THE IMPACT OF LIQUIDITY RISK, CREDIT RISK AND OPERATIONAL RISK ON THE PERFORMANCE OF IRAQI PRIVATE BANKS

BY

NOOR HASHIM MOHAMMED

(817745)

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NOOR HASHIM MOHAMMED

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Nama Penyelia : **DR. SABRI NAYAN**
(Name of Supervisor)

Tandatangan :
(Signature)

Dr. SABRI NAYAN
Senior Lecturer
School of Economics, Finance and Banking (SOFB)
COB, Universiti Utara Malaysia

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Abstract

The main objectives of this research is to study the effect of liquidity risk, credit risk and operational risk on the performance of private banks in Iraq for the period 2009 to 2014. This study especially focus on Iraqi commercial private Banks. The dependent variables for bank performances are measured by return on asset (ROA) and return on equity (ROE), and independent variables which are, liquidity risks are measured by liquidity ratio and calculate as liquid asset to total asset, credit risks are measured by non-performing loan ratio and operational risks are measured by earnings before interest and tax divide on total asset. This study employs panel data regression analysis of fixed effects and random effects models. Furthermore, the results show that liquidity risk was found having positive significant relationship with ROA and ROE. While credit risk has negative significant relationship with ROA, and negative insignificant relationship with ROE. However, operational risk was found to have significant and negative effect on ROA. While operational risk was significant and positively related to ROE.

Keywords: Liquidity risk (LR), Credit risk (CR), Operational risk (OR), return on asset (ROA), return on equity (ROE).

ABSTRAK

Objektif utama kajian ini adalah untuk mengkaji kesan risiko kecairan, risiko kredit dan risiko operasi ke atas pencapaian bank-bank di Iraq bagi tempoh (2009 hingga 2014). Kajian ini lebih memberi tumpuan kepada Bank Komersial Swasta di Iraq. Pembolehubah bersandar adalah pencapaian bank yang diukur berdasarkan Pulangan atas Aset (ROA) dan Pulangan atas Ekuiti (ROE). Dalam pembolehubah tidak bersandar, risiko kecairan diukur menggunakan nisbah kecairan dan dikira sebagai aset cecair kepada jumlah aset, risiko kredit diukur oleh nisbah pinjaman tidak berbayar dan risiko operasi diukur menggunakan pendapatan sebelum faedah dan cukai yang dibahagi dengan jumlah aset. Kajian ini menggunakan panel data analisis regrasi yang memberi kesan tetap dan model kesan rawak. Tambahan pula, keputusan menunjukkan bahawa risiko kecairan didapati mempunyai hubungan yang ketara positif dengan ROA dan ROE. Manakala risiko kredit mempunyai hubungan yang ketara negatif dengan ROA dan hubungan yang tidak ketara negatif dengan ROE. Walau bagaimanapun, risiko operasi didapati mempunyai kesan yang ketara negatif dengan ROA. Manakala risiko operasi adalah penting dan positif yang berkaitan dengan ROE.

Kata Kunci: risiko kecairan (LR), risiko kredit (CR), risiko operasi (OR), pulangan atas aset (ROA), pulangan atas ekuiti (ROE).

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CHAPTER ONE

BACKGROUND OF THE STUDY

1.1 Introduction

This chapter consists of nine sections. It serves the purpose of introducing the entire research. Section 1.2 presents background of the study. Then, section 1.3 consists of problem statement. While section 1.4 presents a number of research questions, which are translated into objectives of the study as, contained in section 1.5. Furthermore, section 1.6 explains the scope of the study and significance of the study is presented in section 1.7. Additionally, organization of the study in section 1.8. Finally, section 1.9 Summarize the chapter.

1.2 Background of the Study

1.2.1 Overview of Iraqi banking sectors

Iraqi banking sector grew up since the nineteenth century as a special sector featuring a group of Iraqi banks and branches of Arab and foreign banks (with seventeen branches). Then the emergence of a government banking sector that is represented by the establishment of the Agricultural bank and Industrial bank in 1935, the Rafidain Bank in 1941, the Central Bank of Iraq in 1947, and the Real Estate Bank in 1948. The government banks and private banks were competing to provide better services to the public (Abdul Nabi, 2012). In Iraq, due to the country‘s huge economic liberalization, the banking sector is starting to play an important role in pushing the country towards free market trade. This sector is showing amazing chance for extension and variety and accounted 44.6% of total stock market capitalization, and participated 18.7% to Gross Domestic Product (GDP) (Iraqi Banks Annual report, 2014). The Iraqi government is

placing major assertion on the banking organizations development and they hope that they will be able to finance projects and deal with incoming capital investment. Banking sectors in Iraq is divide into Commercial banks and Islamic banks, Commercial banks have a conclusive role for the distribution of economic resources in the countries. Their essential contributions are in the growth of the economy in the countries, through making availability of funds for different investors to borrow as well as financial deepening in the countries (Duraj & Moci, 2015).

This was followed by the nationalization of private banks in 1964, and the formation of four banking groups, which were merged with the Iraqi commercial bank. The Iraqi commercial bank was merged with Rafidain bank in 1974, and also Rasheed bank were established in 1988. In 1991, Law No. 12 was issued, which modified whereby CBI Law No. 64 of 1976, which allowed the private sector once again to establish private banks, which began with two banks in 1992, and ended in (24) local private commercial banks by the end of 2014. The new banking Law No. 94 of 2004 was issued, which allowed foreign banks to operate in Iraq, which their number reached to (16) banks by the end of 2014 (*The Banking Act No. 94 of 2004; The Banking Act No. 12 of 1991*).

1.2.2 Risk in Banking Sector

Risk in banking such as objectives can accomplish with the sudden results of happening of something and it consist of uncertainty or gain chance with threat (Adeusi, Akeke, Adebisi, & Oladunjoye, 2014). The banking environment is full of great risk because it depends on the lending business which have higher percentage more than owner's capital (Owojori, Akintoye, & Adidu, 2011). As compared to other industry banking

business is more risky. Banks are not only involved in deposit acceptance and issue loan, it is rapidly growing sector along high amount of income with continuous improving service and growing products for satisfaction of customers (Adeusi *et al*., 2014).

The Basel Committee on Banks Supervision (Basel II) divided into three type of risk: operational risk, credit risk and market risk. Furthermore, according to Sanromero (1997) there are five types of risks, these includes: legal risk, operational risk, credit risk, market risk and liquidity risk. Moreover, Crouhy, Galai and Mark (2006) also discussed the types of banking risk which involves: business risk, credit risk, market risk, liquidity risk, operational risk, legal risk, strategic risk, and reputation risk. In addition, liquidity risk, credit risk and operational risk are the most important risks which influences on the performance of banks (Ariffin & Kassim, 2011; Tandelilin, Kaaro, Mahadwartha & Supriyatna, 2007). Therefore, it is obvious that the adoption of an effective and efficient risk management in the banking sector will apparently mitigate the industry against the risk of failure.

Hence, the main focus of the current study is that the influence of risk management represented by liquidity risk, credit risk and operational risk on the Iraqi bank's performance because these risks are the most important risk in banking sectors (Ariffin & Kassim, 2011; Tafri, Rahman & Omar, 2011; Tandelilin, *et al*., 2007). A study by Santomero (1997) found the liquidity risk as a funding crisis risk due to high risk with unexpected happening which can lose the confidence and also make existence of national proportion in crisis.

According to Alalade, Binuyo and Oguntodu (2014), credit risk is the risk of loss resulting from failure of obligors or borrowers to meet their payment. Therefore credit risk can be considered as the exposure faced by a bank as a result of a borrow default in meeting a debt obligation at maturity. According to Cruz (2002), 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 (Adeusi, *et al*., 2014). Operational risk is quite different from other risks encountered by banks because it is asymmetric, reducing banks performance mostly through provision of loss, as well as having a negative mean due to losses experienced through insufficient or poor internal processes, systems, and people, or by external environment of the bank (Tandelilin, *et al*., 2007).

Therefore, this study examines the association between liquidity risk, operational risk and credit risk with Iraqi banks performance. To measure bank's performance there are various types of ratios used of which return on asset (ROA) and return on equity (ROE) according to (Samson & Tarila, 2014; Ongore & Kusa, 2013; Tomar & Bino, 2012; Alexandru & Romanescu, 2008; Athanasoglou, Brissimis & Delis, 2008; Goddard and Molyneux & Wilson, 2004; Klapper & Love, 2004).

Due to the liquidity crisis and instability of the security situation, the Iraqi banks performance dramatically decrease, Return on equity (ROE) and return on assets (ROA) of the banking sectors witnessed decrease from 80% percent and 60% percent in 2005 to 53% percent and 20% percent in 2008 (Iraqi banks annual reports, (2005-2014). In the year 2010, ROE and ROA of the commercial private banks increased to

55% percent and 40% percent respectively. However, the ROE and ROA of the banking sectors decreased sharply again to 30% percent and 10% percent in 2014 respectively (Iraqi banks annual reports, 2005-2014).

Table 1.1

ROE and ROA for Iraqi Banks

Year	ROE	ROA
2005	80.00	60.00
2006	78.30	45.50
2007	70.10	39.10
2008	53.00	20.00
2009	50.00	29.94
2010	55.20	40.00
2011	42.21	22.93
2012	40.00	17.54
2013	33.61	15.34
2014	30.23	10.21

Sources: Annual reports of Iraqi banks (2005-2014).

1.3 Problem Statement

The Iraqi banking system has been faced with a lot of operational problems as well as problems linked to marketing (Abdul Redha, 2013). The poor performance of the Iraqi banking system was behind the call for improving the banking performance via re-organizing the structure of the process (Abdul Redha, 2013). According to the Iraqi country profile report (2014), the Iraqi banking system has many problems including among others low capitalization. A large volume of non-performing loans and weak enforcement of regulations, therefore many Iraqi banks are technically insolvent because many debtors fail to repay on time the bankruptcy of the national bank in 2014 is an example of that.

Moreover, the Iraqi banking system has not been able to effectively gain the trust of the Iraqi savers to attractive them to deal the business transactions through banks. This can be explained, according to Iraqi Annual Report (2014); by the fact that only 2.74 per cent of the total Iraqi population has bank accounts and only around 600,000 cheques have been circulated annually. It has also been emphasized that most of the economic transaction are cash-based and the Iraqi banking system holds only 60 per cent of the money supply (Almayahi, 2015).

The first issue, in spite of the Iraqi economic openness since 2003 and increasing the number of private banks and foreign banks, the liquidity crises affected a number of local private Iraqi banks such as Al-Warka Bank, Economy Bank, Basra Bank, Trans Iraq Bank, International Development Bank, Elaf Bank, and United Bank (Alhassoun, 2014).

The other issue, due to the security situation, which Iraq faces, the increase of unemployment rates, increased financial and administrative corruption and favouritism, resulted in the increase non-performing loans (NPLs), which indicates weakness of risk management in Iraqi banks (Alshammari, 2012). NPL, which is an important indicator of credit risk, high NPL decreased asset quality of the banks and eroded the banks' profits (Rose & Hudgins, 2010; Brownbridge & Harvey 1998). Additionally, the NPL in Iraqi banks increased sharply from 20.8 percent in 2005 to 26.2 percent in 2008, and increase again in 2013 and 2014 to 27.4 percent and 28 percent respectively (Iraqi banks annual reports, 2005-2014).

Although there are a lot of studies on liquidity risk, credit risk and operational risk and banks performance in developed and developing countries such as Adeusi *et al.* (2014), Soyemi, Ogunleye and Ashogbon (2014), Kanchu and Kumar (2013), Sohaimi (2013), Kolapo, Ayeni and Oke (2012), Ariffin and Kassim (2011), Mainelli (2002) and Thirlwell (2002), but the results are inconsistent. However, in the Iraqi environment there is scarce studies about this topic. Therefore, the current study examines that there is a significant for liquidity risk, credit risk and operational risk on Iraqi bank's performance.

The purpose of this study is to fill the literature gap by deeply analyzing the risk management practices in banks and relate these practices with bank performance. The study emphasis on the Iraqi banks having complete data collection and reliability techniques. Furthermore this study aims to contribute in strategy making and improve risk management policies in banks of Iraq also increase overall competencies in banking sector.

1.4 Research Questions

Based on the problem statement, the research questions will be formulated as follows:

1. Is there a significant influence for liquidity risks on bank performance?
2. Is there a significant impact for credit risks on bank performance?
3. Is there a significant influence for operational risks on bank performance?

1.5 Research Objectives

In general, this study seeks to discover the association between liquidity risk, operational risk and credit risk with Iraqi bank performance. Specific objectives of the study are:

1. To investigate the influence for liquidity risks on the performance of bank.
2. To examine any significant effect between credit risks and bank performance.
3. To assess the influence for operational risk on the performance of bank.

1.6 Scope of the Study

The current study is conducted to investigate the influence of liquidity risk, credit risk and operational risk on bank's performance. The study sample is consists of eighteen commercial private local banks listed in Iraqi Stock Exchange (ISX), also for the preparation of the accounting and financial ratios was based on the annual report for each bank. This study covers a period of six years from (2009 to 2014) because the Iraqi bank's performance decrease dramatically during this period as I mentioned in problem statement, the study also focused on liquidity risk, credit risk and operational risk

because these risks are the most important risks which affect bank's performance (Ariffin & Kassim, 2011).

1.7 Significant of the Study

This study is expected to contribute to the existence literature relating to the bank performance determinants especially in Iraq since there are few studies discussed on this issue. Furthermore, this study may help the regulatory, banks managements, and other researchers as beneficial for promoting further research on the area of bank's performance, especially on Iraqi banks. The result of this study contributes a new knowledge on risk management of Iraqi banks, which are scarcely been discussed in the previous literature.

1.8 Organization of the Thesis

This thesis include of five main chapters. Chapter one provides an overview of the study, which consist of background of study, problem statement, and research questions, research objectives, scope and significant of the study, and finally, organization of the study. Chapter two reviews the literature, the subject discussed in this chapter are the relationship between liquidity risk, credit risk, operational risk and bank's performance. Chapter three details the theoretical framework, measurement of variables, research methodology and finally, data analysis. Chapter four discusses the results and finding of the study which includes the descriptive statistical analysis, correlation, diagnostic test, hausman test and finally, regression analysis. Finally, chapter five includes summary and conclusions of the study, implications of the study and finally, the limitation of the study and future suggestions.

1.9 Concluding Remarks

As an introductory chapter, this chapter provides an insight into the entire research. It covers aspects such as background of the study. Under this sub-section on background for the study, a background regarding risk management. Next to the sub-section on background of the study, the chapter provides a problem statement where the problem at stake was explained. Following providing a concise problem statement, a number of research questions were drawn in another sub-section and later translated into objectives in the next sub-section. Significance attached to this study is provided in a separate sub-section. The last sub-sections of the chapter handle scope the study covers and also the organization of the study. Finally the next chapter will discussed the literature review.

CHAPTER TWO

LITERTURE REVIEW

2.1 Introduction

This chapter is dedicated to the review of literature related to the study. This chapter consists of seven sections. In section 2.2 definition and concept of bank performance. Section 2.3 is meant to provide an insight into the banking risks and explain the concept and dimensions of liquidity risk, credit risk and operational risk. Sections 2.4 is allocated to the empirical researches on the link between liquidity risk, credit risk, operational risk and bank's performance. Finally, Section 2.5 the concluding remarks of the chapter.

2.2 Definition and Concept of Bank Performance

Bank performance refers to general measure of how well a bank generates revenues from its capital (Nickel & Rodriguez, 2002). It also shows a bank's overall financial health over a period, and it helps to compare different banks across the banking sector at the same time (Nickel & Rodriguez, 2002).

Banks performance valuation is crucial for regulators, depositors and bank managers. Furthermore, the bank performance provide the security to deposit investors during financial market competition than investor decide whether to withdraw funds or invest more. Moreover, bank performance provide the signal to managers than they decide about the ratio of deposit service or loan service or financing with both services. Similarly, regulatory body also interested to know about the performance of bank for making new regulations (Samad & Hassan, 1999). The valuation of bank performance

rely on the measurement of the use of assets, calculate the revenue and expenses, equities and liabilities. Bank performance indicates the efficient use of financial and human resources capacity of the bank to achieve its purpose (Rajagopal, 1996). The financial ratio method is mostly used for the valuation of bank performance, the reason is that it provide the more clear and simple results which helpful to compare the bank performance with previous time period and also easy for the managers to improve performance (Lin, Liu, & Chu, 2005).

Mahmoud and Ahmed (2014) indicates that the bank's capacity to obtain long-term objectives is based on its bank performance. Bank performance is the measurement of the outcome obtained or expected in the light of predefined standards to determine what can be measured (Al-Hennawi, 2009).

2.3 Banking Risks

Banking risks can be explained as a phenomenon that occurs during the course of banking operations and causing negative effects on these activities by the deterioration in asset quality, reduced profits or even losses registration, all of which affect the functionality of the bank. Banking risk may arise because of internal or external causes, and the light of unforeseen expenses that may arise, risk management activities have a particular interest to banks (Cocri & Andrieu, 2009).

Risk can be regarded as the possibility of something occurring and the level of losing, which happens from an activity or situation (Bessis, 2010). Losses can occur directly

or indirectly. An instance is when an earthquake causes direct loss of buildings; meanwhile, indirect losses occur when there is reputation loss, loss of customers' confidence, and increase in operational costs in the time of recovery. The possibility of something to occur will influence achieving objectives (Kanchu & Kumar, 2013). According to Power (2004), "Risks are usually defined by the adverse impact on profitability of several distinct sources of uncertainty. Meanwhile, the degree and types of organization risks can be uncovered due to certain factors which include volume, business activities complexity, size volume, and so on. Systematic and unsystematic risks are the two classifications of risk (Al-Tamimi & Al-Mazrooei, 2007). Systematic risk is regarded as risk that is intrinsic to entire market or system. At times it is regarded as systemic risk, market risk or undiversification risk which cannot be evaded due to diversification. Meanwhile, unsystematic risk is regarded as risk that is related to specific assets and therefore can be evaded by diversification. It is also referred as diversifiable risk, residual risk or specific risk (Al-Tamimi & Al-Mazrooei, 2007).

Banking risks can be described as an unplanned situation with financial effects leading to loss or decrease profits (Kanchu & Kumar, 2013). Banking risks can be described also as potential of loss, which may be financial loss or loss to the picture or reputation. Banks like any other commercial organisation also intend to take risk, which is inherent in any business (Power, 2004). The higher the risk taken, the higher the gain would be. However, higher risks may lead into higher losses. However, banks are prudent enough to identify, measure and price risk, and maintain adequate capital to take care of any eventuality (Power, 2004). The main important risks in banking are liquidity risk, credit risk and operational risk (Ariffin & Kassim, 2011; Tafri, *et al*., 2011; Tandelilin, *et al.*, 2007).

2.3.1 Liquidity Risks

Liquidity risk is regarded as the reliable tracker that leads to any austere market crisis; it is the ultimate fuse that carries the spark that explodes both credit and market risks and is the catalyst that often transmutes inaccessible loss measures to systemic contagious failures (Kanchu & Kumar, 2013). Furthermore, Kanchu and Kumar (2013) discussed that it is not possible for institutions to fulfil their commitments and they only can fulfil this by funds borrowing at very high cost or they can manage their assets at very less prices. Banks liquidity can be defined as when bank achieve the expectations and also fulfil the needs of contingency cash. The banks can fulfil the need of cash by maturities of liabilities, payment of loan and deposits withdraw (Crouhy, Galai & Mark, 2005). When banks encourage the borrowings and deposits, development in investments, assets selling and loan disbursement then it can fulfil the cash need.

According to Crouhy, *et al*. (2005) insufficient liquidity decrease the profitability because it reduces the unexpected cash which used for extra cost. This insufficient liquidity makes the deficiency of capital which leads to bank insolvency. There should be strategies for funding, risk management process, liquidity risk revelation limits, and plan of alternative strategy along crisis scenario included in the liquidity management policies of bank. Banks consider the liquidity because sometimes the balance sheet unexpectedly change upward or downward than from liquidity they can manage and reimburse the unexpected balance sheet, and also they can offer the funds for the growth purpose. When bank offers the required funds at reasonable price and suitable time then it has potential to make more liquidity.

Meanwhile, early liquidity risk studies such as Chari and Jagannathan (1988) and Diamond and Dybvig (1983) assumed that the inadequate information on banks refinancing with valuable assets affect bank liquidity risk. In this view, Ratnovski (2013) provides 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 (Rochet & Vives, 2004; Freixas, Rochet, & Parigi, 2004; Huang & Ratnovski, 2011), and increase in moral hazard (Farhi & Tirole, 2011). Furthermore, Berger and Bouwman (2005) stressed that the importance and role of banks in liquidity production has grown sharply overtime; while, Paravisini (2004), Loutskina (2005), Khwaja and Mian (2005), Loutskina and Strahan (2009) proved that liquidity crises to banks has impact on supply of loan.

The different functions engaged in by banks really exposed them to liquidity risk which may occur if they could not meet their expected commitments (Jenkinson, 2008), since the depositors might ask for their respective funds at any time, leading to intensity of assets sales (Diamond & Rajan, 2005), which will negatively affect bank profitability. 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 arrangement.

2.3.2 Credit Risks

When the borrower fail to pay back the money to bank as per terms and conditions, it knows as credit risk. The borrowers always have way to default because of some reasons which illustrated as banks credit risk. The bank has to face these losses and it can happen by different situations sometimes by unexpected changes in worth of portfolio to decrease the quality of credit which consider as default. The purpose of managing the credit risk is to raise the rate of return of bank and decrease the risk, also make the credit experience with restrictions (Kanchu & Kumar, 2013). When borrower cannot fulfil the obligation of debt as per requirements and he breach the contract than the credit risk increases (Poudel, 2012). In addition, purported that weak credit quality may originate this loss and it effects the debt value, it means borrower try to mature the commitment and obligations as earlier discussed by Crouhy *et al.* (2006).

However, Instefjord (2005) found that credit derivatives transaction is a potential threat to the stability of bank despite hedging credit exposures, especially when operating in extremely elastic credit market sectors (Nijskens & Wagner, 2011). Hence, The management of credit risk deem very imperative to banks because it is a vital part of loan process, maximizes the risk of the bank to increase their performance, adjust the risk rate of return through protecting the bank from the negative influence of credit risk (Musyoki & Kadubo, 2011).

2.3.3 Operational Risks

Operational risk is regarded by the Basel Committee (2003) to mean: "the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events". This definition focused on four event causes of operational risk which

are external events, systems, processes and people. Moreover, according to Jarrow (2008) operational risk can be divided into two types. The first type is related to 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 (or in the back office).

The second type is related to the risk of loss caused by incentives, which include both mismanagement and fraud; this represents an agency cost that occurs because of the separation of a company's management and ownership. These two types of operational risk losses transpire with recurrent regularity, and they might be minor or disastrous. Huge disastrous instances include the bankers trust and Procter and Gamble debacle, the Barings bank failures, and the Orange County case (Tafri *et al.*, 2011; Bacha, Satou & Moran, 2001).

In this regards, it seem 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, Lewis & Wei, 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).

2.4 Risks and bank performance

A main goal of bank management is to increase shareholders' return signifying performance. The goal often comes at the cost of increasing risk. Moreover, the motivation of banks for risk management comes from those risks which can lead to weak banks performance. Study of risk and bank performance conducted by RI (2012), the study examined the effect of risk management on the performance of banks. Furthermore, the study revealed that there is a statistically significant and positive association between risk management and bank performance, and affirms that effective risk management enhance bank's performance depends largely on risk management being enshrined into the organization**.** In addition, Ariffin and Kassim (2011) found significant positive relationship between risk management and bank performance in Islamic banks in Malaysia. Similarly, Arena (2008) found a significant statistically positive association between risk management and performance of bank in Uganda.

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 favor 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 and 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.

2.4.1 Liquidity Risks and Bank Performance

Several studies such as (Olagunju, David & Samuel, 2012; Kosmidou, Tanna, & Pasiouras, 2008; Barth *et al*., 2003; Molyneux &Thornton, 1992) are underway to uncover the relationship that exists between liquidity risk and bank performance, According to some studies the liquidity risk has positive relationship with banks performance. Likewise, the study by Bourke (1989) considered the 12 countries of Australia, Europe and North America to test the evidence of relationship between bank performance and liquidity risk. He found the significant positive relationship between the bank performance and liquidity risk. His result is contrary to the expectations because it is common that assets which are not liquid have the greater liquidity premium that causes high return.

The study by Emami, Ahmadi and Tabari (2013) discussed the relationship between liquidity risk and commercial banks performance in Iran. Furthermore, this study used the panel data to analyzes the performance of Iran's commercial banks. Moreover, this study considered two groups of banks with macro-economic and specific variables for the empirical model. The findings of this study shows that there is a negative relationship between liquidity risk and proxies of performance including return on equity and return on assets, therefore, it is clear that liquidity risk can weaken the banks performance.

Furthermore, Neupane and Subedi (2013) investigated the liquidity risk determinants and their influence on Nepalese financial banks' performance by analysing the association amongst liquidity risk of selected Nepalese commercial banks and financial

bank performance. This study used both time series and primary data. Primary data were collected through structured questionnaire. While time series data were from quarterly publication of the banks secondary sources. Data were analysed using various statistical tools such as statistical descriptive, correlation and multiple data analysis. Multivariate linear regression model employed to analyse the data. They found that, there is a statistically significant association amongst liquidity risk and financial bank performance.

In addition, Olagunju *et al.* (2012) also found the positive relationship between bank performance and liquidity risk. Their studies show that liquidity risk and bank performance have bi-directional relationship, it means that both liquidity risk and bank performance have significant effect on each other. Similarly, Arif and Anees (2012) examined the effect of liquidity risk on performance of Pakistani's banks. This study found the significant relationship between performance of Pakistani's banks and liquidity risk. Furthermore, Darabi and Molayi (2011) used the methods of regression and correlation analysis to study the influence of liquidity risk on performance of Bank in Iran. In their study the authors found that, there is a significant statistically association between liquidity risk and the performance of bank. The finding of this study implies that, the higher liquidity risk, is the higher bank performance.

Graham and Bordeleau (2010) explored the impact of liquidity risk on Canadian Banks' performance. Empirically this study differs, it tests the impact of banks liquidity assets on their performance. This study findings shows that the liquidity asset is significantly correlate with bank performance. In the meanwhile, the liquid assets like government securities and cash mostly have low return than others, the holding by bank of this assets

consider as an opportunity cost. The bank can hold these liquid assets for the high bank performance without any regulation. Policy makers also prefer to hold the large number of liquid assets because it is consider as financial system stability benefits. The non-linear regression is used to check the relationship of bank performance and liquid assets holdings along the control variables. The evidence of this empirical study rely on panel of American and Canadian banks from 1997-2009. It suggested that the banks who hold liquid assets have improved the profitability. Similarly, on one point these liquid assets diminish performance of banks.

There is another study done by Rostamiyan and Haji (2009) as measuring the liquidity management of banks using value at risk model (the case study of Saman Bank-Iran) in which they define the liquidity management as a bank's ability to perform its financial obligations over time. They believed that liquidity management needs to identify the risks that are exposed to liquidity as well as the changes caused by environmental variables. Liquidity management can be carried out at different levels and managers can use liquidity risk as an index to control and manage liquidity.

In addition, Kosmidou *et al.* (2008) described that the funding of short term and liquid asset ratio has significant positive impact on the ROA. Furthermore, Kosmidou *et al.* (2008) scrutinized the determinants of Greek banks performance during 1990-2002 which was the Europe financial integration period. They used the pooled time series data for analysis which was unbalanced. Their results were consistent to the Bourke (1989) results and they also discussed that bank performance and liquidity risk have significant positive relationship.

To sum up, on the study of banking institutions, previous studies such as Emami *et al*. (2013), Neupane and Subedi (2013), Arif and Anees (2012), Darabi and Molayi (2011), Graham and Bordeleau (2010), Rostamiyan and Haji (2009) found a significant association between liquidity risk and performance of banks.

2.4.2 Credit Risk and Bank Performance

Credit risk is considered as the most important risk faced by banks in accomplishment their business depends on efficient management and accurate measurement of this risk to a greater extent than other risks (Kargi, 2011). Credit risk is an important factor in determining bank performance. Basel Committee of Banking Supervision (2001) introduced the credit default risk, he define it as due to credit events like rejection, bankruptcy, due obligations, there is possibility to lose partially or totally outstanding loan.

Additionally, Berrios (2013) examined the association amongst credit risk and profitability and liquidity of banks in the USA public state commercial banks. The author used 200 bank observations for 5 years. He has used regression model with OLS. The study found that there is a significant statistically and positive association between credit risk and bank performance. This study has used analytical method more robust than Kargi's analytical methods. However, he used single equation estimation method for each year. Panel data analysis could be used in this situation. This study has not accounted non-public banks, thus the results of this study does not represent other types banks in USA or other countries banks. This study used only single credit risk measure,

bank profitability. Other credit risk information are not covered in this study. Time series effects were not accounted in this study.

Furthermore, Kolapo *et al*. (2012) examined the relationship between commercial bank performance and credit risk in Nigeria. They found that bank performance can be measured by banks return on assets with cross sectional variance. Moreover, Onaolapo (2012) investigated the impact of credit risk on the financial performance of Nigerian deposit banks. His findings demonstrate the significant relationship between credit risk and banks performance.

In addition, Kargi (2011) examined the relationship between profitability and credit risk in Nigerian banks. He also suggested significant positive relationship of advances and loans and non-performing loan with bank performance. This study also used cross section, time series and the sample size of this study 6 banks and 4 years which indicates that sample is small. They employed pooled regression and correlation analysis which is not rigorous methodology. The estimation method was ordinary least squares estimation method. This method presumes many assumptions to produce robust results. Asymptotic statistical theory does not work for small sample case. Small sample may lead to wrong or biased estimates that can mislead researchers (Kargi, 2011). Correspondingly, Hamisu (2011) determined the impact of credit risk on the Nigerian banks performance by considering 20 banks and use regression model. The results of his study illustrates the positive significant relationship between financial performance and credit risk in banks.

Kithinji (2010) investigated the relationship between credit risk and commercial bank performance in Kenya. He noticed that there was high credit level by the employing Basel II during previous years and also this level decreased during 2007 and 2008 by Basel II implementation in commercial banks. He suggested by his findings that there is no influence of credit amount and non-performing loan on the commercial banks profit. Correspondingly, Hosna and Manzura (2009) found that there is positive significant impact of credit risk on the commercial banks performance in Sweden. His finding also suggest that provision for non-performing loan has a negative relationship with bank performance.

To sum up, on the study of banking institutions, previous studies such as Berrios (2013), Onaolapo (2012), Kolapo *et al.* (2012), Hamisu (2011), Kargi (2011), Kithinji (2010), Hosna and Manzura (2009) found a significant association amongst credit risk and performance of banks.

2.4.3 Operational Risks and Bank Performance

The Basel committee of the Bank of International Settlements (BIS) has provided new regulatory capital requirements on operational risk (BIS, 2001) and finalized in 2004. Numerous challenges remain through significant progress in the operational risk management in the banking sector. The BIS recommended robust estimation techniques needed, however, there are challenges in the banking sector still now. There is number of frauds which mostly occur in the operational risk. These frauds are mostly occur in the inside of bank and it can be of different types, such as, fraud by staff, fraud by outside person and bank staff, this is loss and it happen by the internal operational

system failure and threats from external environment (Owojori, Akintoye & Adidu, 2011).

The study by Soyemi, Ogunleye and Ashogbon (2014) investigated the impact of operational risk on the performance of Nigerian banks. Their findings revealed that there is significant relationship between operational risk and performance of banks. Furthermore, this study noted that practices of risk management is mainly related to the financial performance of banks in Nigeria. Likewise, Hussain and Al-Ajmi (2012) examined the effects of operational risk on conventional and Islamic banks of Bahraini banks' performance; they found that the operational risks have extensively positive effect on both conventional and Islamic Bahraini banks' performance.

Similarly, Tafri *et al.* (2011) examined empirical evidences on the level of operational risk in Malaysia. The findings of the study explored the differences in the extensiveness of stress testing operational risk. The findings also, pointed a weak risk management infrastructure in Malaysian Islamic banks in respect of conventional banks.

Cornalba and Giudici (2004) indicate that banks look out for qualitative and quantitative data requirements of improve measuring approach for measuring operational risk. The challenges and paradox of operational risk was portrayed by Power (2004) as being a way of widens "enforced self-regulation" into banking operations. It was established by the study that the banking regulations of Basel II has productively established kinds of pressure and operational risk in three main areas which include definitional issues, levels of quantification, and data collection. All these signify the significance of operational risk.

In addition, Blacker (2000) examines the alleviation of operational risk of British retailing banks. He found that mitigating operational risk embraces broad connection sequences amid people, technology, and process. The study indicates that accounting for alleviating of operational risk depends on the management of business unit, as limitations were rested on business unit that persuade alleviating 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 Flores, Ponte and Rodrıguez (2006). Fernández-Laviada (2007) stressed that well-organized operational risk management structure will reinforce internal controls of an organization which resulted in a better performance of the organization. To sum up, on the study of banking institutions, previous studies such as Soyemi, *et al*. (2014), Hussain and Al-Ajmi (2012), Tafri *et al*. (2011), Blacker (2000) found a significant association between operational risk and bank's performance.

To sum up, it seems that most studies of liquidity risk, credit risk and operational risk done on developed countries and developing countries. Iraq is not in the literature. This study tries to fill up this gap by investigating the influence of risk management on Iraqi banks' performance.

2.5 Concluding Remarks

The chapter presented a review of empirical studies of banking risk, the concept and definition of bank performance, the previous studies on the association amongst risk management and performance of bank, then, the previous findings on the relationship between the risk management measurements used for the current study (credit risk, liquidity risk, and operational risk) and bank performance.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

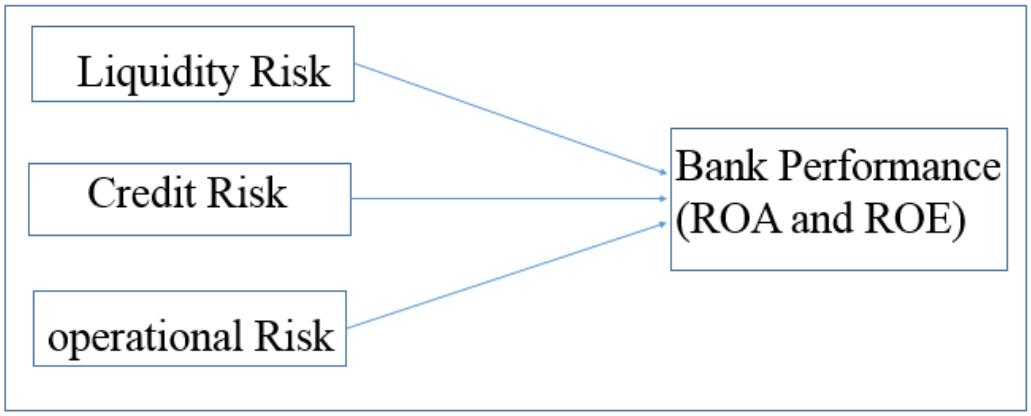
The method used to conduct this study is described in this chapter. It discusses the theoretical framework which was developed based on the review of the literature. It also explains the development of hypotheses, the measurement of both independent and dependent variables of the current study, the population and data collection and finally, the analysis of the data.

3.2 Theoretical Framework

The research framework as illustrated in figure 3.1 has been developed based on review of the literature and research problems. The framework lays emphasis on the effects of liquidity risk, credit risk and operational risk on the performance of commercial private banks in Iraq. The bank's performance which is the dependent variable is measured by Return on Asset (ROA) and Return on Equity (ROE). The independent variables are risk management in banking such as credit risk, liquidity risk and operational risk.

Figure 3.1

Theoretical Framework



3.3 Measurement of Variables

3.3.1 Dependent Variables

The dependent variable of the current study is bank performance which is measured by return on assets (ROA) and return on equity (ROE), more approaches regarding bank performance, from profitability ratios to more complex composite indexes. Performance proxies commonly used are: ROE and ROA (Samson & Tarila, 2014; Tomar & Bino, 2012; Taskin**,** Sasaki, Segawa & Ando 2012; Chitan, 2012; Athanasoglou *et al*., 2008; Ahmad, 2006; Goddard, Molyneux &Wilson, 2004).

Return on equity (ROE) measure the degree of return on the stockholders' equity of the mutual stock owners (Taskin *et al*., 2012). It measures a bank's competence at generating profits from every dollar (USD) of net possessions, and displays how well a business uses asset USD to make incomes development. ROE is the most inclusive measure of the performance of a bank and its organization. It takes into account all

aspects of funding and trading, from the viewpoint of the ordinary stockholder (Samson & Tarila, 2014).

Return on equity (ROE) is computed by dividing the net income of banks with their shareholders' equity. It measures returns earnings of shareholders on their investments. In a typical bank, shareholders' equity is usually small in comparison to other sources of funds that are used to fund a bank's assets. Due to the likelihood of lower return on assets by financial intermediaries, numerous banks make use of huge financial leverage so as to increase ROE to the level of competition (Hassan & Bashir 2003).Therefore, higher ROE indicates better managerial performance of the banks (Rose & Hudgins, 2013).

$$ROE = \frac{Net\ Income}{Total\ Equity}$$

While, return on asset (ROA) is computed by dividing the net income of banks with their total assets. (Ali & Nasir, 2014; Kaur, 2014; Miiller, 2014; Saibaba & Ansari, 2013; Al-Matari, Al-Swidi, Faudziah, & Al-Matari, 2012; Poudel, 2012; Khrawish, 2011; Arena, 2008; Altman, 1977). ROA measures bank efficiency in converting bank assets into earnings. In general, higher ROA indicates better performance of banks, providing it is not the outcome of extreme risk-taking (Rose & Hudgins, 2013). The higher the ROA shows the higher efficacy of company management by using resources (Rose & Hudgins, 2013).

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

3.3.2 Independent Variables:

The independent variables for the current study are liquidity risk, credit risk and operational risk.

3.3.2.1 Liquidity Risk

According to Muranaga and Ohsawa (2002), during the specific time period for a required financial asset that traded with adequate market price. The liquidity risk has two key points in definition: i) make possible the asset liquidity when it is required; and ii) with fair value of market. The banks have more liquidity risk because they settle or liquidate the assets at suitable price (Muranaga & Ohsawa, 2002). The erroneous assessment of risk and policy of control can indulge the bank in liquidity risk.

For this study, liquidity risk is calculated by ratio of liquidity (liquid asset to total assets) (Barth, Nolle, Phumiwasana & Yago, 2003; Demirgüç-Kunt, Laeven, & Levine, 2003; Molyneux & Thornton, 1992; Bourke, 1989). The evidence from these studies show that when the ratio of liquidity is high than bank will be less risk and more liquid. Hence, as the increase in cash with invested proportional fund, the liquidity risk will decrease with high liquidity ratio.

3.3.2.2 Credit Risk

When borrowers do not perform than the credit risk happens. Previous literature and theories indicated that there is negative correlation between the credit risk and bank performance, when credit risk will high then performance will decrease (Al Khatib, 2009; Athanasoglou *et al.*, 2008; Tafri, Hamid, Meera & Omar, 2009). In this study the credit risk base on non-performing loan ratio which is measured as non-performing

loan to total loan (Alalade *et al*., 2014; Kolapo *et al*., 2012; Hamisu, 2011). Credit risk is consider as a sever threat to bank performance because it can collapse the banks (Chijoriga, 1997).

The potential problem when bank borrowers cannot fulfil the obligations as per agreement is known as the credit risk (Chijoriga, 1997). It is included in the most important measurements to check the loan or assets quality in banks. It is calculated by gross loan percentage which is ambiguous in bank portfolio. When the ratio of non-performing loan will be less than the asset or credit performance will be high in commercial banks (Samad, 2004). The higher non-performing loan of banks shows that operation and investment is more risky in that bank (Daniels, Ramirez, 2008).

3.3.2.3 Operational Risk

Operational risk is defined as: "the risk of loss resulting from inadequate or failed internal processes, people, and systems, or from external events" (BCBS, 2005). The dimensions of operational risk are risk mitigation and damage control (Van den Brink, 2002). Financial damage usually happens shortly or directly after a severe risk is perceived and has a direct visible influence on the bank's profit and loss account. Higher operational risk indicates that a bank is suffering from a huge operational loss caused by internal processes, systems, and people, or through external events. Operational risk of this study is measured by dividing earnings before interest and tax (EBIT) with total assets. This ratio provides a system on how better an organization is applying its assets for achieving earnings. This measurement is also used as a proxy for operational risk by Ali, Akhtar and Sadaqat (2011), Isshaq and Bokpin (2009).

Operational risk is defined as the risk of loss resulting from the inadequate or failed internal processes, people and systems or from external events (Basel Committee on Banking Supervision, 2005). Higher operational risk indicates that a bank is suffering from a huge operational loss caused by internal processes, systems, and people, or through external events. This risk mainly comprises of human error in banking operation, financial fraud and natural disasters that could cause losses to banks and possibly lead to their collapse (Cruz, 2002).

The measurements of dependent variable and independent variables of this study are as the following Table 3.1:

Table 3.1

Summary of Variable and Measurement

Variable	Measure	Notation	Sources
Dependent variables			
Return on equity	$ROE = \frac{Net\ Income}{Total\ Equity}$	ROE	Samson & Tarila, (2014); Hoque, (2013); Taskin *et al*., (2012); Khrawish, (2011).
Return on assets	$ROA = \frac{Net\ Income}{Total\ Assets}$	ROA	Ali & Nasir, (2014) Saibaba & Ansari, (2013) Poudel, (2012) Al-Matari, *et al*., (2012)
Independent variables			
Liquidity risk	Liquid asset / total asset	LR	Demirgüç-Kunt *et al*., (2003); Molyneux & Thornton, (1992)
Credit risk	Non-performing loans / total loans	CR	Alalade *et al.*, (2014); Kolapo *et al*., (2012); Hamisu, (2011).
Operational risk	Earnings before interest and tax /total assets	OR	Ali, Akhtar & Sadaqat, (2011); Isshaq & Bokpin 2009).

3.4 Data Sources

The data used for the current study are collected from the annual reports of the Iraqi commercial private banks under reviewed.

3.5 Population and Sample of the Study

The population of the study comprise of 24 private commercial banks. However, the sample comprises of 18 commercial private listed banks in Iraq. The data used for banks are retrieved from the annual reports. The data are confined to the period of 2009-2014. The list of commercial private banks used for the current study is available in Appendix 1.

3.6 Hypothesis Development

This study is hypothesized by developing framework on liquidity risk, credit risk and operational risk.

3.6.1 Liquidity Risk

The main focus of liquidity risk is on banks success or failure. Mostly previous empirical literature based on the bank performance determinants. Furthermore, Naceur and Kandil, (2009), Athanasoglou *et al.* (2008), Kosmidou, (2008), Pasiouras and Kosmidou, (2007), Kosmidou, Tanna, and Pasiouras, (2005), Demirgüç-Kunt *et al.* (2003), Barth *et al.* (2003), Shen, Kuo, and Chen, (2001), Demirgüç-Kunt and Huizinga, (1999), Molyneux and Thornton, (1992) and Bourke, (1989), measure the liquidity risk of banks by using liquidity ratios and consider exogenous variable, the

liquidity risk. Moreover, there are few studies on the liquidity risk causes. The prior studies revealed that there is mix results on the relationship between liquidity risk and bank performance. Some studies show the significant positive relationship between liquidity risk and bank performance (Olagunju.*et al.,* 2012; Kosmidou *et al.,* 2008; Barth *et al*., 2003; Molyneux &Thornton, 1992; Bourke 1989), some studies found significant negative relationship between liquidity risk and bank performance (Kosmidou, 2008; Kosmidou *et al.,* 2005; Demirgüç-Kunt & Huizinga, 1999; Bourke, 1989). Therefore, this study is hypothesized as:

H1a: There is a significant impact of liquidity risk on ROA.

H1b: There is a significant impact of liquidity risk on ROE.

3.6.2 Credit Risk

The bank performance is also affected by the credit risk, it base on the probability of loss due to the carelessness or failure of debtor to fulfil the bank obligation (Mansur, Zangeneh & Zitz, 1993).The management of credit risk is crucial for making the loan portfolio quality which is significant for the banks robust performance ultimately for economy. The growing academic literature on credit risk management describes that the bank crisis is mostly happen due to failure of credit risk management and it ultimately lead towards the economic failure such global financial crisis during 2008 (Ogboi & Unuafe, 2013; Onaolapo, 2012; Fofack, 2005). In 2003, the BCBS (Basel committee on banking supervision) relates to the risk of banks management which is the reduction of potential to fail in fulfilling obligations according to agreement, this statement indicate that the credit risk shows impact on banks performance (Onaolapo, 2012).

Furthermore, Musyoki and Kadubo (2011), Kolapo *et al*. (2012), Poudel (2012), Hosna, Manzura and Juanjuan (2009) show that, there is a significant negative association between credit risk and the performance of bank. While Boahene, Dasah and Agyei (2012) shows a positive and significant association amongst credit risk and the performance of bank. Therefore, this study hypothesized the association amongst credit risk and the performance of bank as follows;

H2a: There is a significant association amongst credit risk and ROA.

H2b: There is a significant association amongst credit risk and ROE.

3.6.3 Operational Risk

This type of risk is asymmetric and make losses without any gain, it is more different than other type of risk in banks. There is negative meaning of operational losses, the banks should make the managed expenditure to avoid from operational risk, especially when the marginal expenditure and marginal reduction are equal during operational event with loss expectations. Therefore, banks can reduce the expected future cash flow with minimizing the operational loss events expected costs and raise in bank performance (King, 2001).

It is compulsory for banks management to manage the operational losses because of customers, the customers are more conscious about the insolvency risk. When the insolvency risk will be low than bank performance will be high (Cummins *et al.*, 2006; Merton, Robert, Perold & Andre, 1993) Prior studies examined the impact of

operational risk on bank performance and found significant results in banks (Aruwa & Musa, 2014; Chernobai & Jorion, 2008; Cummins *et al*., 2006; King, 2001). Furthermore, Hussain and Al-Ajmi (2012) found positive significant relationship between operational risk and bank performance. While, Tafri *et al*. (2011) found significant negative relationship between operational risk and bank performance. Hence, this study hypothesized on the basis of prior studies as:

H3a: There is a significant impact of operational risk on ROA.

H3b: There is a significant impact of operational risk on ROE.

3.7 Regression Models

The regression model is used to analyze the relationship between liquidity risk, credit risk, and operational risk with bank performance. The panel data regression is suitable for the estimated sample. The model is specified as follows Model (1) and (2) are employed to test the hypotheses and the relationship between liquidity risk, operational risk, credit risk, and bank performance. The bank performance is measured using two different measurements

$$ROA_{it} = \beta_0 + \beta_1 LQ_{it} + \beta_2 CR_{it} + \beta_3 OR_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 1$$

$$ROE_{it} = \beta_0 + \beta_1 LQ_{it} + \beta_2 CR_{it} + \beta_3 OR_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 2$$

Where:

ROA= return on asset

ROE= return on equity

LQ= Liquidity Risk.

CR= Credit Risk.

OR= Operational Risk.

ε = Error Term.

3.8 Empirical Method

This section deals with the data analysis techniques employed to solve the research question of this study. The data will be analysed based on the several methods using the E-views program version 8.1.

i. Descriptive statistics

ii. Correlation

iii. Diagnostic test

iv. Panel OLS.

3.8.1 Correlation

It is often essential to examine the correlation between two or more fiscal variables. There are several ways to observe how sets of data are correlated. Two of the most useful means are scattered plots and correlation analysis. In statistical terms, dependence are correlation between two casual variables. Correlation refers to any relations involving dependence.

3.8.2 Diagnostic Test

The diagnostic tests that were employed on the data are explained in the present section. Before regression analysis is conducted several tests such as, normality, Heteroscedasticity and auto-correlation test are carried out, this was followed by the diagnostic tests employed, particularly for the panel data.

3.8.1.1 Normality

This refers to the scale which the distribution of the sample data corresponds to a normal distribution. Normality test is the most fundamental assumption in multivariate analysis. Residual plots and statistical test are used to check the normality test of the data based on Jarque-Bera test (Hair, Black, Babin, Anderson &Tatham, 2006).

3.8.1.2 Heteroscedasticity

In this study, the ARCH Test was used to detect the existence of heteroscedasticity problem in the model. Gujarati (2003) noted that ARCH Test is appropriate for large sample test and is not sensitive to the assumption that the distribution μi are not normally distributed.

3.8.1.3 Auto-correlation

Auto-correlation is referred to as the correlation amongst members of the series of observations ordered in space or time (Gujarati, 2003). In detecting the existence of auto- correlation in the model, Breusch-Godfrey serial correlation LM test is used.

Gujarati (2003) and Hayashi (2000) shows that Breusch-Godfrey serial correlation LM test is the most useful test for detecting auto-correlation problem in small and large samples.

3.8.1.4 Multicollinearity Test

Hair, Anderson, Tatham and Black (2010) suggest that if an independent variable has a collinearity tolerance more than 0.1 and VIF less than 10, a multicollinearity problem does not exist.

3.8.3 Panel Least Squares Regression

The most common statistical method for the application of different disciplines is the regression analysis (Hair *et al*., 2010). Regression provide the value prediction of one variable from other variables (DeCoster, 2004), it means that value of dependent variable is predicting from the independent variable.

3.9 Concluding Remarks

This chapter summarizes the research framework, data collection, methods used and hypotheses of the study. This study investigates the relationships between liquidity risk, credit risk, operational risk and Iraqi banks performance. Data for the study comprised of 18 private commercial banks. The study period covers 6 years, which is from the year 2009 to 2014. Thus, the sample size of the study is 108 observations.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter provide the main results of the empirical tests. This chapter starts with descriptive statistics of the studied variables in section 4.2. Then, correlation in section 4.3. Additionally, it provides analysis of diagnostic test which includes, normality test, multicollinearity test, heteroscedasticity test, autocorrelation in section 4.4. In section 4.5 Hausman test. Furthermore, this chapter provide the results of regression analysis the impacts of liquidity risk, credit risk and operational risk on bank performance as explained in section 4.6. Finally, it provides the discussion and finding of the results.

4.2 Descriptive Statistics

Table 4.1 summarise the descriptive statistics for the full sample that is used in this study, it also provides information about the value of mean, median standard deviation, number of observations, maximum and minimum.

Table 4.1

Descriptive Statistics

Variables	Observations	Mean	Median	Maximum	Minimum	Std. Dev.
ROE	108	0.5142	0.5411	0.8816	0.1123	0.1747
ROA	108	0.4462	0.4188	0.9860	0.0479	0.2367
LR	108	0.3269	0.3293	0.9559	0.0001	0.1961
CR	108	0.2395	0.2369	0.4875	0.0400	0.1423
OR	108	0.1734	0.0981	0.5876	1.59E-05	0.1643

Note: ROE: return on equity, ROA: return on asset, LR: liquidity risk, CR: credit risk and OR: operational risk.

Based on table 4.1 above, the table illustrates the descriptive statistics for the dependent variables and the independent variables used in this study. The dependent variables are return on asset (ROA) and return on equity (ROE), while the independent variables are liquidity risk (LR), credit risk (CR) and operational risk (OR). From table above, it is observed that ROE has the highest mean value (51.43) percent with a standard deviation of (17.48) percent, while the mean value of ROA is (44.62) percent with a standard deviation of (23.68) percent. The high ROE indicate that a high returns to shareholders of commercial private banks. This implies that the higher the ROE the better the firm is in terms of profit generation (Khrawish, 2011).

With regards to the independent variables, from table 4.1 it is observed that the mean value of liquidity risk of the eighteen banks is 32.69 (0.3269) percent over study period between2009 to 2014 with standard deviation of 19.62 (0.1961) percent. Table 4.1 above also shows the highest mean value for liquidity risk compared to mean value of operational risk and mean value of credit risk are 0.1734, 0.2395 respectively, that indicating a high exposure of bank to liquidity problem. While the mean value of operational risk is 17.34 percent over study period from 2009 to 2014 with standard deviation of 16.44 percent which indicates that banks have low exposure to operational loss. However, the mean value of credit risk is 23.96 percent with standard deviation of 14.23 percent that indicates that banks take risk in their operations and investment (Daniel, 2014).

4.3 Correlation

Table 4.2 depicts correlation matrix of the variables. This is showing the correlation between the variables used for this study.

Table 4.2

Correlation Matrix

	ROE	ROA	LR	CR	OR
ROE	1.000				

ROA	0.019	1.000			
	0.842	-----			
LR	0.397 **	0.330 **	1.000		
	0.000	0.000	------		
CR	-0.396 **	-0.436 **	-0.242 *	1.000	
	0.000	0.000	0.011	------	
OR	0.605 **	0.089	0.132	-0.450 **	1.000
	0.000	0.357	0.173	0.000	------

Note: ** indicate significant at 0.01 level, * indicate significant at 0.05 level.

Table 4.2 presents the Pearson correlation coefficients to measure the strength of relationships amongst the variables in this study. Moreover, Table 4.2 shows that none of the correlation coefficients between the variables are higher than 0.80. According to Gujarati (2003), if the correlation coefficients are higher than 0.80, it might lead to multicollinearity problem between the variables. The highest correlation coefficient of 0.60 is between return on equity and operational risk.

Furthermore, the table indicates that the correlation coefficient amongst return on equity and liquidity risk is positive (r=0.397) and significant (p-value=0.000) at 0.01

level. Similarly, the correlation coefficient between return on equity and operational risk is positive (r=0.60) and significant (p-value=0.000) at 0.01 level, this indicates that an increase or decrease in return on equity would be accompanied by a decrease or increase in liquidity risk and operational risk respectively. While the correlation coefficient between return on equity and credit risk is negative (r= -0.396) and significant (p-value=0.000) at 0.01 level. Furthermore, table above shows that the correlation coefficient amongst ROA and liquidity risk is positive (r=0.330) and significant (p-value=0.000) at 0.01 level. While the correlation coefficient between return on asset and credit risk is negative (r= -0.436) and significant (p-value=0.000) at 0.01 level. The results further shows that the correlation coefficient between liquidity risk and credit risk is negative (r=-0.242) and significant (p-value=0.011) at 0.05 level. Lastly, the correlation coefficient between credit risk and operational risk is negative (r=-0.450) and significant (p-value=0.000) at 0.01 level.

4.4 Diagnostic Test

4.4.1 Autocorrelation Test

This study uses Breusch-Godfrey serial correlation LM test to test the autocorrelation. If the p-value is higher than of 0.05 level, this indicates that non-existence of autocorrelation. In table 4.3 below the results show that the p-value of the F-statistics of ROE and ROA are (0.7757), (0.0805) respectively, and the p-value of Obs*R-squared of ROE and ROA are (0.7647), (0.0741) respectively. It is observed that from the results both ROA and ROE are higher than 0.05 level, therefore this indicates non-existence of autocorrelation.

Table 4.3

Breusch-Godfrey Serial Correlation LM Test.

	F-statistic.	Obs*R-squared.
Model 1 (ROE)	0.2546 (0.7757)	0.5365 (0.7647)
Model 2 (ROA)	2.5826 (0.0805)	5.2055 (0.0741)

P-values are in parenthesis

4.4.2 Heteroscedasticity Test

Heteroscedasticity ARCH Test results are presented in Table 4.4. Based on the results, the p-value is higher than 0.05 for ROE and ROA, which indicate that the both of model accepts the null hypothesis and no issue of heteroscedasticity exists.

Table 4.4

Heteroscedasticity ARCH Test

	Obs*R-squared	Prob. Chi-Square
ROE	4.4015	0.2212
ROA	0.8880	0.8283

*Note: Ho (null): Constant variance (homoscedasticity), H1: Constant variance (*heteroscedasticity*).*

4.4.3 Normality Test

This study uses the Jarque-Bera test which is a chi-square based test to determine whether the cumulative distribution of the residuals is significantly different from the theoretical normal distribution. The null hypothesis is that, there is no statistically significant difference. When the probability is less than 0.05, the null hypothesis must

be rejected and the inference would be that the residuals are non-normally distributed. For this study the Prob. Chi-Square in ROE model and ROA model are 0.7469, 0.5503 respectively. Consequently, the null hypothesis is accepted and therefore the inference is that the residuals are normally distributed. The result of the normality test is as table 4.5 below:

Table 4.5

Test of Normality using Jarque-Bera test

	Obs*R-square	Prob. Chi-Square
Standardized Residual of ROE	0.5835	0.7469
Standardized Residual of ROA	1.1620	0.5503

4.4.4 Multicollinearity test

Hair, Anderson, Babin and Black (2010) suggest that if an independent variable has a collinearity tolerance more than 0.1 and VIF less than 10, a multicollinearity problem does not exist. Accordingly, the results in Table 4.6 indicate that all of the collinearity tolerance values are found to be above the value of 0.1, and all of the VIF values are found to be below the value of 10. Therefore, multicollinearity is unlikely to affect the regression analysis as table 4.6 bellow:

Table 4.6

Multticollinearity Test

Variables	*Tolerance Value*	*VIFs Value*
LR	0.56	1.76
CR	0.58	1.71
OR	0.67	1.47

4.5 Hausman Test

The Hausman test is use to compare between random effects and fixed effects. If the P-value is insignificant (Prob>chi2 higher than 0.05) then random effects is appropriate to run the regression model. If P-value is a significant (Prob<chi2 lower than 0.05) then, fixed effects is suitable to run the regression model.

Table 4.7

Hausman Test.

Model	Chi-Sq. Statistic.	Chi-Sq. d.f.	Prob>chi2.	Result
ROE	3.0348	3	0.3863	Random Effects
ROA	16.7508	3	0.0008	Fixed Effects

Table 4.7 above shows that the p-value for ROE model is insignificant (p-value>0.05), this indicate that random effects is appropriate to run in this model. While, the p-value for ROA model is significant (P-value<0.05), this indicate fixed effect is appropriate to run for this model.

4.6 Regression Analysis

4.6.1 Regression Analysis of Return on Asset (ROA)

The results of the panel data regression of liquidity risk, credit risk and operational risk on the performance of banks using ROA as measurement are depicted in table 4.8 as below:

Table 4.8

Regression Analysis of the independent variables on ROA

Variables	Coefficient	t-Statistic	Prob.
LR	0.6447 *	4.0682	0.0001
CR	-0.5785 *	-3.1611	0.0022
OR	-0.5526 *	-3.3190	0.0013
Constant	0.4698	5.4218	0.0000
R-squared	0.5294		
Adjusted R-squared	0.4213		
F-statistic	4.8952		
Prob(F-statistic)	0.0000		
N	108		

Note: * indicate significant at 0.01 level (2- tailed).

In table 4.8 above, the regression analysis showed that the F-statistics of the model ROA is significant, implying that there is an association amongst the dependent variable ROA and the sets of independent variables (liquidity risk, operational risk and credit risk). The value of the adjusted R-squared indicates that the regression model that consists of liquidity risk, credit risk and operational risk explain 42 percent (0.4213) variations in return on asset. However, the regression results show that, all the independent variables are significant to return on asset. Among the three significant variables, liquidity risk shows the highest coefficient value of beta (0.6447); which indicates that the most robust contribution in clarify the dependent variable. Nevertheless, it shows that both credit risk and operational risk have a negative

association with ROA. While, liquidity risk has positive association with return on asset.

4.6.2 Regression Analysis of Return on Equity (ROE)

The association amongst liquidity risk, credit risk and operational risk with ROE is shown as table below;

Table 4.9

Regression Analysis of the independent variables on ROE

Variables.	Coefficient.	t-Statistic.	Prob.
LR	0.2541*	3.5903	0.0005
CR	-0.1070	-1.0355	0.3028
OR	0.5718*	6.4507	0.0000
Constant	0.3576	7.7103	0.0000
R-squared	0.4694		
Adjusted R-squared	0.4541		
F-statistic	30.673		
Prob(F-statistic)	0.0000		
N	108		

Note: * indicate significant at 0.01 level (2- tailed).

Table 4.9 above illustrates the regression analysis of ROE with liquidity risk, credit risk and operational risk. Table 4.9 showed that the F-statistics of the model are significant, which indicating that there is an association amongst the dependent variable ROE and the sets of independent variables (liquidity risk, credit risk and operational risk). The value of the adjusted R-squared indicates that the regression model that consists of

liquidity risk, credit risk and operational risk clarify 45 percent (0.4541) variations in return on equity. However, the regression results show that liquidity risk and operational risk variables are significant to return on equity except of credit risk, which is found to be insignificant. Among the two significant variables, operational risk shows the highest coefficient value of beta (0.5718); which indicates the most robust contribution in clarify the dependent variable. Nevertheless, it shows that both liquidity risk and operational risk have a positive significant association with ROE. While, credit risk has an adverse association with ROE, but insignificant.

Furthermore, the hypotheses testing results of liquidity risk, credit risk and operational risk on bank performance (ROA and ROE) are summarized in table 4.10 as below:

Table 4.10

Summary of the Hypotheses Testing Results

Hypotheses	Model 1 (ROA)
H1a: There is a significant association amongst liquidity risk and ROA.	**Hypothesis is supported**
H2a: There is a significant association amongst credit risk and ROA.	**Hypothesis is supported**
H3a: There is a significant association amongst operational risk and ROA.	**Hypothesis is supported**
Hypotheses	Model 2 (ROE)
H1b: There is a significant association amongst liquidity risk and ROE.	**Hypothesis is supported**
H2a: There is a significant association amongst credit risk and ROE.	Hypothesis is not supported
H3b: There is a significant association amongst operational risk and ROE.	**Hypothesis is supported**

4.7 Discussion and finding

4.7.1 Liquidity risk and bank performance

The regression analyses in table 4.8 and table 4.9 of this study show that the impact of liquidity risk on bank performance is found to be significant. The results also show that, liquidity risk is positively related to bank performance (ROA and ROE), liquidity risk β coefficient is (0.6447), (0.2541) this indicates that one unit increases in liquidity risk will increase bank performance by (0.6447), (0.2541) units, implying that the higher

the liquidity risk, the higher is the bank performance. The finding of this study is consistent with the study of (Aremu, Ekpo, & Mustaph, 2013; Srairi, 2009; Barth, Nolle, Phumiwasana & Yago, 2003; Molyneux &Thornton, 1992). Therefore, the results support the hypothesis of significant association amongst liquidity risk and bank performance (ROA & ROE).

4.7.2 Credit Risk and Bank Performance

The regression analyses in table 4.8 and table 4.9 of this study show that credit risk is found to be significant to ROA and negatively related to ROA. Credit risk beta coefficient is (- 0.5785) which means that one unit increase in credit risk decreases ROA by (0.5785) units, indicating that an increase in credit risk does not induce banks to increase their ROA. The finding of this study are consistent to literature of (Musyoki & Kadubo, 2011; Poudel, 2012; Kolapo *et al*., 2012). However, the results show that credit risk is found to be insignificant and adversely associated to ROE. Credit risk beta coefficient is (-0.1070) which means that one unit increase in credit risk decreases ROE by (0.1070) units, implying that the higher the credit risk, the lower is the ROE. This results is consistent with the literature of (Sayedi, 2014; Ogboi & Unuafe, 2013; Kithinji, 2010; Srairi, 2009). Hence, the results support the hypothesis of significant association amongst credit risk and ROA but the hypothesis of a significant relationship between credit risk and ROE is not supported.

4.7.3 Operational Risk and Bank Performance

The regression analyses in table 4.8 and table 4.9 of this study show that operational risk is found to be significant and negatively associated to ROA. Operational risk beta

coefficient is (-0.5526) which means that one unit increase in operational risk decreases ROA by (0.5526) units, indicating that an increase in operational risk does not induce banks to increase their ROA. The finding of this study is consistence with literature of (Tafri, Rahman & Omar 2011). However, the results also show that operational risk is found to be significant and positively associated to ROE. Moreover, operational risk β coefficient is (0.5718) this indicates that one unit increases in operational risk will increase ROE by (0.5718) units, implying that the higher the operational risk, the higher is the ROE. The finding of this study is consistence with literature of (Hussain & Al-Ajmi, 2012). Therefore, the results support the hypothesis of significant relationship between operational risk and bank performance (ROA and ROE).

4.8 Concluding Remarks

This chapter summarise the finding of the study. Furthermore, it illuminates on the results of the descriptive statistics of all variables, correlation, diagnostic test, and regression analysis. Moreover, this chapter visibly interprets the outcomes of the regression through discussion of the findings.

CHAPTER FIVE

SUMMARY AND CONCLUSION

5.1 Introduction

This chapter presents the whole research based on what have been discussed in the previous chapters. First, an overview of the summary of this study in section 5.2. In addition, this chapter provides implications of the study in section 5.3 which includes implication to the policymakers, implication for managers and implication for academic researchers. Then, the limitations of the study and future suggestion in section 5.4. Finally, the summary of the chapter.

5.2 Summary of the findings

The current study investigates the impact of (liquidity risk, credit risk and operational risk) on bank performance which is ROA and ROE in Iraq. The data for the study is retrieved from the annual reports of Iraqi banks. The sample consists of 18 commercial private listed banks in Iraq. The period of this study covers six years from 2009 to 2014, which made up to 108 observations. Liquidity risk which measured by liquidity ratio, this study found that the relationship between liquidity risk and the performance of bank has significant and positively associated to the performance of bank (ROA & ROE) as a measure of the dependent variables. The measurement of liquidity risk is ratio of liquid asset to total assets which shows that when the bank is liquid than there will be less risky failure. When banks have less liquid assets then it increase the cash reserves for the reduction of liquidity risk. Hence, the banks borrow at high rate from the market during the crisis of liquidity than its return also decrease. In addition, the results are opposite to expectations because illiquid assets are with high liquid premium have high

return. Thus, the liquidity risk and bank performance have bi-directional relationship, it means that liquidity risk have significant effect on the bank performance and it's vice versa.

Furthermore, credit risk is measured by ratio of non-performing loan which has negative impact on ROA. This finding shows that high non-performing loan ratio can decrease the ROA because non-performing loan ratio illustrate the credit risk more high and require additional reserves which reduce the amount of profit and banks return. Though the credit risk has insignificant negative relationship with ROE. This finding could be insufficient for loan loss provisioning with decreased ROE. Hence, the bank may develop and follow the proper efficient strategy to overcome the risky loans even when regulatory body and government are reluctant to make decision about bank shut down.

To sum up, that means credit risk will insignificantly decline with the bank performance. The insignificant decline in credit risk has adverse influence on banks performance in Iraq. Correspondingly, operational risk which measured by (profit before interest and tax to total asset), the results found that operational risk has significant and negatively related to ROA, that indicating an increase in operational risk does not induce banks to increase their ROA. However, the results also show that operational risk is found to be significant and positively associated to ROE, this positive relationship it can be traced to the high confidence and sincerity of the bank clients towards Iraqi private banks. Furthermore, indicating that the higher the operational risk, the higher is the ROE for these period.

5.3 Implication of the Study

5.3.1 Implication to the Policymakers

There are a number of important implications for policymakers arising from the results of this study. Private commercial banks have shown poor performance which is a cause for concern, as it is likely to constrain the growth and development of the banking sector in Iraq, and consequently the overall economy. As a consequence, banking regulation and supervision should encourage private commercial banks to focus on enhancing their performance through improving the quality of existing activities, improving management, and development of staff. In the long run, this could help government and local banks to improve their performance.

Furthermore, such reforms may include eliminating the distinction between government banks and other banks or reducing government control and interference in such banks. In addition, perhaps it would be helpful to such institutions to conduct their services in collaboration with the experts in other commercial banks. Besides that, domestic banks should be encouraged to compete in all sectors and segments of international financial markets so that they could achieve higher performance, resolve the problems of weak banks, improve the legal frameworks and enable information sharing among financial institutions on creditworthiness of borrowers.

5.3.2 Implication for Managers

The results presented in this study could be useful to management who is concerned with improving performance of their banks. It should create awareness among

management of the importance of risk management in enhancing bank performance. Findings of this study provide information about risk management that significantly affect on banks performance in Iraq. These risks should be considered by the management if they intends to improve bank performance. Furthermore, owners, depositors and creditors may also find the results of this study to be of value. In addition, managements should continue to ensure that they continue to maintain low level of liquidity risk, credit risk and operational risk in order to increase the profitability of banks.

5.3.3 Implications for Academic Researchers

The results presented in this study could be useful to academic researchers studying bank performance worldwide. This study provides evidence that risk management play important roles in determining bank performance. It would be worthwhile to extend the study to other markets in the future, especially in emerging markets.

5.4 Limitations of the Study and Future Suggestion

1. This study is limited to the banking sector, may be the future research will cover the other sectors like insurance, manufacture sector.

2. This Study is limited to the private commercial banks which listed in Iraqi Stock Exchange (ISX). It does not study the others banks which are not listed in the Iraqi Stock Exchange (ISX) such as Islamic banks, foreign banks and public banks. Therefore, Future studies should study the other type of banks.

3. Due to the time constrain of this study, it is just covered only six years from 2009 until 2014. Hence, it suggest that for future studies could attempt to extend the study by considering a larger sample size, in order to have a better understanding of the relationship amongst risk management and bank performance. Given that the overall financial situation is still fraught of possible future instability, I would suggest that a qualitative study should be performed to address same issue by exploring the behaviours of banks management and the perceptions of shareholders.

4. In order to get a more comprehensive analysis of bank performance, it is necessary to doing comparison between Iraqi banks with other banks in developing countries. Thus, it is suggested that a cross country study is conducted as to compare the result of Iraqi banks with the other banks in developing countries.

5. Finally, some elaborate statistical tests could be used such as the GARCH Model, Simple Linear Regression, CHI-SQUARE TEST, DURBIN WATSON TEST and Time Series to provide a clearer and deeper understanding of the relationship amongst risk management and the performance of bank.

5.5 Concluding Remarks

This study tests independent and dependent variables which determines the risk management in commercial private banks in Iraq. The main findings of this study shows that all variables except credit risk which are liquidity risk and operational risk are significantly with bank performance (ROA & ROE) as a measure of dependent variable. While credit risk is found to be significant related to ROA and insignificant associated to ROE.

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