RISKS AND BANK PERFORMANCE IN JORDAN

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ABSTRACT

Issue that revolves around risks and bank performance has always been an essential and critical element for banking sector in Jordan. Indeed, this study examines the impact of risks on bank performance in Jordan. Data of this study were retrieved from the Data Stream and annual reports of listed banks in Amman Stock Exchange (ASE). The sample of study comprises of 15 banks in Jordan and the period of study is confined to 2010-2014 which involved 75 observations. The dependent variable of this study is bank performance which was measured by using ROA while risks' hypotheses variables are operational risk, credit risk, and liquidity risk. The results show that operational risk and credit risk have a negative significant relationship with ROA while liquidity risk is found to have a positive insignificant relationship with ROA. Also, the study discovers that the relationship between firm size and ROA is negatively significant while the relationship between bank age and ROA is found to be positively significant. Finally, the result of the relationship between management change and ROA is positively insignificant. Hence, hypotheses of significant relationship between operational risk and credit risk with bank performance are supported while hypothesis of significant relationship between liquidity risk and bank performance is not. Moreover, the study provides suggestions and recommendations for future research work.

Keywords: Operational Risk, Credit Risk, Liquidity Risk, Return on Assets, Bank Institution.

ABSTRAK

Isu berkaitan risiko dan prestasi bank di Jordon adalah kritikal dan menjadi elemen yang penting untuk dikaji. Oleh itu, kajian ini mengkaji kesan risiko terhadap prestasi bank di Jordon. Data kajian ini diperolehi daripada Data Stream dan laporan tahunan bank yang disenaraikan di Bursa Saham Amman (ASE). Sampel kajian adalah terdiri daripada 15 buah bank di Jordon dan tempoh kajian adalah terhad kepada tahun 2010 sehingga 2014 yang membentuk 75 pemerhatian. Pemboleh ubah bersandar dalam kajian ini adalah prestasi bank yang diukur dengan menggunakan pulangan atas aset (ROA). Manakala pemboleh ubah hipotesis risiko ialah risiko operasi, risiko kredit dan risiko kecairan. Dapatan kajian menunjukkan bahawa risiko operasi dan risiko kredit menpunyai hubungan yang negatif dan signifikan dengan ROA, manakala risiko kecairan didapati mempunyai hubungan yang positif dan tidak signifikan terhadap ROA. Kajian ini juga mendapati bahawa hubungan saiz firma dan ROA adalah negatif dan signifikan, manakala hubungan antara umur bank dan ROA didapati positif dan signifikan. Akhir sekali, terdapat hubungan yang positif dan tidak signifikan antara perubahan pengurusan dengan ROA. Justeru itu, hipotesis kajian menunjukkan bahawa terdapat hubungan yang signifikan antara risiko operasi dan risiko kredit terhadap prestasi bank. Manakala risiko kecairan tidak menunjukkan hubungan yang signifikan terhadap prestasi bank. Tambahan lagi, kajian ini turut menyediakan cadangan untuk penyelidikan pada masa hadapan.

Kata Kunci: Risiko Operasi, Risiko Kredit, Risiko Kecairan, Pulangan atas Aset, Institusi Bank.

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Marwan Hasan Altarawneh
December, 2016

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LIST OF ABBREVIATIONS

Abbreviation	Description of Abbreviation
ROA	Return on Asset
OR	Operational Risk
CR	Credit Risk
LQ	Liquidity Risk
FIRMSIZE	Firm Size
BANKAGE	Bank Age
MCHANG	Management Change
UK	United Kingdom
US	United States
VIF	Variance Inflation Factor
CBJ	Central Bank of Jordan
GDP	Gross Domestic Product
ASE	Amman Stock Exchange
MLR	Multiple Linear Regressions

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

The banking sector is the backbone and major component of the financial system. Thus, it will give impact to the stability of an economy. Any problem and interference that happens in the banking system will give implications for the economic conditions of a country (Akkizidis & Khandelwal, 2007). It means the good economic conditions have resulted from good strategies and good management in handling and controlling any problems that occur around the country.

According to Ayub (2009) the word 'bank' is derived from an Italian word 'banco' which means shelf or bench. It is used to display coins and for trading money. Therefore, a bank is an institution authorized to take deposits from customers for their financial purposes in expanding their short term and long term finance facilities. He also described that the role of a bank is to keep money which is received from ordinary people, organizations, state or surplus units which are in circulation of the economy in a country. Then, the bank will use this pooled money for making advances to others to get a return. The return can be in the form of interests, dividends or others.

Since the bank is a very important component between surplus and deficit units in the economy, it needs to maintain and perform their services efficiently (Iqbal & Molyneux, 2016). Banks with efficient performance can attract many customers in order to maintain the economic condition in the country (Iqbal & Molyneux, 2016).

This chapter briefly gives the overview of the study. This section specifically highlights the background of the study, problem statements, research questions, research objectives, significance and scope of the study, organization of this study and the definition of key terms. Finally, a summary of the chapter.

1.2 Background of the study

The financial system of Jordan is based on the banks, for which the economic activities are financed by the banks, so banks play a great role in the Jordanian economy (Zeitun & Benjelloun, 2013). Jordan has unique banking system because it is following two types of banking systems which included the Islamic banking system and conventional or commercial banking systems. Moreover, the Islamic banking system follows the Shari'a or Islamic laws for the services and financing. There are three Islamic banks working in Jordan which include Jordan Dubai Islamic bank, the Islamic international Arab bank PLC and Jordan Islamic bank for finance and investment. Islamic banks have a main role included interest rate free and riba prohibited banking.

The banking sector of Jordan is controlled by the central bank of Jordan, it handled both Islamic and conventional banks. Jordan established the central bank in 1964, it is an independent institution and it works on the behalf of government for fiscal responsibilities. Moreover, the central bank not only regulates the banks, it also introduces and sponsors new financial institutions (Khamis, 2003).

In 2010, as stated by the central bank, Jordan had 13 commercial banks and 3 Islamic banks which were operational. Furthermore, it stated that the public owned 3 specific credit institutions and 9 foreign banks in Jordan (Central Bank of Jordan, 2010).

Risk plays a vital role in banking institutions. In running their services and financial activities, banks are also exposed to risks. Risk is one of the factors that affect the efficiency of the bank (Van Greuning & Iqbal, 2007). In addition, bank also faces several risks in their operation such as operational risk, credit risk, and liquidity risk. All these risks will affect the efficiency of the banking sector. According to Abu Hussain & Al-Ajmi (2012) the most important risks facing both Islamic and conventional banks are operational risk, credit risk, and liquidity risk.

Berger & DeYoung (1997) concluded that since early 1990s, the study about the efficiency of financial institutions become a crucial component of the banking literature. One of the reasons is because efficiency is the good measurement to measure the bank's success. Banks with good track record and efficient services also become crucial components in order to attract customers to use the bank services. This is because nowadays, the competition among the banks itself has become increasingly intense.

The emergence of financial crisis in 1997 and 2008 intensify the need for strong risk management performance in banking system because the crisis serves as a wake-up call for the banks that any financial transactions they undergo lead to risk exposures which may go further than the normal capital charges, insignificant transaction values as well as other actions thought suitable for preventing unforeseen losses (Grody, Hughes, & Toms, 2010).

In addition, weak risk management can be linked to poor performance, which leads to financial crisis and unexpected collapse of big banks and corporations all over the world. Edwards (2004) noted that failure to follow a proper risk process based on segregation of responsibilities was the core cause of bank collapse. Barings Bank which is the oldest

United Kingdom merchant bank went into a bankruptcy in 1995 when it lost £827 million due to weak speculative investments, mainly from futures contracts (Edwards, 2004; and Masood, Hanim-Tafri, Abdul-Rahman, & Omar, 2011).

Furthermore, other bank distress or crisis which are caused by poor risk management are such as Lehman Brothers Holdings, Inc. filed for liquidation in the united states in 2008 due to excessive risk-taking (Ng, Chong, & Ismail, 2012). For example, Orange County California lost on interest rate derivatives worth $1.5 billion in 1994, DM1.8 billion was lost by Metallgesellschaft on oil futures in 1994, $2.6 billion were lost by Sumitomo Corporation on copper derivatives in 2011, and Allied Irish Bank lost $750 million because of unauthorized trading in 2002. All these can be traced to weak and poor risk practiced by the various financial institutions (Ascarelli, 2002).

Many financial institutions, including banks in Asia, also seriously distressed with the 1997 financial meltdown due to poor risk management (Masood et al., 2011). In, Jordan, the reported loss of 200 million Jordanian dinar (JD) by Petra Bank in 1989 (Asfor, 2003).

Numerous studies have been conducted on the risk within the banking and corporate sector and found that risk is a usual practice of modern banks nowadays (Shafiq & Nasr, 2010). It is found that risk was one of the factors which affect returns on bank's stocks (Cooper, Speh, & Downey, 2011). However, the current increase in global trend on banks collapse and financial crises raises questions as to the effectiveness of the risk management in the banking sector (Abu Hussain & Al-Ajmi, 2012).

A worldwide study conducted by the Economist Intelligence Unit (2010) examines how the financial institutions worldwide intensified their risks in response to the global crisis. The results reported that the financial institution had shown, or projected to show, a methodical renovation of their system of risk management, which include data quality improvement and accessibility, strengthening of risk governance, running to a firm-wide method to hazard management and profound risk incorporation within the consistency of occupation.

Prior studies discussed in the foregoing paragraph signify that there is a lot to be done in embedding a strong risk management culture in the financial sectors (Abu Hussain & Al-Ajmi, 2012). Risk management has been an existing and continuing process which directly depends on modifications of both the internal and the external surroundings of banks (Abu Hussain & Al-Ajmi, 2012). These modifications need stable concentration for identification of risk and its control. Masood et al (2011) noted that effective and efficient management is essential for the sustainability of business growth and continuous profitability and performance of banks.

Abu Hussain & Al-Ajmi (2012) noted that there is still a lot more to be put in place in the processing of embedding a strong risk management culture in the financial institutions. According to their study, there has been a consensus among regulators, practitioners, and academics that effective and efficient risk management must be a priority to bank management since bank as the main source of finance plays a key role in an economy. Banking operation is exposed to numerous risk factors such as market, operational, liquidity and credit risks which have been known as the most important factors which affect banks' performance (Ariffin & Kassim, 2011).

Finally, this study examines the risk in measuring the performance of banks in Jordan. This study uses the risk variables to examine if there is any relationship between risk and Jordanian banks performance.

1.3 Problem Statement

The focus of banking studies has long been the financial institution's profitability (Musyoki & Kadubo, 2011; and Suna & Changb, 2010). Previous findings have clear effects on bank management in which to enhance performance and also for decision and policy makers that are concerned with bank soundness, bank safety, and bank competitiveness (Suna & Changb, 2010). Numerous studies on the association between various kinds of risk and performance have been done in developed countries but very limited have been done in emerging countries, this creates research gap in the study of bank performance as differences in the characteristics of developing countries (i.e. political environment, culture, economy) limit the applicability of the findings of developed countries to the developing countries (Aebi, Sabato, & Schmid, 2012; and Suna & Changb, 2010).

Although there are a lot of studies on risk and performance but the results are inconsistent. For example, studies found a positive relationship and other studies found a negative relationship Thus, the inconsistent results of previous studies create gap in the study of bank performance and there is a need for more studies in order to minimize the inconsistency of the results (Allen, DeLong, & Saunders, 2004). In addition, most studies on risk and performance focused on listed companies and very few were done on banking institutions (Suna & Changb, 2010). Therefore, there is need for more studies on risk to

focus on banking institutions due to the vast growth and importance of banking institutions in the economy.

Moreover, the Jordanian economy had effected by many external and internal shocks such as crisis and regional instability risks such as financial crisis of 1989, the first and second Gulf war's 1990-1991 and 2003 respectively. These crises left negative effects on Jordan, the tourism and foreign investment badly affected by these crises. Besides, during 2011, the political instability in Arab countries on regional basis had started in Iraq, Egypt, Syria, Libya, Tunisia, and Palestine (Zeitun & Benjelloun, 2013).

Although banking sector in Jordan did not have a credit risk management system, which is the most important point of banking business to read and anticipate any future risks that may affect the projects and investments with any banking institution. In Jordanian banks resulted in them not being able to avoid risk and preserve shareholders and customers investments (Grassa, 2012).

To illustrate the practicality of the problem of poor risk management in Jordanian banks, the Housing bank which is the largest bank in the country suffered heavy losses exceeding 70 million dinars in 2012 when subsidiaries in neighboring countries such as Syria collapsed. Banking sources confirmed that the losses resulted from a miscalculation by the bank's board to the repercussions of the Syrian crisis on the branches of the Housing Bank which was established in several cities and provinces in Syria.

As well as, the sources pointed out that the Housing Bank administration ignored the seriousness of the events in the neighboring countries, and was powerless in front read the political landscape and its impact on the economic situation. In spite of the crisis were

not surprised, adding that all indicators were suggesting that Syria will be the next stop of the Arab Spring after the success of the Egyptian revolution, but the weakness of the credit risk management strategy, and slow to absorb the scene exacerbated the bank's losses. Most of the banks in Jordan have subsidiaries in the neighboring countries such as Housing Bank and Cairo Amman Bank, during the war in those countries caused to fall these subsidiaries and affected on the parent's banks in Jordan.

Housing Bank responsible for the heavy loss incurred as a result of the lack of bank and clear mechanisms able to keep track of risks and avoided preserving the money of shareholders and customers (Grassa, 2012).

In addition, empirical results for a study done in Jordan confirmed that the majority of the Jordanian banks are inefficient in managing their inputs (financial resources), thereby signifying high risk (Zeitun & Benjelloun, 2013).

Even though, there are numerous studies about the banking sector performance whereas only a few studies existed on the banking sector performance in developing countries. While, most of the studies conducted in developed countries, for instance, in US banking sector. Therefore, studies have less focus on banks performance in the Middle East countries, thus, there is need to conduct research on banking sector performance in Arab countries, especially in Jordan, due to banks' great importance and strong economy based on banking system (Zeitun & Benjelloun, 2013).

According to Hashem, Ayoub, & Ata (2015), bank's performances in Jordan is weak and facing different challenges and difficulties due to numerous socio-political-economic factors including the political upheavals in the region, rising unemployment rates, and

major dependency on the remittances from the Gulf countries. Tandelilin, Kaaro, & Mahadwartha (2007) stated that the three kinds of risks namely operational risk, credit risk, and liquidity risk are the most important risks in banking. Hence, this study investigates the relationship between three kinds of risk to the performance of banks the three kinds of risks namely (operational risk, credit risk, and liquidity risk), on bank performance in Jordan.

1.4 Research Questions

1. What is the relationship between operational risk and bank performance in Jordan?
2. What is the relationship between credit risk and bank performance in Jordan?
3. What is the relationship between liquidity risk and bank performance in Jordan?

1.5 Research Objectives

The main objective of this study is to investigate the relationship between three type of risk and bank performance in Jordan. The following are the specific objectives of the study:

1. To examine the relationship between operational risk and bank performance in Jordan.
2. To examine the relationship between credit risk and bank performance in Jordan.
3. To examine the relationship between liquidity risk and bank performance in Jordan.

1.6 Significant of the study

This study has great importance and significance due to three reasons; first, this study enhances the understandings about banking sector risk in Jordan, second, this study notifies the banking sector's performance related risk variables and thirdly, among few studies, that study banking sector risk and its effects on bank performance in Jordan.

This study is important to policy-makers because it helps in facilitating the formulation of policies regarding risk in banking, and also to promote effective risk management culture through enforcing the implementation of an effective risk on banks for creation of measures and prevention against any possible threat of financial distress in the economy and enables them to improve their risk practice. The study also contributes to the body of relevant literature and reference materials in the field of risk and its impact on the performance of the banking sector in Jordan.

1.7 Scope of the study

This study mainly emphasized on the banking sector of Jordan. For this purpose, this study considered 15 listed banks of Jordan. This study indicated risk variables related to banks which involved operational risk, credit risk, and liquidity risk. Furthermore, this study measured the performance of banks through the accounting variable which is return on assets (ROA).

1.8 Definition of Key Terms

1.8.1 Operational Risk

Operational risks refers to the possibility that operating expenses might vary significantly from what is expected, in which producing a decline in net income and companies value

(Cabedo & Tirado, 2004; and Fields, Fraser, & Wilkins, 2004) defined further the operational risks as the risks of direct or indirect losses resulting from internal process errors, personnel or systems errors or from external factors (Fields et al., 2004).

1.8.2. Credit Risk

Credit risk simply as the potential that a bank borrower or counterpart will fail to meet its obligations in accordance with agrees terms. The goal of credit risk system is to maximize a bank's risk- adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. The effective management of credit risk is a critical component (Musyoki & Kadubo, 2011).

The most significant risk in the financial institutions is credit risk (Fields et al., 2004; and Shafie, 2005). Credit risk is a risk of default on loans provided by loans (Madura, 2011). This risk shows that a borrower will not able to repay his loan when due. A decrease in the real value of financial institutions may occur if credit risks are high (Cabedo & Tirado, 2004).

1.8.3 Liquidity Risk

Liquidity risk is defined as the variation in net income and market value of equity caused by a financial institution's difficulty in obtaining cash at reasonable cost from either the sale of assets or new borrowings (Fields et al., 2004).

Banks liquidity risk is commonly created when banks involve in investing long-term assets with short-term debt because a bank that is unable to overturn maturing debt may fail in spite of being solvent (Ratnovski, 2013). Rise in uncertainty over bank's solvency

leads to major modern bank liquidity problems in some developed economies, which also played out a primary role in the general funding markets (Goldsmith-Pinkham & Yorulmazer, 2010; Huang & Ratnovski, 2011; and Shin, 2009).

1.8.4 Bank Performance

The bank performance is considered as the dependent variable in this study represents return on asset (ROA). ROA is the most important and popular measurement of bank performance and has been extensively used by other researchers such as (Azhar-Rosly & Afandi-Abu Bakar, 2003; and Kumbirai & Webb, 2010).

ROA is computed by dividing the net income of banks with their total assets. ROA measures bank efficiency in converting bank assets into earnings (Malhotra, Poteau, & Singh, 2011).

1.9 Organization of the study

This study is divided into five chapters. The first chapter introduces the introduction, chapter two, reviews the previous literature on risk variables, chapter three explains the research methodology, chapter four discusses the findings of the study. Finally, chapter five provides the conclusion of the study.

1.10 Chapter Summary

This chapter demonstrated the over review of the study by highlighting the introduction of study, the background of the study, problem statement, research questions and research objectives, significance of this study and later the scope of the study. Besides, this chapter also defined the key terms and in the last, this chapter described the organization of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature and the findings of the previous studies on risk and influence on bank performance. The purpose is to develop the expected relationship between selected risk factors and also frame out the probable impact on the performance of the banks. In addition, this provides the relationship between types of risk, namely operational risk, credit risk, and liquidity risk, as well as the bank performance.

2.2 Definition of Risk

Risk can be viewed as the possibility of something happening and the level of losing, which happens from a movement or activity (Partnerships British Columbia, 2005). Losses can happen directly or indirectly. A case is a point at which an earthquake causes coordinate loss of structures. Meanwhile, indirect losses happen when there is notoriety loss, loss of client's certainty, and increment in operational expenses at the time of recovery. The likelihood of something to happen will impact accomplishing. Systematic and unsystematic risks are the two characterizations of hazard (Powers, Hassan Al-Tamimi, & Mohammed Al-Mazrooei, 2007).

Systematic risk is observed as risk that is essential to the entire market or system. Furthermore, it is viewed as a systemic risk, market risk or un-expansion risk which cannot be dodged because of broadening. Meanwhile, unsystematic risk is viewed as the risk which is identified with particular resources and consequently can be dodged by

enhancement. It is likewise thought as residual risk or specific risk, diversifiable risk (Powers et al., 2007).

The banking operations will expose banks to the risks. Understanding the banking risk plays an important role in order to engage with effective management and supervision. Likewise, risks are also known and defined as the probability of loss. This loss depends on three elements which are hazard, exposure, and vulnerability in banking operations itself. Furthermore, risk can be concluded as the actual exposure of something of human value to a hazard and is often considered as the combination of probability and loss (Crichton, 1999; Habib & Baudoin, 2010; Kargi, 2011; and Rosman, 2009). In addition, risk can be concluded as the condition in where variability of unexpected outcome in the organization exists.

Several studies have focused on risk in banking institutions. In a study of Dima & Orzea (2012) and Rosman (2009) have defined banking risks as adverse as well as giving bad impacts where they will affect the profitability of diverse sources of uncertainty and unpredictability situation. Risk measurement is necessary to banks in order for them to understand, see and forward in capturing the source of uncertainty of its potential adverse effect on profitability. According to Dima & Orzea (2012); and Rosman (2009) they stated that the main risks faced by banks are as shown in the following figure.

Figure 2.1 Main Bank Risks Faced by Banks
Sources: (Dima & Orzea, 2012; and Rosman, 2009)

Figure 2.1 shows a group of risks that need to be faced by every organization. There are several kinds of risk, e.g., liquidity risk, credit risk, operational risk, interest rate risk, etc., that are involved in the banking operation like country risk and settlement risk. Thus, every type of risks will link and give effect to the operation of banks. The efficient management of risks will portray efficient performance by banks.

However, this study focuses on the credit risk, liquidity risk and operational risk, which are related to the economic changes of the environment as well as to the efficiency in banks. This was supported by Abu Hussain & Al-Ajmi (2012) who stated that operational risk, credit risk, and liquidity risk, are the most important categories of risks facing by both Islamic and conventional banks compared to other risks.

2.3 Risks in the Banking Sector

The significance of risk has changed for the duration of the time and it conveys different important subject to its result. The estimation of risk is measured often, however, the parameters are constantly neglected to meet the standard. To comprehend the significance of risk, it requires heaps of time and endeavours. A minor study is insufficient to comprehend the entire importance of risks. The result, or to most of the result, could diverge from the paths that lead to the expected or common result. The deviation sometimes leads to potential loss badly. However, the events will still happen, regardless of the result, means with the respect that divergence can be positive (upside) and negative (downside). The positive side of risk is constantly alluring but once in a while conceivable in regular daily existence. In the long run, the risk segment which people and associations putting most effort to secure and manage with full capacity is the pessimistic (downside) risk (Ariffin & Kassim, 2011).

In a bank, either conventional or commercial, when the entire organization is certainly faced with a growing number of risks, are the most common risks, i.e., operational risks credit risk, and liquidity risk. At present, there are a huge number of new types of risks that all financial institution faces from the global markets. According to Iqbal (2008) there are several basic factors leading to these processes, such as increased volatility of the financial markets, globalization and increased competition in financial markets, financial innovations and a drop of traditional banking business practice and regulatory environment of financial institutions, especially banks.

In a few out of several types of risks and the inter-related nature of the risk themselves, risk has become an essential element of business policy for every bank. To properly

implement the active risk process, it is necessary to observe the process through some of its successive stages which differ between conventional and Islamic banking. Thus, a complete procedure of risk in every single budgetary organization ought to incorporate every one of the parts which cover the foundation for legitimate environment of risk, scanning for the right alleviation instruments for various sorts of risks, measuring risks and appropriate inner monitoring and control (Khan & Ahmed, 2001).

Exploiting the shareholders' value is the key point of the management of banks, and this can be done through a good risk management (Dima & Orzea, 2012). It is costly for the financial sector to be bankrupt; therefore, the effect will be on the bank's debt and equity holders as well as the taxpayers (Dima & Orzea, 2012). Hence, in order to avoid from constantly under pressured and assume high risks, banks need to manage their risk effectively so as to avoid or minimize losses (Dima & Orzea, 2012). However, the competition that occurs in the banking sector can lead to financial stability. This notion can be traced to when deposits intensely compete, this will make interest rates to fall and the value of the franchise will be negatively affected.

Banks will not lose anything from default and they will increase their incentives on risk. Banking regulation all over the world has been importantly shaped by this argument, especially based on merger policies and competition. This view has been challenged by the study of De Nicoló, Honohan, & Ize (2005). De Nicoló et al (2005) who argued that what should be the key to bank stability future models is the lending market.

It is expressed by De Nicoló et al (2005) that borrowers were assumed implicitly based on their effect on the firm's risk, so as to have total control on the bank risks. In addition

Wagner (2010) maintained that as the riskiness of firms was controlled by borrower, banks determined the amount of risk they desired to acquire. The stability influence of competition in the lending market could be revised when banks control their risk-taking. This is due to the optimal risk level necessary for the banks to hold, so they would prefer offsetting the influence innocuous borrowers on the balance sheet through attracting more risk because the loan market was competitive and affect the values of the bank's franchise.

Bank controllers and investigators have for a long search to know that how to decide risk-taking in banks. Some current observational and hypothetical research by Daniels & Ramirez (2008); Jensen (2004); Lee & Kwok (2000); Yasuda (2003); and Yin, Wu, & Chen (2002) suggested that some factors influenced risk-taking by banks, which included regulatory actions, risk preferences, ownership structure, leverage, agency problems amid shareholders and management, and threat caused by deposit insurance mispricing.

An instance is the suggestion of moral threat of deposit insurance that when capital declines banks increases their positions of risk practically, this risk-shifting activity is not normally observed by all banks, or thrifts (Altunbas, Carbo, Gardener, & Molyneux, 2007; and Hughes, Lang, Mester, & Moon, 2000).

2.4 The Importance of Managing Risk in the Banking Sector

The advancement is clearly a crucial wonder for all fragments of a contemporary economy (Frame & White, 2004). Risks and costs must be reduced by a successful money related development and enhanced administrations must be given to various clients. Certain features of financial innovation might cause significant risks that should

be considered. Furthermore, Kanchu & Kumar (2013) stated that through opening access to different activities and products, banks were also involved in new risks that were related to these activities and products. The fast rates of innovation happening in the financial industry called for the need for evaluation of the effectiveness of risk management in financial institutions and devising of suitable regulatory reactions to the challenges posed by financial innovation.

It esteems imperative that risk management practice must move with the pace of money related developments. Van-Greuning & Brajovic-Bratanovic (2009) stressed that risk and changes increase exponentially, but most bankers were very slow in adjusting their view of risk. Practically, this indicated that the ability of the market to innovation mostly better than its capability to comprehend and appropriately put up the associated risk.

The development of risk management to be a discipline is traced in (Dowd, 2005) according to the factors were as follows: (i) outstanding development in trading activity (ii) enormous rises in the kind of instruments transacted as well as trading volumes in the past decades; (ii) the enormous development of financial derivatives products and activity, and (iv) fast improvement in information technology.

The financial risks of banks are for the most part related to managing the balance sheet of the banks, and they have been largely categorized as interest rate risk, credit risk, and liquidity risk. Due to the emergence of sophisticated activities and products like structured products and derivatives, banks have been gradually exposed to further similarly vital risk like operational risk. To react to this, risk practices have been

developing, and the current development can be viewed from the integration of numerous financial risks made to different management. Gallati (2003) stated that:

Three sensible strategies of risk proposed in Moles (2004) are as follows. They are: "(i) an awareness towards the risks being taken by the firm; (ii) measurement of the risks to determine their impact and materiality; and (iii) risk adjustment through the adoption of policies or a course of action to manage or reduce the risks". A key issue facing all framework of risk is how to measure risk. As a financial institution and products change, measuring of risk also becomes more complex. An accurate measure of risk is the vital move towards competent and efficient risk management (Allen et al., 2004).

Focal points of financing risk management might not be underestimated. Dowd (2005) underlined this through his perceptions that: (i) increase in firm value is encouraged by the expansion in firm value at the expense of cost of bankruptcy, since it renders unlikelihood of bankruptcy; (ii) the existence of informational asymmetries indicates external finance seems costlier than the internal finance, which leads to losing better investment prospects. Risk in alleviating these difficulties through reduction of inconsistency in the cash flow; and (iii) risk investors to achieve an improved risks allocation since the company would characteristically have improved capital markets accessibility.

2.5 Risk and Bank Performance

Expanding shareholder's arrival exemplifying bank execution is one noteworthy goal of bank management (Adeusi, Akeke, Adebisi, & Oladunjoye, 2014). This goal always achieved with increasing risk (Tandelilin et al., 2007). The risk faced by banks include

insolvency risk, liquidity risk, country risk, foreign exchange risk, operational risk, off-balance risk, credit risk, market risk, and interest risk; therefore, the motivation of banks towards risk management arises from only those risks that can result in bank under performance (Tandelilin et al., 2007).

The issues of overseeing risk in the banking industry have tremendous impact on both bank and the development of the economy as well as on broad business improvement (Tai, 2005; and Tandelilin et al., 2007).

There are some advantages for banks that improved the implementation of risk management (Tandelilin et al., 2007): (i) it is consistent with compliance function in favour of the rule; (ii) it improves their opportunity and reputation towards attracting more comprehensive customers in order to build their fund resources portfolio; (iii) it improves their profitability and efficiency. The study of Cebenoyan & Strahan (2004) stressed that banks with improved risk management have better availability of credit than those with low-risk management. The better availability of credit results into prospect of increasing bank's profitability and assets production.

A study by Zeitun & Benjelloun (2013) in Jordan, evaluates the efficiency of the Jordanian banks over the period 2005-2010. The results show that, on the technical efficiency scale only a few Jordanian banks were efficient in managing their financial resources and generating profit. Furthermore, only few banks were found to be efficient on the scale of pure technical efficiency and only so in a few years. The financial crisis was found to have a significant impact on banks' efficiency. In addition, risk plays a vital role in banking institutions. In running their services and financial activities, banks are

also exposed to risks. Risk is one of the factors that affect the efficiency of the bank (Van Greuning & Iqbal, 2007).

A study about Nigerian bank's risk and financial performance Adeusi et al (2014) found a critical relationship between risk and bank's performance. The results subsequently highlighted the requirement for banks to have a judicious risk in order to secure the interests of investors. Similarly, a study by Fernando (2014) on Sri Lankan banks found that risk management enhanced the performance of banks.

2.6 Operational Risk and Bank Performance

Operational risk is "the risk of loss resulting from inadequate or failed internal processes, people, and systems or from external events" Basel Committee (2003). This definition concentrated on four occasion reasons for operational risk which are external events, systems, processes and people. In addition, as indicated by Jarrow (2008) operational risk could be divided into two types. The first type is identified with a risk of loss caused by the company's operating system (i.e., a failure in an investment or transaction) either caused by legal considerations or caused by an error in production.

The second sort is identified with the risk of loss brought about by motivators, which incorporate both mismanagement and fraud. This represents an agency cost that occurs because of the separation of an organization's management and possession. These two types of operational risk losses happen with repetitive consistency. They may be minor or appalling. Huge disastrous instances include the banker's trust and Procter and Gamble debacle, the Barings bank failure, and the Orange County case (Edwards, 2004; and Masood et al., 2011). Therefore, managing operational risk encompasses an array of

approaches and methods that fundamentally work for two purposes, which are prevention of catastrophic losses and reducing average losses (Chapelle, Crama, Hübner, & Peters, 2008).

Operational risk is entirely not quite the same as other risks experienced by banks since it is asymmetric, diminishing bank's performance for the most part through provision of loss, and in addition having an antagonistic mean because of losses experienced through insufficient or poor internal processes, systems, and people, or by outside environment of the bank (Cummins, Lewis, & Wei, 2006). In this regards, it seems sensible for banks to create expenditures on the management of operational risk to the barest minimum, where the marginal expenditure and the marginal decrease in projected losses acquired through operational events will equal (Cummins et al., 2006). In other words, by managing operational risk, future projected cash flows can be maximized by banks through reduction of the projected costs of operational loss events. Since banks customers have more sensitivity to insolvency risk that could be exacerbated by huge operational losses, banks are highly motivated to efficiently manage operational losses (Froot, 2007).

In a study in early 2000 the alleviation of operational risk of British retailing banks is examined (see Blacker, 2000). He found that mitigating operational risk embraces broad connection sequences amid people, technology, and process. The study shows that representing easing operational risk relies on the administration of business unit, as constraints were rested on business unit that persuaded alleviating operational risk. In another study Elliott, Letza, McGuinness, & Smallman (2000) indicated that operational risk is an organizational construct in which the framework of operational risk is built. It was also indicated in a study (see Cornalba & Giudici, 2004) that banks looked out for

qualitative and quantitative data requirements of improving measuring approach for measuring operational risk.

The difficulties and mystery of operational risk was depicted by Power (2005) just like a method for extends "implemented self-direction" into banking operations. It was established by the study that the banking regulations of Basel II had productively established kinds of pressure and operational risk in three main areas which included definitional issues, the levels of quantification, and data collection. All these signified the significance of operational risk.

Moreover, the application of informational system and the condensed capability of taking up fresh methods, policies as well as scheme for operational risk were emphasized by Fernández-Laviada (2007); and Flores, Bónson-Ponte, & Escobar-Rodriguez (2006), stressed that well-organized operational risk structure reinforces internal controls of an organization which resulted in a better performance of the organization.

Previous studies such as Ashraf, Altunbas, & Goddard (2007); and Dinger (2009) found a noteworthy connection between operational risk and performance of banks. Wasiuzzaman and Gunasegavan (2013) compared Islamic and conventional banks in Malaysia. They found that operational risks were highly significant in affecting profitability (performance).

2.7 Credit Risk and Bank Performance

Credit risk is seen to be the degree of significant worth varieties that happen in the debt instruments and additionally in derivatives due to the variations in debtors and

counterparties credit quality (Lopez & Saidenberg, 2000). This risk is a vital risk source for the capital adequacy of banking institutions (Alessandri & Drehmann, 2010).

However, the net worth and profitability are not only determined by default risk of assets but also on off-balance sheet items, re-pricing characteristics, liabilities, and overall credit quality (Drehmann, Sorensen, & Stringa, 2008).

There is a part of the main elements of the 2007-2009 financial crises is the ways by which credit risk is transferred by banks in the financial system (Nijskens & Wagner, 2011). As it is traditionally practiced, only a few risks are shed from the balance sheets of banks, which are through credit guarantees or loan sales. This is only restricted to credit facilities that are less complex such as the consumer credit (Nijskens & Wagner, 2011). After the crisis, banks have intensely increased the way they transfer credit risk. Banks are no more keen on purchasing derivatives and holding them either to charge-off or to development.

They are progressively inspired by executing them with counter gathering whereby the introduction of credit-risk is moved alongside the diminishment in complete risk of the principal lender (Newton, 2008). Banks now use credit derivatives like the Credit-Default-Swaps (CDS) in transferring the credit risk.

However, Instefjord (2005) found that the credit derivatives transaction was a potential threat to the stability of bank despite hedging credit exposures, especially when operating in extremely elastic credit market sectors.

Consequently, the administration of risk deem exceptionally imperative to banks since it is a fundamental piece of the advance process amplifies the risk of the bank to expand their execution, alter the risk rate of return through securing the bank from the negative impact of credit risk (Musyoki & Kadubo, 2011).

It is recommended that bank risk taking pervasive affects bank benefits and wellbeing (Athanasoglou, Brissimis, & Delis, 2008). It is also declared that the productivity of a bank relies upon its capacity to anticipate, avoid and monitor risk, conceivable to cover losses brought by risk and it additionally has the net impact of expanding the proportion of substandard credits in the bank's credit portfolio and diminishing the bank's profitability (Bobakovia, 2003). In addition, it was indicated by Sanusi (2002) that the expanded number of banks over-extended their current human resources capacity which came about into numerous issues, for example, financial crimes, poor credit appraisal system, accumulation of poor asset quality among others and this prompted increment in the quantity of distressed banks. Other components recognized are bad management, unfavourable proprietorship impacts and different types of insider misuse combined with political contemplations and delayed court process particularly with respect to debt recovery.

A few number of banks can withstand a persevering run, even within the sight of a decent loan specialist of final resort as investors take out their assets, the bank weaknesses and without liquidity bolster, the bank is constrained in the end to close its entryways (Umoh, 1994). Accordingly, the risks confronted by banks are endogenous, connected with the way of banking business itself, while others are exogenous to the banking approach.

It is highlighted in a study, conducted by Owojori, Akintoye, & Adidu (2011) that accessible insights from the liquidated banks plainly demonstrated that powerlessness to gather loans and advances reached out to clients and directors or organizations identified with executives' directors was a noteworthy contributor to the distress of the liquidated banks.

Another study by Abiola & Olausi (2014) surveyed the effect of credit risk on the performance of Nigerian commercial banks. Their discoveries uncovered that credit risk significantly affects the productivity of commercial banks. Similarly, it was found in a study, conducted by Cooper, Jackson, & Patterson (2003) that changes in credit risks may reflect changes in the strength of a bank's loan portfolio which may in turn influence the bank's execution.

In addition, the variety in bank gainfulness are generally owing to varieties in credit risk, since expanded presentation to credit risk is ordinarily connected with diminished firm benefit (Sufian & Chong, 2008). Further research by Pasiouras (2008) explored that there was a negative relationship between the credit risk and bank benefit.

The selection of credit risk best practices in the US and reported that more than 90% of banks in that nation have embraced fine practices. Successful credit risk has picked up an expanded centre as of late, to a great extent because of the way that deficient credit risk is still the principle wellspring of major issues inside the bank industry.

The central objective of a powerful credit risk approach must be to expand a bank's risk balanced rate of return by keeping up credit presentation inside adequate cut-off limits.

Furthermore, the banks must have to manage credit risks in the whole portfolio and the risk in particular transaction of credits (Brewer, Jackson, & Moser, 2001).

Furthermore, a study conducted by Musyoki & Kadubo (2011) reported that effect of credit risk on the financial performance of banks in Kenya had an opposite effect on bank's financial performance, but the evasion rate had the greatest impact on the financial performance of banks.

2.8 Liquidity Risk and Bank Performance

Liquidity risk is viewed as the consistent tracker that leads to any austere market crisis. It is the ultimate fuse that carries the spark that explodes both credit and market risks. It is the incentive that mostly changes inaccessible loss measures to systemic contagious failures (Acerbi, Scandolo, Giacomo, 2008). It was noted in a study by Nikolaou (2009) that liquidity risk is the incapability of transacting at a reasonable price with proximity as it is regarded as the non-diversifiable systematic liquidity risk component. Furthermore, International Monetary Fund 2008 contented that funding liquidity risk encompasses the incapability of a financial intermediary in servicing its liabilities. It is regarded as the risk that occurs when the bank failed to immediately settle its liabilities at their due date (Drehmann & Nikolaou, 2013).

Banks liquidity risk is commonly created when banks involve in investing long-term asset with short-term debt because a bank that is unable to overturn maturing debt may fail in spite of being solvent (Ratnovski, 2013). Rise in uncertainty over bank's solvency leads to major modern bank liquidity problem in some developed economies, which also played out a primary role in the general funding markets (Gatev & Strahan, 2006;

Goldsmith-Pinkham & Yorulmazer, 2010; Huang & Ratnovski, 2011; and Shin, 2009). This prompts the objective of the renewed Basel III in using the Net-Stable-Funding-Ratio (a limitation on maturity disparity restricting refinancing volume falling due to each date) and Liquidity Coverage Ratio (requirement of liquidity) to solve the issue of liquidity risk in banks (Supervisión Bancaria, 2010).

Meanwhile, early liquidity risk studies such as Chari & Jagannathan (1988); and Diamond & Dybvig (1983) assumed that the inadequate information on banks refinancing with valuable assets affects bank liquidity risk. In this view, Ratnovski (2013) provided a benchmark for refinancing for solvent banks in the active interbank markets, which implies that for better description of current banks liquidity risk, it is essential for models to show how the market-based refinancing of solvent banks, may be restricted by market failures. This market failure can be traced to informational frictions (Freixas, Rochet, & Parigi, 2004; Huang & Ratnovski, 2011; and Rochet & Vives, 2004) and increase in moral hazard (Farhi & Tirole, 2012).

Valuable activities are performed by banks on the two sides of the balance sheets. On the assets side, banks lend loans in order to support borrowers, thus improving credit flow in the economy. While on the side of liability, liquidity is provided on demand to customers (Saeed, 2015). Furthermore, liquidity risk from the asset part of the balance sheet of banks has been the focus of recent empirical and theoretical studies. Berger & Bouwman (2005) stressed that the importance role of banks in liquidity production has grown sharply overtime; while Khwaja & Mian (2005); Loutskina (2005); Loutskina & Strahan (2006); and Paravisini (2004) proved that liquidity crises to banks has an impact on the supply of loan. Banks that have made pledges of lending to their customers will face the

risk of unforeseen liquidity demands from their borrowers (Gatev, Schuermann, & Strahan, 2009).

Furthermore, it is observed that this unforeseen liquidity risk exposure can only be reduced through transactions deposits (Gatev et al., 2009). Banks that have high degree of deposits transaction may not experience high risk despite their exposure on the asset side to un-drawn their loan payments, while banks that have loan-liquidity risk exposure will experience high risk without high degree of deposits transaction. During tight markets periods, when funds move into banks from the securities markets the deposit-lending hedge becomes specifically powerful.

The different functions engaged in by banks really exposed them to liquidity risk which may occur if they could not meet their expected commitments (see Jenkinson, 2008) since the depositors might ask for their respective funds at any time, leading to intensity assets sales see (see Diamond & Rajan, 2001) which will negatively affect bank profitability (Arif & Nauman-Anees, 2012). Liquidity risk influences the reputation and performance of the bank (Jenkinson, 2008). The confidence of the customers will be affected if there is no timely provision of funds, leading to bad reputation to the bank. Moreover, having a poor liquidity position could also lead to regulator penalties or finings. Thus, it is vital for banks to attain a satisfactory liquidity.

The problems of liquidity may have an effect on the earnings of a bank as well as its capital; and in some dangerous situations may lead to a solvent bank collapse (Arif & Nauman-Anees, 2012). This may cause banks to involve in borrowing from the financial market even under and extremely high cost in the time of liquidity crisis. This ultimately

leads to a drop in the earnings of banks. In addition, additional borrowing by banks in order to meet the demand of depositors may put the capital of the bank at risk. Therefore, the debt-to-equity ratio will increase, which then affect the effort of the bank in maintaining an optimum capital structure.

Liquidity risk can lead to a fire sale of bank assets that could spill over to weakening of capital base of the bank (Diamond & Rajan, 2001; and Falconer, 2001). If circumstances rise for financial institutions to sell a huge amount of their illiquid assets in order for the funding requirements, thus as to lessen the leverage based on the capital adequacy requirement, there may be need for fire-sale risk. This situation might result in offering price discount for buyer's attraction. This circumstance will have influence on other institutions balance sheets because they will be indulged to mark their assets based on the fire sale's price (Goddard, Molyneux, & Wilson, 2009).

It is also observed that banks can refuse to borrow, even to a prospective entrepreneur, if they feel that the bank has high liquidity risk (Diamond & Rajan, 2001). This serves as an opportunity loss to the bank when a bank cannot meet demand deposits requirements (Diamond & Rajan, 2005). In no circumstances will a bank involve in investing all its assets in the long-term investments. Numerous funding resources are only invested in the short-term liquid investments. This offers a buffer over shock of liquidity (Tirole, 2008). In addition, it is emphasized that a discrepancy in production of resources and depositors demand obliged a bank to achieve the resources at an increased cost.

Liquidity has more influence on the portfolios and tradable securities. Generally, it is the loss that emerges through liquidation of a certain position (Zheng & Shen, 2008). It

deems vital for a bank to have knowledge of the position of its liquidity from the perspective of marketing. It assists in expanding customer loans in terms of attracting market prospects (Falconer, 2001). A bank that has issues of liquidity loses some amount of business prospects. This will make a bank to be in a competitive disadvantage than competitors.

Because of this, liquidity risk is considered as an imperative inside determinant of bank gainfulness since it can be a wellspring of bank disappointments; and it emerges from the conceivable powerlessness of a bank to suit diminishes in liabilities or to reserve increments on the benefit's side of the accounting report (Athanasoglou, Delis, & Staikouras, 2006). To maintain a strategic distance from bankruptcy, banks frequently hold liquid resources that can be effectively changed over into money. Thus, liquid resources are normally connected with lower rate of return; along these lines, the higher liquidity would be connected with lower productivity. It is sustained by the study of Goddard, Molyneux, & Wilson (2004) that there is a feeble negative relationship between the level of liquidity and the bank benefit. Nevertheless, Kosmidou, Tanna, & Pasiouras (2005) suggested that there is a robust and optimistic association between them.

Another study connected internal risk variables for the measurement of bank productivity, for example, quality and liquidity risk. The study suggested that biggest banks are scale wasteful when the risk and quality elements are controlled. This is on the grounds that the large banks would not have come to the ideal size to accomplish the ideal scale productivity. Their cost is higher than the required and different banks ought to develop to accomplish the ideal scale effectiveness (Altunbas, Liu, Molyneux, & Seth,

2000). The study also suggested that if the risk and quality elements are not concerned, the scale productivity has overstated.

Liquidity risk and functioning of banking practices in Pakistan is suggested by Arif & Nauman-Anees (2012). The after effects of numerous relapses demonstrate that liquidity risk influences bank benefit altogether, with liquidity gap and non-executing as the two components fueling the liquidity risk. They both have negative associations with productivity.

2.9 Critical Analysis of the Related Studies

Jarrow (2008) estimated the operational risk processes parameters using market prices is considered. It is argued that it is conceptually possible to estimate operational risk factor parameters using only market prices. However, the main limitations in this study were such that, from a useful point of view, with the exception of in uncommon cases, this reasonable probability can't be accomplished. The comment is that this approach still makes them remain challenges: (i) this approach does exclude estimates for the system type operational risk parameters, (ii) nor does it incorporate organization cost operational loses not sufficiently noteworthy to be accounted for in the financial press, and (iii) at last, this system still requires an estimate of the adjustment in the company's esteem when the office cost occasion happens.

Cummins et al. (2006) claimed that it seemed sensible for banks to create expenditures on the management of operational risk to the barest minimum, where the marginal expenditure and the marginal decrease in projected losses acquired through operational events will equal. However, the misfortune sum or size of the operational misfortune

occasion had no association with the market esteem effect on non-declaring firms in the business. In the event that declarations of operational occasions pass on antagonistic data about the future money streams of non-reporting firms, such declarations may prompt increments in the cost of capital and/or diminish the normal estimation of future interior capital accessible for interest in new tasks. Such impacts are particularly problematical if outer capital is more exorbitant than inside capital.

Blacker (2000) suggested that accounting for alleviating operational risk depended on the management of the business unit. But the main critical point here is such that the author has not discussed the people risk, which deliberate wilful behaviour, for example, misrepresentation or vindictive harm, Errors, for example, errors brought on by weariness, ineptitude, absence of administration supervision, and insufficient staffing levels.

Regarding credit risk and bank performance, many researchers, for example (Drehmann et al., 2008; and Lopez & Saidenberg, 2000) explored the inevitable parameters and have explored their strengths and weaknesses. That is, the main objectives of these studies were to predict the probability distribution function of losses which can rise from a banker's credit collection. However, in reality, such loss distributions are for the most part not symmetric. Since credit defaults or rating changes are not regular occasions and since debts instruments have set instalments that reach the conceivable returns, the loss circulation is for the most part skewed toward zero.

Some other studies regarding credit risk, for example (Athanasoglou et al., 2008; Bobakovia, 2003; and Sanusi, 2002) argued that bank risk has pervasive effects on bank

profits and safety as well as it increased the performance of banks. However, did not take into consideration the prevalent parameters that introduced several problems.

These issues include, the increased number of banks over-stretched their existing human resources capacity, for example, financial crimes, poor credit appraisal system, and accumulation of poor asset quality among others. All these issues lead to increase in the number of distressed banks.

Other studies, such as Brewer et al (2001); Pasiouras (2008); and Sufian & Chong (2008) have discussed the relationship between the credit risk and bank profitability. In addition, they investigated that the more the banks were to expose to high-risk loans, the accumulation of unpaid loans would be too high and thus profitability would become too low. But they did not take into consideration the principal opinions, e.g., credit risk policies, which were considered the most important factor for bank risk and cause severe problems in the banking industry.

In addition, Musyoki & Kadubo (2011) in their study investigated the impact of credit risk on the financial performance of banks in Kenya, which revealed that all risk parameters have an inverse impact on bank's financial performance. Moreover, they showed that there was a constructive result of the credit risk markers of gross loans/non-performing loans proportion on money related execution, and a negative impact of provision for net offices/facilities loss proportion on budgetary execution, and no impact of the capital ampleness proportion and the credit premium/credit offices proportion on bank's monetary execution.

But this assumption was conflicting to Abiola & Olausi (2014) who found that the rate of funding to add up to weighted hazard resources has a constructive outcome while loan cost risk influences contrarily the bank's money related execution, and in their discoveries that credit risk administration as measured by capital sufficiency variable had a critical beneficial outcome on the budgetary execution. Furthermore, it was revealed that viable credit risk system positively affected bank's monetary execution.

Related to "liquidity risk and bank performance", the authors in the studies such as Acerbi (2008); Drehmann & Nikolaou (2013); Nikolaou (2009); and Ratnovski (2013) noted that liquidity risk was the incapable of transacting at a reasonable price with proximity, and was therefore considered the non-diversifiable systematic liquidity risk component. However, this was not clear from the mentioned studies that rose in uncertainty over bank's solvency.

But in reality, the rise in this uncertainty leads to major modern bank liquidity problem, which also plays an important role in the general funding markets, particularly in the developed economies.

Moreover, Berger & Bouwman (2005); Gatev et al (2009); and Saeed (2015) claimed that banks which have made pledges of lending to their customers would face the risk of unforeseen liquidity demands from their borrowers. But these studies lacked the information regarding the risk which is commonly created, i.e., it is unclear whether their claim is about the bank's involvement in investing long-term or short-term asset as well as short-term debt or long-term debt.

2.10 Theories of the Risk

According to Ehrhardt and Brigham (2003), risks refer to the probability that some adverse event will take place. Sharpe (1964) proposed the theory of risk which hypothesized that risks can be divided into systematic risks and unsystematic risks. The systematic risk cannot be diversified and decreased such as, market changes and economic recession. These risks are created through differences in the prices of certain economic size (Cabedo and Tirado, 2004).

Nevertheless, unsystematic risks can be mitigated by diversifying the investment or portfolio of assets (Markowitz, 1959). Unsystematic risks are created by unanticipated variation in company related factors or internal factors for banks, the main types of unsystematic risks included operational risk, credit risk, and liquidity risk.

Operational risk indicates the likelihood that operating costs might differ significantly from anticipated, which reduce net income and firms value (Fields et al., 2004). Also, operational risk is the risk of direct or indirect losses emanating from internal process mistakes, employees or systems mistakes or from factors external to the organisation (Cabedo and Tirado, 2004). It also measured the effectiveness of the bank as less efficient banks are more difficult to earn profit (see Fields et al., 2004). For credit risk, this type of risk is the most significant risk in the banks (Fields et al., 2004). Credit risk refers to the risk of non-payment on loans (Madura, 2003). In other words, this risk illustrates that a borrower will not able to pay his loan when he has a due. Normally, if the credit risk is high, the real value of banks may decline (Cabedo and Tirado, 2004). The other risk, liquidity risk is the difference in net income and market value of equity due to the reason that the bank is facing difficulty to obtain cash at reasonable cost.

2.11 Chapter Summary

The purpose of this chapter is to review the past studies regarding risk and bank performance relationship. This chapter included the prior literature about the risk and bank performance. Furthermore, this chapter also described the over review of the risks in the banking sector and significance of risk management in banks. Additionally, this chapter discussed the empirical studies on the relationship between risk types (operational risk, credit risk, and liquidity risk) and bank performance.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research framework and methodology according to nature of study. Research methodology is a systematic way to provide the solution of problem by collecting data and analyze it statistically (Kothari, 2001). Additionally, research methods and techniques suggested by previous studies. Thus, this chapter consists of research design, study population, sample size, sampling technique, data sources, data collection method, specific study variables, analyzing method and data collection instrument.

3.2 Framework of the study

The research framework of this study concentrates on the influence of risk on the bank performance. This study attempts to investigate the relationship between the risk variables such as operational risk, credit risk, and liquidity risk, with Jordanian bank performance.

Next figure demonstrated the study's research model along all variables of study. For the hypotheses development, the explanation and discussion on each variable is described briefly in below.

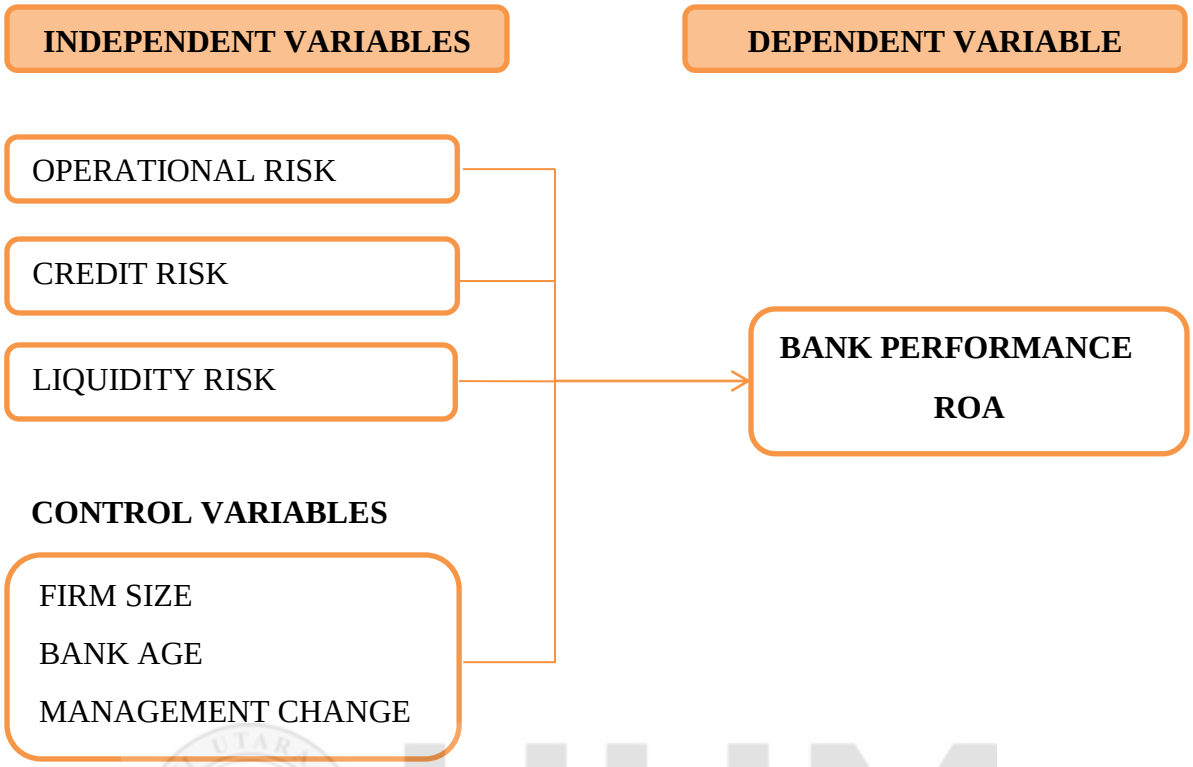

Figure 3.1 Theoretical Framework

3.3 Bank Performance

The bank performance is considered as the dependent variable in this study represents return on asset (ROA).

ROA is the most important and popular measure of bank performance and have been extensively used by other researchers such as (Al Karim & Alam, 2013; Alkhatib & Harasheh, 2012; Rosly & Abu Bakar, 2003; Kumbirai & Webb, 2010; Malhotra et al., 2011; Tarawneh, 2006; and Vong & Chan, 2009).

3.3.1 Return on Assets (ROA)

ROA is computed by dividing the net income of banks with their total assets. ROA measures bank efficiency in converting bank assets into earnings. In general, higher ROA

indicates better performance of banks, provided it is not the result of excessive risk-taking (Saeed, 2015). Banks will typically have a relatively low ROA in comparison to industrial organizations mainly because banks are highly leveraged (Malhotra et al., 2011).

ROA also is different in various companies representing measurements of efficient utilization of assets. It is generally an effective firm profitability indicator compared to a benchmark rate of return equivalent to the risk-adjusted weighted average cost of capital (Al-Matari, Al-Swidi, Fadzil, & Al-Matari, 2012). Based on Miller (1995) ROA measures the efficiency with which a firm uses its assets during its business operations in order to generate net income.

It refers to bank's efficiency making profits. It measures the ability of bank management in investments of its assets, buildings and land, inventory and stocks. If the ROA is high that means the bank is more efficient and capable of using the funds (Wen, 2010). The ROA also gauges the firm's performance in terms of its finance and operations (Klapper & Love, 2004). Therefore, the higher the ROA, the more effective is the use of assets to satisfy the shareholder's interests (Ibrahim & Samad, 2011).

3.4 Hypotheses Development

This part provides the relationship between operational risk, credit risk, and liquidity risk, as independent variables with bank performances.

3.4.1 Operational risk

Operational risk consists of two types. The preliminary type is related to a risk of loss brought about by the organizations working framework either created by legitimate contemplation or created by an error in production.

The next type is related to the risk of loss achieved by inspirations, which join both mismanagement and misrepresentation. This shows an office cost that happens due to the partition of an association's administration and ownership. These two kinds of operational risk losses happen with tedious consistency, and they might be minor or horrifying (Jarrow, 2008).

Immense disastrous occurrences incorporate the investor's trust, Procter and Gamble calamity, the Barings bank disappointment, and the Orange County case (Edwards, 2004). Along these lines, overseeing operational risk incorporates a variety of methodologies and strategies that in a general sense work for two purposes, which are avoidance of calamitous losses and lessening normal risks.

Operational risk is altogether not exactly the same as different risks experienced by banks since it is asymmetric, lessening bank's performance generally through arrangement of loss, and also having a hostile mean in view of loss experienced through lacking or poor inward procedures, frameworks, and individuals, or by outside environment of the bank (Cummins et al., 2006). In this respects, it appears to be sensible for banks to make consumption on the administration of operational risk to the barest least, where the negligible use and the peripheral reduction in anticipated loss gained through operational occasions will meet. At the end of the day, by overseeing operational risk, future

anticipated money streams can be amplified by banks through decrease of the anticipated expenses of operational loss occasions. Since banks clients have more affectability to bankruptcy risk that could be exacerbated by immense operational risk, banks are exceptionally energetic to proficiently oversee operational misfortunes.

The study demonstrates that speaking to facilitating operational risk depends on the organization of specialty unit, as limitations are refreshed on specialty unit that influenced mitigating operational risk. It can also not be wrong to say that in the system of operational risk banks pay special mind to subjective and quantitative information necessities of enhance measuring approach for measuring operational risk.

In regards to operational risk (Cummins et al., 2006) stressed that it seems sensible for banks to create expenditures on the management of operational risk to the barest minimum, where the marginal expenditure and the marginal reduction in expected losses from operational events will equal. Froot (2007) argued that by managing operational risk, future projected cash flows can be maximized by banks through reduction of the projected costs of operational loss events and thus will increase the bank performance.

In addition, since bank customers have more sensitivity to insolvency risk that could be exacerbated by huge operational losses, banks are highly motivated to efficiently manage operational losses in order to reduce insolvency risk and increase bank performance. Previous studies found a negative significant association between operational risk and the performance of banks (Al-Tamimi, Hussein, Miniaoui, & Elkelish, 2015; Ali, Akhtar, & Ahmed, 2011; Ali, Akhtar, & Sadaqat, 2011; Ashraf, Altunbas, & Goddard, 2007; Demirovic & Thomas, 2007; Dinger, 2009; Isshaq & Alufar-Bokpin, 2009; and Jacobson,

Lindé, & Roszbach, 2006). Therefore, this study hypothesized the relationship between operational risk and bank performance as follows:

H1: There is a negative significant relationship between operational risk and bank performance.

3.4.2 Credit risk

Credit risk is considered as the level of huge worth assortments that happen in the debt instruments and furthermore in subordinates because of the varieties in indebted individuals and counterparties credit quality. This kind of risk is an extremely key risk hotspot for the capital ampleness of keeping banking organizations. In any case, the total assets and benefits are controlled risk, as well as on balance sheet items, re-estimating attributes, liabilities, and general credit quality (Drehmannet al., 2008).

In addition, it is also true that the credit subsidiaries exchange is a potential danger to the solidness of bank regardless of supporting credit exposures, particularly when working into a great degree versatile credit showcase areas. Subsequently, the organization of risk deem extraordinarily basic to banks since it is an essential piece of advanced process, opens up the risk of the banks to grow their execution, modify the risk rate of return through securing the bank from the negative effect of credit risk, which is also proven in a study, conducted by Musyoki & Kadubo (2011).

It is suggested that bank risk taking inescapable influences bank advantages and prosperity, therefore, it is likewise proclaimed that the efficiency of a bank depends upon its ability to envision, evade and screen risk, possible to cover losses brought by risk.

This furthermore has the net effect of growing the extent of substandard credits in the bank's credit portfolio and decreasing the bank's benefit (Bobakovia, 2003).

The extended number of banks over-expanded their present human resources, which occurred into various issues, for instance, money related violations, poor credit evaluation framework, gathering of poor resource quality among others and this provoked augmentation in a number of distressed banks. Different segments perceived are awful administration, unfavorable proprietorship impacts and distinctive sorts of insider abuse joined with political considerations especially regarding debt recovery.

Moreover, Bobakovia (2003) noted that the ability of banks to foresee, prevent and monitor risk and the possibility to cover losses that are caused by risk arisen determines the profitability of the banks. This also has an impact on the increasing insufficient credits ratio in the bank's credit portfolio and reducing the profitability. This shows that credit risk influences bank performance. Among studies that found a negative significant association between credit risk and bank performance such as (Al-Tamimi, Hussein, Miniaoui, & Elkelish, 2015; Ali, Akhtar, & Ahmed, 2011; Ashraf, Altunbas, & Goddard, 2007; Demirovic & Thomas, 2007; Dinger, 2009; How, Karim, & Verhoeven, 2005; Jacobson, Lindé, & Roszbach, 2006; Pasiouras, 2008; and Ruziqa, 2013). Therefore, this study hypothesized the relationship between credit risk and bank performance as follows:

H2: There is a negative significant relationship between credit risk and bank performance.

3.4.3 Liquidity Risk

Liquidity risk is ordinarily made when banks include in contributing long haul resource with fleeting debt in light of the fact that a bank that cannot overturn developing debt may come up short because of being dissolvable. In the interim, early liquidity risk related research, for example (Chari & Jagannathan, 1988; and Diamond & Dybvig, 1983) accepted that the deficient data on banks renegotiating with profitable resources influence bank liquidity risk. In this view (Ratnovski, 2013) provides a benchmark to renegotiating for dissolvable banks in the dynamic interbank markets, which infers that for better depiction of current banks liquidity risk, it is vital for models to show how the market-based renegotiating of dissolvable banks, might be limited by market disappointments. This market disappointment can be followed to informational frictions and increment in moral risk.

Athanasoglou et al (2006) indicate that liquidity risk is a vital internal bank profitability determinant due to its ability to become a source of bank failures, and it occurs from the probable incapability of a bank in accommodating reductions in liabilities or to fund rises on the assets side of the balance sheet. Meanwhile, some studies found a negative significant influence of liquidity risk on bank performance. (Al-Tamimi, Hussein, Miniaoui, & Elkelish, 2015; Distinguin, Roulet, & Tarazi, 2012; Pana, Park, & Query, 2010; and Shen, Chen, Kao, & Yeh, 2009). Therefore, this study hypothesized the relationship between liquidity risk and bank performance as follow:

H3: There is a negative significant relationship between liquidity risk and bank performance.

3.5 Research Design

This study attempts to identify any relationship that may exist between the risks and bank performance of the Jordanian banks. This study uses the ex-post facto research design to obtain and utilization of documentary source of data from the annual reports and accounts of the banks listed in Amman Stock Exchange for the period under study. Also this study utilizes a panel data analysis, which examines the relationship between the influence of risk and Jordanian bank performance.

3.6 Sampling

The total listed banks in Amman Stock Exchange are 16 banks. This study is utilizing panel data along 15 listed banks of Jordan during 2010-2014. One of the banks is involved with another one, which are both under the same ownership. This the reason to conduct the study using 15 banks which are all listed. The specific data is about five years for each bank. The selected 15 banks included Islamic and conventional which are listed on Amman Stock Exchange (ASE). These banks are selected because they have same nature and environment of business. This study utilizes Islamic banks because these kind of banks are also affected by the same risks and challenges faced by conventional banks in Jordan (Hashem et al., 2015). However, it is convenient to check the effect of independent variable on the dependent variable due to same nature of factors in these particular banks. This study did not consider foreign banks because of unavailability of data of those foreign banks' branches in Jordan. It is not easy to collect data from these banks because of foreign ownerships. Moreover, this study used bank scope and annual reports of banks from official websites as the sources for data collection. Appendix A mentions the bank names and their official websites.

3.7 Data collection procedures

This study required the secondary data. For this purpose, this study collected data about risk and bank performance from annual reports of banks in Jordan. These annual reports existed on the official websites of banks. The data of variable bank performance is collected from the financial statements including, balance sheet and income statement which is available in annual reports of banks on official websites.

3.8 Measurement of the variables

This section provides measurements of dependent variable, independent variables and control variables. The explanation of the measurements of the variables for the study laid down in detail in the following paragraphs.

The following is the well-established model which used in this study (see for example Al-Matari et al., 2012).

$$\mathbf{ROA}_{it} = \alpha + \beta_1 \mathbf{OR}_{it} + \beta_2 \mathbf{CR}_{it} + \beta_3 \mathbf{LQ}_{it} + \beta_4 \mathbf{FIRMSIZE}_{it} + \beta_5 \mathbf{BANKAGE}_{it} + \beta_6 \mathbf{MCHANG}_{it} + \varepsilon_{it}$$

Where;

ROA = Return on asset ratio.

OR = Operational Risk.

CR = Credit Risk.

LQ = Liquidity Risk

FIRMSIZE = Firm Size.

BANKAGE = Bank Age.

MCHANG = Management Change

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = The Coefficients of Variables.

α = Constant.

ε_{it} = Random Error of variable.

3.8.1 Dependent Variables

Return on Assets is used to measure the banks' performance. ROA is the most important and popular measurement of bank performance and has been extensively used by other researchers such as (Al Karim & Alam, 2013; Alkhatib & Harasheh, 2012; Azhar Rosly & Afandi Abu Bakar, 2003; Kumbirai & Webb, 2010; Malhotra, Poteau, & Singh, 2011; Tarawneh, 2006; and Vong & Chan, 2009). ROA is considered to be the net income divided by total assets of the bank.

3.8.2 Hypotheses Variables

This section highlights the risk type's measurements as independent variables which are measured as follows:

Operational Risk : Total expenses divided by total revenue.
Credit Risk : Total debt divided by total Assets.
Liquidity Risk : Net loans divided by deposit.

3.8.3Control variables

This section provides firm size, and bank age as the control variables.

3.8.3.1 Firm Size

This study considered firm size as the control variable, the reason is that most of the companies have different characteristics and nature. Lehn, Patro, and Zhao (2009) stated that the important determinant for the board size and structure are included firm size and growth. They concluded that board size is directly affected by the firm size and it is inverse to the growth opportunities proxies; such as firm size is inversely proportional to insider representation and it is directly proportional to growth opportunities, it means that firm size shows an effect on financial performance.

Moreover, the firm size also shows an effect of company performance. In the prior empirical studies about corporate governance, firm size is mostly used as control variable (De Andres, Azofra, & Lopez, 2005; Ghosh, 2006; and Linck, Netter, & Yang, 2008). Thus, it is clear that firm size has great effect on companies' performance. For instance, it is possible that large firms are less influenced as compared to small companies due to more empowerment for resolving agency problems, more redundancy and government bureaucracy (Lehn et al., 2009). Moreover, Coles, McWilliams, and Sen (2001) discussed that on the growing stage form required more board members who can monitor the manager's performance, or firms required more new directors who can provide more services to board and can monitor the growth of the company.

Lastly, this study calculated the firm size through the natural log of total assets as suggested by prior studies (Abor & Fiador, 2013; Adjaoud & Ben-Amar, 2010; Ghabayen, 2012; and Haye, 2014).

3.8.3.2 Bank Age

Bank age is a number of year's bank incorporated. As organizations age, routines, systems, and standard operating procedures are consciously created (Blau & Scott, 1962). A result of the developing organizational is that senior managers will have less need to become involved in operating decisions, or even all strategic decisions (Mintzberg, 1979).

Bank age is used widely as a control variable by a number of the empirical studies which examined the relationship between corporate governance and firm's performance as (Ahmed, Ahmed, & Ahmed, 2010; and Amran & Che-Ahmad, 2010). Following (Ahmed

et al., 2010), the current study measures the age of a firm as the difference between observation year and establishment year of the firm.

3.8.3.3 Management Change

This study utilizes management change as a control variable in order to measure the financial performance of the banks. The use of this variable gives a clear indication of the performance of the banks in order to know the reasons which led to the fluctuation of the performance of banks.

An organization experiences a number of critical incidents throughout the course of its operation, both positive and negative, all of which can result in management change, namely through changes in executive management or board structure (Fee & Hadlock, 2003; and Price, 2011). It has been well-documented that the value of human capital is increased by directors, which ultimately depends on their performance as decision makers by improving their standing as decision control professionals (Fama, 1980; and Fama & Jensen, 1983).

On the other hand, a number of other elements imply that directors will not necessarily act in the interest of the shareholders; for instance, external directors could owe their standing to management who primarily suggested their role (Hart, 1995). Secondly, multiple and interlocking directorships could decrease the overall efficiency of external directors (Hart, 1995; and Patton & Baker, 1987). Lastly, directors might not own a significant portion of the firm's equity, meaning they may have little to gain personally as a result of firm performance improvements (Hart, 1995; and Jensen, 1993).

An in-depth review and summary of the numerous empirical researches of the causes, consequences, and marketing impacts of management turnover, with regard to characteristic firms, was provided by Furtado & Karan (1990). Research analysed internal forces centred on monitoring management performance, such as through the board of directors (see Fama, 1980) competing management (see Fama & Jensen, 1983) and block shareholders (Shleifer & Vishny, 1997). Findings highlight an inverse link between management turnover and firm performance (Warner, Watts, & Wruck, 1988). Mclntosh & Gonzalez-Lima (1994) carried out a joint test centred on the postulation that data relating to management performance can be seen through stock returns, with return data then directed towards assessing performance. Accordingly, management change (MCHANG) measured as a dichotomous variable, coded "1" if board members have changed and "0" if not, has an inverse link with regard to financial performance. And according to the above, this section provides measurements to the control variables which are as follows:

FIRMSIZE : The log of total assets.

BANK AGE : Numbers of years since the company start incorporation.

MCHANG : A dummy variable, coded "1" if there is a change in board and "0"otherwise.

3.9 Research Variables

Table 3.1
Description of Dependent and Independent variables:

DEPENDENT VARIABLES (BANK PERFORMANCE)	**Label**	**Description**	**Prediction**
Return on asset	*ROA*	Net income divided by total assets.	-
INDEPENDENT VARIABLES	**Label**	**Description**	**Prediction**
Operational Risk	*OR*	Total expenses divided by total revenue.	Negative
Credit Risk	*CR*	Total debt divided by total assets.	Negative
Liquidity Risk	*LQ*	Net loans divided by deposits	Negative
CONTROL VARIABLES	**Label**	**Description**	**Prediction**
Firm Size (number)	*FIRMSIZE*	The log of total assets.	Positive
Bank Age	*BANKAGE*	Numbers of years since the company start incorporation.	Positive
Management Change	*MCHANG*	A dummy variable, coded "1" if there is a change in board members and "0" otherwise	Positive

3.10 Data Analysis

The study analyzed the data by using STATA statistical software and computes the measurement by using descriptive statistics and diagnostic tests.

3.10.1 Descriptive Analysis

The purpose of descriptive analysis is to calculate the mean, range (minimum and maximum) and standard deviation for each variable of the study.

3.10.2 Diagnostic Tests of Panel Data Analysis

Normality, heteroscedasticity, autocorrelation, and multicollinearity are the common diagnostic tests to be conducted before analysis and econometric modeling can be done (Carneiro, 2006). These four (4) tests were conducted in this study in order to prove that there is a high possibility that econometric assumptions are not violated and to obtain truthful results.

3.10.2.1 Normality Test

Normality is described as the shape of the distribution of data for individual quantitative data variable and its normal distribution. It is a basic assumption in multivariate analysis that follows the premise that a significant deviation from normality will result in an invalid statistical outcome (Hair, Black, Babin, Anderson, & Tatham, 2006).

According to Tabachnick & Fidell (2007) the distribution shape can be observed on a graph. The residual distributions according to standardized normal probability plots (pnorm) that are sensitive to non-normality in the middle data range were noted.

3.10.2.2 Heteroscedasticity Test

The test for heteroscedasticity of a group of variance is needed in the panel data analysis because such analysis is a combination of time series and cross sectional data. There are many heteroscedasticity tests available, namely, Goldfeld-Quandt Test, Spearman's Rank Correlation, Glejser Test, Park Test, White Heteroscedasticity Test and the Breush-Pagan Goldfrey Test.

Consequently Gujarati (2009) pointed out that there is no answer for the best and most powerful test to diagnose the problem. Greene (2003) suggested using the White

Heteroscedasticity Test. The Whites test itself has many alternatives and the choice of such a test depends on the statistical package used. In the panel data analysis using Stata statistical software, a modified Wald test for group wise heteroscedasticity in the residuals could measure heterogeneity from the significance of the chi-square value (Greene, 2003).

3.10.2.3 Autocorrelation Test

Another diagnostic test that is pertinent to the panel data analysis involves checking the correlation between the disturbance term of observations in time or space (Gujarati, 2009). In the panel data analysis, the test to ascertain the presence of autocorrelation in the panel is based on the Wooldridge test for autocorrelation (Carneiro, 2006). The test involves checking the significance of null hypothesis that there is no idiosyncratic error of a linear panel data model. The significant *F-value* indicates the existence of autocorrelation in the model. This problem can be solved by using the random effect model or the fixed effects model since the model always provides consistent estimators (Gujarati, 2009; and Wooldridge, 2003).

3.10.2.4 Multicollinearity Test

The panel data analysis is capable of reducing the multicollinearity problem (Baltagi, Bratberg, & Holmås, 2005). Multicollinearity checking is a common diagnostic test to ensure that none of the independent variables are highly correlated, which can result in massive variance bias. The high correlation between two (2) independent variables would result in a huge bias in variance, thus, causing the estimations to be unreliable (Baltagi et al., 2005). The Variance inflation Factor (VIF) is an example of the test that is common

to examine such a problem. It treats one (1) of the independent variables as dependent variables and the remaining independent variables as independent variables.

3.10.3 Panel Data Analysis

According to Baltagi et al (2005) panel data refers to the pooling of observations on a cross section over several times. In short, it is a hybrid of time series and cross sectional data structures, thus, enabling the researcher to study the dynamics of change over the short time series. In this study, panel data structure rather than cross sectional or time series is utilized due to the potential benefits provided by this approach, in particular it can enhance the quantity and quality of data that could not be provided with either a cross sectional or a time series alone (Greene, 2003).

The studies further suggest that research on risk and bank performance could be conducted by utilizing panel data analysis since it offers various benefits other than data structure, such as cross sectional and time series where panel data are capable, to some extent, of controlling for model specification (Anderson & Zeghal, 1994). In the current study, the analysis of static panel data includes the random effect and fixed effect analysis.

3.10.3.1 Choosing between Fixed Effects Model vs. Random Effects Model

Baltagi et al (2005) proposed the fixed effects model or random effects model to estimate the panel data. The fixed effects model is a regression with constant slopes, however, the intercepts differ according to the cross sectional unit while the random effects model would have a random constant term (Greene, 2003). The choice of the fixed effects model or random effects model can be tested based on the Hausman specification test

proposed by Hausman (1978). This test is based on the difference between the fixed effects and random effects estimators. The fixed effect is preferable over random effect when the Hausman test result is significant in the model (Al-Ajmi, 2008).

3.10.4 Multiple Linear Regression Analysis

This study employs panel data analyses in order to examine the association between the bank performance and risk variables, such as operational risk, credit risk and liquidity risk.

3.11 Chapter Summary

This study aims at investigating the relationship between risk and bank financial performance in Jordan. This present chapter clarifies the methodology utilized in the study as a part of the examination and highlighted the hypotheses that have been formulated. Moreover, a clarification of the theoretical framework and hypotheses formulation. Finally, it explains the research design and data analysis.

CHAPTER FOUR

ANALYSIS AND FINDINGS

4.1 Introduction

This section exhibits the analysis of the findings of the study. The data is analysed with the use of Stata software. As was shown before in chapter three, there are three risk variables and one financial performance variable which were measured using ROA. Moreover, this section is divided into ten sub-sections which are as follows; Section 4.1 starts with introduction and Section 4.2 exhibits the descriptive statistics of the variables in the study. Section 4.3 discusses diagnostic tests of panel data and correlation analysis is presented in Section 4.4. Section 4.5 discusses about the model selection between fixed effect and random effects and linear regression Analysis. Additionally, the results after correction are presented in Section 4.6. Section 4.7 presents the further test. Section 4.8 shows the result after correction for further test. Discussion of the finding is explained in section 4.9. Finally, Section 4.10 ends with the summary of the chapter

4.2 Descriptive Statistics

Descriptive analysis is conducted as to give brief information about the sample target that can prompt simple and better elucidation of data (Genser, Cooper, Yazdanbakhsh, Barreto, & Rodrigues, 2007). Table 4.1 exhibits the mean, standard deviation, minimum, and maximum of the variables shown in the study. The descriptive statistics for the independent and independent variables have been abridged and exhibits in Table 4.1 that included the information of mean, standard deviation, minimum, and maximum of the variables in the study. With the application of linear regression analysis, the scores might greatly affect the results and turns into a reason for concern by the researcher. The means,

standard deviation, minimum, and maximum resulting from the Stata were displayed in the table below.

Table 4.1
Summary of Descriptive Statistics N=75

Variables	**Mean**	**Std. Dev.**	**Minimum**	**Maximum**
ROA	0.0127457	0.0048383	-0.0016592	0.0250551
OR	0.5882972	0.1224084	0.3386002	1.029558
CR	0.8631452	0.0323187	0.7803605	0.9286216
LQ	0 .0242872	0.0383219	0.000	0.1860429
FIRMSIZE (Log)	21.36685	0.9478624	19.65224	23.97595
FIRMSIZE (In Billions JD)	3.50	5.82	3.43	25.9
BANKAGE	35.2	16.2006	13	74
MCHANG	0.4933333	0.5033223	0	1

ROA = Net income divided by total assets; OR = Total expenses divided by total revenue; CR = Total debt divided by total assets; LQ = Net loans divided by deposits; FIRMSIZE = The log of total assets; FIRMSIZE = Total assets in Jordanian dinar (USD1 = 0.71JD), BANKAGE = Numbers of years since the company start incorporation; MCHANG = A dummy variable, coded "1" if there is a change in board members and "0" otherwise.

Based on Table 4.1 above, it shows the results for descriptive statistics taken from the variables incorporated into the model. The descriptive statistics comprise of mean, standard deviation, minimum and maximum. Taking into account the descriptive analysis as condensed in Table 4.1, the mean value of the return on assets (ROA) is 0.0127457 with a minimum value of -0.0016592 and the maximum of 0.0250551, showing a limited disparity in the ROA over the Jordanian banks in the sample.

As to operation risk (OR), the mean value is 0.5882972 and the minimum and maximum in the banks are 0.3386002 and 1.029558 respectively.

As for credit risk (CR), the result in the table uncovers that the value of the mean for Credit Risk is 0.8631452 with a minimum of 0.7803605 and the maximum of 0.9286216. The summary of the results reveal that the mean for liquidity risk (LQ) is 0 .0242872 with the minimum 0.000 and the maximum 0.1860429 in the Jordanian banks. The zero

value of the liquidity risk as shown in Table 4.1 is due to the formula which was used to measure liquidity risk (total loan divided by total deposit), some banks presents that the loan ratio was not valued from several years, thus, the results of descriptive statistics representing the same situation of banks for several years.

Saeed (2015) conducted a study in Malaysia on risk and bank performance. His study considers risk factor such as operational risk, credit risk, and liquidity risk. The bank performance is measured by using ROA. Descriptive statistics shows the mean, minimum, and maximum, for all the variables calculated through comparison between prior study and current study. The mean value for the return on assets (ROA) is 0.02136 with a minimum value of -0.0086 and the maximum of 0.048185, in Malaysian banks. Meanwhile, the Table 4.1 shows the mean value for the return on assets (ROA) as 0.0127457 with a minimum value of -0.0016592 and the maximum of 0.0250551 in Jordanian banks.

Operation risk (OR) in this study found the mean value as 0.5882972 and the minimum and maximum in the banks are 0.3386002 and 1.029558 respectively. Whereas in prior study about Malaysia (see Saeed, 2015) shows the mean value as 0.036623, the minimum -0.00711 and the maximum 0.09965.

As for credit risk (CR) in Jordanian bank, the mean for credit risk is 0.8631452 with a minimum of 0.7803605 and the maximum of 0.9286216. While prior study in Malaysia shows the mean value as 0.600236 and the minimum 0.038848 with maximum 0.964445 (see Saeed, 2015).

For liquidity risk (LQ) the mean value is 0.0242872 with the minimum 0.000 and the maximum 0.1860429 in Jordanian banks, whereas the prior study in Malaysia shows the mean value as 0.830349 with the minimum 0.0000 and the maximum 4.48522 (see Saeed, 2015).

With regards to firm size (FIRMSIZE) in log of total assets, the result in Table 4.1 reveals that the mean of number of firm size is around 21.36685 for Jordanian banks with a minimum of 19.65224 and a maximum of 23.97595. Moreover (FIRMSIZE) in total assets in Billions of Jordanian Dinar (JD), the result in Table 4.1 shows that the mean number of firm size is 3.50 with a minimum of 3.43 and a maximum of 25.9.

Regarding bank age (BANKAGE), the mean of the banks age is 35.2 with a minimum age of 13 year and a maximum age of 74 years for banks in Jordan.

Lastly, management change (MCHANG), the banks in the specimen have had changes in the board of directors membership with a mean of 0.4933333 for changes in the management with minimum change of 0 and maximum change of 1 which is a dummy variable.

4.3 Diagnostic Tests

Research diagnostics are carried out to support the validity of the results from regression analysis by identifying and correcting the model from regression related problems namely non-normality, heteroscedasticity, autocorrelation and multicolinearity (Gujarati & Porter, 2003; and Hair Jr, Black, Babin, Anderson, & Tatham, 2006) tests have been carried out in this study. The discussions are as follows:

4.3.1 Normality Test

The normality issue is tested using Skewness / Kurtosis test. In order to determine whether the data is normal enough for further statistical test, normality test is conducted. Under this normality test, the main concern is the distribution of score on variables and this is conducted by examining the value of skewness (symmetry of the distribution) and kurtosis (peakedness of the distribution). According to Klein (1998) the data is normally distributed if the value of skewness is less ±3 and the kurtosis does not exceed ±10.

Table 4.2
Summary of the test

Variables	***Obs***	***Skewness***	***Kurtosis***
ROA	75	-0.509	0.617
OR	75	1.388	2.774
CR	75	0.300	-0.341
LQ	75	2.332	5.654
FIRMSIZE	75	1.133	1.552
BANKAGE	75	0.699	-0.277
MCHANG	75	0.027	-2.055

ROA = Net income divided by total assets; OR = Total expenses divided by total revenue; CR = Total debt divided by total assets; LQ = Net loans divided by deposits; FIRMSIZE = The log of total assets; BANKAGE = Numbers of years since the company start incorporation; MCHANG = A dummy variable, coded "1" if there is a change in board members and "0" otherwise.

The result in Table 4.2 shows that all variables are normally distributed. Thus, the descriptive statistics provide reliable data on normality and the result of the final model utilizing these data are supported.

4.3.2 Heteroscedasticity Test

Heteroscedasticity or what is generally known as the unequal variance is viewed as one of the common transgression. It is known in multivariate analysis in which the residual in regression measurement is heteroscedasticity. Heteroscedasticity shows up with any expansion or reduction of the variance and this prompts statistical extrapolation issues within the regression model. The homoscedastic presumption should be analysed prior to employing regression analysis on the outcomes.

Heteroscedasticity can be identified through graphical tests where, the residuals of the model are plotted in contradiction of the anticipated value of firm performance and each descriptive variable to ascertain regardless of whether the model's error terms have consistent variances.

Many tests can be employed in order to identify the heteroscedasticity issue, such as the white's General Heteroscedasticity Test, Spearman's Rank Correlation Test, Park Test, Goldfeld-Quandt Test, Glejser Test and Breusch-Pagan-Godfrey Test. This study has utilized Breusch-Pagan-Godfery/Cook-Weisberg Test in order to check for the existence of homoscedasticity among the error terms (Gujarati, 2009)

The problem of heteroscedasticity is taken care of with the assistance of White Heteroscedasticity Consistent Variance with the Standard error technique as was suggested by Gujarati & Porter (2003). Such a test is carried out by STATA software. The above technique reduces or expands the standard error as required and the variances prompt the respective decline or expansion of t-statistics with the coefficient staying

fixed. The outcomes do not basically vary from the previous regression with slightly variations in the p-values and t-statistic to display the estimator's correction.

Table 4.3
Test for Model Specification and Heteroscedasticity

	Chi2	***F***	***p*-value**
Breusch-Pagan	9.26	-	0.0023
Ramsey Test	-	0.65	0.5853
Ho (null)	reject		reject

Note: Ho (null): Constant variance (homoscedasticity).

The result of Breusch-Pagan/Cook-Weisberg Test is shown in Table 4.3. Taking into account the result, the *p*-value is less than 0.05 in the model, indicating that heteroscedasticity exist.

In statistical analysis, the result shown in Table 4.3 above, Ramsey test specify that if the *F*-statistic is lower that the *p*-value give significance point, then we accept the null hypothesis of correct specification. While the *p*-value is lower the *F*-statistic given in table 4.3. This implies that the functional form has problem of heteroscedasticity in the model.

4.3.3 Autocorrelation Test

The word autocorrelation can be used to choose the query of whether or not the sample data set is created from a random procedure. It is common that the residual terms of any two cases ought not to be correlated but instead independent. Autocorrelation is believed to be existing where the residual terms are not independent (Bah & Field, 2001).

Autocorrelation can be identified in different process with one of the method being the use of the Wooldridge Test. This test checks for serial connection in fixed or random-effects one way models acquired by Wooldridge (2010).

Table 4.4
Test for autocorrelation

	***F* (1, 14)**	***p*-value**
Autocorrelation	7.815	0.0143
H0	reject	reject

Note: Wooldridge test for autocorrelation. Ho (null): No first-order autocorrelation.

From the outcome of the Table 4.4 above, the Wooldridge test was conducted to find out whether there is an autocorrelation problem in the data. From the analysis done, it was discovered that autocorrelation exist in relation to return on assets in the Jordanian banks.

4.3.4 Multicolinearity Test

Multicolinearity is a situation where two or more presumption's variables are extremely associated to one another. It refers to the extent to which one variable can be described by the other variables in the analysis. As multicolinearity increases, it confuses the interpretation of the variety since it is more challenging to determine the impact of any single variable, attributable to their interrelationships (Gloede, Hammer, Ommen, Ernstmann, & Pfaff, 2013). Research by Mullner, Hubert, & Wesche (1998) stated that multicollinearity is one out of the numerous methods utilized by the researchers to check the presence of an irregular relationship between independent variables that more often than not clarifies the consequences of which variables influenced can be controlled by alternate variables within the study.

4.3.4.1 Pearson Correlation Matrix

Roldan-Valadez, Rios, Suarez-May, Favila, & Aguilar-Castañeda (2013) expressed that the correlation analysis is important in depicting the direction and strength of the linear relationship amongst two variables. More precisely, the Pearson Correlation analysis was undertaken to clarify and assess the strengths of the relationship amongst the study

variables as presented in Table 4.5. The correlation coefficient (*r*) values presented in the Table 4.5 displays the strength of the relationship among variables. Hair, Black, Babin, & Anderson (2010) suggested that the correlation value of 0 proves no relationship, while the correlation ±1.0 indicates perfect relationship. On the other hand, interpreted the correlation within 0 and 1.0 which are as follows; the correlation (*r*) between ±0.1 and ±0.29 indicate little relationship, and then between ±0.30 and ±0.49 indicate an average relationship and more than ±0.50 displays strong/solid relationship.

Table 4.5
Summary of Pearson Correlation Matrix

	OR	**CR**	**LQ**	**FIRMSIZE**	**BANKAGE**	**MCHANG**
OR	1.000					
CR	-0.161	1.000				
LQ	-0.064	-0.287*	1.000			
FIRMSIZE	-0.163*	0.082	-0.234*	1.000		
BANKAGE	-0.36	0.062	-0.204	0.710**	1.000	
MCHANG	0.303**	-0.079	-0.046	0.043	-0.122	1.000

Notes:
** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
OR = Total expenses divided by total revenue; CR = Total debt divided by total assets; LQ = Net loans divided by deposits; FIRMSIZE = The log of total assets; BANKAGE = Numbers of years since the company start incorporation; MCHANG = A dummy variable, coded "1" if there is a change in board members and "0" otherwise.

Table 4.5 discloses the Pearson Correlation Matrix between the control variables and independent variables with the return on asset of banks listed in Amman stock exchange in assessing the relationship between all variables in this study and bank performance by ROA.

From the table above, there are few of correlations amongst the variables in the model at 1% and 5% significant level. As it shown in Table 4.5 the highest level of correlation is seen amongst firm size (FIRMSIZE) and bank age (BANKAGE) with 71% at level of correlation of 1% of significant.

4.3.4.2 Variance Inflation Factor (VIF)

The use of Variance Inflation Factor (VIF) for every independent variable turned into a common strategy for identifying the multicolinearity and to estimation the outcome (Naser, Al-Khatib, & Karbhari, 2002). The VIF expressed that if VIF is more than 10, it demonstrates that the independent variable in the research has extreme relationships that prompt the multicolinearity issue. In this study, the researcher joined the multicolinearity diagnostic with the VIF while running the linear regression models.

Table 4.6 reveals the outcome of the multicolinearity issue as VIF for all independent variables is less than 10 which implies that the independent variables are within the normal range. It is accordingly presumed that the present study is free from multicolinearity.

Table 4.6
Summary of Multicolinearity Test

Variables	**Collinearity Statistics**	
	Tolerance	***VIF***
OR	0.838714	1.19
CR	0.894355	1.12
LQ	0.866853	1.15
FIRMSIZE	0.458690	2.18
BANKAGE	0.473373	2.11
MCHANG	0.879493	1.14
Mean VIF		1.48

OR = Total expenses divided by total revenue; CR = Total debt divided by total assets; LQ = Net loans divided by deposits; FIRMSIZE = The log of total assets; BANKAGE = Numbers of years since the company start incorporation; MCHANG = A dummy variable, coded "1" if there is a change in board members and "0" otherwise.

4.4 Model Selection between Fixed Effect and Random Effects

The Hausman test is another statistical hypothesis test in the field of econometrics. This test assesses the impact of an alternative estimator versus an estimator. It assists researchers to assess whether a statistical model matches to the data (Oyerinde, 2014).

Hausman specification test assists in selecting between Fixed Effect model and Random Effect model. As indicated by the Hausman test, the null hypothesis is a coefficient estimated by efficient Random Effect estimator and is equal to the one estimated by the reliable Fixed Effect estimator. If the values in the study are insignificant (p-value, prob > chi2 larger than .05), at that point, it is safe to utilize Random Effect model; else, Fixed Effect model impact is used (Davidson & MacKinnon, 1993; and Greene, 2003).

Table 4.7
Hausman Specification Tests

	Chi2	***p-value***
Hausman	2.02	0.9180
H0	reject	reject

The *p*-value (0.9180) for the Hausman test as indicated in Table 4.7 is insignificant and therefore established that Random Effect model is more suitable since there is no proof of significant disparities within the banks; hence, Random Effect regression can be run (Gujarati, 2009).

Therefore Fixed Effect is rejected and the Random Effect is accepted. Thus, this study adopted Random Effect to analyse panel data.

4.5 Linear Regression Analysis

In the current study, the analysis of linear regression is being utilized as a statistical technique to investigate the relationships that arise amongst the dependent variable and three independent variables comprising operational risk, credit risk, liquidity risk and the three control variables which are firm size, bank age and management change for 15 listed banks in Jordan. Table 4.8 reveals the analysis of results for fixed and random effects model in the study.

Table 4.8

Regression result of the model fixed and random effects (Dependent = ROA)

		Fixed Effect		**Random Effect**	
Variables	*Expected Sig*	*Coef.*	*t-value*	*Coef.*	*z-value*
OR	-	-0.0297916	-10.38***	-0.0291964	-12.16***
CR	-	-0.0321641	-1.87**	-0.0308187	-2.32***
LQ	-	0.0033941	0.52	0.0024548	0.40
FIRMSIZE	+	-0.0020963	-1.25	-0.0013393	-1.48*
BANKAGE	+	0.0000524	0.54	0.0000881	1.68**
MCHANG	+	-0.0002859	-0.54	-0.0003282	-0.70
_cons		0.1010388	2.98	0.0821423	4.02
Number of obs			75		75
Number of group			15		15
Wald chi2 (6)			-		240.84
F (6, 54)			34.91		-
R2			0.6169		0.7170
Prob > chi2			-		0.0000
Prob > F			0.0000		-

*** Significant at level 0.01

** Significant at level 0.05

* Significant at level 0.1

ROA = Net income divided by total assets; OR = Total expenses divided by total revenue; CR = Total debt divided by total assets; LQ = Net loans divided by deposits; FIRMSIZE = The log of total assets; BANKAGE = Numbers of years since the company start incorporation; MCHANG = A dummy variable, coded "1" if there is a change in board members and "0" otherwise.

4.6 Result after Correction of Heteroscedasticity and Autocorrelation

From the results of Table 4.3 the result of Breusch-Pagan/Cook-Weisberg Test for Heteroscedasticity shows that the *p*-value is less than 0.05 in the model, indicating that heteroscedasticity exist. In addition Table 4.4 the Wooldridge test was conducted to find out that autocorrelation exists in relation to return on assets ROA. Based on these results as shown in Table 4.3 and Table 4.4 he data was corrected and the problems were corrected by stata. As it shown from Table 4.9 the problem of heteroscedasticity and autocorrelation was corrected by using stata command of correction the errors of heteroscedasticity and autocorrelation.

Table 4.9

Regression result, after correction the error of heteroskedastic and autocorrelation.

ROA	*Expected Sig*	*Coef.*	*z-value*
OR	-	-0.0327737	-14.11 ***
CR	-	-0.0201249	-2.07 **
LQ	-	0.0047191	0.50
FIRMSIZE	+	-0.0011402	-2.36 ***
BANKAGE	+	0.0001015	4.28 ***
MCHANG	+	0.0005025	0.81
_cons		0.0698236	5.22

Group variable:	ID	Number of obs =	75
Time variable :	YEAR	Number of groups =	15
Panels :	heteroskedastic (balanced)	Obs per group:	
Autocorrelation:	no autocorrelation	min =	5
		avg =	5
		max =	5
Estimated covariances =	15	R-squared =	0.7369
Estimated autocorrelations =	0	Wald chi2 (6) =	297.43
Estimated coefficients =	7	Prob > chi2 =	0.0000

*** Significant at level 0.01

** Significant at level 0.05

* Significant at level 0.1

ROA = Net income divided by total assets; OR = Total expenses divided by total revenue; CR = Total debt divided by total assets; LQ = Net loans divided by deposits; FIRMSIZE = The log of total assets; BANKAGE = Numbers of years since the company start incorporation; MCHANG = A dummy variable, coded "1" if there is a change in board members and "0" otherwise.

4.7 Further Test

Section 4.7 presents the further test by using log of the variables that tested in the study. For the purpose of testing, each interactive variable was originally added to the original model.

Table 4.10

Regression result of the fixed and random effects between log (operational risk, credit risk and liquidity risk) and ROA.

		Fixed Effect		**Random Effect**	
Variables	*Expected Sig*	*Coef.*	*t-value*	*Coef.*	*z-value*
Log OR	-	-0.039527	-8.66***	-0.0397235	-10.63***
Log CR	-	-0.059157	-1.67**	-0.0573723	-2.10**
Log LQ	-	-0.0001815	-0.74	-0.0001331	-0.58
FIRMSIZE	+	-0.0016556	-0.94	-0.0012487	-1.33*
BANKAGE	+	0.0000413	0.39	0.0000871	1.60*
MCHANG	+	-0.0005885	-1.03	-0.0005311	-1.06
_cons		0.0334451	0.93	0.02325	1.24
Number of obs			75		75
Number of group			15		15
Wald chi2 (6)			-		204.94
F (6, 54)			29.43		-
R2			0.6148		0.6954
Prob > chi2			-		0.0000
Prob > F			0.0000		-

*** Significant at level 0.01

** Significant at level 0.05

* Significant at level 0.1

ROA = Net income divided by total assets; Log OR = Log Operational Risk; Log CR = Log Credit Risk; Log LQ = Log Liquidity Risk; FIRMSIZE = The log of total assets; BANKAGE = Numbers of years since the company start incorporation; MCHANG = A dummy variable, coded "1" if there is a change in board members and "0" otherwise.

The *p*-value (0.9137) for the Hausman test as indicated in the result of further test is insignificant and therefore established that random effect model is more suitable. Hence, random effect regression can be run (Gujarati, 2009). Therefore Fixed Effect is rejected and the Random Effect is accepted. Thus, this study adopted Random Effect to analyse panel data.

4.8 Further test after Correction of Heteroscedasticity and Autocorrelation

Table 4.11
Regression result, after correction the error of heteroskedastic and autocorrelation.

ROA	*Expected Sig*	*Coef.*	*z-value*
Log OR	-	-0.0474197	-12.42***
Log CR	-	-0.0370914	-1.93**
Log LQ	-	0.0001161	0.43
FIRMSIZE	+	-0.0011593	2.25**
BANKAGE	+	0.0001061	4.21***
MCHANG	+	0.0004181	0.66
_cons		0.02005	1.95

Group variable: ID		Number of obs	= 75
Time variable: YEAR		Number of groups	= 15
Panels: heteroskedastic (balanced)		Obs per group:	
Autocorrelation: no autocorrelation		min	= 5
		avg	= 5
		max	= 5
Estimated covariances	= 15	R-squared	= 0.7180
Estimated autocorrelations	= 0	Wald chi2(6)	= 233.76
Estimated coefficients	= 7	Prob > chi2	= 0.000

*** Significant at level 0.01
** Significant at level 0.05
* Significant at level 0.1
ROA = Net income divided by total assets; Log OR = Log Operational Risk; Log CR = Log Credit Risk; Log LQ = Log Liquidity Risk; FIRMSIZE = The log of total assets; BANKAGE = Numbers of years since the company start incorporation; MCHANG = A dummy variable, coded "1" if there is a change in board members and "0" otherwise. .

4.9 Discussions

4.9.1 (ROA as Dependent Variable)

In probing the hypotheses model using a linear regression analysis, some indicators were engaged. Some of which are using the R^2 coefficient, that assesses the robustness of the regression equation. It is also referred to as the coefficient of determination which uncovers the point of difference between the dependent variable which is described by model of the variables. In this study, the R^2 displays the point of difference of dependent variable (ROA) which is described by the dependent variable (bank performance measured by using ROA) resulting from the collective influence of the independent

variable namely (operational risk, credit risk, liquidity risk). Furthermore, when the R^2 is equivalent to 1 it implies that there is an excellent linear connection amongst the dependent and independent variables in the study. Moreover, when R^2 is equivalent to 0, this implies no linear connection existing amongst the dependent and the independent variables. As a result, the value/unit under R^2 exhibits the level of difference in the dependent variable (bank performance measured by using ROA) is being described in the model which involves (operational risk, credit risk, liquidity risk).

As shown by the results in Table 4.9, the rate of *R2* in the model is 0.7369. This implies that the model describes 73.69% of the difference in bank performance measured by using ROA. This is being considered as acceptable results. In cases where there is a small sample, *R2* value is a rather optimistic overestimation of the real population value (Tabachnick & Fidell, 2007). *R2* signifies that 0.7369 percent of the disparity in the dependent variable is discussed by the disparities in the independent variables within the study. This implies that the deviation in bank performance measured by ROA is statistically described by the regression equation. The results in Table 4.9 also display that the model is significant (p<0.0l) indicating the validity of the model used.

In order to test the hypotheses, standard beta coefficients were utilized. Standardized required the values of each different variable to be converted to the same scale for contrast of the beta value that is the highest (while disregarding the negative signs). In this way, standardized beta coefficients may be contrasted with one another with the higher coefficient signifying that they are strong influence of the variables on the dependent variable. Regression coefficient disclosed that the variables were predictors of the model's dependent variable.

Generally, the results in Table 4.9 displayed the four variables in the study that were discovered to be significant with bank performance predictors (measured by ROA). The variables are operational risk (OR) (β= -0.0327737, p<0.01), credit risk (CR) (β= -0.0201249, p<0.05), firm size (FIRMSIZE) (β= -0.0011402, p<0.01), and finally bank age (BANKAGE) (β=0.0001015, p<0.01).

However, other variables such as liquidity risk (LQ) (β=0.0047191, p>0.1), and management change (MCHANG) (β=0.0005025, p>0.1) failed to make a significant contribution as dependent variable predictors (bank performance measured by using ROA).

4.9.2 Hypotheses Testing

In this section, the results of the analysis of the relationship between bank performance. ROA as dependent variable and operational risk, credit risk, and liquidity risk are the hypotheses variables. Whereas the control variables are the firm size, bank age and management change are presented through panel data analysis. In addition, presents the results of farther test for the relationship between operational risk, credit risk, liquidity risk and the bank performance (ROA) which are all in logs to investigate the robustness of the result.

4.9.2.1 Operational Risk and ROA

Based on Table 4.9, Operational risk has negative significant relationship with ROA. The results indicate that the higher the operational risk, the lower is the bank's performance. The possible explanations behind the relationship are an absence of certainty and persistence of the bank's clients towards Jordanian banks. Since 1990, governments

around the globe have lifted limitations on banks to boost great improvement in the banks. The new banking instruments presented after the evacuation of these confinements and the irreconcilable situations rising up out of cross-industry organizations have expanded bank's operational risks, making various financial issues. In this way, banks worldwide have been tending to the issue of operational risks, including the thought of risk management.

In spite of the fact that the banks are presented to operational risk, for example, disappointment of inward process, individuals or group at the same time, that may influence the trust, certainty, and dependability of the clients, and they keep on supporting the banks by depositing cash, loan and situating resources into the bank's securities.

This finding is consistent with other studies such as Al-Tamimi, Hussein, Miniaoui, & Elkelish (2015); Beck, De Jonghe, & Schepens (2013); Imbierowicz & Rauch (2014); Islam, Alam, & Al-Amin (2015); and Jiménez, Lopez, & Saurina (2013) which found a negative relationship between Operational risk and performance.

Table 4.11 presents the results of the relationship between operational risk and bank performance (ROA) which is in log to investigate the robustness of the result. The relationship between log operational risk and bank performance (ROA) was found to be statistically negative significant at level (0.01). This suggests that operational risk influence bank performance.

4.9.2.2 Credit Risk and ROA

Based on Table 4.9, Credit risk is also found negative significant to ROA. The negative relationship with ROA implies that the higher the credit risk the lower is the bank performance. The plausible reason for the negative relationship between credit risk and ROA is because of increase in non-performing loan of the banks, which reduces the bank performance. The credit risk was negatively correlated with the operating expenses of Jordanian banks, signifying the ability of the credit risk to serve as an effective risk indicator.

In other words, the process for managing credit risk can be simplified by using the proper guidelines, and it is not necessary for banks to develop a risk system procedure by themselves or with others, which lowers related costs. However, the use of the proper guidelines displayed no significant effect on the Jordanian banks, which may have resulted from the Jordanian banks having comparatively fewer risk assets and therefore not requiring complicated formulas to manage them.

The banks were thus able to satisfy the requirements regarding equity capital without having to make deliberate adjustments or to manage risks. This result is consistent with previous studies such as (Ab-Rahim, Md-Nor, Ramlee, & Ubaidillah, 2012; Beck, De Jonghe, & Schepens, 2013; Imbierowicz & Rauch, 2014; Islam, Alam, & Al-Amin, 2015; Jiménez, Lopez, & Saurina, 2013; Ongore & Kusa, 2013; Ruziqa, 2013; Said, 2013; and Sufian & Abdul Majid, 2007) which found a negative relationship between credit risk and performance.

In addition Table 4.11 presents the results of the relationship between credit risk and bank performance (ROA) which is in logs to investigate the robustness of the result. The result shows that there is statistically negative significant at level (0.05). This suggests that credit risk influence bank performance.

4.9.2.3 Liquidity Risk and ROA

Based on Table 4.9, the third hypotheses variable, liquidity risk is found insignificant with ROA. The plausible reason for the insignificant relationship between liquidity risk and ROA is because of increase in banks liabilities and liquidity gap which reduces bank performance (Saeed, 2015). Also banks may be unable to meet short term financial demands. This usually occurs because of the inability to convert a security or hard asset to cash without a loss of capital and/or income. This finding is consistent with other studies such as (Imbierowicz & Rauch, 2014; Khan, Scheule, & Wu, 2016; and Lartey, Antwi, & Boadi, 2013). Table 4.11 presents the results of the relationship between liquidity risk and bank performance (ROA) which is in logs to investigate the robustness of the result. The relationship between log liquidity risk and bank performance (ROA) was found to be statistically insignificant. This prompt that liquidity risk does not influence the performance of the banks.

4.9.2.4 Control Variables and ROA

Three control variables were adopted in this study, which are the firm size, bank age and management change. First of them is the firm size. The use of firm size as a control variable is being justified by the findings of companies with various distinct characteristics. According to Patro, Lehn, & Zhao (2003) firm size is explicitly associated to its size and is inversely comparative to the alternate of growth prospects. In addition,

the firm size affects firm performance and is usually utilized as control variable in experimental research. (Cheung, Thomas Connelly, Limpaphayom, & Zhou, 2007; De Andres, Azofra, & Lopez, 2005; and Ghosh, 2006). The result in Table 4.9 shows a negative relationship, and statistically significant at level (0.01) between firm size (FIRMSIZE) and ROA. This is not consistent with Klapper & Love (2004) who discovered that there is a positive significant relationship between firm size and performance.

The second control variable is bank age the results presented in Table 4.9 shows a positive relationship and significantly related at level (0.01) with ROA. The results are consistent with the previous studies (Evans, 1987; and Stinchcombe & March, 1965) which showed that an increase in the age of a company accompanies an increase in management abilities and skills to improve firm performance. Therefore, bank performance increases with the bank age.

Finally, the third control variable that was considered in this study is the management change. Table 4.9 displays a positive relationship and insignificantly related to ROA. The results are not consistent with previous studies that any changes in board of director's structure leads to decreased firm performance (Hart, 1995; Patton & Baker, 1987; and Warner, Watts, & Wruck, 1988). However, any changes in the board of directors affect not only the firm's value in the market, but also the firm's performance (Fama, 1980; and Furtado & Karan, 1990). Therefore, the bank performance decreases with changes in the board of directors.

4.10 Chapter Summary

This chapter has discussed as well as provided detail discussions on the results as per the objectives of the study. This chapter carries out the diagnostic tests, model selection between fixed effect and random effects, linear regression analysis. Also, further test was lined out. Finally, discussions of the results. Thus, the following chapter is conclusions and recommendations for future research.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This current study has examined the relationship between some specific set of risk variables such as operational risk, credit risk, and liquidity risk representing the independent variables, firm size, bank age and management change, representing the control variables and measure of bank performance (ROA), representing the dependent variable, from 2010 - 2014 annual reports of banks listed on the Amman Stock Exchange. This chapter provides the introduction of the chapter. The second section is the research summary, and then followed by the limitation of the study. Finally, it presents the recommendations for future studies, the contribution of the study, and as well as the conclusion.

5.2 Research Summary

The study investigates 15 banks that are quoted in the Amman stock exchange for the time frame of 2010 to 2014. The key objective of this study is to investigate the effect of risk on Jordanian banks' performance. For the purpose of this research, risk variables are to be represented by operational risk, credit risk, and liquidity risk to determine the influence it has on the bank performance of Jordanian banks. In view of the results obtained, this study found that the relationship between operational risk and bank performance is negatively significant, this result indicates that the higher the operational risk, the lower the bank performance for these periods under review.

In addition, credit risk has negative significant relationship with bank performance. This shows that credit risk fairly influences bank performance in these periods under review. This negative relationship could be due to increase in non-performing loan which reduces bank performance. Furthermore, liquidity risk has positive insignificant relationship with bank performance.

Other control variables which include: firm size, bank age and management change were also investigated. The study documents a negative and significant relationship between the firm size and bank performance, for bank age was found that a positive and significant relationship exists with the bank performance. Management change was not found to be significantly associated with bank performance.

This study carried out further test by using logarithm for all the hypothesis variables in other to show the robustness of the result. The log operational risk was found to be negative and significant with bank performance, and similarly the log of credit risk was found to be negative and significant with bank performance. Finally, the result implies that the log of liquidity risk was found to be positive and insignificant with Jordanian banks financial performance as measured by ROA.

Table 5.1
Summary of the Hypothesis Testing Results

Hypothesis	Hypothesis statement	Findings
H1	There is a negative significant relationship between operational risk and bank performance.	Negative & Significant
H2	There is a negative significant relationship between credit risk and bank performance.	Negative & Significant
H3	There is a negative significant relationship between liquidity risk and bank performance.	Positive & Insignificant

In conclusion, the study results obtained from panel data analyses showed that two hypotheses were negative while the other one is positive. Specifically, Table 5.1 indicates that H1 is negative and significant and H2 is negative and significant. On the other hand, H3 is positive and insignificant. Based on the result in Table 4.9, the objectives of the study are achieved as shown in Table 5.1.

5.3 Limitations of the Study

There are few studies on risk and bank performance in the Jordanian banking industry. Most of the empirical studies referenced in this study were studies conducted in developed countries. However, due to the differences in environment and culture between these countries, the results of these studies might not be appropriate and suitable to apply in the Jordanian setting. Some of the data used in this study was collected from data-stream. Even though the data-stream is source of data collection, it still provides missing data of some certain banks in Jordan.

5.4 Suggestions for Future Research

Future research on risk can focus on other risk factors such as interest rate risk, market risk, and foreign exchange risk. In addition, future studies can also consider risk in other countries such as Iraq, Libya, Tunisia, and Syria in order to provide a more robust result of the relationship between risk and bank performance of developing countries.

Moreover, the data utilized for the present study is originated from 15 banks in Jordan with their return on asset. A larger data set relating financial might convey a substitute model of the relationship that exists between risk and performance.

5.5 Contributions

5.5.1 Body of Knowledge

The results of this study are important to other researchers. It is useful because of its contribution to body of knowledge specifically on the relationship between risk and bank performance. Also this will be useful to future researchers who are interested in conducting the same type of research like in this field of study. This study also provides evidence of the relationship between operational risk, credit risk and liquidity risk with performance of Jordanian banks.

5.5.2 Policy Implications

The result of this study is of importance to policy makers because it will facilitate the formulation of policies regarding risk in banking, through enforcing the implementation of an effective risk on banks for creation of measures and prevention against any possible threat of financial crisis on the economy. It is imperative for banks regulators and policy makers in Jordan to continue to enforce and promote the implementation of an effective risk management in banks that will ensure and prevent possible threat of bankruptcy, liquidation and financial meltdown.

Furthermore, this study can contribute current information and opportunities especially to the policy maker. Based on the result of this study, policy makers can build new rules and regulations to improve the banking area in Jordan from time to time in line with the current situation. It will also provide valuable information to help banks such as improve and upgrade their efficiencies in terms of their offering of products and services to the customers.

5.5.3 Practical Implications

It is important to practitioners by showing the factors that affect bank performance, and enables them to improve their risk management practice. Jordanian banks must always formulate forward looking risk systems and sound practices for managing risks, particularly in times of rapid growth in new products or markets. If banks fail to adhere to basic risk principles, it may affect them in evaluating risk of new products in the market, which will hinder their increase in market share.

Besides, it also provides valuable information as well as guidance for banking institutions to improve their position of services in the future. The good services provided by banks will give positive impact to the bank. Therefore, the study serves as an input to banks in Jordan. In addition, this type of research provides better understanding and valuable information to the banks in order to become more competitive and acceptable by relevant parties such as customers and investors.

In addition, this study also gives benefits for investors and depositors as well as customers. The study serves as an input to depositors and investors alike in terms of making decision to act. For instance, a good and efficient bank management will attract customers as they normally like to do their transactions with banks that have good and efficient service performance. Customers and investors usually will look at the position and the bank's performance before they make any decision to deal with the bank.

5.6 Conclusions

The purpose of this study is to examine the effect of risk variables on the performance of Jordanian banks; the objectives of this study have been accomplished. The study investigates the relationship between the hypotheses variables namely operational risk, credit risk, and liquidity risk with the dependent variable namely return on asset (ROA). Based on the results of the panel data analysis, only four variable namely operational risk, credit risk, firm size, and bank age were found to be significant relationship with the banks performance which was measured using return on asset (ROA).

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Appendix A

List of Banks in Jordan and Their Websites

S/N	Bank Name	Websites
1.	Jordan Islamic Bank	http://www.jordanislamicbank.com
2.	Jordan Kuwait Bank	http://www.jkb.com
3.	Jordan Commercial Bank	http://www.jcbank.com.jo
4.	The Housing Bank for Trade and Finance	http://www.hbtf.com
5.	Arab Jordan Investment Bank	http://www.ajib.com
6.	Bank Al Etihad	http://www.bankaletihad.com
7.	Arab Banking Corporation	https://www.bank-abc.com
8.	Invest Bank	http://www.investbank.jo
9.	Capital Bank of Jordan	http://www.capitalbank.jo
10.	Societe Generale de Banque Jordanie	http://www.sgbj.com.jo
11.	Cairo Amman Bank	http://www.cab.jo
12.	Bank of Jordan	http://www.bankofjordan.com
13.	Jordan Ahli Bank	http://www.ahli.com
14.	Islamic International Arab Bank	http://www.iiabank.com.jo
15.	Arab Bank	http://www.arabbank.jo

Source: *Central Bank of Jordan (CBJ) annual report, 2015.*