NEAR EAST UNIVERSITY

GRADUATE SCHOOL OF SOCIAL SCIENCES

BANKING AND ACCOUNTING PROGRAM

THE RELATIONSHIP BETWEEN LIQUIDITY RISK AND FINANCIAL PERFORMANCE OF PRIVATE COMMERCIAL BANKS IN TURKEY

BAWAN SABIR

MASTER'S THESIS

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ASSOC. PROF. DR.TURGUT TÜRSOY

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ACCEPTANCE

We as the jury members certify the "the relationship between liquidity risk and financial performance of private commercial banks in Turkey" Prepared by Bawan Sabir defended on

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JURY MEMBERS

Assoc. Prof. Dr. Turgut Türsoy (Supervisor)

Near East University / Department of Banking and Finance

Assoc. Prof. Dr. Aliya Z. Işiksal (Head of Jury)

Near East University / Department of Banking and Accounting

Assist. Prof. Dr. Behiye Çavuşoğlu

Near East University / Department of Economics

Prof. Dr. Mustafa Sağsan

Graduate School of Social Sciences
Director

DECLARATION

I am a master student at the Banking and Accounting Department , hereby declare that this dissertation entitled "The Effect of Capital Competence on the Profitability of Development and Investment Banks in Turkey " has been prepared myself under the guidance and supervision of "**Assoc. Prof.Dr.Turgut Türsoy**" in partial fulfilment of The Near East University, Graduate School of Social Sciences regulations and does not to the best of my knowledge breach any Law of Copyrights and has been tested for plagiarism and a copy of the result can be found in the Thesis.

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Name, Surname: Bawan Sabir

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DEDICATION

This study is dedicated to my father, mother, wife, sister, brother, and late Aunt who passed away on the 12th of June 2017, with that I would like to say that, ‘you will be greatly missed’. Appreciation also goes to my friends from the banking and finance department at Near East University who have helped me a lot.

ABSTRACT

THE RELATIONSHIP BETWEEN LIQUIDITY RISK AND FINANCIAL PERFORMANCE OF PRIVATE COMMERCIAL BANKS IN TURKEY

The study examines the relationship between liquidity and bank performance with relevancy to Turkey. This is attributed to observations that were made which showed that improvements in liquidity do not necessarily translate to positive changes in bank performance. The study used an autoregressive distribution lag model to estimate a bank performance-liquidity model using secondary data which ranged from 1964 to 2016. The bounds test was used to determine if there is long-run cointegration between and the results showed that there is a long run cointegration between financial performance, liquidity, asset quality, and bank size. The results also showed that improvements in the bank's liquid assets position have negative implications on the banks' financial performance and that positive improvements in bank capital have a positive effect on bank performance. It was however established that there is a negative relationship between bank's asset quality and financial performance. Recommendations were thus made that banks need to come up with better liquidity management strategies that are capable of matching liquidity needs of the bank with illiquid needs and investments as well as come up with better and more effective asset quality management practices.

Keywords: Autoregressive distributed lag, asset quality, bank capital, bank liquidity, bank performance, bank profitability, bank size, inflation.

ŐZ

TÜRKIYE'DEKI ÖZEL BANKALARIN LIKIDITE RISKI VE FINANSAL VERIMLILIK ARASINDAKI İLIŞKI

Bu araştırma Türkiye ile alakalı likidite ve banka performansının arasındaki ilişkiyi incelemektedir. Likidite üzerinde oluşan gelişimlerin banka verimliliğine olumlu şekilde yansımadığı yapılan gözlemlere dayanmaktadır. Bu araştırma öz bağlanımlı dağıtım geciken modelini kullanarak, 1964'ten 2016 kadar olan kinci verilerden yararlanarak banka verimlilik-likidite modeli tahmin etmiştir. Sınır testi eğer uzun dönem eş bütünleşme saptamak için kullanılmıştır ve sonuçlar finansal verimlilik, likidite, varlık kalitesi ve banka büyüklüğünün arasında uzun dönem eş bütünleşme olduğunu göstermiştir. Buna ek olarak, sonuçlar bankanın likit varlıklarındaki gelişmelerin bankaların finansal verimliliği üzerinde olumsuz ve banka sermayesindeki olumlu gelişmelerin banka verimliliğinde olumlu etkileri olduğunu göstermiştir. Fakat, bankaların varlık kalitesinin ve finansal verimlilik arasında olumsuz etkisi olduğu ortaya çıkmıştır. Bu yüzden, bankaların likidite ihtiyaçlarını likit olmayan ihtiyaçları ve yatırımları eleştirebilecek daha iyi bir likidite yönetim stratejisi hazırlamasını, yanı sıra daha iyi ve etkili varlık kalite yönetim uygulamaları oluşturulması tavsiyeleri uygun görülmüştür.

Anahtar Kelimeler: Öz bağlanımlı dağıtım geciken, varlık kalitesi, banka sermayesi, banka likiditesi, banka verimlilik, banka karlılık, banka büyüklüğü, enflasyon.

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ADF: Augmented Dickey-Fuller

ARDL: Autoregressive distributed lag

BRSA: Banking regulation and supervision authority

PP: Phillips Perron

SDIF: Savings deposit insurance fund

LA: Liquid assets

CPI: Consumer price index

SE: Shareholder equity

TA: Total assets

AQ: Asset quality

INTRODUCTION

Background to the study: There has been a rise in the nature of risks that banks have been facing and such has also been associated with a high risky banking environment (Aebi et al., 2012). Such has a tendency to increase the probability of making losses because of the high level of uncertainty. One of the notable banking risk that has been threatening the operational capacity and survival prospects of banks is liquidity risk (Basel, 2008) and (Campello et al. ,2011), contend that liquidity risk tends to limit the capacity of banks to response not only to withdrawal needs but also on its ability to undertake profitable investments and manoeuvres in the earliest possible time. As a result, this tends to hinder the financial performance of banks.

Meanwhile, risk management strategies have been enacted as a strategy that helps to reduce a bank's risk exposure and this is a major element for banks and monetary authorities (Eljelly, 2004). It is strongly believed that a less risky financial sector is more stable and can perform its financial intermediation obligations in an effective and cost-efficient manner (Hassan, 2009; Marozva, 2015; Ongore and Kusa, 2013). This is based on the idea that bank customers are more willing to engage their services with banks that are highly liquid as this is seen as fostering convenience in times of need. This is supported by (Hassan, 2009), who posits that highly liquid banks are more capable of investing in high income generating projects and customer service improvements. (Fatemi and Fooladi, 2006), outlines that high liquidity facilitates investments in income generating assets which positively contributes to the financial performance of the bank. It is also important to note that liquidity challenges have severe effects on a bank's reputation.

Thus, it is believed that in order to be capable of meeting required obligations, there must be a match between a bank's short-term liabilities and assets (Maaka, 2013).

Meanwhile, the 2008 financial crisis that was experienced in Turkey has left a highly risky banking environment with cases of liquidity, solvency, default and interest risks being observed (Fahlenbrach et al., 2012). However, liquidity risk has been on an upward trend with most banks being deemed to be incapable of meeting their short-term obligations (BAT, 2016). This was also observed to have affected the financial position of commercial banks as banking aspects such as the interbank market was adversely affected. As a result, high demands for withdrawals were witnessed and some banks began to experience downswings in financial performance.

Problem statement: The importance of liquidity to a bank is tied to the ability of the bank to meet its short-term obligations (Marozva, 2015). This is reinforced by ideas given by (Nyborg et al. 2002), which outlined that a highly liquid bank is usually associated with a high reputation and that it is good for banks to be highly liquid. This is because bank customers are believed to be more willing to engage with banks that can easily deliver in times of need especially withdrawals and in some cases loans. The importance of liquidity has been hugely placed on meeting the bank's short-term obligation (Ongore and Kusa, 2013; Saunders and Cornett, 2003; Wang, 2002), but little has been done to examine how liquidity influences the financial performance. A study by (Wekesa and Admin stration, 2016), outlined that liquidity has a huge influence on the financial performance of banks. This is based on the idea that highly liquid banks are more capable of investing timely in profitable assets and projects at a lower cost (Yeh, 1996). Such affects the bank's financial performance. However, this claim has been dismissed citing that the ability to deal with liquidity risk is what maintains a bank's dominance and market share (Maaka, 2013).

Moreover, the determinants of bank performance are presumed to be many and that bank performance itself has more than two indicates which makes it complex to ascertain the linkage between liquidity and financial performance. Other studies have shown that the relationship between liquidity and financial

performance is conditional on other banking activities as well as macroeconomic activities (Eljelly, 2004; Fatemi and Fooladi, 2006). As a result, it is not clear as to the nature of the relationship that exists between liquidity and financial performance and circumstances under which liquidity can cause positive changes in the bank's financial performance. This, therefore, calls for a study in this area and this study thus strives to examine the relationship between liquidity and a bank's financial performance with relevancy to Turkey.

Research objectives: The main emphasis is to examine the relationship between liquidity and a bank's financial performance with relevancy to Turkey. This study also hopes to attain the following aims;

1) To see if there are any factors that can influence the extent to which bank liquidity affects the financial performance of commercial banks in Turkey.
2) To examine current challenges that are causing liquidity challenges among commercial banks in Turkey.
3) To determine the possible measures that can be put in place to improve both the liquidity and financial performance of banks in Turkey.

Research questions: The study is centred on providing answers with the following established questions;

1) What is the nature of the relationship that exists between liquidity and the financial performance of commercial banks in Turkey?
2) Are thereany factors that are influencing the extent to which bank liquidity affects the financial performance of commercial banks in Turkey?
3) What are the current challenges that are causing liquidity challenges among commercial banks in Turkey?
4) What are the possible measures that can be put in place to improve both the liquidity and financial performance of banks in Turkey?

Significance of the study: The study is of huge importance not only to commercials banks in Turkey but to banks around the world as it provides insights on the financial and reputational benefits that banks can reap by having the right the liquidity levels. Thus, findings of this study can place bank agers and monetary authorities in a better position to address liquidity challenges and boost the financial performance of banks. Furthermore, the information provided herein can be used by a lot of stakeholders such as shareholders, governments etc. The study also provides theoretical and empirical frameworks that can be used to form a base upon which future studies can be developed.

Organisation of the study: The study is structured in five different parts. The first part covers related theoretical and empirical frameworks while the second part provides an insight of issues surrounding liquidity and financial performance of commercial banks in Turkey. The third part gives a description of the methods that were used to gather and analyzethe findings. An analysis and presentation of the findings are addressed in the fourth part while the fifth part concludes the study.

1. CHAPTER: LITERATURE REVIEW

1.1 Introduction

This chapter provides details about the theoretical foundations that surround liquidity and how it affects bank performance. It also looks at how liquidity affects commercial banks and the possible strategies banks can use to effectively manage their liquidity positions. In addition, it also looks at the notion of bank performance and how various empirical studies have addressed the impact of liquidity on bank performance. The main emphasis of this chapter is to develop and provide solid arguments that can be used to support the obtained findings as well as identify both theoretical and empirical gaps that are still yet to be covered.

1.2 Theoretical literature (the Anticipated Income Theory of Liquidity)

The undertaking of this study will be based on ideas given by the Anticipated Income Theory of Liquidity by (Prochnow, 1945), which asserts that holding liquid assets such as cash will have a positive effect on liquidity. The theory, however, argues that having a lot of liquid assets at hand compromises opportunities to invest in profitable projects. Thus, in order to make more profits, the theory believes that banks should issue different types of loans were interest and principal payments can be made ininstalments. Instalments, in this case, are viewed as contributing to the liquidity position of the bank. According to (Prochnow, 1945). This theory is based on that:

- Securities and bonds are a form of collateral security when making long-term loans and banks can sell them on the secondary market when in need of funding or can collect payments on them.
- Future liquidity insights can be known by analyzing principle repayments and interest payments of the mid-term to long-term loan amortization.
- Long-term loans must be made on the condition that they are to be collected at the earliest possible time.

- This theory is broader as compared to former liquidity theories and provides a wider description of the relationship between liquidity and profitability.

1.3 Liquidity risk in commercial banks

Liquidity can be defined as the ability as the ability of an institution to meet its financial obligations (Muranaga and Ohsawa, 2002). This definition shows that there are basically two important aspects that must be looked at when examining the concept of liquidity. The first one pertains to the ability of the financial institution to convert assets into means of payment. This implies that banks must have a strong ability to converts assets into cash. Not only should they have this ability, but they must also be in a strong position to do this easily. Which implies that swiftness is another key feature which determines bank liquidity (Kumar, 2008). This can also be said to be a major feature which influences the difference between liquidity positions among banks. Some banks are more liquid than other than others and this hence can be said to be due to the fact of the differences in capabilities of converting assets into means of payment. Thus, the swifter and fast a bank can convert assets into means of payment the more liquid the bank is considered to be.

Secondly, it can be noted that liquidity is not only concerned about converting assets into means of payment and meeting short-term obligations but also on how much the bank gets from converting those assets into means of payment. This implies that whatever a bank gets from the assets conversion process must be high enough to allow it to make profitable liquidity positions. This can be supported by arguments made by (Muranaga and Ohsawa, 2002), which showed that most banks tend to suffer liquidity drawbacks by failing to effectively realise the potential gains of converting their assets into means of payment. This is because the assets conversion process must leave the bank at a profitable position rather than further plunging the bank is the worst scenario than its previous position.

It has also been noted that banks that fail to liquidate their assets to boost their liquid positions tend to get exposed to a lot of risks. The first risk that banks will

suffer from is losses as it losses on potential sales and frustrations caused on customers who might not have the patience to wait and bear with the bank during its dire times (Kumar, 2008). In most cases, frustrations suffered by bank customers as a result of their banks failing to meet their demands or possibly the failure by their banks to fulfil their obligations can cause what is termed a bank run (Muranaga and Ohsawa, 2002, p.22). This is a widespread increased demand or withdrawal of funds (deposits) from banks by customers as a result of panic behaviour (Muranaga and & Ohsawa, 2002, p.22).

There are also several factors which influence a bank's liquidity position and the notable one is related to the level of commitment made by the banks towards long-term lending. This is because differences in the level of commitments made by the bank towards long-term lending determine the bank's liquidity position (Kashyap et al., 2002). This implies that banks can be illiquid or suffer from liquidity problems as a result of committing more funds to long-term lending. What the banks will be having is possibly interest-bearing assets with no room to further improve their short-term liquidity and investment needs. Hence, it is Important to ensure that banks match their long-term commitments with their liquidity management procedures. If not, then challenges are unavoidable that banks will experience liquid problems which can threaten not only performance but also reputation, growth and survival (Kashyap et al., 2002).

Liquidity problems have a tendency to destroy the banks corporate made and this is what most consumers associate with a good bank and a bad bank. A high level of long-term commitment to long-term lending, therefore, reduces the bank's liquidity position. This might, in turn, be reflected by negative changes in profit levels. This is usually the job bank managers to ensure that the liquidity needs of the bank are well balanced with the liquidity sources of the bank. Hence, if a bank desires to make more profits, grow in the future and possibly survive, then it must make sure that it has the necessary liquidity to meet its short-term obligations.

On the other hand, observations can be made in relation to maturity transformation which deals with the rate at which the bank's assets and liabilities will mature (Goodhart, 2008). This is highly related to the rate at which the liquidity conversion process will be done. Maturity transformation is usually not a problem especially if the bank has a lot of assets to convert to cash at an effective and efficient market price. This is important in dealing with potential liquidity challenges which have a potency to cause bank runs and also bank failures (Diamond and Rajan, 2005). This outcome is what bank managers and central banks are not willing to see and hence more emphasis is always placed towards dealing with liquidity as well as bank capital positions. With that aspect, we can thus establish that liquidity is a source of leverage that can be used by banks to improve their liquidity positions.

From these two basic concepts, deductions can be made that banks which have outstanding performance margins tend to have a greater ability and swiftness to convert their assets into means of payment at a fast rate with a high level of effectiveness and efficiency. Hence, we can expect such an important observation to be a key determinate of the differences in both liquidity and profitability positions of banks.

1.3.1 Interest rate risk

Liquidity risk is most cases influenced by the level of interest rates banks charge on both liquid and non-liquid funds. According to (Goodhart, 2008), the more banks can charge on liquid and on-liquid funds determine the number of revenue streams that will be made. Such is important as it boosts the bank's short-term liquidity position. This is because such revenue streams can be sued to cater for small and short-term obligations. There is, however, a problem that interest revenue will fall short of expected levels to meet or possibly cover the short-term interest expense.

A sound approach to liquidity management must be coupled with a good match or effective strategy towards ensuring that interest revenue is always greater than interest expenses incurred by the bank (Diamond and Rajan, 2005). In the event that banks have incurred huge interest expenses, the tendency is high

that net interest margin will be low. This indicates performance wise that the bank has not been doing well and can be at the alarm of the banks' shareholders who might consider bank managers as not being effective in managing their funds and the bank's assets.

1.3.2 Solvency and credit risks

Banks can often make commitments to customers and such commitments can either be short run or long run commitments. The most important thing is to ensure that these commitments are met when due. In the event that banks have failed to honour their commitments, banks, in this case, are said to be insolvent (Sinkey, 2006). This is an unfavourable condition which requires immediate attention and banks must be capable of dealing with insolvent risk to avoid collapse. On the other hand, credit risk is one of the risks that pose threats to banks. This is because customers may fail to pay back borrowed loans and this compromises their ability to meet both short-term and long-term obligations (Diamond and Rajan, 2005).

1.4 Liquidity risk and performance of banks

Liquidity plays an important part in an organisation especially banks and efforts are always placed towards ensuring that banks are well positioned to deal with liquidity risk. This is because liquidity allows banks to meet their short-term needs be it meeting customer deposits. Failure to do so has significant negative impact on bank performance (Falconer, 2001). This is because bank customers can engage in panic behaviour in the event that they have failed to access their deposits from banks. According to (Diamond Rajan, 2001), if such situation persist, banks may suffer from bank runs. The problem with bank runs is that they can cripple the entire financial sector (Falconer, 2001). This is because the effects can spread through contagion effects. Thus, bank managers and central banks must be well positioned as well to ensure that there are no incidences of bank liquidity that are threatening banks and the banking sector at large respectively.

Efforts to deal with liquidity risk often see banks borrowing from the interbank market usually at unfavourable rates and market rates often change in response

to changes in the banking environment (Zheng and Shen, 2008). During periods of high liquidity risk, the interbank is always high as it reflects banking and risk conditions. The problem of borrowing at a high and unfavourable rate is what affects bank performance as well. This is because banks will be forced to pay high-interest rates to service the loans. As a result, profitability often declines with each successive increase in bank performance. Secondly, if the level of liquidity risk remains so high, banks might be forced to borrow more but this requires that capital is pledged as a form collateral security (Sinkey, 2006). Pledging capital as a collateral security for borrowed funds has a tendency to risk the firm's capital and hence, it is important to make sure that there are always funds that are set aside as provisions to cater for such risk. This goes in line with stipulations made by Basel III which posits that the level of capital adequacy is high to avoid the significant collapse of banks from risks such as liquidity risks (Diamond and Rajan, 2005). Liquidity risks are thus said to be positively correlated with capital structure problems as banks can encounter in ensuring that their capital levels are optimally balanced.

Liquidity has also been established to pose widespread problems that impair a bank's asset quality and position (Zheng and Shen, 2008). This is attributed to the idea that banks are sometimes forced to dispose of some of their core assets so as to meet their liquidity needs. In most cases, illiquid assets are the ones that banks will be capable of disposing off but the challenge will be that illiquid assets are usually those that support banking activities and operations. They often require huge investments to be made and such investments are either costly or difficult to secure (Goddard et al., 2009). Moreover, the disposal of a bank's illiquid assets does not happen overnight and with the level of pressure that will be amounting on banks to meet liquidity needs, banks are sometimes put in a difficult position which sees them selling their illiquid assets at unprofitable rates. This only eases the Liquidity problem but in the long run, this can impair bank operations and cripple the bank's profit earning capacity. Such problems are often reflected in the bank's balance sheet (Diamond and Rajan, 2001).

On the other hand, it is highly possible to link liquidity problems to the ability of the bank to issue more loans. This can be supported by remarks made by (Diamond and Rajan, 2005), which contends that a bank's ability to issue more loans is tied to its liquidity levels. Which implies that the prevailing liquidity will hamper the bank's ability to give out loans. This happens irrespective of the profitability of the loan since there is no guarantee that banks will be made to meet other obligations soon after giving out the loans. This is also because will not be willing to commit huge funds to long-term obligations which are characterised by a high level of illiquidity.

Liquidity challenges have also been knowing to be negatively reducing the bank's tradable portfolio and securities. As a result, banks might end up selling certain asset positions and this comes with a lot of challenges, sacrifices and opportunity costs. At this stage, liquidity problems will be so high to an extent that some investors might pull their investments out of the bank while some might be required to continuously inject more funds into the bank. This injection of a new source of funds usually comes with a lot of stringent conditions tied to it and such conditions may not favour banks to operate in a favourable way (Goddard et al., 2009). These kinds of problems often require changes in corporate governance structures. Constant bank supervision is also required to overturn banking situations and an increased role played by the central bank. As noted, the central bank often comes to imposes high capital ratios not ensure that banks have enough capital to absorb losses and cater for future circumstances such as liquidity risks which may threaten to impair bank performance, growth and survival (Zheng and Shen, 2008).

Hence, from these ideas, it can be noted that liquidity is an important aspect of bank operations and it affects not only bank performance but goes on to affect the ability of the bank to grow. Most banks that face liquidity usually encounter severe challenges in trying to expand their operations. Hence, it is advisable that banks desiring to grow must ensure that they do not have any potential situation that is undermining their liquidity positions. Secondly, it can be noted that liquidity challenges can threaten the survival of banks. If not contained liquidity can push a bank of our existence.

1.5 Managing liquidity risk

As noted from the above-established ideas, it can be contended that liquidity management is a core pillar of banking operations and there must be well trained and qualified banking personnel who can successfully manage a bank's liquidity position. A successful ability to manage risk has been established to rely on four important steps (Majid, 2003).

- Risk identification: It is of paramount importance to ensure that banks managers are well positioned to identify potential risks such as liquidity risks which may impair bank performance. It is believed that most problems that are encountered by banks are as a result of the failure by banks to identify risks facing the banks (Majid, 2003). Risk identification places the bank in a strong position to identify potential risks before they impair bank performance.

- Risk measurement: Risk measurement relies heavily on the ability of the bank to first identify those risks facing the bank. It is after identification that bank' risk managers can use appropriate risk management to measure banking risks (Zheng and Shen, 2008).

- Risk monitoring: When risk has been identified and measured, it is most appropriate in this state for risk managers to start devising strategies to monitor risks. Risk monitoring places efforts on ensuring that banking risks are within reasonable levels that do not impair performance (Majid, 2003). They also ensure that banks have assets and services that are well priced to reflect the risks conditions being faced by the bank. There are also situations when risk managers can monitor risks to ensure that the bank takes advantages of the risk situation and make a profit out of it (Zheng and Shen, 2008).

- Risk mitigation: when risk has been identified, measured and monitor, bank managers must now place attention towards mitigating such risks. Such moves include establishing safety nets which cushion banks from the risk effects (Diamond & Rajan, 2001). Risk mitigation strategies are

thus aimed at ensuring that potential risks do not compromise the banks' profit earning capacity, threaten growth potential and survival aspects.

What is now setting a difference between banks in terms of performance, growth and survival is no longer an issue of accessing huge sources of funds and possessing huge asset levels, but also a matter of possessing the required risk management techniques. Insights obtained from (Ali, 2004), showed that the economic and banking environments are increasingly becoming volatile and this means that banks are now being exposed to high and more risks requires good risks management strategies.

1.6 Determinants of financial performance

There are several indicators that can be used to measure financial performance but the emphasis is usually placed towards the use of financial measures (Guglielmo, 2008). This is because financial measures provide a more accurate description of the company's performance and they are also measurable and make it easy to compare financial performance between two periods of time (Mesquita and Lara, 2003). The notable measures of financial performance are;

- Profitability measures which provide an indication of variations in firm performance usually expressed in terms of changes in profit levels from one year to the other (Adler, 2012). Profitability thus provides an indication of how successful the business is doing over the course of an operational period. Thus, when it comes to banks, profitability shows how successful banks have been over the course of an operational period. It also shows the extent to which the bank has grown (Fatemi and Fooladi, 2006). This means that profitability provides an indication of the capacity level of the bank when compared to other banks. With profitability is also an assessment of revenue potential or revenue earned with respect to costs incurred in generating that particular revenue (Bozec, 2005). The greater the revenue the more profits banks will make and this indicates that the banks are generating more revenue. Profitability allows the offer the bank to reward its shareholders for investments made into the bank.

- Profitability can be ascertained using ROA which provides an indication of how much bank managers are capable of generating from using the bank's assets. Thus, a high ROA provides a strong indication that bank managers have been well capable of using the bank's assets. On the other hand, ROE provides an indication of how much the bank's shareholders will get from investing their capital into the bank NIM, on the other hand, weighs net interest income against net interest expenses. A high NIM shows a strong ability of the use of the bank'sinterest-generating assets and a better management of interest expenses (Hadlock and James, 2002).
- Non-Financial Measures are not significantly used to mirror business performance especially in banks but they remain an important tool for assessing bank performance. Most banks are increasingly competing in terms of customer satisfaction, after-sales service, reliability, and service and product quality all these aspects are not measured using traditional financial measurements tools and yet they provide an indication of the goals or aims of almost all the organisations (Grubert and Mutti, 1991). Organisations can also use both financial and non-financial measures to ascertain company performance which includes among others system downtime, non-product hours, delivery time, warranty claims, number of customer complaints, lead time, quality etc. The use of financial and non-financial measures is sometimes separated by the swiftness and easiness one enjoys when computing performance using financial measures (Du Rietz and Henrekson, 2000).
- Liquidity measures as noted in the previous sections, it has become to be known that liquidity provides an indication of how well, fast and easy a bank can convert its assets into means of payment. Liquidity measures can either focus on operational aspects or structural aspects of the business, that is, cash flow and balance sheet measures (Hadlock and James, 2002). Effective liquidity management strategies are therefore those strategies that allow the business to deal with its financial responsibilities when dues without causing disturbances in operational

activities. Changes in liquidity are widely known to be measured by working capital and current ratio and the greater the ratio the better the liquidity position of the firm (Du Rietz and Henrekson, 2000).

- Solvency measures look at the difference that exists between the levels of owner's equity that has been ploughed into the business in relation to the amount of borrowed capital. Alternatively, it can be said to be a reflection of the ability of the bank to pay back its debts assuming that all its assets have been sold. Solvency is that an indication of the risk of the business to payback its debts in the event that the business has experienced financial downfalls (Hammes, 2003). Solvency can sometimes extend to include short terms and long-term liabilities. The most commonly used indicators of solvency are a debt-to-equity ratio, equity-to-asset ratio and debt-to-asset ratio.

1.7 Empirical studies

Though liquidity can assume widely known definitions, firms tend to have different approaches towards handling and dealing with liquidity risk. Differences in approaches towards dealing with liquidity risk emanate from efforts to continuously improve operational performance. A study by (Adler, 2012), outlined that banks place efforts towards managing liquidity so as to ensure that they are well placed to take advantage of market opportunities. What this implies is that changes in the banking or economic environments always pose both threats and opportunities, and liquidity management becomes a tool that banks will use to position themselves in the best position to reap from market opportunities and deal with banking challenges.

On the other hand, there are a number of studies which examine variations in bank performance as a result of changes in bank-specific and non-bank specific elements. What is of concern is that a notable number of researchers managed to establish different findings of bank performance. For instance, a study by (Adler, 2012), hinted that variations in academic performance tend to differ on a specific measure that has been used to estimate bank performance. This

implies that changes or effects of bank-specific and non-bank specific elements vary on whether ROA, ROE or NIM has been used to estimate a bank profitability model.

(Bikker, 2010), did a study that looks at potential changes in bank performance attributed to changes in market structure and costs. The results hinted that increases in costs are a huge obstacle that is affecting bank performance with major costs experienced by banks being wages and salaries. The study also outlined that increases in costs especially in securing capital funding have an adverse effect on the capacity of banks to secure long-term funds and that decision to choose from either to use capital or equity lies in the number of costs that are incurred by the banks with the cheaper source of funds being opted for. Similar deductions were made concerning market structure and it was established that monopolistic financial structures are against bank competitiveness and probable measures are to deregulate and create a conducive and competitive operating environment for banks to operate in.

The focus of this research will be on both funding and market liquidity. Ideally, market and funding liquidity are complementary since the easier it is to trade security means the easier it is to get funds to trade securities. This literature review will attempt to summarise the impact of liquidity on bank performance, hence the need to look at liquidity as a cost, and as a risk and their impact on net interest margin, return on equity (ROE), return on assets (ROA) and economic value added (EVA). That is, investors need to be rewarded for holding illiquid assets and for the sensitivity of the security to liquidity shocks. According to European Central Bank (ECB) (2010), bank performance is described as the bank's capacity to generate sustainable profits. The main drivers of bank performance are indicated by (Bikker, 2010), as costs, efficiency, profits and market structure.

(Bourke, 1989), placed emphasis on examining the changes in liquidity among 12 banks in Australia, North America and Europe. The findings of the study showed that there is a significant variation in liquidity among the banks and such variability was attributed to difference in banking regulations found in

different geographical or global spheres. The findings however provided strong evidence of the influence of liquidity on bank performance and cited that liquidity has a high potency to impair bank performance in the event that bank managers do not adequately address liquidity challenges.

(Kosmidou, Tanna and Pasiouras, 2005), did a study that offered support to findings made by Bourke and went on further to outline that having a highly liquid position is of great benefit to the bank. The given reasons showed that banks with high liquid positions are in a better position to improve market operations and possibly expand into other markets. However, liquidity challenges were highly linked to the potency of the bank to meet both short-term and long-term obligations. The study went on to establish that improvements in liquidity are highly correlated with the potential benefits offered by banks. (Shen, Chen, Kao and Yeh, 2010), also focused on looking at the interaction between liquidity and bank performance. The study indicated that improvements in liquidity have a high potency to trigger positive changes in bank performance. However, it manages to highlight conditions under which liquidity triggered favourable changes in performance can is subject to a given number of factors. As a result, the findings indicated that positive changes in performance triggered by improvements in liquidity can be witnessed in threw an event that banks are swifter towards converting their assets into a means of payment. The findings also highlighted that banks that are well capable of converting such assets into cash at a profitable rate have a huge tendency to make profitable returns out of the conversion process. Hence, conclusions were made that banks that can profitable access liquidity funds at a relatively low cost using few resources and time tend to enjoy from profitable returns. This is because most banks tend to suffer losses in the vent that they have experienced financial challenges and are forced to dispose of some of their core assets at a relatively lower return or prices.

(Demirgüç-Kunt and Huizinga, 1999), did a study to examine the potential causes in bank performance. The study highlighted that NIM is positively related to total assets and loans made by the bank. The ability to make loans out of available funds is thus seen as an indicator of an improved liquidity position. In

addition, it was also established that bank size is positively correlated with liquidity which implies that big banks are more liquid or have a better liquidity position as compared to small banks.

(Naceur and Kandil, 2009), focused on the impact of liquidity, capital asset ratios and central bank regulation on bank performance. The study findings are based on contentions made that improvement in the ability of the bank to handle banking challenges such as liquidity risks plays a key role towards improving bank performance. Increases in inflation were also considered to squeeze banks of liquid funds because consumers would be willing to get access to their funds and use them before inflation erodes the value of their savings.

(Drehmann and Nikolaou,2009), in their study managed to bring out ideas which contend that having enough liquidity is a desirable outcome as it allows banks to meet their obligations. The findings however diverge from the basic notion of highlighting the idea that liquidity is influences investments. Efforts was thus placed on the influence of liquidity towards meeting payments. In addition, propositions were made that mismatches in liquidity have high potency to disrupt banking activities and that the inability to sell assets at a relatively fair value is what is termed illiquidity. Such concurs with findings made by (Brunnermeier and Pedersen, 2009), which highlighted that bank liquidity is highly associated with the potential to convert assets into a monetary form of payment at a relatively fair value.

(Fatemi and Fooladi, 2006), looked at the influence of default, credit and liquidity risk on the performance of 100 banks. The results showed that there is a variation in performance that occurs as a result of changes in default, credit and liquidity risk. As a result, such changes are presumed to cause aggressive reactions by banks which causes them to pass the risks to consumers in as much as possible as they can. What it therefore means is that banks that are able to pass risks to consumers are well placed to enjoy from any risky situation to their benefit and at the expense of other banks and bank consumers.

Al-Tamimi and Al-Mazrooei, (2007), made comparisons between foreign-owned and locally owned banks in the UAE.

With efforts to determine which notable risks are affecting banks in UAE, the study managed to outline that foreign exchange risks are one of the principal risk element that is threatening operational improvements of banks in UAE.

Other risks such as operational risk and credit risks were also established to be among the key risk elements that threaten the growth and survival of banks. This follows similar patterns of observations made by (Al-Tamimi, 2002), which highlighted that proper strategic approach to risk management is needed to guide the firm towards a sound path to improved growth. As a result, emphasis is usually placed towards having sound risk identification strategies as well as the capacity to measure, monitor and regulate it.

(Aremu, 2011), on the other hand at how liquidity imposes a series of challenges on the operational performance of banks in Nigerian using time series data. Obtained findings concurred with findings made by (Fatemi and Fooladi, 2006), which posits that central banks have an influence on the extent to which liquidity challenges affect bank performance. Granger causality tests that were employed from the study also showed that liquidity granger causes bank performance but bank performance was established not to granger caused liquidity. However, liquidity was also discovered as being granger caused by bank size.

1.8 Chapter summary

Ideas have been established in this study that liquidity is of huge importance in the banking sector and this is because it has huge implications on the performance of the bank, how it grows, and its ability to continue surviving.

The study also established that liquidity is not just a process of converting a bank's assets into cash so as to meet short-term obligations but also a process and activity which must be done effectively and efficiently to allow the bank to make sizeable returns from the process. This is because liquidity requires that there be speed in the conversion process. If not then bank runs are always on the verge of threatening the bank's profit levels, growth and survival prospects.

The assets conversion process must also be done at a rate that will yield maximum returns to the bank. Most banks can experience unfavourable liquidity positions as a result of converting their assets into means of payment at undesired rates and this in pair's bank performance.

It has also been noted that banks that fail to liquidate their assets to boost their liquid positions tend to get exposed to a lot of risks. The first risk that banks will suffer from is losses as it losses on potential sales and frustrations caused on customers who might not have the patience to wait and bear with the bank during its dire times. Deductions have also been made that banks which have outstanding performance margins tend to have a greater ability and swiftness to convert their assets into means of payment at a fast rate with a high level of effectiveness and efficiency. Hence, we can expect such an important observation to be a key determinate of the differences in both liquidity and profitability positions of banks.

1.9 Summary of empirical literature

Table **1.1**: Summary of empirical literature

Author	Variable	Country	Method	Results
Tamimi and Al-Mazrooei (2007)	exchange rate, customer loans risk and total assets	UAE	OLS	Bank profitability is positively related to the exchange rate and total assets and customer loans.
Al-Tamimi (2008)	Total assets, customer deposits, liquidity.	UAE	OLS	Bank size, turnover, deposits have a positive implication on bank liquidity.
Maaka (2013).	Net profit, leverage ratio, loans, customer deposits, cash balance.	Kenya	OLS	The results showed that cash deposits and liquidity are negatively related to bank profitability. Customer deposits, liquidity gap, non-performing loans and leverage ratio liquidity were observed to be negatively related to bank profitability.
Mohd Said and Hanafi (2011)	ROA, ROE (dependent variables), GDP, inflation, interest rates, financial ratios, interactive dummy	China	OLS	Bank performance is positively related to inflation, GDP, interest rate and interest rates.
Ongore and Kusa (2013)	ROA, ROE, Liquidity and bank-specific factors	Kenya	Generalised Least square	Liquidity and bank performance are negatively related and bank performance and bank-specific factors are unilaterally related.

Author	Variable	Country	Method	Results
Wekesa and Administration, (2016).	ROA, ROE. Liquidity, total assets, liabilities, GDP	Kenya	OLS	The positive relationship between liquidity, total assets and financial growth of banks. Current liabilities are adversely related to profitability
Fatemi and Fooladi, (2006).	ROE, ROA, liquidity risk,	USA.	OLS	Liquidity is inversely related with ROA and ROE.
Mirakhor, (2011).	ROE, ROA, NIM liquidity risk, shareholder equity, total asset, asset utilization.	KSA	OLS	High liquidity calls a fall in performance and low liquidity causes an increase in bank performance.
Drehmann and Nikolaou, 2009).	NIM, ROE, ROA, liquid assets, total loans, total assets, bank capital, bank efficiency.	UAE	OLS	Maturity mismatch between inflows and outflows causes a decline in bank performance.
Kieschnick, et al., (2008)	ROA, ROE, NIM, working capital	USA	Panel OLS	Net operating working capital reduces firm value.
Nyborg et al., 2002).	NIM, ROE, ROA, Total assets, non-performing loans, asset quality.	USA	Panel GLS	Large banks have high NIM, ROE and ROA which are positively related to assets quality and negatively related to non-performing loans

2. CHAPTER: MACROECONOMIC OVERVIEW OF THE TURKISH ECONOMY, POLICY IMPROVEMENTS, BANKING SECTOR CHALLENGES AND PRODUCTIVITY ASSESSMENT

2.1 Introduction

This chapter looks at an overview of Turkey's macroeconomic environment and how it affected Turkey banking sector indicators such as liquidity and profitability. This chapter also looks at banking sector changes that were affected to deal with banking sector problems as well as the effect of the financial crisis that had threatened the development and growth of Turkey's banking sector. It also provides an outline of the key challenges that have been standing as obstacles to the growth and development of Turkey's banking sector as well as an overall assessment of the productivity of the Turkish banking sector. Such is important so as to help in offering explanations as to how both banking and economic variables influence the performance of banks in Turkey.

2.2 Overview of the macroeconomic environment

Though the Turkish economy was showing patterns of inconsistent economic performance, the Turkish banking sector remained vulnerable to economic problems. Since the introduction of efforts to disinflation the Turkish economy were introduced in 1999, there has been a significant number of challenges that were faced with by the government and banks. This because the Turkish government was in need of funds and yet it had a problem with a continued rising deficit (Bussiere and Fratzscher, 2006). What gave banks in Turkey the capacity to lend much money to the government during the period of heavy government deficit is their ability to maintain a lot of open foreign-exchange positions. However, observations were made during that time that the nature of problems affecting the Turkish banking sector was a lot (Macovei, 2009). According to ideas given by (Keyder, 2001), some of the key problems affecting the Turkish banks include lack of capital to bailout banks facing huge risks, a lot

of state banks which were failing to access the required amount of cash to fund operations, lack of ability by the Turkish government to enforce effective macroeconomic policies and a lot of political interferences on the economy (Yeldan, 2006).

But much of the economic problems that were being observed in Turkey were being caused by Inflation. As noted in figure 2.1, it can be seen that CPI inflation was posing serious effects as it can be seen to have reached the highest rate which is above 12.98% in November 2017 whereas the core inflation went above the 12.50% mark.

Figure **2.1**: CPI and core Inflation trends 2004- 2017

Source: Turkey Data Monitor (n.d)

Figure **2.2**: Trends in growth 2008-2016

Source: Trading Economics (n.d)

Figure 2.2, shows that there has been a steady rise in Turkey's GDP from 2010 to 2013 where it rose from US$771.88 million to US$950.6 million. It can also be noted that Turkey's GDP has been relatively declining as it fell to US$934.17 in 2014 to US$857.75 in 2015 and US$857.75 in 2016.

periods of falling inflation especially from the end of the year 2016 were associated with falling levels of economic growth as shown by GDP. The lowest GDP rate averaged around -2.5% in the year 2016.

There were, however, improvements in financial intermediation throughout the mid-1990s, but later falls and this is during the period 2001 to 2002 in which the economic crisis was posing effects in Turkey (Özatay, 2000). When financial intermediation is determined using the volume of loans made as a percentage of GNP, observations can be made that financial intermediation has been on the rise reaching up to 64% in the year 2016.

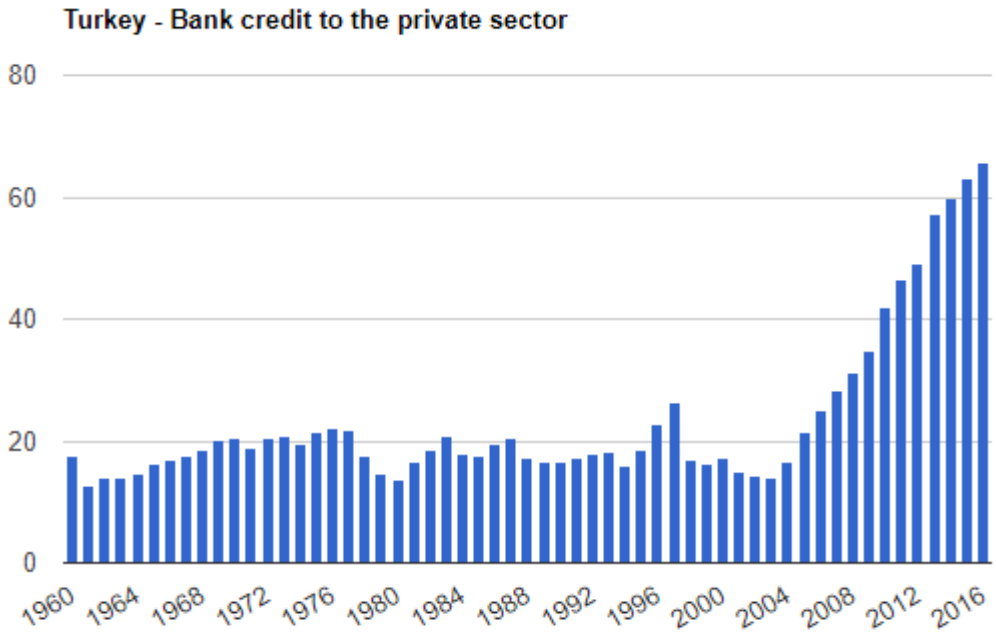


Figure **2.3**: Credit to the private sector (% of GNP)

Source: BRSA (2003)

By the period December 1999, Turkey was now facing a lot of macroeconomic instabilities which were proving to be rising all the time (Ishii, Habermeier and Canales-Kriljenko, 2002). Among the outcomes of macroeconomic instabilities that were observed in Turkey is the increasing public debt concern. Hence, the major solution was to introduce deflationary policies which were also considered by the IMF to be an effective strategy to solve Turkey's problems (Dufour and Orhangazi, 2009). These policies would also go a long way in using an exchange rate policy to deal with the problem of inflation, use of fiscal adjustments and structural reforms. But the effective change in the entire banking sector that there be an effective way to recapitalise and reform the banking sector. This led to positive developments in the banking sector which improvements in the government's ability to regulate banks through the introduction of banks. This was made possible through the established of a new supervisory and regulatory agency called the Banking Regulatory and Supervisory Agency (BRSA), (Akyüz and Boratav, 2003).

The introduction of this programme did, however, fail to produce the desired results and the government had to resort to a floating exchange rate system in 2000 after the whole system failed. However, much of the problems were considered to be as a result of problems being faced in the financial sector and during the period in which the crisis was being observed, problems in the financial sector led to serious economic effects on the Turkish economy (Özatay and and Sak, 2002). Efforts were thus placed to try and resuscitate the economy through the injection of money into the economy through TBS. This strategy had also undesired effects on the economy because it was associated with huge costs which strained further economic activities and it is reported that in 2001, 35 % of GNP or simply US$50 billion was chucked out by restructuring costs (Bussiere and Fratzscher, 2006). The most effective strategy was also characterised by the placing of banks under Savings and Deposits Insurance Fund (SDIF) but this was also associated with a lot of costs which proved to be strenuous for the Turkish government. Table 2.1, shows major costs that were incurred as a result of the banking crisis that rocked Turkey.

Table **2.1**: The cost of the banking sector crisis

	Costs as a % of GDP	**Costs in US $ bn**
Treasury costs	29.5	43.7
Restructuring of public banks	14.8	21.9
'Duty losses'	12.8	19.0
Recapitalisation	2.0	2.9
Private banks under SDIF	14.7	21.8
Private sector costs	6.4	9.5
Cost met by the SDIF	4.5	6.7
Shareholders capital injection	1.9	2.8
Total	35.9	53.2

Source: BRSA (2003)

2.3 Key changes effected in the regulatory structure, from 1999 to the present

Regulatory structuring programmes went into effective and full-scale use in 1999 following the commencement of disinflation programmes. This was reinforced by the introduction of the new Banking Act was passed in the same year (BRSA, 2003). The new act was in strong support of the establishment of the BRSA. This was so important because the banking sector required a lot of reforms especially when it comes to approaching matters relating to lending which were considered not to be transparent (BRSA, 2003). It is believed that Turkey's regulatory system was good but the problem is that there was lack of enforcement by the Central bank (Macovei, 2009). But notable changes began to take place soon after the establishment of BSRA whose main focus began to shift towards rehabilitation and restructuring of the Turkish banking sector. This led to a series of changes and these changes can be outlined as follows;

2.3.1 Main amendments to the banking law

The old banking act was considered to be ineffective in dealing with major economic and financial issues that were limiting the financial sector (Yeldan, 2006). The new act thus provided strong support to the existing bank regulatory system, improve asset collection and reinforce the role played by the BRS. For example, the introduction of the Law on Financial Sector Restructuring, No. 4743, can be seen as part of the efforts that were made to improve the legislative effectiveness of existing banking regulations (Özatay, 2000). This also extended to include corporate debt restructuring and ensure that Turkey's banking rules were closely related to standards that were similar to those of the EU. Hence, the main emphasis was to improve the banking sector framework in relation to the following aspects;

(i) Separating the duties of SDIF from those of BRSA.
(ii) Offering strong support to SDIF and BRSA.
(iii) Offer improved lending capacity to concerned parties.
(iv) Onsite inspections
(v) Creating a proper and fit and proper method for bank owners;

2.3.2 Capital adequacy

There was a huge need to ensure that Turkey's banking standards were in close resemblance to international standards. As result, new changes had to be made especially in the area of capital adequacy determination. This saw the inclusion of capital charges being included in determining capital adequacy levels as part of the risk-management and internal control procedures (Özatay, 2000). In order to prevent foreign exchange exposure of banks, the BRSA required that the capital adequacy rate is pegged at 20% (BRSA, 2003). In addition, a new committee was set up so as to help minimise risks and identify products that needed financial restructuring

2.3.3 Connected-lending practices

One of the key issues that were affected banks in turkey is that the lending practices were not connected and hence there was a need to ensure that new practices would connect them. As a result, bank participants and shareholders began to be classified under one risk category. Thus, is because the old practice is believed to have strongly led to abused lending (Dufour and Orhangazi, 2009). Hence, the newly introduced practices can be said to have led to improved and transparent connected-lending practices. This also led to changes that limited the level of bank's risk exposure to 25% from 75% for any risk category and this was also associated with the introduction of adjustment periods which would assist banks in complying with the newly imposed changes (Ishii, Habermeier & Canales-Kriljenko, 2002).

2.3.4 Limits on participation in non-financial sectors

A lot of banks in Turkey were participating in a lot of non-financial sector activities which were not closely resembling finance (Yeldan, 2006). Hence, the newly imposed strategies and framework-imposed limits on the banks' ability to engage in increased engagement levels in non-financial sectors have restricted the level of participation to not more than 60% and that not more than 15% should be invested in non-financial sector activities (BRSA, 2003).

2.3.5 Loan-loss reserves and provisioning

These laws were introduced but were not put into effective use not only until the year 2001 when BRSA ensured that these regulations matched EU standards. In doing so, (BRSA, 2003) had to ensure that all loans and other receivables were classified into five groups;

1) Standard category,
2) The watch-list,
3) Limited collection possibility,
4) Doubtful collection possibility, and
5) The write-off category (BRSA, 2003).

In the event that non-payment period has gone high above 180 days, the collateral or credit quality would be considered to be under 'standard' category', (BRSA, 2003). Once loans made to a certain borrower have been considered to be non-performing, all the loans that have been made to that borrower are also considered to be falling under the non-performing loans category and these loans are often related to the total level of liabilities and loans (Özatay and Sak, 2002).

2.3.6 Risk-management practices

Old risk management practices are strongly blamed for the severe financial sector problems that were encountered in Turkey (Akyüz and Boratav, 2003). Thus, new and improved risk management practices were called for and had to be introduced. These practices needed that Turkey's financial system be well organised and structured.

2.3.7 Accounting and audit practices

Lack of accountability in the banking sector is in most cases considered to be a problem that occurs as a result of failing to have sound and proper accounting and audit practices (Yeldan, 2006). This can also be reinforced by idea established by (Keyder,2001) which contends that any banks sector that lacks proper and sound accounting and audit practices tends to suffer from transparency issues. This is because there will not be a system that enforces accountability and proper ethical conduct by banks. (BRSA, 2003) thus contends that there should be improved roles played by both internal and external auditors and that this should be supported by proper accounting practices. This strongly led to innovative changes in accounting practices and helped to promote transparency among banks.

2.3.8 Non-bank financial institutions

In 2005, the newly adopted banking law led to the conclusion that both the supervision and Regulation of non-bank financial institutions should be under the control of BRSA and not the treasury (Özatay and Sak, 2002).

2.4 Obstacles to sound banking

Though a lot of effort was placed towards improving the banking sector's operational environment and capacity, a lot of changes were still continued to be observed. This is because the newly introduced laws and measures were surrounded by a lot of conflicting issues and a lot of changes still needed to be made with some changes being impossible to make within a short period of time. Basically, there were four major challenges that stood as obstacles to the improvement of Turkey's banking sector growth and development especially in the aftermath of the 2001 to 2002 financial crisis and these challenges are discussed in this study as follows;

2.4.1 Macroeconomic instability

Turkey was characterised by a lot of instabilities which were causing financial challenges. These instabilities do not only include the highly rising price levels but also went on to include in severe changes in high real interest rates. A study by (BRSA,2003), showed that severe changes in real interest rates were a

major cause of the financial sector challenges that seriously affected the level of financial development of Turkey.

The notable issue is that interest rates were highly volatile and this resulted in a lot of uncertainty as interest rates remained volatile. These changes had a lot of 'direct' and 'indirect' transmission channels effects on the financial sector. What this affected is that it led to the crowding out the effect of private sector investment (supply) as well as uncertainty (a decline in the demand for funds). The indirect effects are considered to cause a shift in skills and banking activities to the treasury. Hence, macroeconomic instabilities have been having undesired effects on the Turkish banking sector which affected income distribution, growth levels, led to increased informal activities and constricted financial development.

There are arguments which contend that financial intermediation does not necessarily lead to improvement in financial intermediation. For instance, a study conducted by (Özatay, 2000), outlined that financial intermediation is associated with a lot of problems which require constant monitoring and supervision. If such problems remain unaddressed, chances are very high that they can affect other economic outcomes such as economic growth, employment, trade etc. This can be related to observations made in relation to Turkey in which it was established that efforts to monitor and supervise the Turkish banking sector strained the Turkish central bank as it continued to incur a rising level of supervision costs and this has been against the backdrop of rising inflation and interest rates (Akyüz and Boratav, 2003).

2.4.2 The large share of state-owned banks

Turkey has a lot of State-owned banks which account for more than 20% of total loans and 42% of total deposits made (Dufour and Orhangazi, 2009). But this is also common in EU with a lot of countries such as Germany also has a high number of state-owned banks (Özatay, 2000). Observations were made that the financial crisis that took place was necessitated by state-owned banks (Ishii, Habermeier and Canales-Kriljenko, 2002). A lot of measures had to be put in place to help State-owned banks deal with these problems and two of the

state banks owned banks, that is, Emlak and Ziraat, Halk are considered to have made strong efforts to engaged in measures to curb the effects of the financial crisis by engaging in strategic banking measures which include legislative changes, retrenchment, downsizing etc., (Bussiere and Fratzscher, 2006). The challenges were mainly observed in the area of uncertainties in future economic and banking outcomes as both the banking and economic environments remained volatile. Also, the effort was called to have some of the state-owned banks privatised so as to improve resource allocation and efficiency in the banking sector (Macovei, 2009). The effects of public banks are considered to be detrimental even when the presence of private banks is not taken into account. This is because ideas by (Keyder, 2001) show that public banks have an adverse effect on the smooth operation of the entire banking system in a number of ways. For example, introducing a maximum on deposit guarantees, public banks can have what is known as an implicit blanket guarantee. This has an effect of causing huge transfer of deposits from private banks to public banks which in this case will be Turkish lira deposits. The movement of deposits to public banks affects the entire banking systems irrespective of the fact that such transfer has occurred at competitive rates and hence can be said to lead to competitive disadvantage.

The other thing that can be noted is the issue of strengths against weaknesses of public banks. Observations were made that the strengths of public banks can sometimes be undermined by their weaknesses (Dufour and Orhangazi, 2009). This is because state banks tend to lack the innovative ability to compete with private banks, poor staff quality and have infrastructural challenges. One of the best ways of avoiding these problems is to have these state-owned banks privatised. There are other ideas which contend that the best way is to reduce the number of public banks that are in operation (Özatay and Sak, 2002). In this way, one can hope that the net effects on public banks on the operational effectiveness and well-functioning of the banking sector are minimised. Alternatively, it can be said that reducing the number of public banks helps to reduce the nature and magnitude of effects posed by public banks. Also, there are ideas which contend that no investor is willing to invest in a state-owned

bank that does not show strong signs of improvement in performance and other banking indicators such as earnings per share, shareholder book value and dividend per share (Macovei, 2009). This can be pointed to be the exact case that happened to Turkey in the context of Halk bank and Ziraat bank.

Lastly, public banks can be said to possess a monopolistic advantage over private banks especially when considerations are made that state-owned organisations are not required by the Turkish government to open bank accounts with any private bank (BRSA, 2016). As a result, deductions can be made that this monopolistic element tends to cause public banks to have a monopolistic advantage over the management of public funds. It can also be said that this element tends to reduce the number of customers who have access to highly advance financial products that are at the disposal of foreign and private banks. Public banks have also been accused of causing interest rates to rise high above those which private banks are offering so as to lure a huge customer base (Dufour and Orhangazi, 2009). This can be said to be the main reasons why state-owned banks have a huge dominance over Turkish Lira deposits (BRSA, 2016)

2.4.3 Limits to growth potential and state of the loan portfolio

When the idea of the loan portfolio is factored in, the Turkish banking system can be said to be suffering from the problem of non-performing loans. This problem was however established to be relatively low in nations that experienced a financial crisis (Dufour and Orhangazi, 2009). These non-performing loans can be said to affect economic growth and there is also an element of them affecting the performance and growth of banks. Hence, a high increase in non-performing loans can be said to be detrimental to bank performance and economic growth as was noted in Turkey with economic growth average below 4% in early 2015 (World Bank, 2017).

2.4.3.1 Non-performing loans and the status of the loan portfolio

Soon after the 2001 crisis, the BRSA encountered a series of challenges and on the challenges was to deal with the interrelated lending activities that had been made by banks which were declared insolvent and placed under the control of SDIF, provisioned non-performing loans of public banks made out of public funds and the need to come up with a debt-workout strategy (Yeldan, 2006).

The problem of non-performing loans grew severely and it is reported that in Turkey by the period 2003, NPLs were accounting for at least half of the restructuring costs (Bussiere and Fratzscher, 2006). This problem was considered to be in two distinct areas, that is, state-owned banks and private banks that had been placed under the control of the SDIF. But much of the debts that were being owed were relatively high in the private sector because of huge amounts of lending that had been given or made to the banks' shareholders (Bussiere and Fratzscher, 2006).

A total of US$11 billion was incurred just in ensuring that the restructuring exercise is carried out and this had a contagion effect on other companies (Akyüz and Boratav, 2003). This mainly affected companies which were owned or controlled by the owing shareholders who had received loans from banks which had been declared insolvent and placed under the control of the SDIF. It is also estimated by (Akyüz and Boratav, 2003) than US$9 billion has been lent to these shareholders while US$2 billion is believed to have been made to other banks that were also placed under the control of the SDIF (Akyüz and Boratav, 2003). This problem is considered by (Dufour and Orhangazi, 2009), to be as a result of politically centred lending which was made as a result of political patronage or ties. Table 2.2 shows the growth in banks' NPLs that has been observed since the period December 2001 to December 2003.

Table **2.2**: NPL ratio and provisions in the Turkish banking sector

	NPL ratio (%)		Provision/NPL (%)			
	Dec-01	Dec-02	Dec-03	Dec-01	Dec-02	Dec-03
State banks	37.3	37.4	26.2	62.7	73.9	97.6
Private banks	27.6	8.9	6.5	31.5	53.0	80
Foreign banks	5.5	4.9	4.3	75.6	77.7	78.5
Investment banks	10.7	4.0	3.5	82.3	64.2	90.3
SDIF banks	67.3	69.4	53.8	55.9	60.5	75.4
Total	29.3	17.6	11.5	47.1	64.2	88.5

Sources: BRSA Annual Report (2003)

Efforts to restructure the banking sector were mainly targeted at SDIF and state banks. The table shows that though there have been improvements in state banks' NPL portfolio, they have however not been significant enough even though efforts were made to boost the capitalization levels. Before the restructuring exercise was carried out, public banks were mainly responsible for meeting commercial loans and Treasury needs (Dufour and Orhangazi, 2009). Arguments were made by (Özatay, 2000), that a huge part of the lending was politically centred and would be directed to certain groups and companies or groups which had low credit ratings and could not afford to access to private-sector credit.

2.4.3.2 Looking forward: Growth potential of the loan portfolio

Much of the Turkish credit demand was mainly out of three areas or economic elements, consumers, SMEs, and large corporations. Furthermore, much of the problems that are being observed in the Turkish banking sector are considered to be relatively linked on how to profitably expand these segments (Macovei, 2009).

The credit market in Turkey is still competitive and much of the lending is between banks and corporations. Though spreads made from loans have considerably declined, it still follows that future growth levels in loans are undeniable especially those institutions and individuals that have better credit ratings (Bussiere and Fratzscher, 2006).

Banks in Turkey are confronting an issue of assessing how reliable SMEs are when it comes to repaying back the borrowed funds especially after considering that there is always a problem of information asymmetry. Sectors that have a huge number of SMEs tend to have a lot of non-enlisted exchanges and as a result, the genuine credit worthiness of the forthcoming borrower is once in a while reflected in the monetary articulations. Hence, it hard to settle on legitimate credit choices about SMEs (Yeldan, 2006). Such is particularly common with foreign-owned banks, which must comply with the regulatory needs of their respective governments. A greater part of the loaning made to SMEs by pledges and property mortgages and in order to guarantee a loan, it must first be proved that there are available legal instruments support loaning to SMEs, the legitimate instruments first should be made.

With a population of more than 15 million households, a total of 2.5 million loans had been made to consumers in Turkey by the year 2003 and these remained unpaid (Yeldan, 2006). The huge population figure indicates that there is more room for the Turkish economy to grow. Alternatively, it can be said that the bankable population in Turkey sti8ll remains relatively high especially after considerations can be made that a huge number of people in Turkey do not use a lot of bank products (Bussiere and Fratzscher, 2006). According to (Yeldan, 2006), this problem is as a result of low levels of education, inequalities in the distribution of income and low per capita income among the low income earning

social groups. But with the low levels of domestic savings and a huge current account deficit making additional loans can prove to be a risky and undesirable for Turkish banks. In such a case, the government of Turkey can impose high tax rates on lending so as to reduce it.

Another limitation that affects the supply of loans is the capital adequacy determination methods that are used to come up with the capital adequacy ratio. This is because the ratio has to be made in accordance with stipulations made by the Basel guidelines (Akyüz and Boratav, 2003). This had a problem of considering the risk-weighting to be zero and yet the risk-weighting of the private sector is positive (Aebi, Sabato and Schimid, 2012). Considerations can be made that if the asset composition of the banks is taken into account then the capital adequacy ratio will be lower than the estimated ratio.

2.4.4 Heavily taxed financial sector

The Turkish banking sector has been one of the heavily taxed financial sectors and this has been attracting huge attention among analysts. As a result, the Banks Association and the large business association, TUSIAD came up with suggestions on how to deal with the high tax rates. Ultimately this led to the establishment that high tax rates that were being charged on banks would lead to an increase in the costs of credit by more than 50% (BRSA, 2016). Of which it is believed that more than 85% of the costs are passed on to the consumer.

High taxation levels have been also considered to be highly associated with ‘financial repression’ by imposing unnecessary burdens on the financial system which hampers its growth and development (Akyüz and Boratav, 2003). Moreover, other studies have shown that they have an effect of causing a huge migration of funds to offshore markets where there is a high financial liberalisation (Ishii, Habermeier and Canales-Kriljenko, 2002). Sources suggest that high tax rates are one of the major reasons why the external debt of private sector banks rose so high and in 2003 it went on to stand at US$27.5 billion. This also comes in the form of loans that are provided by those foreign-owned banks through their respective branches. High tax levels have thus had an effect of causing a huge international transfer of loans and deposits to foreign

branches or subsidiaries. It is reported that almost all the private banks in Turkey have a subsidiary bank in Europe mostly the Netherlands. This has been also a major problem especially when considerations were being made that international asset transfers started taking place to other European countries. The main issue was primarily based on the idea that such international transfers were difficult to monitor and supervise (BRSA, 2016). This problem was however dealt with by the introduction of the BRSA.

3.5 The McKinsey study: An overall productivity assessment

The McKinsey study was undertaken so as to determine or measure the productivity of the Turkish banking sector. Though arguments were not that it is difficult to accurately determine productivity without having to look at the homogeneity of outputs and inputs (Macovei, 2009). McKinsey study is considered to have offered a breakthrough in this aspect and went on to establish how productive the Turkish banking sector is (McKinsey, 2003). The findings that were made showed that a lot still needs to be done if Turkey is to match the productivity indicators such as the countrywide indicators as well as those of the US. The findings also showed that Turkey has a low banking productivity which is 46% below its full capacity and 42% of the US benchmark (McKinsey, 2003). The model estimation process considers that banking sector productivity is a function of labour productivity which in turn is influenced by loans, deposit accounts and payment transactions. Labour, in this case, is considered to be an input while these determinants are considered to be output. (McKinsey, 2003), found that the major contributor to the productivity of Turkish banks is the organization of tasks and functions of transaction payment systems. This also considered to be having a huge effect on the productivity gap. The study, however, went on to establish that there are other factors that determine or influence the productivity gap of the Turkish banking system and these include customer demographics and behaviour, capacity utilization, scale and, technology or capital intensity. This can offer explanations to a payment system that is composed of branch-level transactions and labour intensive with the former accounting for 46% of all payment transactions. The study led to the

establishment that branch design and practices and lack of infrastructure to offer alternative delivery channels. Hence, conclusions were made that productivity variances in the Turkish banking sector stood at 46% and of which 21%, of the changes in productivity, is explained by the operational activities of state banks. Recommendations by McKinsey (2003) contend that adjusting the efficiency of public banks together with that of public banks will help boost the entire banking sector productivity by 8%. The study went on to make the following recommendations to policy-makers;

- State banks should have productivity-related performance measures into;
- Deal with unfair advantages possessed by public banks promoting operational fairness
- Introducing legislative measures that improves efficiency in loan application processes and promote the use of alternative delivery channels.

3. CHAPTER: RESEARCH METHODOLOGY

3.1 Introduction

This chapter looks at the estimation procedures that were followed to estimate the impact of liquidity on bank performance. This chapter also looks at the tests that were carried out to ensure that the variables meet the necessary conditions required to estimate the liquidity and bank performance model. Thus, this chapter looks at stationarity tests, diagnostic tests, and autoregressive distribution lag (ARDL) model, justification of variables and the data sources.

3.2 Stationarity test

Before estimating a model, it is important to check the data if it has a unit root or not. Ideas given by (Gujarat, 2009), showed that failure to determine if the data has a unit root might lead to a spurious situation. This is usually noticeable in standard regression estimation models which require that the data be stationary at levels. However, some models such as error correction models require that the data be non-stationary at the level and stationary at first differences.

Data is stationary when its properties do not change with time (autocorrelation and variance). Variables can either be stationary at the level I(O), at first difference I(I) but it is not good to have variables that are stationary at the second difference I(2), (Gujarat, 2009).

In this study, an autoregressive distributed lag (ARDL) model was used to estimate a bank profitability model. As noted above that an ARDL involves determining the error correction term, the data has thus got to be non-stationary at the level and stationary at first difference. In order to do so, the Phillips Perron (PP) and the Augmented Dickey-Fuller (ADF) tests were used as part of the stationarity tests.

The ADF is used because of its capability to deal with difficult scenarios or models but it requires that attention is given to it as it has high chances of

suffering from type 1 errors (Von Sachs & Neumann, 2000). The ADF is based on the following hypothesis;

- **H_0:** The data is stationary at 0.05 significance level.
- **H_1**: The data is non-stationary at 0.05 significance level

The ADF tests for stationarity with no constant and trend, constant and no trend and with both constant and trend. The Augmented Dickey-Fuller adds lagged differences to three circumstances:

- No constant, no trend: $\Delta y_t = \gamma y_{t-1} + \sum_{s=1}^{m} \partial s \Delta y_{t-s} + vt$
- Constant, no trend: $\Delta y_t = \alpha + \gamma y_{t-1} + \sum_{s=1}^{m} \partial s \Delta y_{t-s} + vt$
- Constant and trend: $\Delta y_t = \alpha + \gamma y_{t-1} + \lambda_t + \sum_{s=1}^{m} \partial s \Delta y_{t-s} + vt$

The PP,on the other hand, is used to check if the data set is integrated with the order 1. The PP is derived from the ADF's hypothesis of the following nature in which the first difference operator is given by Δ.

$$\rho = 1 \text{ in } \Delta y_t = (\rho - 1) y_{t-1} + u_t$$

The advantage of using the PP test over the ADF is that it deals with the problem of autocorrelation which is some cases neglected by the ADF (Phillips and Perron, 1988).

3.3 Model estimation

The ARDL has been developed by (Pesaran and Shin, 1995) and these Authors argue that the ARDL is way better in estimating the existence of cointegration as compared to other techniques such as Granger causality. As a result, the ARDL is considered to be a reliable estimator, especially when using data with small sample sizes (Pesaaran et al., 2001). Moreover, it can be used for variables that are integrated of different levels, that is, I (0) and I (I), (Pessaran, 1997).

The ARDL model will help to determine if the variables are cointegrated in the long run using an error correction term. Such an error correction term will also help to determine the speed of adjustment (Pesaaran et al., 2001). (Masih and Masih, 2002, p. 69), however, contends that in order for cointegration to exist, the error term must be less than 0 and significant.

The bounds test, on the other hand, shows that there is a long run relationship between the variables (Pessaran, 1997). The decision is determined by comparing the F-statistic with both the lower and upper bounds values. The decision is, therefore, to accept that there is a long run relationship when the F-statistic is high above both the lower and upper bounds values.

In this study, the effort is placed on examining the relationship between liquidity risk and financial performance. The dependent variable was identified as NIM while liquidity was estimated using the proportion of liquid assets to total assets (LA). The study managed to observe that the relationship between liquidity risk and financial performance was being affected by the size of the banks which was measured using total assets (TA), the banks' asset quality (AQ), capital proxies using shareholder equity (SE) and inflation (CPI). The data was initially converted to logarithms and this can be denoted in a functional form as follows;

$$LNIM = F(LSE, LLA, LAQ, LTA, LCPI) \quad (1).$$

In regression terms, expression (2) can be written as follows;

$$LNIM = \alpha + \alpha_1 LSE + \alpha_2 LLA + \alpha_3 LAQ + \alpha_4 LTA + \alpha_5 LCPI + \mu \quad (2).$$

With intercept being denoted by α while the estimated parameters are represented by α_1 to α_5 and the error term by μ. When expression (2) is changed into an ARDL model, the following expression is obtained;

$$\Delta \boldsymbol{LNIM} = \alpha_0 + \alpha_1 \sum_{i=0}^{n} \Delta \boldsymbol{LSE} + \alpha_2 \sum_{i=0}^{n} \Delta \boldsymbol{LLA} + \alpha_3 \sum_{i=0}^{n} \Delta \boldsymbol{LAQ} + \alpha_4 \sum_{i=0}^{n} \Delta \boldsymbol{LTA} + \alpha_5 \sum_{i=0}^{n} \Delta \boldsymbol{LCPI}_{+} \Upsilon_{\mathbf{1}} \boldsymbol{\mu_{t-1}} \quad (3).$$

3.4 Diagnostic tests

When it comes to the issue of model diagnostic tests, four specific tests were conducted. The main emphasis is to ensure that the model will be capable of highly predicting the relationship between variables as highly reliable as possible (Berndt, 1991). Diagnostic tests also seek to ensure that the model can be used for policy purposes without any bias.

The first test pertained to a serial correlation which occurs when the errors terms are correlated (Durbin and Watson, 1950). This has a problem of causing the standard errors to be high and the p-values to be either insignificant yet in actual fact they are significant or vice versa. A serial correlation test was conducted using the serial correlation test and the decision is to accept that there is a serial correlation when the p-value is less than 0.05.

The other test that was carried out related to heteroscedasticity which occurs when the variance of the errors terms is not homoscedastic (Nelson, 1991). The Breusch-Godfrey-Pagan test and the Arch test were used to test the presence of heteroscedasticity and the null hypothesis is that there is no heteroscedasticity. There is also an element of ensuring that the variables are normally distributed. Normality tests are usually done using the Jarque-Bera test will be high above 0.05 in order for the data to be considered to be normally distributed. The above tests were also supported by the use of stability tests which were conducted using the Cusum and Cusum of squares tests to test if the model is stable enough to offer a reliable forecast.

3.5 Definition and justification of variables

3.5.1 Bank profitability

There are basically three ways that can be used to measure bank performance and these are ROA, ROE and NIM. However, due to data availability issues, the study was restricted to NIM to estimate the impact of bank liquidity on bank profitability. Hence, NIM was used as a dependent variable.

3.5.2 Bank capital

Bank capital is one of the key pillars of a successful and financially developed banking sector. This is because highly capitalised banks are less prone to risks and can easily fund their operations (Davidson and Dutia, 1991). This implies that there is a positive relationship between bank capital and bank performance as noted by (Ongore and Kusa, 2013). Bank capital was estimated using shareholder equity (SE). Banks that have challenges in securing capital funding are more likely to face challenges in meeting the demand for deposits and chances are very high that they might be declared insolvent. When banks are declared insolvent, this affects the economic performance of a nation. Hence, it is important to put bank capital as a notable variable that affects bank performance.

3.5.3 Bank liquidity

Bank liquidity refers to the ability of the bank to swiftly convert its assets into means of payment (Lartey, Antwi and Boadi, 2013). Bank liquidity was determined using the level of the banks' liquid assets (LA) in relation to total assets. The general idea is that banks which are more liquid will make more profits but however a study by (Mohd Said and Tumin, 2011), outlined that too much liquidity can actually hinder bank performance. This normally occurs when there is a mismatch in liquid assets and illiquid assets. Hence, expectations were made that too much liquidity impairs bank performance.

3.5.4 Asset quality

Asset quality in this study will be taken to mean the extent to which the banks' assets are efficient in generating high returns at lower costs over a given period of time. Usually asset quality can cause the banks' financial performance to improve if the revenue generated from using the banks' assets is greater than expenses that are incurred in servicing those assets. Ideas given by (Maaka, 2013), showed that asset quality and performance can be negatively related to each other. The reasons point to the idea that expenses such as maintenance costs can sometimes rise so high above the revenue generated towards improving the quality of the banks' assets. Moreover, when it comes to securities and tangible assets, efforts to improve asset quality may be made to towards those assets that can only generate high returns in the short run and fewer returns in the long run. This implies that the bank's financial performance will be high in the short run and will fall in the long run. As a result, the relationship between asset quality and financial performance can be said to be negative in the long run.

3.5.5 Bank size

Bank size in this study was measured using the total assets (TA) that are in possession of the banks. This implies that big banks are those that have a high level of total assets while small banks are those that have few total assets. The relationship between bank size and profitability is determined by the extent to which the banks' assets are being used to effectively generate more income. This can be evidenced by a study conducted by Silver and Amber, (2003) which outlines that banks can make profits if the revenue generated by the assets is greater than the level of expense incurred in servicing those assets. This implies that when it comes to the issue of total assets, an increase in bank size may fail to cause a positive change in bank performance when the acquired assets are not efficient and generating huge returns to cover costs incurred.

3.5.6 Inflation

Inflation in this study was taken to mean average changes in the basket of goods as measured by the consumer price index (CPI). The inclusion of this variable in this study is justified by an observation made which showed that inflation has been a notable economic phenomenon that has been affecting not only economic performance but also bank performance (Naceur and Omran, 2011). It is reported that in January 2018, Turkey's inflation rate stood at 10.35% (Inflation EU, n.d). There are however various ideas that can be given about how inflations affect bank performance. Other studies have managed to outline that inflation hinders bank performance (Bonin, Hasan and Watchel, 2005; Boyd, Levine and Smith, 2001).

However, a study by (Tamimi and Al-Mazrooei, 2007), contends that banks can benefit from increases in inflation when the value of non-fixed interest assets or securities tends that are pegged to the inflation rate tends to increase with the increase in the inflation rate.

3.6 Data sources

Data analysis was made possible using secondary data and the main advantage of using secondary data is that it allows comparisons to be made and the relationship between variables as well as their magnitude of effect can easily be determined (Judge et al., 1982). The data was obtained from the BAT and the period under study ranged from 1960 to 2016. However, data on consumer price index (CPI) was obtained from the World Bank statistical indicators.

4. CHAPTER: DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter provides an outline of the estimation procedures that were used to analyze and present the obtained findings. This chapter will thus look at unit root tests, diagnostic tests, short-run estimations, level equation analysis and bounds test estimation.

4.2 Unit root tests

Unit root tests are conducted so as to check if the estimated model does not have a unit root and (Dickey and Fuller, 1979) established that the presence of a unit root causes the model to be spurious. Hence it is important to test for stationarity before estimating the model. The Philips Perron (PP) and the Augmented Dickey-Fuller (ADF) tests were used to ascertaining the presence of a unit root.

Table **4.1**: Phillips Perron tests at the level and the first difference

	5% Critical value at level		**5% Critical value at first difference**	
Variable	**t-stat**	**Prob.**	**t-stat**	**Prob.**
LNIM	-3.492149	0.3397	-3.493692	0.0000
LSE	-3.492149	0.2769	-3.493692	0.0000
LLA	-3.492149	0.3546	-3.493692	0.0000
LAQ	-3.492149	0.7002	-3.493692	0.0000
LTA	-3.492149	0.5089	-3.493692	0.0000
LCPI	-3.492149	0.5792	-3.493692	0.0001

From the given results, it can be seen that all the variables are non-stationary at a level as noted by both the PP and the ADF tests at 0.05 significance level. The tests also show that the variables are stationary when tested at first difference at 0.05 significance level. This provides strong evidence that the variables are stationary at the first difference. Hence, it can be established that the condition of the variables is good enough to estimate an ARDL bounds model.

Table **4.2:** Augmented Dickey-Fuller tests at the level and the first difference

	5% Critical value at level		**5% Critical value at first difference**	
Variable	**t-stat**	**Prob.**	**t-stat**	**Prob.**
LNIM	-3.492149	0.3096	-3.495295	0.0000
LSE	-3.492149	0.2279	-3.493692	0.0000
LLA	-3.492149	0.1989	-3.495295	0.0000
LAQ	-3.492149	0.8385	-3.493692	0.0000
LTA	-3.492149	0.5534	-3.493692	0.0000
LCPI	-3.492149	0.4230	-3.493692	0.0000

4.3 Diagnostic tests

Diagnostic tests were carried out using Breusch-Godfrey-Pagan test and Harvey test while serial correlation was determined using the serial correlation LM test. The presence of both heteroscedasticity and serial correlation affects the size of the standard errors that are observed during the estimation process and may cause insignificant variables to appear as significant or vice versa. Hence, it is important to check whether the estimated model does not have

heteroscedasticity and serial correlation problems. Heteroscedasticity and serial correlation results are presented in table 4.3 and 4.5.

4.3.1 Heteroscedasticity

Arch and Hervey heteroscedasticity test results do reject the idea that there are Heteroscedasticity problems with the estimated model. The decision is to accept that there is no heteroscedasticity when the p-value is greater than 0.05. Since the obtained values (0.8808 and 0.2166) are greater than 0.05, it can be concluded that there is no heteroscedasticity.

Table **4.3:** Heteroscedasticity test

	Breusch-Godfrey-Pagan	**Arch test**
F-statistic	1.4720 (0.8808)	1.5124(0.2166)

4.3.2 Serial correlation test

Findings made in table 4.2 show that the model does not suffer from serial correlation. As a result, it can be considered to be a good model as the null hypothesis that there is no serial correlation is accepted at 5%.

Table **4.4**: Serial Correlation LM test

F-statistic 1.5285	Prob. F(2, 28) 0.2344
Obs* R-sqaured 5.2168	Prob. Chi-square (2) 0.0737

4.4 Short run estimations

Short ARDL reveals that the previous bank performance level of the first period is negatively affecting future bank performance in the second period. This follows a continuous significant decline in bank performance from -0.302729 to -0.469012. In overall, liquid assets can be said to be causing a combined positive effect on bank performance though the rate at which bank liquidity is causing positive changes in bank performance is not constant and keep fluctuating from positive highs and positive lows. Positive changes in asset quality can be seen to be causing a significant decline in bank performance of -0. 8469. This suggests that the banks are not getting more interest revenue from an improvement made in asset quality or there are diseconomies of scale that are being observed to be related with the (Wekesa and Adminstration, 2016).

However, in the short run, an increase in shareholder equity is having combined negative and significant effects on banks profit earning capacity. This is either because increases in shareholder equity are costly for the banks which are forced to pay high-interest payments on the increased capital base. This can be explained by ideas given by (Mohd Said and Hanafi, 2011), which suggests that an increase in shareholder equity is associated with a lot of transaction and information costs which can end up reducing profits made by the bank.

Table **4.5**: Short run estimations

Selected Model: ARDL (3, 4, 0, 4, 4, 2); Dependent Variable: LNIM

Variable	Coefficient	Std. error	t-statistic	Prob.
D(LNIM(-1))	-0.302729	0.102824	-2.944143	0.0062*
D(LNIM(-2))	-0.469012	0.111749	-4.197018	0.0002*
D(LLA)	0.067998	0.453745	0.149859	0.8819
D(LLA(-1))	1.558454	0.503419	3.095742	0.0042*
D(LLA(-2))	0.739438	0.456668	1.619201	0.1159
D(LLA(-3))	1.390675	0.471158	2.951610	0.0061*
D(LAQ)	-0.846946	0.206353	-4.104359	0.0003*
D(LSE)	-0.232462	0.203629	-1.141596	0.2627
D(LSE(-1))	-1.043368	0.266271	-3.918446	0.0005*
D(LSE(-2))	-0.370832	0.213873	-1.733890	0.0932**
D(LSE(-3))	-0.574726	0.200828	-2.861784	0.0076*
D(LTA)	-0.269013	0.207407	-1.297030	0.2045
D(LTA(-1))	0.330873	0.170587	1.939614	0.0619**
D(LTA(-2))	0.825435	0.183202	4.505589	0.0001*
D(LTA(-3))	0.345564	0.207344	1.666621	0.1060
D(LCPI)	0.086596	0.061715	1.403141	0.1708
D(LCPI(-1))	-0.142826	0.072110	-1.980663	0.0569**
CointEq(-1)	-0.470590	0.063354	-7.427920	0.0000
R^2	**0.6662**		**Prob(F-statistic)**	**0.00057**
Adjusted R^2	**0.4214**		**Durbin Watson Stat**	**2.1314**

* = sig. at 0.01; ** = sig. at 0.10

In the short run, an increase in the banks' asset quality is resulting in a significant increase in the bank's NIM by 0.330873, 0.825435 and 0.345564 in the first, second and third periods of trading. The rate at which banks size causes a positive change in bank performance can be seen to have declined in the third period. Reason can possibly mean that this can be as a result of the idea that bank managers are not using the banks' assets in an effective manner hence returns made from using those assets are decreasing. This result is in line with study findings made by (Tamimi and Al-Mazrooei, 2007), which contend that an improvement in the bank's asset quality does not always guarantee that the banks' assets will generate more returns.

The obtained error correction term of -0.47059 is negative and significant at 1% and this shows that there is a long run cointegration between the variables. This also shows that the speed at which the variables will move back to equilibrium is 4.71%.

The short-run results are showing that changes in CPI have a net negative effect on bank performance which is significant at 1%. However, negatives of CPI on bank performance can be observed to be taking in the first period while the second period sees a reduction in bank performance of -0.142826 in the first period. Inflation can thus be said to because of negative effects on bank performance.

4.5 Long run coefficients

Changes in the bank's liquid assets position can be noted to be negatively related to the banks' financial performance as noted by an insignificant coefficient of -1.5314. This shows that an increase in liquid assets will negatively cause a reduction in the financial performance of the banks by -1.5314 units. The results are the same as the study results given by (Mohd Said and Tumin, 2011). This reason is that banks are probably not using liquid funds inan effective manner or possibly because the liquid funds are just lying idle and are not being diverted to meaningful purposes.

Table **4.6:** Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LLA	-1.046248	1.3701618	-2.763340	0.4512
LAQ	-1.789951	0.614353	-2.913556	0.0067*
LSE	2.795487	0.689540	4.054131	0.0003*
LTA	-0.730251	0.206286	-3.539995	0.0013*
LCPI	0.807864	0.174090	4.640498	0.0001*
C	7.552431	5.555482	1.359455	0.1841

LNIM = F(LLA, LPA, LSE, LTA, LCPI), * Significant at 0.01

The obtained level equations results provide strong evidence of the existence of a negative relationship between bank's asset quality and financial performance. This can be noted by a coefficient of -1.790 units which denote that an increase in bank's asset quality by 1 unit will result in a decrease in bank performance by 1.790 units. This relationship is significant at 0.01 significance level and this support obtained results by (Maaka, 2013), which showed that asset quality and performance are negatively related to each other.

The results also show that shareholder equity which provides an indication of the bank's capital ratio is also positively and significantly related to performance by 2.7955 at 1%. The results show that increases in shareholder capital by 1 unit will result in an increase in bank performance by 0.6510 units. This supports ideas given by (Ongore and Kusa, 2013), which show that improvements in shareholder equity are not costly as noted with debt equity which involves possibly high-interest payments. High-interest payments have a tendency to reduce bank profitability.

An increase in the size of the banks as shown by the level of total assets can be established to be causing a significant decline in bank performance of -0.730251 units. The decrease in bank performance is either as a result of the fact that the assets are not highly productive and hence are generating fewer returns or contributing less to the productivity, effectiveness of the bank. Such is similar to ideas given by Silver and Amber, (2003), which assert that an increase in bank size may fail to cause a positive change in bank performance when the acquired assets are not efficient and generating huge returns to cover costs incurred.

The relationship between CPI and bank performance can be noted to be positive. This is because a 1 unit increase in asset quality will result in a significant increase in bank performance by 0.8079 units. This possibly suggests that the banks are holding assets that have variable interest rates which are tied to the inflation rate. Hence, a rising inflation rate will cause the value of assets whose returns are pegged to the inflation rate to increase. This result confirms findings which were established by (Tamimi and Al-Mazrooei, 2007), which assert that efforts the value of non-fixed interest assets or securities tends that are pegged to the inflation rate tend to increase when the inflation rate is high. But if banks had fixed interest bearing assets, they will make losses as the value of such assets is eroded away.

4.6 Bounds test

Bounds test was conducted to determine if there is long-run cointegration between financial performance, liquidity, asset quality, and bank size. The decision to accept that there is long-run cointegration is based on whether the F-statistic is high above both the lower bounds I (0) and upper bounds I (1) levels.

Table **4.7**: Bounds test

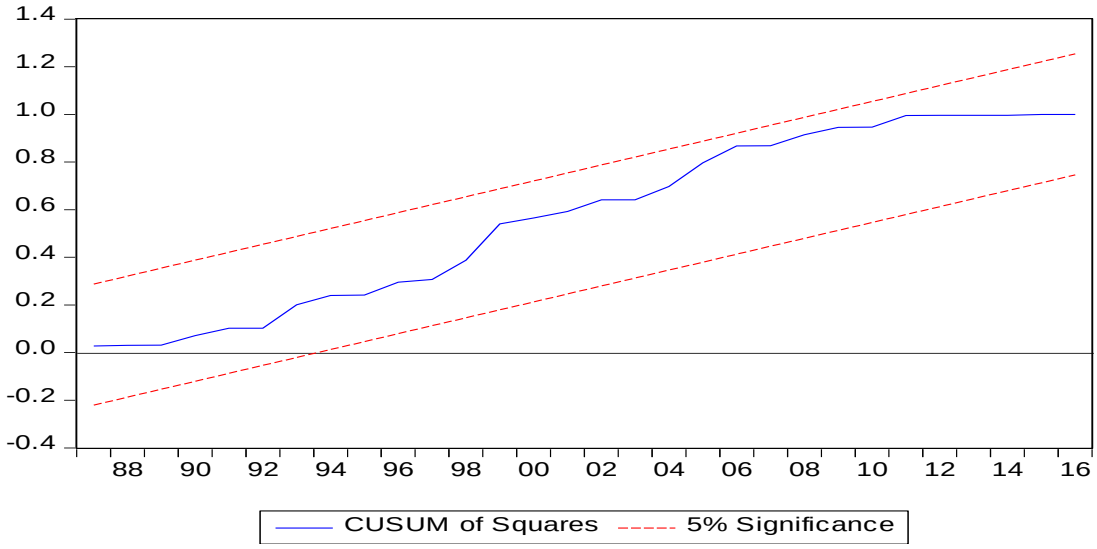
			Critical bounds		
Test statistic	Value	K	Significance	IO Bound	I1 Bound
F-statistic	4.581862	5	10%	2.08	3
			5%	2.39	3.38
			2.5%	2.7	3.73
			1%	3.06	4.15

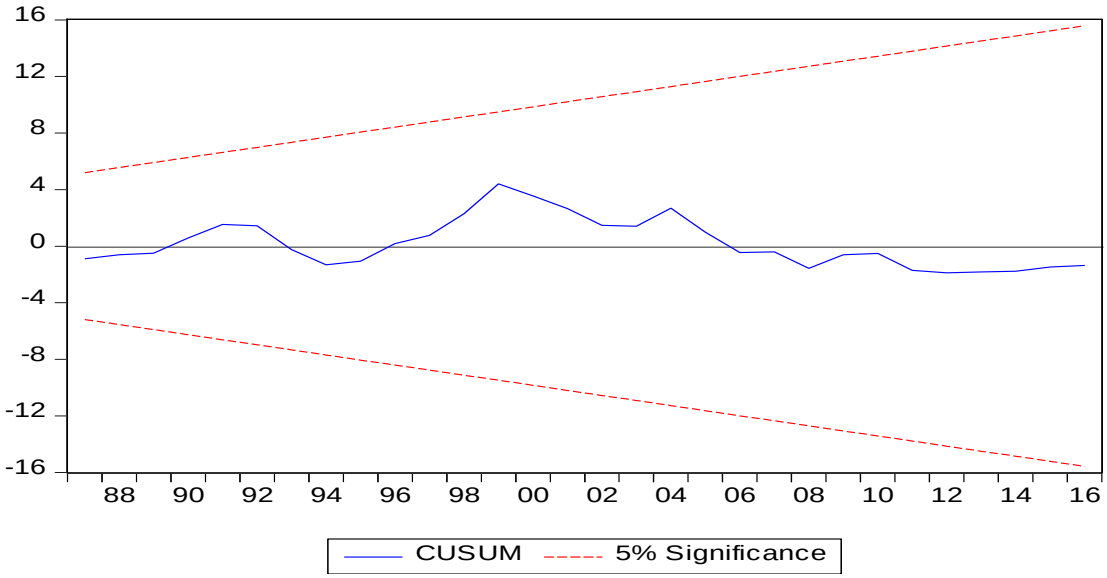
*Null Hypothesis: No long-run relationships exist

Based on the obtained results, it can be noted that an F-statistic of 4.581862 is higher than the upper bounds at both 1%, 2.5%, 5% and 10%. Hence, conclusions can be made that there is a long run relationship between the variables.

4.7 Model predictive stability tests

Model predictive tests were done so as to determine whether the estimated model is highly stable enough to give better predictive results. This was done using Cusum test and Cusum of squares tests. The obtained results showed that the estimated model is within the given bounds and hence conclusions can be made that the estimated model is highly stable.





5. CHAPTER: CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FUTURE STUDIES

5.1 Conclusions

The main emphasis is to examine the relationship between liquidity and a bank's financial performance with relevancy to Turkey. The study also sought to determine if there are any factors that can influence the extent to which bank liquidity affects the financial performance of commercial banks. This has been attributed to a series of observations that were which showed that improvements in bank liquidity do not always lead to an improvement in banks performance.

Based on the established results, conclusions will be made that there is a long run cointegration between bank performance and liquidity. The speed of adjustment of the cointegrated variables can be said to be relatively mild and hence it can be said that there are moderate movements or changes in bank performance equilibrium in response to changes in liquidity.

It can also be noted and concluded that improvements in the bank's liquid assets position have negative implications on the banks' financial performance. Hence, deductions will be made that improvements in liquidity are reducing investments in productive liquid fixed assets which have a high potential to bring in huge returns in the future. Thus, as the number of investments made towards profitable illiquid declines, banks will be suffering from a reduction in future profits. Hence, conclusions can be made that improvements in bank liquidity do not always lead to improved bank performance.

The results have shown that there a negative relationship between bank's asset quality and financial performance. Suggested reasons have shown that this is possible because efforts to improve asset quality are characterized by risk-averse strategies which reduce risky but yet profitable investments in assets whose quality might be poor in the short run. With this observation in mind, conclusions will, therefore, be made that improvements in asset quality will

result in a reduction in bank performance on the condition that improvements in asset quality are associated with risk-averse strategies which hamper investments in risky but yet profitable assets.

As noted from the study, positive improvements in bank capital have a positive effect on bank performance. This is possible because improvements in bank capital provide a cushion which banks can use to guard against risks. Moreover, improvements in bank capital provide banks with funds needed to invest in long run profitable investments and assets which have a huge potential to generate high returns. Hence, conclusions can be made that improvements in bank capital results in an improvement in banks performance so long as banks can guard against risks and have more money to invest in long run profitable investments and assets which generate high returns in the future.

The results have shown that an increase in the size of the causes a significant decline in bank performance. Suggesting that the assets are not highly productive and hence are generating fewer returns or contributing less to the productivity, effectiveness of the bank. Hence, it can be concluded that an increase in bank size does not always lead to positive changes in bank performance especially when the acquired assets are not efficiently generating huge returns to cover costs incurred. Lastly, conclusions can be made that an increase in inflation has positive effects on bank performance in the long run. This possibly suggests that the banks have managed to hedge against inflationary risks by tying the value and returns of their investments to price indexes. But an increase in inflation has been noted by other studies to cause inflation and this results in the conclusions that an increase in inflation can cause an increase in bank performance when banks have hedged against inflation risks and tied both the value of their assets and returns to price indexes.

5.2 Recommendations

From this study, it has been noted that there is a cointegration that exists between bank liquidity and bank performance. Recommendations can, therefore, be made based on these results as well as the bounds tests results which have shown that there is a long run relationship between the variables;

- Foremost, it can be recommended that there is a need for commercial banks to come up with better liquidity management strategies that are capable of matching liquidity needs with illiquid needs and investments.
- Recommendations can also be made to banks to come up with better and more effective asset quality management practices in a manner that improvements in asset quality do not reduce future profitable investments.
- There is also a greater need for banks to continually ensure that they have better and high capital funds to meet possible future risks and cater for profitable investments in the future.
- Banks are also encouraged to introduce hedging strategies to hedge against risks such as inflation risks, default risks, and interest rate risks.
- Recommendations can be made to the government to introduce effective monetary and fiscal policies that can support banking operations possibly by making it cheaper and less restrictive for banks to operate. These policies must also be targeted at reducing inflation and ensure that banking costs do not rise abnormally with the increase in inflation.

5.3 Suggestions for future studies

The study successfully addressed the implications of bank liquidity on bank performance drawing observations from a developing economy. However, future studies must be done to incorporate other countries from either developing or developed economies. A panel analysis of banks in different countries will provide a much deeper insight of financial development and banking matters and issues on a wider scale.

REFERENCES

Adler, D. (2012). The new field of liquidity and financial frictions. *Research Foundation Literature Reviews*, *7*(2), 1-3

Aebi, V., Sabato, G., & Schmid, M. (2012). Risk management, corporate governance, and bank performance in the financial crisis. Journal of Banking & Finance, 36(12), 3213-3226.

Agbada, A. O., & Osuji, C. C. (2013). An Empirical Analysis of Trends in Financial Intermediation and Output in Nigeria. Global Journal of Management And Business Research.

Agbada, A. O., & Osuji, C. C. (2013). The efficacy of liquidity management and banking performance in Nigeria. International review of management and business research, 2(1), 223-233.

Akyüz, Y., &Boratav, K. (2003). The making of the Turkish financial crisis. *World Development*, *31*(9), 1549-1566.

Ali, S. S. (2004, February). Islamic modes of finance and associated liquidity risks. In conference on Monetary Sector in Iran: Structure, Performance & Challenging Issues, February, Tehran, Iran.

Allen, F., & Gale, D. (2004). Financial fragility, liquidity, and asset prices. Journal of the European Economic Association, 2(6), 1015-1048.

Allen, F., &Faulhaber, G. R. (1989). Signalling by underpricing in the IPO market. Journal of financial Economics, 23(2), 303-323.

Al-Tamimi, H. A. H. (2002). Risk management practices: an empirical analysis of the UAE commercial banks. Finance India, 16(3), 1045.

Aremu, M. A., & Adeyemi, S. L. (2011). Small and medium scale enterprises as a survival strategy for employment generation in Nigeria. Journal of sustainable development, 4(1), 200.

Berndt, E. R., & Hansson, B. (1991). Measuring the contribution of public infrastructure capital in Sweden (No. w3842). National Bureau of Economic Research.

Bikker, J. A., &Spierdijk, L. (2010). Measuring and explaining competition in the financial sector. The Journal of Applied Business and Economics, 11(1), 11.

Blaško, M., &SinkeyJr, J. F. (2006). Bank asset structure, real-estate lending, and risk-taking. The Quarterly Review of Economics and Finance, 46(1), 53-81.

Bonin, J. P., Hasan, I., & Wachtel, P. (2005). Bank performance, efficiency and ownership in transition countries. Journal of banking & finance, 29(1), 31-53.

Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. Journal of Banking & Finance, 13(1), 65-79.

Boyd, J. H., Levine, R., & Smith, B. D. (2001). The impact of inflation on financial sector performance. Journal of monetary Economics, 47(2), 221-248.

Bozec, R. (2005). Boards of directors, market discipline and firm performance. Journal of Business Finance & Accounting, 32(9-10), 1921-1960.

Brunnermeier, M. K., & Pedersen, L. H. (2009). Funding liquidity and market liquidity. Review of Financial Studies, 22(2201-2238), 6.

Bussiere, M., &Fratzscher, M. (2006). Towards a new early warning system of financial crises. *journal of International Money and Finance*, *25*(6), 953-973.

Campello, M., Giambona, E., Graham, J. R., & Harvey, C. R. (2011). Liquidity management and corporate investment during a financial crisis. The Review of Financial Studies, 24(6), 1944-1979.

Chen, Y. K., Shen, C. H., Kao, L., &Yeh, C. Y. (2018). Bank Liquidity Risk and Performance. *Review of Pacific Basin Financial Markets and Policies*, 1850007.

Cornett, M. M., Marcus, A. J., Saunders, A., &Tehranian, H. (2007). The impact of institutional ownership on corporate operating performance. *Journal of Banking & Finance*, *31*(6), 1771-1794.

Davidson III, W. N., &Dutia, D. (1991). Debt, liquidity, and profitability problems in small firms. Entrepreneurship Theory and Practice, 16(1), 53-64.

De Mesquita, J. M. C., & Lara, J. E. (2003). Capital structure and profitability: the Brazilian case.

Deloof, M., &Jegers, M. (1996). Trade credit, product quality, and intragroup trade: some European evidence. Financial management, 33-43.

Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: some international evidence. The World Bank Economic Review, 13(2), 379-408.

Diamond, D. W., &Rajan, R. G. (2001). Liquidity risk, liquidity creation, and financial fragility: A theory of banking. Journal of political Economy, 109(2), 287-327.

Diamond, D. W., &Rajan, R. G. (2005). Liquidity shortages and banking crises. The Journal of finance, 60(2), 615-647.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. Journal of the American statistical association, 74(366a), 427-431.

Du Rietz, A., &Henrekson, M. (2000). Testing the female underperformance hypothesis. Small Business Economics, 14(1), 1-10.

Dufour, M., &Orhangazi, Ö. (2009). The 2000–2001 financial crisis in Turkey: a crisis for whom?. *Review of Political Economy*, *21*(1), 101-122.

Durbin, J., & Watson, G. S. (1950). Testing for serial correlation in least squares regression: I. Biometrika, 37(3/4), 409-428.

Eljelly, A. M. (2004). Liquidity-profitability tradeoff: An empirical investigation in an emerging market. International journal of commerce and management, 14(2), 48-61.

Fahlenbrach, R., Prilmeier, R., &Stulz, R. M. (2012). This time is the same: Using bank performance in 1998 to explain bank performance during the recent financial crisis. The Journal of Finance, 67(6), 2139-2185.

Falconer, B. (2001). Structural liquidity: the worry beneath the surface. Balance Sheet, 9(3), 13-19.

Fasci, M. A., & Valdez, J. (1998). A performance contrast of male-and female-owned small accounting practices. Journal of small business management, 36(3), 1.

Fatemi, A., &Fooladi, I. (2006). Credit risk management: a survey of practices. Managerial Finance, 32(3), 227-233.

Gatev, E., Schuermann, T., & Strahan, P. E. (2007). Managing bank liquidity risk: How deposit-loan synergies vary with market conditions. The Review of Financial Studies, 22(3), 995-1020.

Gilbert, E., & Reichert, A. (1995). The practice of financial management among large United States corporations. Financial Practice & Education, 5(1), 16-23.

Goddard, J., Molyneux, P., & Wilson, J. O. (2009). The financial crisis in Europe: evolution, policy responses and lessons for the future. *Journal of financial regulation and compliance*, *17*(4), 362-380.

Goodhart, C. (2008). Liquidity risk management. Banque de France Financial Stability Review, 11, 39-44.

Grubert, H., &Mutti, J. (1991). Taxes, tariffs and transfer pricing in multinational corporate decision making. *The Review of economics and Statistics*, 285-293.

Guglielmo, M. R. (2008). Managing liquidity risk. Bank Accounting and Finance, 21(1), 3.

Gujarati, D. N. (2009). Basic econometrics. Tata McGraw-Hill Education.

Hadlock, C. J., & James, C. M. (2002). Do banks provide financial slack?. the Journal of Finance, 57(3), 1383-1419.

Hammes, K. (2003). Essays on capital structure and trade financing (No. 131).

Hassan Al-Tamimi, H. A. (2008). Implementing Basel II: an investigation of the UAE banks' Basel II preparations. Journal of Financial Regulation and Compliance, 16(2), 173-187.

Hassan Al-Tamimi, H. A., & Mohammed Al-Mazrooei, F. (2007). Banks' risk management: a comparison study of UAE national and foreign banks. The Journal of Risk Finance, 8(4), 394-409.

Ishii, S., Habermeier, K. F., & Canales-Kriljenko, J. I. (2002). *Capital account liberalization and financial sector stability* (Vol. 211). International Monetary Fund.

Ishii, S., Habermeier, K. F., & Canales-Kriljenko, J. I. (2002). *Capital account liberalization and financial sector stability* (Vol. 211). International Monetary Fund

Jenkinson, N. (2008). Strengthening regimes for controlling liquidity risk. In Euro Money Conference on Liquidity and Funding Risk Management (Vol. 6, pp. 9-14). London: Bank of England.

Johnson, S., Boone, P., Breach, A., & Friedman, E. (2000). Corporate governance in the Asian financial crisis. *Journal of financial Economics*, *58*(1-2), 141-186.

Judge, G. G., Hill, R. C., Griffiths, W., Lutkepohl, H., & Lee, T. C. (1982). Introduction to the Theory and Practice of Econometrics

Kashyap, A. K., Rajan, R., & Stein, J. C. (2002). Banks as liquidity providers: An explanation for the coexistence of lending and deposit-taking. The Journal of Finance, 57(1), 33-73.

Keyder, N. (2001). The aftermath of the exchange rate-based program and the November 2000 financial crisis in Turkey. *Russian & East European Finance and Trade*, *37*(5), 22-44.

Keynes, J. M. (1936). William Stanley Jevons 1835-1882: A centenary allocation on his life and work as economist and statistician. Journal of the Royal Statistical Society, 99(3), 516-555.

Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of EU financial integration. Managerial Finance, 34(3), 146-159.

Kosmidou, K., Tanna, S., &Pasiouras, F. (2005, June). Determinants of profitability of domestic UK commercial banks: panel evidence from the period 1995-2002. In Money Macro and Finance (MMF) Research Group Conference (Vol. 45, pp. 1-27).

Kosmidou, K., Tanna, S., &Pasiouras, F. (2005, June). Determinants of profitability of domestic UK commercial banks: panel evidence from the period 1995-2002. In *Money Macro and Finance (MMF) Research Group Conference* (Vol. 45, pp. 1-27

Kumar, S., & Bansal, L. K. (2008). The impact of mergers and acquisitions on corporate performance in India. *Management Decision*, *46*(10), 1531-1543
.

Lartey, V. C., Antwi, S., &Boadi, E. K. (2013). The relationship between liquidity and profitability of listed banks in Ghana. International Journal of Business and Social Science, 4(3).

Maaka, Z. A. (2013). The relationship between liquidity risk and financial performance of commercial banks in Kenya. Unpublished MBA Project, 25-27.

MacKenzie, D. (2003). Long-Term Capital Management and the sociology of arbitrage. *Economy and society*, *32*(3), 349-380.

Macovei, M. (2009). *Growth and economic crises in Turkey: leaving behind a turbulent past?* (No. 386). Directorate General Economic and Financial Affairs (DG ECFIN), European Commission.

Majid, A., &Rais, A. (2003, March). Development of liquidity management instruments: challenges and opportunities. In International Conference on Islamic Banking: Risk Management, Regulation and Supervision, held in Jakarta Indonesia September.

Marozva, G. (2015). Liquidity and bank performance. The International Business & Economics Research Journal (Online), 14(3), 453.

Masih, A. M. M., & Masih, R. (2002). Propagative causal price transmission among international stock markets: evidence from the pre-and post-globalization period. Global Finance Journal, 13(1), 63-91.

McKinsey, D. N., Brome, C. R., Dzhosyuk, S. N., Golub, R., Habicht, K., Huffman, P. R., ... & Yang, L. (2003). Time dependence of liquid-helium fluorescence. *Physical Review A*, *67*(6), 062716

Molyneux, P., & Thornton, J. (1992). Determinants of European bank profitability: A note. Journal of banking & Finance, 16(6), 1173-1178.

Muranaga, G. F., &Ohsawa, H. (2002). Liquidity Risk and Performance in the Banking Sector, Finance Essay.

Naceur, S. B., &Kandil, M. (2009). The impact of capital requirements on banks' cost of intermediation and performance: The case of Egypt. Journal of Economics and Business, 61(1), 70-89.

Naceur, S. B., &Omran, M. (2011). The effects of bank regulations, competition, and financial reforms on banks' performance. *Emerging markets review*, *12*(1), 1-20.

Nelson, D. B. (1991). Conditional heteroskedasticity in asset returns: A new approach. Econometrica: Journal of the Econometric Society, 347-370.

Nikolaou, K., &Drehmann, M. (2009). Funding liquidity risk: definition and measurement (No. 1024).

Nyborg, K. G., Rydqvist, K., &Sundaresan, S. M. (2002). Bidder behavior in multiunit auctions: Evidence from Swedish Treasury Auctions. Journal of Political Economy, 110(2), 394-424.

Olagunju, A., David, A. O., & Samuel, O. O. (2012). Liquidity management and commercial banks' profitability in Nigeria. Research Journal of Finance and Accounting, 2(7-8), 24-38.

Ongore, V. O., & Kusa, G. B. (2013). Determinants of financial performance of commercial banks in Kenya. International Journal of Economics and Financial Issues, 3(1), 237.

Öniş, Z. (2009). Beyond the 2001 financial crisis: The political economy of the new phase of neo-liberal restructuring in Turkey. *Review of International Political Economy*, *16*(3), 409-432.

Özatay, F. (2000). The 1994 currency crisis in Turkey. *The Journal of Policy Reform*, *3*(4), 327-352.

Özatay, F., &Sak, G. (2002, April). The 2000-2001 financial crisis in Turkey. In *Brookings Trade Forum* (pp. 121-160).

Palepu, K. G., Bernard, V. L., Healy, P. M., & Peek, E. (2007). Business analysis and valuation: text and cases. Cengage Learning EMEA.

Pesaran, H. M., & Shin, Y. (1995). Long-run structural modelling (No. 9419). Faculty of Economics, University of Cambridge.

Pesaran, M. H. (1997). The role of economic theory in modelling the long run. The Economic Journal, 107(440), 178-191.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of applied econometrics, 16(3), 289-326.

Phillips, P. C., &Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, *75*(2), 335-346.

Prochnow, H. V. (1945). The Bretton Woods Bank Program. Sec. Corp., Banking & Mercantile L., 89.

Raheman, A., & Nasr, M. (2007). Working capital management and profitability–case of Pakistani firms. International review of business research papers, 3(1), 279-300.

Said, R. M., &Tumin, M. H. (2011). Performance and financial ratios of commercial banks in Malaysia and China. International Review of Business Research Papers, 7(2), 157-169.

Said, R. M., &Tumin, M. H. (2011). Performance and financial ratios of commercial banks in Malaysia and China. International Review of Business Research Papers, 7(2), 157-169.

Saleem, Q., & Rehman, R. U. (2011). Impacts of liquidity ratios on profitability. Interdisciplinary Journal of Research in Business, 1(7), 95-98.

Sharma, D. S. (2005). The association between ISO 9000 certification and financial performance. The international journal of accounting, 40(2), 151-172.

Silver, M. D. A., &Amber, M. V. (2003). Determinants of commercial bank performance in transition: An application of data envelopment analysis (No. 2-146). International Monetary Fund.

Tobin, J. (1958). Liquidity preference as behavior towards risk. The review of economic studies, 25(2), 65-86.

Turkey Data Monitor (n.d). Playing three monkeys with Turkish inflation. Accessed from https://ahvalnews.com/economy/playing-three-monkeys-turkish-inflation on 4 June 2018.

Von Sachs, R., & Neumann, M. H. (2000). A Wavelet-Based Test for Stationarity. Journal of Time Series Analysis, 21(5), 597-613.

wadsBozec, Hein JW de Baar, K. Elkalay, M. Frankignoulle, L. S. Schiettecatte, Gerhard Kattner, and A. V. Borges. "The carbon budget of the North Sea." *Biogeosciences* (2005)

Wang, Y. J. (2002). Liquidity management, operating performance, and corporate value: evidence from Japan and Taiwan. *Journal of multinational financial management*, *12*(2), 159-169

Weinraub, H. J., & Visscher, S. (1998). Industry practice relating to aggressive conservative working capital policies. Journal of Financial and Strategic Decision, 11(2), 11-18.

WEKESA, N. R., & ADMINSTRATION, M. O. B. (2016). THE RELATIONSHIP BETWEEN LIQUIDITY RISK AND FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA.

Yeh, Q. J. (1996). The application of data envelopment analysis in conjunction with financial ratios for bank performance evaluation. Journal of the Operational Research Society, 47(8), 980-988.

Yeldan, E& Epstein. (2008). Inflation targeting, employment creation and economic development: assessing the impacts and policy alternatives. *International Review of Applied Economics*, *22*(2), 131-144.

Yeldan, E. (2006). Neoliberal global remedies: From speculative-led growth to IMF-led crisis in Turkey. *Review of Radical Political Economics*, *38*(2), 193-213

Zheng, H., & Shen, Y. (2008). Jump liquidity risk and its impact on CVaR. The Journal of Risk Finance, 9(5), 477-492.

Zygmunt, J. (2013, March). Does liquidity impact on profitability. In Conference of informatics and management sciences, March (pp. 38-49).

LIST OF APPENDICES

Appendix 1: Short run ARDL estimation

Dependent Variable: LNIM
Method: ARDL
Date: 04/11/18 Time: 18:32
Sample (adjusted): 1964 2016
Included observations: 53 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LSE LLA LAQ LTA LCPI
Fixed regressors: C
Number of models evalulated: 12500
Selected Model: ARDL(3, 4, 4, 0, 4, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNIM(-1)	0.226389	0.143236	1.580533	0.1245
LNIM(-2)	-0.167224	0.162195	-1.031007	0.3108
LNIM(-3)	0.469856	0.124989	3.759183	0.0007
LSE	-0.232908	0.260549	-0.893914	0.3785
LSE(-1)	0.503611	0.292584	1.721249	0.0955
LSE(-2)	0.673870	0.274740	2.452752	0.0202
LSE(-3)	-0.203277	0.259474	-0.783419	0.4395
LSE(-4)	0.575323	0.245453	2.343923	0.0259
LLA	0.068157	0.591415	0.115243	0.9090
LLA(-1)	0.999489	0.790424	1.264497	0.2158
LLA(-2)	-0.821430	0.816040	-1.006604	0.3222
LLA(-3)	0.653711	0.790371	0.827093	0.4147
LLA(-4)	-1.392689	0.602608	-2.311102	0.0279
LAQ	-0.843032	0.169761	-4.965998	0.0000
LTA	-0.267467	0.251811	-1.062176	0.2966
LTA(-1)	0.254323	0.296381	0.858093	0.3976
LTA(-2)	0.495071	0.286140	1.730171	0.0939
LTA(-3)	-0.480145	0.291704	-1.646002	0.1102
LTA(-4)	-0.345715	0.260568	-1.326774	0.1946
LCPI	0.086513	0.071896	1.203309	0.2383
LCPI(-1)	0.151092	0.068226	2.214571	0.0345
LCPI(-2)	0.142884	0.087525	1.632481	0.1130
C	3.557045	2.466731	1.442008	0.1597

R-squared	0.886709	Mean dependent var	1.512436
Adjusted R-squared	0.803628	S.D. dependent var	0.579555
S.E. of regression	0.256823	Akaike info criterion	0.417971
Sum squared resid	1.978743	Schwarz criterion	1.273004
Log likelihood	11.92376	Hannan-Quinn criter.	0.746776
F-statistic	10.67290	Durbin-Watson stat	2.185557
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Appendix 2: Long run ARDL estimation

ARDL Cointegrating And Long Run Form
Original dep. variable: LNIM
Selected Model: ARDL(3, 4, 4, 0, 4, 2)
Date: 04/11/18 Time: 18:36
Sample: 1960 2016
Included observations: 53

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNIM(-1))	-0.302729	0.102824	-2.944143	0.0062
D(LNIM(-2))	-0.469012	0.111749	-4.197018	0.0002
D(LSE)	-0.232462	0.203629	-1.141596	0.2627
D(LSE(-1))	-1.043368	0.266271	-3.918446	0.0005
D(LSE(-2))	-0.370832	0.213873	-1.733890	0.0932
D(LSE(-3))	-0.574726	0.200828	-2.861784	0.0076
D(LLA)	0.067998	0.453745	0.149859	0.8819
D(LLA(-1))	1.558454	0.503419	3.095742	0.0042
D(LLA(-2))	0.739438	0.456668	1.619201	0.1159
D(LLA(-3))	1.390675	0.471158	2.951610	0.0061
D(LAQ)	-0.846946	0.206353	-4.104359	0.0003
D(LTA)	-0.269013	0.207407	-1.297030	0.2045
D(LTA(-1))	0.330873	0.170587	1.939614	0.0619
D(LTA(-2))	0.825435	0.183202	4.505589	0.0001
D(LTA(-3))	0.345564	0.207344	1.666621	0.1060
D(LCPI)	0.086596	0.061715	1.403141	0.1708
D(LCPI(-1))	-0.142826	0.072110	-1.980663	0.0569
CointEq(-1)	-0.470590	0.063354	-7.427920	0.0000

Cointeq = LNIM - (2.7955*LSE -1.0462*LLA -1.7900*LAQ -0.7303*LTA + 0.8079*LCPI + 7.5524)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LSE	2.795487	0.689540	4.054131	0.0003
LLA	-1.046248	1.370618	-0.763340	0.4512
LAQ	-1.789951	0.614353	-2.913556	0.0067
LTA	-0.730251	0.206286	-3.539995	0.0013
LCPI	0.807864	0.174090	4.640498	0.0001
C	7.552431	5.555482	1.359455	0.1841

Appendix 3: ARDL Bounds Test

ARDL Bounds Test
Date: 04/11/18 Time: 18:41
Sample: 1964 2016
Included observations: 53
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	4.581862	5

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.08	3
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

Appendix 4: Serial Correlation LM test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.528463	Prob. F(2,28)	0.2344
Obs*R-squared	5.216779	Prob. Chi-Square(2)	0.0737

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 04/11/18 Time: 18:44
Sample: 1964 2016
Included observations: 53
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNIM(-1)	0.008266	0.223549	0.036978	0.9708
LNIM(-2)	0.193909	0.246418	0.786907	0.4379
LNIM(-3)	-0.131276	0.145092	-0.904774	0.3733
LSE	0.041500	0.258737	0.160395	0.8737
LSE(-1)	0.021300	0.304060	0.070053	0.9446
LSE(-2)	-0.090468	0.275292	-0.328624	0.7449
LSE(-3)	0.023027	0.260005	0.088563	0.9301
LSE(-4)	-0.111498	0.249532	-0.446828	0.6584
LLA	0.226546	0.596626	0.379712	0.7070
LLA(-1)	-0.307394	0.804629	-0.382031	0.7053
LLA(-2)	0.092928	0.836101	0.111144	0.9123
LLA(-3)	0.043513	0.809100	0.053779	0.9575
LLA(-4)	-0.031762	0.625991	-0.050739	0.9599
LAQ	0.059730	0.184314	0.324067	0.7483
LTA	0.006042	0.247760	0.024386	0.9807
LTA(-1)	-0.027095	0.292799	-0.092537	0.9269
LTA(-2)	0.045619	0.288271	0.158251	0.8754
LTA(-3)	-0.030682	0.294754	-0.104095	0.9178
LTA(-4)	0.035273	0.281886	0.125133	0.9013
LCPI	0.002056	0.070982	0.028970	0.9771
LCPI(-1)	-0.007901	0.071727	-0.110148	0.9131
LCPI(-2)	-0.036211	0.089204	-0.405929	0.6879
C	-0.224687	2.454854	-0.091527	0.9277
RESID(-1)	-0.139551	0.276173	-0.505301	0.6173
RESID(-2)	-0.409411	0.262697	-1.558491	0.1303

R-squared	0.098430	Mean dependent var	-3.49E-15
Adjusted R-squared	-0.674345	S.D. dependent var	0.195071
S.E. of regression	0.252415	Akaike info criterion	0.389826
Sum squared resid	1.783975	Schwarz criterion	1.319209
Log likelihood	14.66962	Hannan-Quinn criter.	0.747222
F-statistic	0.127372	Durbin-Watson stat	2.130660
Prob(F-statistic)	0.999999		

Appendix 5: Heteroscedasticity Test: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.472002	Prob. F(22,30)	0.1607
Obs*R-squared	27.51271	Prob. Chi-Square(22)	0.1924
Scaled explained SS	14.54985	Prob. Chi-Square(22)	0.8808

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/11/18 Time: 18:46
Sample: 1964 2016
Included observations: 53

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.894631	0.600530	-1.489736	0.1467
LNIM(-1)	0.008966	0.034871	0.257112	0.7988
LNIM(-2)	0.052287	0.039487	1.324177	0.1954
LNIM(-3)	-0.060941	0.030429	-2.002744	0.0543
LSE	0.133540	0.063431	2.105281	0.0437
LSE(-1)	-0.101569	0.071230	-1.425928	0.1642
LSE(-2)	-0.006537	0.066886	-0.097731	0.9228
LSE(-3)	-0.029608	0.063169	-0.468706	0.6427
LSE(-4)	-0.030336	0.059756	-0.507660	0.6154
LLA	-0.109528	0.143981	-0.760713	0.4528
LLA(-1)	-0.005719	0.192430	-0.029721	0.9765
LLA(-2)	0.323536	0.198666	1.628538	0.1139
LLA(-3)	-0.098280	0.192417	-0.510764	0.6133
LLA(-4)	0.135074	0.146706	0.920714	0.3645
LAQ	0.032326	0.041329	0.782182	0.4402
LTA	-0.110618	0.061304	-1.804418	0.0812
LTA(-1)	0.086941	0.072155	1.204923	0.2377
LTA(-2)	-0.023887	0.069661	-0.342898	0.7341
LTA(-3)	0.156332	0.071016	2.201367	0.0355
LTA(-4)	-0.105131	0.063436	-1.657290	0.1079
LCPI	0.007394	0.017503	0.422453	0.6757
LCPI(-1)	-0.027489	0.016610	-1.655019	0.1083
LCPI(-2)	0.018594	0.021308	0.872622	0.3898

R-squared	0.519108	Mean dependent var	0.037335
Adjusted R-squared	0.166453	S.D. dependent var	0.068483
S.E. of regression	0.062524	Akaike info criterion	-2.407702
Sum squared resid	0.117278	Schwarz criterion	-1.552670
Log likelihood	86.80411	Hannan-Quinn criter.	-2.078898
F-statistic	1.472002	Durbin-Watson stat	2.244583
Prob(F-statistic)	0.160685		

Appendix 6: Heteroscedasticity test: ARCH

Heteroskedasticity Test: ARCH

F-statistic	1.512448	Prob. F(1,50)	0.2245
Obs*R-squared	1.526763	Prob. Chi-Square(1)	0.2166

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/11/18 Time: 18:48
Sample (adjusted): 1965 2016
Included observations: 52 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.031457	0.010897	2.886813	0.0057
RESID^2(-1)	0.171435	0.139399	1.229816	0.2245

R-squared	0.029361	Mean dependent var	0.037979
Adjusted R-squared	0.009948	S.D. dependent var	0.068989
S.E. of regression	0.068645	Akaike info criterion	-2.482047
Sum squared resid	0.235604	Schwarz criterion	-2.407000
Log likelihood	66.53323	Hannan-Quinn criter.	-2.453276
F-statistic	1.512448	Durbin-Watson stat	2.041754
Prob(F-statistic)	0.224521		

PLAGIARISM REPORT

Thesis 3

ORIGINALITY REPORT

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ETHICS COMMITEE APPROVAL

YAKIN DOĞU ÜNİVERSİTESİ

BİLİMSEL ARAŞTIRMALAR ETİK KURULU

31.05.2018

Dear Bawan Yassin Sabir

Your project "**THE RELATIONSHIP BETWEEN LIQUIDITY RISK AND FINANCIAL PERFORMANCE OF PRIVATE COMMERCIAL BANKS IN TURKEY**" has been evaluated. Since only secondary data will be used the project it does not need to go through the ethics committee. You can start your research on the condition that you will use only secondary data.

Assoc. Prof. Dr. Direnç Kanol

Rapporteur of the Scientific Research Ethics Committee

Direnc Kanol

Note: If you need to provide an official letter to an institution with the signature of the Head of NEU Scientific Research Ethics Committee, please apply to the secretariat of the ethics committee by showing this document.