure, process and policies) in place for managing market risk	()	()	()	()	()
38	The bank's overall market risk exposure is maintained at prudent levels and consistent with the available capital	()	()	()	()	()
39	The bank adopts multiple risk measurement methodologies to capture market risk in various business activities	()	()	()	()	()
40	The bank regularly prepares periodic report of market risk	()	()	()	()	()
<u>Managing Liquidity Risk:</u>						
41	There is a proper set of rules and guidelines, for managing liquidity risk, available in the bank	()	()	()	()	()
42	The liquidity risk strategy set by the Board of Directors are effectively transformed and communicated within the bank in the shape of policies and procedures by the top management	()	()	()	()	()

43	The bank has an effective risk management framework (infrastructure, process and policies) in place for managing liquidity risk	()	()	()	()	()
44	The bank regularly prepares periodic report of liquidity risk	()	()	()	()	()
45	Applications of liquidity risk management techniques reduce costs or expected losses	()	()	()	()	()
<u>Managing Operational Risk:</u>						
46	There is a proper set of rules and guidelines, for managing operational risk, available in the bank	()	()	()	()	()
47	Board and executive management of the bank recognizes, understands and has defined all categories of operational risk applicable to their institution	()	()	()	()	()
48	Senior management of the bank transforms the strategic direction given by the board through operational risk management policy	()	()	()	()	()
49	The Bank has contingency and business continuity plans to ensure its ability to operate as going concern and minimize losses in the event of severe business disruption	()	()	()	()	()
50	The bank regularly prepares periodic report of operational risk	()	()	()	()	()
<u>Risk Management Practices:</u>						
51	The bank's executive management regularly reviews the organization's performance in managing its business risks	()	()	()	()	()
52	The bank has highly effective continuous review/feedback on risk management strategies and performance	()	()	()	()	()
53	The bank's risk management procedures and processes are documented and provide guidance to staff about managing risks	()	()	()	()	()
54	The bank's policy encourages training programs in the area risk management	()	()	()	()	()
55	This bank emphasizes the recruitment of highly qualified people in risk management	()	()	()	()	()
56	Efficient risk management is one of the bank's objectives	()	()	()	()	()
57	It is too dangerous to concentrate bank's funds in one specific sector of the economy	()	()	()	()	()

58	The application of Basel capital Accord has improved the risk management effectiveness in the bank	()	()	()	()	()
59	The bank's capital is adequate if the ratio of capital to total risk-weighted assets is equal to the capital adequacy ratio set by the State Bank of Pakistan	()	()	()	()	()
60	Overall, the level of risk management practices of the bank is considered to be excellent	()	()	()	()	()

Part III

➤ The third section is anticipated to obtain information regarding the various risks, methods and techniques used by the banks to manage them

61. Please highlight the various types of risks are currently faced by the bank.

Sr.#	Risk Type	Yes	No	Sr.#	Risk Type	Yes	No
a.	Counterparty Risk			j.	Liquidity Risk		
b.	Country (political) Risk			k.	Market Risk		
c.	Credit Risk			l.	Operational Risk		
d.	Off-balance Sheet Risk			m.	Reputation Risk		
e.	Equity/Commodity Price Risk			n.	Strategic Risk		
f.	Foreign-Exchange Risk			o.	Technology Risk		
g.	Solvency Risk			Any other (Please Specify)			
h.	Interest Rate Risk						
i.	Legal and Regulatory Risk						

62. Please position the top five risks in respect of bank's risk exposure from the above table.

I. _____ II. _____

III. _____ IV. _____

V. _____

63. Please indicate the important method(s) used for risk identification by the bank

Sr.#	Method	Yes	No
a.	Inspection by the Bank Risk Staff		
b.	Audit		
c.	Risk Survey		
d.	Process Analysis		
e.	SWOT Analysis		
f.	Benchmarking		
g.	Scenario Analysis		
h.	Internal Communication (Periodical Reports and Risk Reports		
Any other (Please Specify)			

64. Please point out the important method(s) used for measurement and analysis of risk by the bank.

Sr.#	Method	Yes	No
a.	Statistical Models for Risk Measurement		
b.	Duration (Average of Life) Analysis		
c.	Gap Analysis		
d.	Credit Worthiness Analysis		
e.	Maturity Matching Analysis		
f.	Sensitivity Analysis		
g.	Financial Statement Analysis		
Any other (Please Specify)			

65. Please indicate the important techniques used for risk monitoring and controlling by the bank.

Sr.#	Technique	Yes	No
a.	Risk Reporting		
b.	Establishing Standards (e.g. Credit Limits)		
c.	Adoption of Advanced Technology		
d.	Contingency Plans		
e.	Assets Diversification		
f.	Derivatives (i.e. Forwards, Futures, Options and Swaps)		
g.	Hedging		
h.	Staff Supervision and Training		
i.	Collateral Arrangement		
j.	Deposit Collections		
k.	Contracts		
l.	Security Deposits		
m.	On balance sheet netting		
n.	Reserves for Loan loss		
Any other (Please Specify)			

66. Please indicate the important reports used for risk reporting by the bank

Sr.#	Report	Yes	No
a.	Report for Capital at Risk		
b.	Report for Credit Risk		
c.	Report for Market Risk		
d.	Report for Interest Rate Risk		
e.	Report for Liquidity Risk		
f.	Report for Foreign Exchange Risk		
g.	Report for Operational Risk		
h.	Report for Country Risk		
Any other (Please Specify)			

Thank You for your time and consideration

Appendix Three: Reference letter for data collection



Park Square Luton
Bedfordshire LU1 3JU
United Kingdom
t +44 (0)1234 400400
f +44 (0)1582 743400
www.beds.ac.uk

To whom it may concern

Direct Phone: +44 (0) 1582 743091
E-mail: Michael.Kennedy@beds.ac.uk

Thursday, 18 July 2013

Dear Sir or Madam,

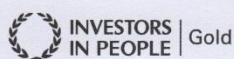
RE: Researcher - Muhammad Ishtiaq (Ref:1025153)

I hereby confirm that Muhammad Ishtiaq is a bona-fide postgraduate Research Student at this university. I am his Director of Studies. I confirm that he is conducting empirical research in order to lay the foundations for his doctoral research thesis.

Yours faithfully

A blue ink handwritten signature of Michael Kennedy.

Michael Kennedy
HoD Accounting and Finance & Acting Department Research Leader
School of Business, University of Bedfordshire
Park Square, Luton, Bedfordshire LU1 3JU



Registered Office
Park Square Luton
Bedfordshire LU1 3JU
England

Vice Chancellor
Professor Les Ebdon CBE

Appendix Four: Interview schedule

Causal Loop Diagram (CLD) of the Risk Management System of Banks in Pakistan

Dear Sir/Madam,

I am working as a regular faculty member at GC University, Faisalabad. Moreover, I am doing my PhD in Banking and Finance at University of Bedfordshire in United Kingdom (UK) and my area of research is to study the risk management practices and their relationship with the performance of banks in Pakistan

Risk management is a keystone of sensible banking and its importance is increasing over the time. The issue of risk management in the banking institutions is a topic of interest not only to the industry players, but also the policy makers. This study will help different stakeholders of banks to understand the impotence and effectiveness of risk management.

I have applied a systems thinking approach and develop a preliminary CLD (attached herewith) to capture and build the behaviour of the risk management system of Pakistani banks in order to:

- understand the actual workings of the risk management system of banks (how the outcomes of this system are made in the circular shape of the cause and effect relationships)
- document the interrelationships between the variables of the risk management system of banks in Pakistan

I am conducting face to face interviews with the managers of risk management departments in order to refine, validate and add more detail in the preliminary CLD. I would be grateful if you would help me and allow me to conduct interviews. Your participation is voluntary and you can refuse to give answer of any question or even to withdraw your involvement at any point of time during the interview. I assure you that all responses to this interview will be kept **STRICTLY CONFIDENTIAL** and used for academic research purpose only.

For further queries, please do not hesitate to contact the researcher or the director of studies.

Consent: If you want to participate, kindly reply my email confirming that

You have read all the above information and is willing to participate in this research study.

Thanks and Kind regards,

Muhammad Ishtiaq

Contacts:

Mr. Muhammad Ishtiaq (muhammad.ishtiaq@beds.ac.uk) + 44 7466822911 (Researcher)

Professor Michael Kennedy (michael.kennedy@beds.ac.uk) (Director of Studies)

University of Bedfordshire, United Kingdom.

Interview Schedule

Date: _____

Interview Start Time: _____

Interview Finish Time: _____

Bank Name / Type: _____

Hello, Dear Sir\Madam, my name is Muhammad Ishtiaq and I am a PhD in student in Banking and Finance at University of Bedfordshire in United Kingdom. As part of the research of my thesis, I am undertaking a study on the risk management practices and their relationship with the performance of banks in Pakistan.

I am thankful to you for agreeing to participate in my research study. Once again I assure you that all responses to this interview will be kept strictly confidential and used for academic research purpose only. I would appreciate your point of view regarding the preliminary CLD and hopeful that it will help me to refine, validate and add more detail in the diagram.

Gender: _____ **Age:** _____

Work Experience (YY: MM)

Overall: _____ **Risk Management:** _____

These questions refer to the CLD the preliminary that I have presented you.

1. Please assess the clarity of the CLD which refers to the extent to which the diagram the clearly communicates the implied theme

(1) Very Poor	(2) Poor	(3) Neutral	(4) Good	(5) Very Good

2. Please assess the logical structure of the diagram which refers to the extent to which relationship of different variables within the CLD are consistent with the system

(1) Very Poor	(2) Poor	(3) Neutral	(4) Good	(5) Very Good

3. Please assess the practical relevance of the diagram which refers to the extent to which the CLD is successful or be effective in the real circumstances

(1) Very Poor	(2) Poor	(3) Neutral	(4) Good	(5) Very Good

4. Please assess the comprehensiveness of the diagram which refers to the extent to which the CLD is covering all the important causal factors of the system

(1) Very Poor	(2) Poor	(3) Neutral	(4) Good	(5) Very Good

5. Please assess the intelligibility of the diagram which refers to the extent to which the CLD has the ability to make complex system intelligible to the common reader

(1) Very Poor	(2) Poor	(3) Neutral	(4) Good	(5) Very Good

6. Please assess the applicability of the diagram which refers to the extent to which the CLD is applicable in banks according to the real world situation

(1) Very Poor	(2) Poor	(3) Neutral	(4) Good	(5) Very Good

7. Please indicate diagram's point of weakness.

8. Please highlight diagram's point of strength.

9. Does this diagram meticulously demonstrate the risk management practices of the banks in Pakistan? Please add any further comments.

(1) Strongly Disagree	(2) Disagree	(3) Neutral	(4) Agree	(5) Strongly Agree

10. Does the CLD represent all the cause and effect relationships between the variables in an appropriate manner? Please add any further comments.

(1) Strongly Disagree	(2) Disagree	(3) Neutral	(4) Agree	(5) Strongly Agree

Appendix Five: Technical Efficiency Scores

The current part of this document has used a non-parametric technique DEA to measure the performance of selected Pakistani banks in terms of efficiency scores (see Section 3.9.2). As mentioned earlier in the section 3.9.1.1, this thesis has adopted the intermediation approach to measure the efficiency scores of the selected Pakistani banks by applying an output oriented VRS model of DEA. This study has used a combination of two inputs and two outputs (Avkiran 1999; Noulas, 2001; Sathye, 2003; Ataulah, Cockerill and Le, 2004; Jaffry et al. 2005; Ataulah and Le, 2006). The inputs are interest expenses (X_1) and non-interest expenses (X_2). However interest income (Y_1) and non-interest income (Y_2) are taken as outputs. Descriptive statistics on the selected inputs and outputs is presented in Table A-1.

Table A-1: Descriptive statistics: inputs and outputs

Variables	Mean	Standard Deviation	Maximum	Minimum
Interest expenses (X_1)	15453963	22444294	146175615	14511
Non-interest expenses (X_2)	279821961	438801011	2160543451	62602
Interest income (Y_1)	37689669	44514206	207654262	90708
Non-interest income (Y_2)	6868335	8448988	44109410	25717
<i>N</i> = 160				

Note: All the calculations are based on Pakistani rupees in thousands

All the output and input variables have been estimated in real terms by utilizing GDP deflator and taking year 2003 as the base year. All the values have been reported in thousands of Pakistani rupees.

DEA measures the efficiency scores of banks through the ratio of weight sum of outputs to weighted sum of inputs (Ataulah, Cockerill and Le, 2004). As discussed in Section 3.9.1, these scores are always between 0 and 1 (Das and Ghosh, 2006; Banker, Chang and Lee, 2010). The score of 1 indicates that the bank is 100 percent efficient, whereas 0 refers to the worst score of efficiency (Miller and Noulas, 1996). This study has used Data Envelopment Analysis Program (DEAP Version 2.1) to estimate the efficiency of the banks. This programme has been developed in 1996 and is involved single simple batch file system where the operator(s) make a data file and a small file containing instructions (Coelli, 2008). The technical efficiency scores of the selected banks for the years 2005-2012 are presented in Table A-2.

According to Table A-2 three banks (NBP, BOP, and MCB), were fully efficient for the year 2005. The most inefficient bank for the year 2005 was DBAG with predicted technical efficiency 0.3770. This inefficient bank could be transformed to a technical efficient bank under VRS if it was able to generate achieved level of output by making use of 62.3 percent less of utilized inputs at present. Four banks (NBP, HBL, MCB and NIB) were fully efficient for the year 2006 and the most inefficient bank for this year was HSBC, with estimated technical efficiency 0.4670. For the year 2007, three banks (NBP, BOP and MCB) were fully efficient and the most inefficient bank for this year was KASB with estimated technical efficiency 0.3740. Two banks (FBL and MBL) were fully efficient for the year 2008. KASB was the most inefficient bank for 2008 with predicted technical efficiency 0.3870.

Similarly, two banks (MCB and DBAG) were fully efficient in the year 2009 and KASB was the most inefficient bank for 2009 with predicted technical efficiency 0.3100. MCB was the only fully efficient bank for both years 2010 and 2011. On the other hand, KASB was the most inefficient bank for both years 2010 and 2011 with predicted technical efficiency 0.2890 and 0.2940 respectively. According to the Table A-2, there are two banks (NBP and HBL) which were fully efficient for the year 2012. The most inefficient bank for the year 2012 was KASB with predicted technical efficiency 0.3110.

Table A-2: Technical efficiency scores

Sr. No.	Bank	2005	2006	2007	2008	2009	2010	2011	2012
Public Banks									
01	National Bank of Pakistan (NBP)	0.9440	1.0000	1.0000	0.8450	0.9210	0.9540	0.9800	1.0000
02	The Bank of Punjab (BOP)	0.8060	0.9090	1.0000	0.9590	0.9590	0.7530	0.9350	0.9510
03	The Bank of Khyber (BOK)	0.6550	0.8030	0.7580	0.4290	0.5050	0.5940	0.7490	0.6390
Private Banks									
04	Habib Bank Limited (HBL)	1.0000	1.0000	0.9530	0.7830	0.8910	0.9040	0.9740	1.0000
05	United Bank Limited (UBL)	0.7640	0.8060	0.8370	0.7600	0.8580	0.7890	0.8700	0.8550
06	Allied Bank Limited (ABL)	0.7910	0.5930	0.6300	0.7110	0.8910	0.8400	0.8770	0.8650
07	MCB Bank Limited (MCB)	1.0000	1.0000	1.0000	0.9770	1.0000	0.9330	1.0000	0.9590
08	Bank Alfalah Limited (BAL)	0.4850	0.6510	0.7020	0.6590	0.6990	0.6830	0.7470	0.7220
09	Askari Bank Limited (AKBL)	0.5840	0.6390	0.7820	0.5880	0.6240	0.7070	0.7630	0.7260
10	Standard Chartered Bank (Pakistan) Limited (SCBPL)	0.8780	0.7490	0.8260	0.5330	0.5640	0.9860	0.6200	0.5900
11	Soneri Bank Limited (SBL)	0.7500	0.8110	0.7480	0.5740	0.6390	0.5880	0.6100	0.5520
12	Bank Al Habib Limited (BAHL)	0.5580	0.5560	0.5470	0.5810	0.7770	0.8350	0.9450	0.9520
13	Faysal Bank Limited (FBL)	0.8840	0.8320	0.7940	1.0000	0.6830	0.5720	0.6180	0.6080
14	Meezan Bank Limited (MBL)	0.5750	0.5270	0.5570	1.0000	0.4660	0.4690	0.5480	0.6030
15	KASB Bank Limited (KASB)	0.6810	0.7870	0.3740	0.3870	0.3100	0.2890	0.2940	0.3110
16	NIB Bank Limited (NIB)	0.7710	1.0000	0.3790	0.7620	0.1830	0.2920	0.3710	0.3840
Foreign Banks									
17	The Bank of Tokyo-Mitsubishi UFJ Limited - Pakistan Operations (BTMU)	1.0000	0.9080	0.9050	0.8820	0.7750	0.7560	0.6780	0.6050
18	Citibank N.A. - Pakistan Operations (CBNA)	0.6300	0.6140	0.6250	0.5320	0.3810	0.3600	0.3740	0.4190
19	Deutsche Bank AG - Pakistan Operations (DBAG)	0.3770	0.5760	0.9860	0.7180	1.0000	1.0000	0.7040	.4700
20	HSBC Bank Middle East Limited - Pakistan Operations (HSBC)	0.4770	0.4670	0.4090	0.4040	0.4190	0.4430	0.4680	0.3650

Note: About 60 % of banks from each banking category (see Appendix One)

A brief summary of the mean efficiency scores of the different categories of banks for the years 2005-2012 is shown in the following Table A-3.

Table A-3: Mean efficiency scores of the different categories of banks

Year	Bank Category			Average
	Public	Private	Foreign	
2005	0.8017	0.7517	0.6210	.7310
2006	0.9040	0.7655	0.6413	.7614
2007	0.9193	0.7022	0.7313	.7406
2008	0.7443	0.7165	0.6340	.7042
2009	0.7950	0.6604	0.6438	.6773
2010	0.7670	0.6836	0.6398	.6874
2011	0.8880	0.7105	0.5560	.7063
2012	0.8633	0.7021	0.4648	.6788

In the Table A-3, the average technical efficiency scores of selected public banks for the year 2005 to 2012 were higher than private and foreign banks. On the other hand, the average technical efficiency scores of selected foreign banks for the year 2005 to 2012 were lower than public and private banks apart from 2007 in which the average technical efficiency scores of private banks were at lower side.

The change in the mean technical efficiency scores of the different banking categories is also reported in Figure A-1.

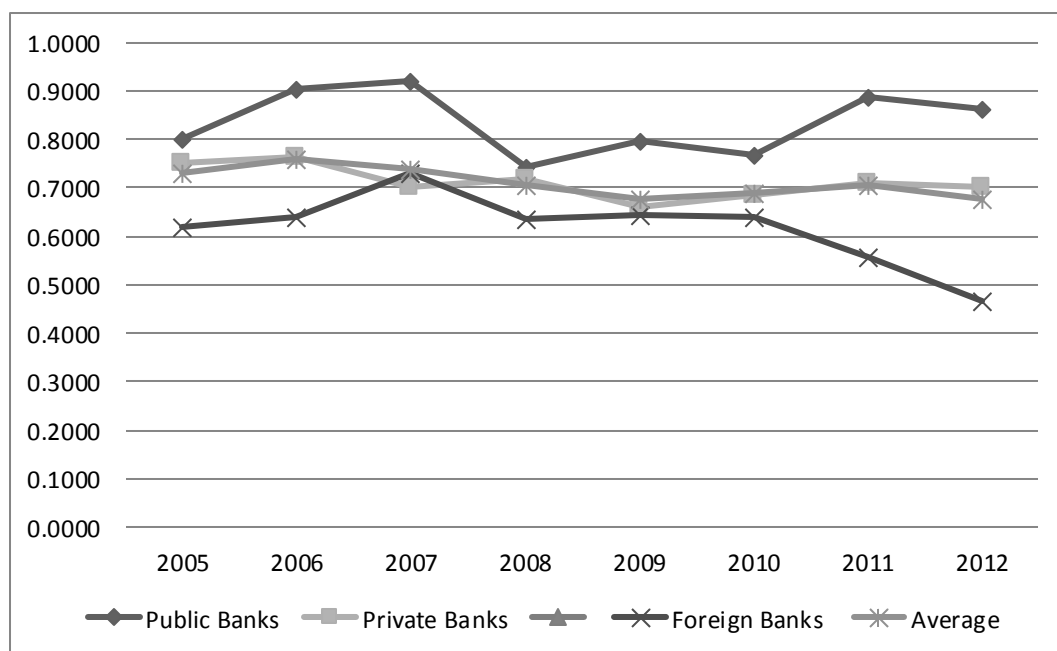


Figure A-1: Mean efficiency scores of the different categories of banks for the year 2005-2012

Figure A-1 reports that the average technical efficiency scores of public banks for the year 2005 to 2012 were higher than the overall average technical efficiency scores of the different categories of banks. On the other hand, the average technical efficiency scores of selected foreign banks for the year 2005 to 2012 were lower than the overall average technical efficiency. However, the average technical efficiency scores of selected private banks for the year 2005 to 2012 were more or less equal to the overall average technical efficiency. The average technical efficiency scores of all the selected banks of different categories under VRS were 73.10 percent, 76.14 percent, 74.06 percent, 70.42 percent, 67.73 percent, 68.74 percent, 70.63 percent, and 67.88 percent for year 2005 to 2012 respectively.