



NEAR EAST UNIVERSITY  
INSTITUTE OF GRADUATE STUDIES  
BANKING AND ACCOUNTING PROGRAM

**BANK PROFITABILITY AND IMPACT OF LIQUIDITY  
MANAGEMENT: A CASE OF BRITISH BANKS**

MOHAMED OMED IKRAM

MASTER THESIS

NICOSIA  
2021

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MASTER THESIS

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2021

## ACCEPTANCE/APPROVAL

We as the jury members certify the 'Bank Profitablity and Impact of Liquidity Management ' case of Birtish Banks prepared by the Muhamad Ikram defended on 29/1/2021 has been found satisfactory for the award of degree of Master

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## DECLARATION

I, Mohamed Ikram hereby declare that this dissertation entitled 'bank profitability and liquidity management: a case of British banks' has been prepared myself under the guidance and supervision of 'ASSOC.Prof.Dr.Turgut Tursoy' in partial fulfillment 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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## **ACKNOWLEDGEMENTS**

This is indeed an achievement for me in the course of my career. A career that has not only taken time but also diligence and scruple.

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## **ABSTRACT**

### **BANK PROFITABILITY AND IMPACT OF LIQUIDITY MANAGEMENT: A CASE OF BRITISH BANKS**

In the performance of financial institutions giving focus to commercial banks, it has been observed that over the years, the preference of liquidity over profitability has emphasized over the years and in some cases, vice-versa. This argument has led to inquiry into various financial institutions of different economies. This study has however, chosen the British banks as sample case study of the topic. The purpose of the study is to follow a quantitative method of analysis into the impact of liquidity on profitability levels of UK banks. Time series data were sourced variables including ROE, total assets, bank credit, liquidity, and loans were used as exogenous variables on the explained variable; return on assets ROA.

It is discovered that over the 21-year observational period, the UK financial system maintained significant high levels of liquidity at the expense of overall profitability of the banks. However, shocks such as the 2008 global financial crisis affected both liquidity and profitability over the period. It shows that liquidity is of lower and relatively weak preference for the banks in UK in determination of their ROA. However, the fall in liquidity inducing the rise in ROA shows that the banks have chosen to deplete liquidity levels in order to grow and improve the earning components of their systems. The study also revealed that Bank Credit has a strong positive relationship with ROA and ROE. It is observed that bank credit accounts for 99% of what constitutes ROA in the UK financial sector. It also shows that the profit made within the financial sector is also dependent on the amount and volume of credit that is advanced to the financial agents and residents in the UK economy. It is recommended that the bank of England should implement more policies to that will maintain the high levels of liquidity to serve as equilibrium between the motive for profit and the satisfaction of financial obligations of customers.

**Keywords:** Liquidity, Liquidity management, Total Assets, Return on Equity, Return on Assets, Bank profitability and British banks.

## ÖZ

### BANK PROFITABILITY AND IMPACT OF LIQUIDITYMANAGEMENT: A CASE OFBRITISH BANKS

Ticari bankalara odaklanan finans kuruluşlarının performansında yıllar içinde karlılık yerine likiditeye ağırlık verildiği ve bazı durumlarda bunun tam tersi bir durum gözlemlenmiştir. Bu argüman farklı ekonomilerin çeşitli finans kuruluşlarının sorgulanmasına neden olmuştur. Fakat bu çalışmada konunun örnek vaka çalışması olarak Britanya bankalarını seçilmiştir. Bu çalışmanın amacı likiditenin Birleşik Krallık bankalarının karlılık seviyeleri üzerindeki etkisi için kantitatif analiz metodunu uygulamaktır. Zaman serisi verisi Özkaynak Karlılığı, toplam aktifler, banka kredisi, likidite dahil kaynaklı değişkenlerdir ve borçlar açıklanan değişken olan aktif karlılığı üzerinde harici değişkenler olarak kullanılmıştır.

21 yıllık gözlem dönemi boyunca, Birleşik Krallık finansal sisteminin, bankaların genel kârlılığı pahasına önemli yüksek likidite seviyelerini koruduğu keşfedilmiştir. Ancak 2008 küresel finans krizi gibi şoklar dönem boyunca hem likiditeyi hem de karlılığı etkilemiştir. Bu, Birleşik Krallıktaki bankaların Aktif Karlılıklarını belirlemede likiditenin daha düşük ve nispeten zayıf bir tercih olduğunu göstermektedir. Fakat Aktif Karlılığındaki yükselişi tetikleyen likidite düşüşü, bankaların, sistemlerinin kazanç bileşenlerini büyütmek ve iyileştirmek için likidite seviyelerini azaltmayı seçtiğini göstermektedir. Bu çalışma ayrıca Banka Kredisinin Aktif Karlılığı ve Özkaynak Karlılığı ile güçlü bir pozitif ilişkisi olduğunu ortaya koymuştur. İngiltere finans sektöründe yatırım getirisinin %99'unu banka kredisinin oluşturduğu görülmektedir. Ayrıca, finans sektöründe elde edilen karın, Birleşik Krallık ekonomisindeki finansal kurumlara ve mukimlere verilen kredi miktarına ve hacmine de bağlı olduğunu göstermektedir. İngiltere bankasının kar motivasyonu ile müşterilerin finansal yükümlülüklerinin yerine getirilmesi arasındaki denge olarak kullanılması için yüksek seviyede likidite tutacak daha fazla politika uygulaması önerilmektedir.



**Anahtar Kelimeler:**Likidite, Likidite yönetimi, Toplam Aktifler, Özkaynak Karlılığı, Aktif Karlılığı, Banka karlılığı ve Britanya bankaları.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Background to the Study

The capacity to cater for provision of funds by a legal agency or financial body at maturity period or instance by is known as liquidity, which includes commitments, withdrawals, deposits, lending and investment and accrued liabilities (Mori, 2013). Giving preference to liquidity definition, liquidity management takes one of two types. One type of liquidity refers to the ability momentarily exchange an asset at its existing price including bond and stocks. The other meaning of liquidity applies to large organizations, such as banks. Financial institutions are evaluated on their ability to meet cash and collateral responsibilities without incurring substantial loss; they are also always evaluated on their liquidity (Drehmann and Nikolaou, 2010). In either case, the effort of stakeholders or administrators to minimize liquidity risk exposures explains liquidity management (Drehmann and Nikolaou, 2010). Given the condition of the global economy and prevailing monetary situation, the concept of liquidity management is gaining so much attention globally (Berger and Bouwman, 2008). The need to maximize profit, sustain a higher degree of liquidity in order to assure safety at the optimality of shareholder's net worth mixed with the achievement of related corporate objectives. In today's commerce, researchers cannot undermine the essence of liquidity management as it affects business profitability. To ensure smooth operations and meeting its daily operational responsibilities, the important part in controlling working capital requires maintenance of its liquidity.

On the other hand, the main goal of venturing into any business is to make profit. It is not simple to run one's trade without profitability. In continuing business and extending business also, not easy to make profit in a short term business; to execute day to day needs in operation and other business demands it is necessary to create funds, when the short term needs of finance is generated by business processes and not by external

debts then the business generates profits in multiple folds, hence, the most essential part of commerce that gives complete knowledge of business attainment are Profitability and Liquidity. In observing business for a long period and looking at the work rate and promotions in the business, Profitability and Liquidity are both applied; together Liquidity and Profitability are equal to one another as they are inter-related and serve almost similar objectives in the financial establishments (Zuhroh, 2019). In the successful functioning of a business organization liquidity is pivotal. Consequently, together in the internal and external analysis of the study of liquidity and its impact on profitability, the two are of major importance because of its close relationship with day-to-day running of a business (Berger and Bouwman, 2008). A dilemma in liquidity management is attaining favourable trade-off between profitability and liquidity (Mori, 2013). This study looks to examine the problems of financial institution liquidity management in order to determine its implication on financial institutions profitability, amongst other things.

## **1.2 Problem Statement**

Scholarly works have worked on banking sector analysis and planned that additional liquidity costs a lot for banks, indicating that additional liquidity reduces profitability ratio of financial entities. A research work surmises that liquidity level are prone to time-variance, holding capital would risk bank gains leading to loaning and credit issues that will disrupt a bank's incomes at risky levels might end in the financial distress (Waleed, 2016). In some analysis it is explicit that the banks with liquidity levels that are high have small internet interest rate margins within the time of financial condition, the bank might lend funds from the financial market at incredible premiums and at times, depicts the reasons decline within the bank profit (Waleed, 2016). In order to attain a balance between the profitability and liquidity commercial financial institutions have to work to maximize the profits and enhance liquidity by maintaining a substantial volume of money for bank liquidity (Basak, 2017). To strike an equilibrium between liquidity levels and



profitability percentage, financial institutions are to discern through precise calculations the quota of cash or available funds in relation to the profit the bank is making because at every level of liquidity or at every percentage rise/fall in liquidity translates to a proportional fall/rise in profitability, hence the reason commercial banks engage strict measures to which if not adhered will spell negative implications for the profitability of their operations (Basak, 2017)

### **1.3 Research Aims and Objective**

#### **1.3.1 Research Aim**

To examine how maintaining liquidity levels affect profitability in British banks

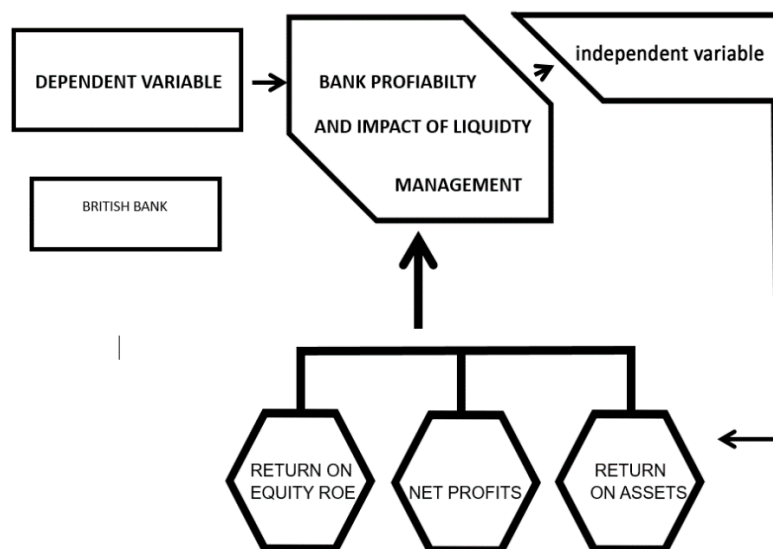
#### **1.3.2 Research Objectives**

- To study the trend of liquidity in British banks over time
- To study the trend over time of profitability determinants in British banks
- To importantly assess how liquidity measures and variables have affected and impacted the profits of banks over time

### **1.4 Research Questions**

1. What are the determinants of liquidity and profitability in British banks?
2. Is there a nexus between liquidity and profitability in British Banks?
3. What is the impact of liquidity levels on the profits taken by British Banks?

### **1.5 conceptual Model**



**Figure 1** conceptual Model

(Source: Author's digramatic Representation)

## 1.6 Hypothesis of the Study

### Hypothesis I

Ho: there is no relationship between profits and liquidity in British banks

H1: there is a relationship between profits and liquidity in British banks

### Hypothesis II

Ho: there is no relationship between return on assets and total assets in British banks

H1: there is a relationship between return on assets and total assets in British banks

## 1.7 Research Method

**Sampling Method:** In this case, they participants are the representatives of the firms used for the topic study. These firms will include a number of banks within the UK financial sector. They comprise of 15 banks from the United Kingdom. These banks are commercial banks that have the funds of the public in its treasury. Being a commercial bank is a requirement for

this study as the researcher is studying availability of money made to customers, termed as liquidity. They are also banks under the control of apex bank called Bank of England which is to show that their activity and liquidity levels are controlled and regulated by the central authority. These banks are selected using the stratified method of sampling probability because the commercial banks are a category of banks amongst different categories.

**Measures:** liquidity and profitability are the measures to be achieved for this study. Each measure will be representing the independent and dependent data variables respectively. However, the dependent variables will be measured and studied with more than one independent variables measuring profitability to examine and see how these variable factors affect liquidity. The dependent variable is liquidity of commercial banks which will be measured by assets and capital ratio while the independent variable is captured by returns on deposit, return on assets, return on equity, return on deposit and net profit margin. Assets measure the entire number of liquid cash and non-liquid cash that each bank has available at a give time to cater for cash request of customers. Returns on deposits measure the rate of profit or gains that customers will have over a certain amount of money they keep with the bank. Return on equity determines the amount of profit that shareholder will have at the end of a business year based on the amount of shares they have in the start-up capital. Net profit margin is the amount of gain that is declared by the banks after deducting the tax and other expenses such as operational costs.

**Procedure-** the procedure to be used in this research is to gather data that will represent both the dependent variable and independent variable as described previously in the conceptual model. The researcher will have to approach each commercial bank within the sample population or access their database to get data on the variables outlined earlier. Furthermore, the researcher will use both descriptive and inferential statistics to analyze the data. A panel data regression will be carried out using E-Views, other statistical analysis will include correlation coefficient,

unit root testing, co-integration test and normality distribution test of the data variables.

### **1.8 Significance of the Study**

The UK financial system has been renowned for its strength and stability in the economy of UK and the entire European Union. The UK banking sector has played bail-out functions for sectors within the UK economy and even beyond its borders. This sustainability is balanced on the banks meeting its goals and objectives, both internally and externally, hence the rationale to study the topic in this context. Important insights will be drawn for recommendations and adoption of measures by other banks and financial system outside the British borders.

### **1.9 Scope of the Study**

This research work is aimed at British banks to understand how they have been able to manage and sustain liquidity levels in banks despite the motive of interest of shareholders which is to increase profit levels. Data available on the variables of profitability and liquidity for at least 21 years predetermined the robustness of this study.

### **1.10 Limitation of Study**

The study is only focused on British banks and the outcome of the result cannot be generalized for other financial institutions in other economies. Other factors that have impact effect on liquidity and profitability such as risk, central bank control measures and other macro-economic variables are not considered or factored into the model of the study.

### **1.11 Organization of the Study**

The totality of this thesis is divided into 5 segments. This first section presents the, background and introduction into the significance and rationale for undertaking this study. Chapter two will present an overview of the UK financial sector over time. It will explain notable theories ascribed to profitability and liquidity in order to establish a firm literature

understanding of the subject study. Chapter three will focus on the research methodology and methods for data gathering and analysis. It will spell out the model and the variables that will be used to measure the key words. Chapter four will be focused on data analysis and interpretation, further discussion of findings will be carried out therein. Chapter five will present the conclusions based on aims, objectives, research questions and hypothesis of the thesis. Summarily, it will proffer recommendations and limitations of study.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The role of liquidity management in banks' profitability is what this research shows in some previous studies. A concise assessment based on documented evidence and extant literature about the subject topic, conceptual and theoretical models that body study underpins are covered in the literature review.

#### **2.2 The Concept of Liquidity**

The sum of capital available for quick usage and finance of operations for creditors has a name which is called liquidity (Basov and Yin, 2011). Today, most of this capital is in the form of credit, not cash. Financial institution. Liquidity is simply the capacity of a financial institution to hold on to sufficient finance in order to pay for its responsibilities when it matures. It is the financial institution's capability to abide by reserve requirements to directly meet checks, cash as well as other fund withdrawal responsibilities obligations (Voloshyn and Voloshyn, 2014). Liquidity can also be said to be as the level of changeability to cash any asset that can be alternated to cash sold at a market price. It is based upon the day to day checks and balance of the liquidity requirements of the financial landscape of a country in order to fulfill needs of liquidity and therefore know the volume of liquidity to allocate or extract from circulation (Sarmiento, 2018). Going forward, financial institution liquidity can be said to be the capability to meet up with monetary obligations as at when due. Subsequently, Liquidity in a commercial financial institution reveals the financial institution's capability to fund all its responsibilities that are contractual, and those responsibilities can be maturity of liabilities, investments, lending, and collection of deposits that exists in bank operations as at when due (Khromov, 2018). In supplement, some of the models are linked to the concept of liquidity management as follow:

### **2.2.1 Anticipated Income Theory**

This model was developed by Prochnow in the early 40s on the foundational practice of extension of periodic loans by the American financial institutions constituted by the commercial banks (Köhler, 2013). The concept of the theory postulates that financial institution's ability to make funds at the disposal of customers liquidity are carried out via structuring and exact phasing of obligations on loan made by a financial institution to its clients. With regards to the model, the liquidity is prepared if the planned payments on loans by customers are centered on the customer obtaining the loan in future. It is stated that the model emphasizes the propensity and the creditability of a borrower as the final guarantee for ensuring enough liquidity (Köhler, 2013). This model motivates many commercial financial institutions to make use of a ladder effects in investment portfolio.

### **2.2.2 Shift-ability Theory**

The shift-ability theory was put forward by H.G. Multon of bank liquidity, who asserted that substantial amounts of assets should be held on to by commercial financial institutions that can be easily transferred without material loss to other financial institutions for cash; so therefore, there is no need to be dependent on maturity, in case of necessity (Ibrahim, 2018). According to this motion, if the demand for liquidity comes up, assets would be perfectly converted without capital loss and would be instantly interchanged. In addition, this is specifically applied to short term market investment, that is sellable instantly as at when needed by financial institutions e.g. bills of exchange and treasury bills, while in general crunch when all financial institutions fall into dire need of funds, the theory requisites that all financial institutions are to acquire assets that central bank-substitutable, which is the last option for all lenders ((Nair and Anand, 2020). Furthermore, there are certain elements of truth in this theory; financial institutions now accept physical assets that can be shifted to other financial institutions. Lastly, liquid assets such as shares and debentures of large firms are acknowledged along with treasure bills and bills of exchange (Nair and Anand, 2020). This has encouraged term lending by financial institutions

### **2.2.3 Commercial loan or Real bills Doctrine Theory**

This theory postulates that a commercial financial institutions should loan a business organization only short-term self-liquidating productive loans (Sum, 2013). Loans that are liquidating in itself are considered to be intended for conveyance of goods via subsequent phases, production financing, transportation, storage, and distribution. Moreover, the theory postulates that Apex banks should loan to the commercial financial institutions after making short period self-liquidating productive loans, on the security of such short period loans. This policy provides the entire economy the appropriate money distribution and the appropriate level of liquidity for each financial institution (Wang, 2011). Furthermore, the rediscounting approved loan by the apex financial institution was predicted to increase or delete financial institutions reserves. The financial institutions have the capability to acquire extra reserves when commercial activities start growing and the requisites of trade increases by rediscounting bills with the apex banks. Interchangeably, the volume of credit by banks, money and bank reserve supply would lessen in a scenario that business cycle is low and trade demands fall, then the amount of bills would fall in rediscounting measure (Wang, 2011).

### **2.3 Liquidity Management**

The degree of the capability and convenience that assets are interchanged to cash is Liquidity. Those assets that can be easily interchanged to cash are Liquid assets, if needed to satisfy financial roles, examples are cash, apex bank reserves, and government debt (Egginton and McCumber, 2018). A bank must have sufficient liquid assets to remain feasible and also to meet its near-term functions, such as withdrawals for customers. Current ratio, Capital ratio, Cash ratio, Quick ratio, Investments ratio are the main measures of liquidity (Xiaopeng Zou, 2012).

### **2.4 The Concept Profitability in Banks**

The capacity of a financial institution to create revenue in surplus of cost, in relation to the financial institution capital's base is bank profitability



(Stevanović and Gavrilović, 2018). A financial institution is able to tolerate negative shocks and add to the steadiness of the financial system when it as a strong and profitable banking system. The rate at which a company turns business activity into profits is measured by the profitability ratio ((Stevanović and Gavrilović, 2018). Speaking in general, the profits realized by the firm has a profitability association with the investment that contributes to the achievement of these profits. The capacity to turn revenue into profits is evaluated by profits margin. The ability to use assets to produce new income is measured by Return on Assets (ROA). Return on Equity (ROE) compares the net income to stakeholder equity (Dumitrescu, 2010).

## **2.5 Assessment of Bank's Profitability**

There are different financial percentages that can be used to determine the extent of the financial institution ability to make profits which can be related to both the stakeholders and depositors. The following ratios are the most essential important earnings ratios used in checking the bank profitability

### **2.5.1 Return on Assets**

ROA is one of the most commonly used variables in shaping and measuring a company's profitability. This ratio measures the running ability of the company based on the company's accumulated profits from its total assets (Chandran, 2018). It is mathematically denoted as net profit after tax divided by the total assets and can be expresses mathematically as follows:

$$\text{ROA} = \text{Net Profit after Tax} / \text{Total Assets}$$

### **2.5.2 Return on Equity**

ROE is considered as an essential marker i.e the amount of net income given back as a ratio of stakeholder's equity. The ratio calculates the

stakeholders' rate of return on their investment in the firm (Chandran, 2018). It can be expressed mathematically:

$$\text{ROE} = \text{Net Profit after Tax} / \text{Total Shareholders' Assets}$$

## **2.6 Empirical Evidence**

A number of investigators have studied the impact of liquidity management on financial institutions' profitability; here are some reviews of them. In the past, several investigators conducted to find the kind of relationship that exists between liquidity and profitability. All the investigations in this area have been carried out and decisions have been reached with the specific differences in their dissimilarities and similarities. Therefore, the relationship between profitability and liquidity are yet to be sorted out as different results were reached. The importance of this paper is most important to third-world countries where the business environment is shaky (Hermuningsih, 2019)

The research of Mashamba, (2018) looks at investigating the impact of liquidity control on profitability in Jordanian commercial financial institutions for the period of 7 years starting from the year 2005. The experimental outcome showed a positive association between liquidity marker (such as quick ratio and the investment ratio) and ROE; whilst, in the same research, the outcome was different which found a negative association amongst capital percentage and the liquid assets percentage as liquidity markers and profitability. The researcher implores that there is a need for an optimal utilization of the obtainable liquidity in different parts of investment in order that the financial institutions' profitability can be high. The research also implores that financial institutions should make use of a general structure of liquidity control to ensure sufficient liquidity for carrying out their work activities more effectively.

Ganguli, (2016) probed the significance of the liquidity control on the performance of the Pakistan non-monetary firms constituting Karachi Stock Exchange (KSE) 100 Index over the period of 5 years starting from the year 2005. The outcome of test has proven that liquidity variables

[such as current ratio and the cash conversion cycle (CCC)] have significant positive effect on profitability (ROA). The research implored firms to slow their credit sales policies, and devise inventory collection rotation system in a clever manner to be more reachable to a huge amount of customers.

Pelster, Irresberger and Weiss, (2014) wanted to examine liquidity control and the performance of financial institutions in Nigeria within the early 20's and late 20's. The outcome of the relationship exhibited a positive relationship between cash reserve requisite and cash deposit and also a solid positive association between financial institution investment and cash ratio. Lastly, the examiners implored that financial institutions should focus mainly on deposits but rather other steps should be taken to lessen liquidity in the sector.

Shaibu and Okafor, (2020) focused at finding experimental facts of the level to which efficient liquidity control affects profitability in commercial financial institutions in Nigeria and how commercial financial institutions can increase their liquidity and profitability status. The outcome of Pearson correlation indicates that there is a significant positive relationship occurring between liquidity and profitability. Subsequently, the study implores that the Apex Bank should be encouraged to sustain a non-rigid Minimum Monetary Policy [MPR] or discount rate in order to make the commercial financial institutions to take advantage of the optional steps of meeting the unforeseen withdrawal needs, and lower the tendency of sustaining too much idle funds at the expense of profitability.

Ghodrati, Jabbari and Esfandyari, (2014) Corcuera et al., (2010) (Ravindra, Satyavathi and Tejaswini, 2020) in their paper, they looked into return on assets (ROA) and the effect liquidity has on ROA. The result of the attempted studies on return on assets (ROA) showed a positive significant relationship with current ratio (CR). The research by Priya and Nimalthasan are contradicted, which shows a negative relationship between liquidity and profitability.

Prajapati, (2019) investigated the top four Steel companies in India with the mixed effect of liquidity on profitability. The outcome showed that both Tata and JSW Steels Ltd are positively related and for the other two steel firms Lloyds and Kalyanithy are related negatively to profitability. Ravindra, Satyavathi and Tejaswini, (2020) tried to examine the effect of working capital control in terms of liquidity managements on all firms listed in the National Stock market of India on profitability. The outcome was a negative relationship amongst current ratio and rerun of assets which is in regards to the trade-off theory. PA and Marbun, (2016) proved that there is no significant relationship amongst current ratio and profitability (ROA).

The relationship among quick ratio and return on assets was showed to be an essential positive relationship. The result of the studies is not in agreement with studies carried out by Kaur and Silky (2013), Malik and Ahmed (2013) and Bhunia et al (2011) for three steel companies (namely: Tata, Kalyani, and JSW) that has a negative relationship between quick ratio and return on assets.

The research of Ajanthan (2013) and Bhunia et al (2011) for three Steel firms (namely: Tata, Kalyani and Lloyods) looked into exploring the similarities between cash ratio and profitability. Karaduman, Akbas, Ozsozgun, and Durer (2010) revealed that CCC and return on assets (ROA) has a converse nexus. By contrast, CCC and ROA, has a positive relationship according to Herli, (2015), which is in agreement at different stages of the supply chain resources has to be blocked to prolong operating cycle.

Garcia, Martins and Brandão, (2011) looked into examining profitability of companies and the effect working capital control has on it. The study was on Karachi Stock Market consisting 40 small and intermediate enterprises within the early 20s and the late 20s. The study showed that CCC and CR which are variables are independent and ROA are not significantly positively related. 10 Fast selling Consumer Goods companies in India were examined by Brandenburg and Seuring, (2011) to analyze the effect

of working capital variables on their profitability within the period of 2000 to the year 2001 and the year 2009 to the year 2010. The outcome of this study marked a negative insignificant relationship between liquidity (CCC) and profitability (ROA) by applying Pearson. While, according to Spearman correlation coefficient showed a positive important relationship between the variables, which is opposing to traditional outcome.

The impact of capital and liquidity control on profitability was examined by Panigrahi, (2014) in South Africa financial institutions for the period of 10 years starting from the year 2004. The observed results showed that between financial institutions' profitability and liquidity and capital management there is no long-term relationship. In the short period, capital ratio has an important positive relationship when ROE was adopted and a negative relationship when ROA was adopted on financial institutions' profitability. The result also revealed that, both substitutes of profitability (ROA and ROE) are negatively related insignificantly to quick ratio, in short period. In the end, the most efficient measure to be applied in South African banks to ensure protection and strength is capital adequacy.

Lee and Chien, (2010) tested the Ghanaian Stock market and attempted to know the relationship between liquidity and financial institution profitability. The paper denoted that there was a reduction in both liquidity and profitability over the period of 5 years starting from the year 2005. Lastly, a weak positive relationship between liquidity and profitability was realized amongst the mentioned financial institutions in Ghana.

To end with, the examination of Buera and Nicolini,( 2014) focused at testing Islamic commercial financial institutions in Bahrain over the period of 6 years starting from the year 2007, to test the effect of key factors of liquidity risk and the worldwide monetary crunch. The result revealed that there was both positive and negative effect on ROA, capital adequacy, deposit, financial leverage and gross domestic product (GDP) they all

possess a significant and positive effect, while financial institution volume and the worldwide financial crunch bears negative impact. The investigator implored that for financial institutions to attain a high profitability, financial institutions should have firm control and manage the variable effectively and appropriately, to attain sustainability of the financial banking system.

## **2.7 liquidity and bank liquidity regulation in the United Kingdom**

Capital adequacy is more covered widely practiced than liquidity control in both foreign and European Union structures. The United Kingdom administrator's exercise stress on companies expected to struggle and endure liquidity stresses via the market financing other than the Apex bank financing. Voluminous UK financial institutions consist of both a qualitative and a quantitative constituent in the present liquidity rule. With regards to the Basel committee on Banking Supervision's 200 Sound Practices for controlling liquidity in a financial organization, the qualitative part requisites a sufficient system and managed with enough liquidity, stress tests and contingency plans (Du, 2017). To add, the Sterling Stock era is a requisite that huge UK financial institutions have to meet up with. This rule is fashioned to make sure financial institutions can exist during the early weeks of a liquidity crunch and have enough liquidity without alternating to wholesale financing and assuming an outflow of retail deposits. The rule obliges financial institutions not to assume Apex bank eligibility to hold government bonds and central banks reserves. In line with the Bank of England, holding of liquid assets has gone down in total assets holdings by the British financial sector from the 1970s to 1 percent in 2008, however, the average 12 percent for huge UK financial institutions, which is more globally comparable percentage to liquid assets total funding (Lopez and Saeidinezhad, 2016). The Sterling Stock rule experienced a number of frailties at the time of the present crunch, like other quantitative liquidity rules. International currency and off balance sheet liabilities are not added to the currents control. Administrators introduced strict and modern reporting requirements and stress tests of liquidity as a quick response to the present crunch, which entails that

financial institutions must incorporate an evaluation describing how financial institution would adjust in a situation when scarcity in liquidity for a “lengthened” period of time consistent with current experiences, Bank of England balance, money at call, comprise cash, legal tender is defined as Broad Liquidity (Nyawata, 2012). Sterling liquidity as a percentage of whole assets is a desired measure for the Bank of England. A boost of around 4 percent is an optional measure covering total liquidity as a percentage of total assets (Schmitt, 2018). Ever since December 2008 the FSA has been talked to on a new liquidity rule Bingeman, (2015), which is going to be centered on serious statements about the sickened and persistent nature of liquidity deficiency and attached closely to the financing demand of each financial institution (FSA, 2007b and 2008b). The international fora and UK certified alongside working members of the proper EU have openly stated their interest for an international and European liquidity standard (Quaglia, 2013). FSA has been approved to go on revamping the liquidity level within circulation by its domestic rule when there is no foreign agreement. The proposition stressed on financial institutions to make use of strong approach to liquidity risk management by their senior management. There are six major parts to the designed changes. Foremost, controlled entities mustn't rely on other entities of their group to endure liquidity stress only if instructed by the FSA, and they must have sufficient liquidity. Secondly, the Committee of European Banking Sector and Basel Committee on Banking Supervision would have a fresh system and control structure based on their recent works. Thirdly, for any organization being capable of surviving liquidity stresses of different sizes and duration, there will be a system known as Quantitative Individual Liquidity Adequacy Standards. Fourthly, to shift from self-adequacy and not result in unwarranted risk to customers, a fresh structure has to be set up for industry-fledged and trans-border liquidity management, through waivers and amendments. Fifthly, a fresh accounting structure for liquidity would be set up with the FSA to head, to supervise both industry-wide and individual firm growth concerning risk in liquidity experiences, with the collection of detailed, standardized liquidity facts and figures at a proper frequency. Sixthly, the proposal involves a

major rise in financial institutions' buffer of liquid assets. Financial institutions are required by the FSA to hold from 6% and not exceeding 10% of government asset securities in comparison with numerical mean of 5 percent of 10 biggest financial institutions currently (Bouis, 2019). Financial institutions could move from 80 to almost 400 billion into government securities of their assets, this was meant by the FSA. The supervisor's assertions assumed it was up to year and they lost revenue by 150 points for financial institutions, because the latest fixed income instruments would have increased profits compared to the government securities they are being compelled to retain. Globally, about 13 out of hundred US commercial financial institutions assets are held up in the US treasury and Agency security, whilst about 6 out of hundred of government bonds are held up in European financial institutions (Akram and Das, 2019). The fresh liquidity proposition would be more advanced compared to the later one, a particular standard fits all numerical outlooks to liquidity control. These actions will look into the liquidity at the time of the financial crunch and moral hazard at time of the crunch. The protection would focus on raising the percentage of liquid assets held up by UK financial institutions and it is specifically significant. If UK controls were to be rather tight, it would be important to make sure that regulatory bridge is contained. Deposit insurances 21. The safeguard against financial unsteadiness, by avoiding "runs" on financial institutions is what Deposit insurance are made for. The cost of insuring financial institutions is mainly not only risk-determined, involves moral hazard into play, with enticements for safeguarded financial institutions to assume huge risk (Davidson and Shelor, 2014). Till the year 2007, with co-insurance, the benchmark of insured deposits was #35 000: the remaining of the 90 percent and the first #2000 was fully covered (Macey, 2011). The idea was to make sure depositors have an enticement to monitor financial institutions and prevent loss of fund, and also reducing moral hazard. In October 2007, the co-insurance element was taken out because the northern rock episode revealed that this plan was not enough to avoid financial institution runs (Yoo, 2017). As the money market pressures increased, the benchmark was increased above the minimal level under



the fresh European consensus to #50 000 (Macey, 2011). The reach of the pre-2007 agreement was increased from 96 percent of qualified retail. All elements would be reported for at on a monthly basis and in most scenarios weekly or daily, apart from reports from systems and controls. To prevent destabilizing markets targets for holding of government securities, this would be phased in gradually. Dependent on the distribution of their assets financial institutions would have to retain both European and American securities. It is expected that deposits payouts on insurance ought to be forecast-able and fast to prevent runs. The Northern Rock case and the authority's confusion and delay in receipt of finance were issues; administrators plan to employ payout targets a week after closing, immediately financial institutions are done targeting December 2010 in similarity with the regulation of other economies like America with fast paying scheme. Hadjiemmanuil, (2013) promoted various swift transfers and deposit. In the deposit insurance system there is a need to boost consumer knowledge. For instance, consumers are not likely to know that a one-time insurance for more than one accounts owned by an individual and the coverage is one depositor to one authorized body, even if the company trades under more than one product. At the verge of failing institutions could be assisted by a smooth operating deposit insurance system by making sure depositors in small quantities are safeguarded from all eventual risks. This sight seemed to work when funds provided by the regulatory body FSCS plays a vital role in attaining a stress free conversion into a fresh acquisition in the nationalization of Bradford & Bingley (O'Brien, 2013). The existence of cross-border financial operations which allowed for so many rising important setbacks, so UK household and organizations were faced by the collapse of 3 banks in the last quarter of 2008, the British government funded the refund of retail deposits when the Icelandic bank seemed unable to pay back these depositors. 24. One of the roles of FSCS is Deposit insurance Gray, (2011), saddled with obligations of compensation funds allocation in case of failures by companies of finance-related operations including companies of investments. The FSA and treasury are systemically independent of FSCS. Financing has been very descent

because it is contingent upon the expectation for 12 months period. Kashian and Drago, (2016) In respect of Bradford & Bingsley the additional government funding made available during the other half of the year 2008, the London Scottish Bank and the Icelandic banks has meant that the FSCS has owned a considerable loan which were applied to finance the resolution of those defaults and which will need to be reimbursed. The FSCS is now capable of borrowing from the government to make available payout swiftly within a small period, in line with the Banking Act in February 2009 Gray, (2011), and they are insistent on raising levies on financial institutions to make up for cost accrued over time. In line with the fresh legislation, pre-financing guided by a target level is possible by the treasury (Biondi, 2014). Even though, such a transformation may solidify the reliability of insurance rule related to deposits and prevent the recurrent characteristics in the present arrangement by rising up finances at inflationary periods other than collecting fines in recession, live demands on finance with the present status of the financial scheme prevent fast conversion to fresh arrangement of financing ahead. Risk-centered insurance premium should be given priority, as applied in other nations including OECD member countries like Italy, Sweden, Canada, Portugal, United States and France that would lower the possibility that it may require deposit insurance, by more closely lined up risk taken by institution (Eling and Jia, 2017). This distinguished system would lay a stigma on financial institutions that are already experiencing troubles; there are few evidences of such weakening effects in the system where this model has been used by Financing and securitization. UK financial institutions are strongly reliant on securitization; securitization amounted to 25 percent of fresh mortgages in the year 2007 Furfine, (2014), and UK financial institution depended on securitization to maintain the stream of lending that was being made via this operation. Securitization was adopted from other financial institutions or from abroad, this posed a structural weakness. The UK securitization need was influenced straight by the subprime crunch in the United States (Ohlrogge and Giesecke, 2016). As an outcome of the increased pace of evasion on principal loans by

America collateralized money owing responsibilities (CDOs), doubts sprung up about the degree of risk of top-ranked securities. This resulted to a 'buyers strike' famous for the US financial institutions and also for UK securitization. Merits could be found in making a much strong base for the British mortgages securitization with a solid base of stakeholders in the institution including funds for pensioners and insurance firms. A law was enacted in the beginning of 2008 by the UK authorities making the collection of controlled covered bonds to obey the UCITS Directive, Veasna and Razafitombo, (2015) thereby placing the UK at the same height with other European countries. This would also make available an extended number of instruments for banks to undertake secured loans, whereas equally giving investors a supplementary option of instruments which is obtainable, the protection of direct alternative to the underlying assets. Nevertheless, the market for covered bonds later aligned with displacement non-secured and even secured credit market after buoyant volumes of collection over many years covering 2008, equally both primary and secondary business volume lessened significantly.

## **2.8 United Kingdom and Capital Adequacy Standards**

Focusing on the Basel 1 standard Ferreira, Jenkinson and Wilson, (2019), the structure of the adequacy standards in capital for the British financial institutions till closure of the year 2006 (including the 1988 Capital Accord). Via the transmission of the appropriate EU instructions, these structures were used in the United Kingdom, which respected the principle of minimum harmonization, thus, over a wide coverage of area authorities which impose lofty standards as necessary. Risk weightings are described in expressions of wide categories or "buckets" of assets, financial institutions were requisite to withhold at least eight percent capital in risk mitigation (Karafolas, 2017). The Basel structure was boosted by regulation in control of risk in business records in 1996 (Sbârcea, 2014). The risk categories were unfinished, this structure had quite a number of shortcomings: (3) inside the categories there was an enticement to take full advantage of risk. Across a number of economies the eight percent risk-centered ratio to capital turned into an objective as

against being the least (Balasubramanyan, 2014). The British administrators set up “individual capital guidance” to prevent this practice, a least level of capital with which supervisors would hold enhanced interventions. Based on well carried out study of the risk taken by the supervisors, least capital for a sole institution was efficiently put to levels usually in excess of 8 percent, and financial institutions often capital holdings rather than exceeding levels above guidelines. Before the crunch UK financial institutions seemed to be adequately capitalized, even though variation in accounting standards made global comparisons hard as financial institutions used record methods for holding assets that are securitized.

The efficaciousness of regulatory capital percentages was weakened. For calculation of capital efficiency, these assets had a comparatively low significance. Owing to credit risk or back-up, these caliming methods had on financial institution, as a result of these risks, financial institutions' capital were understated. European economies including Holland, Spain and Denmark needed different capitalization SIVs and other instruments, which properly alleviated this problem (Nandhini and D. SivaSakthi, 2011). The FSA was overwhelmed by the volume of the entire SIV market at the outset of the crunch, even though they were aware of the exposure of individual UK financial institutions, off-balance sheets records also lowered the clearness of status of financial institutions (Macey-Dare, 2010). Ways enhancing consolation of SIVs in monetary statement is being adopted by the International Accounting Standards Boards (Moldovan, 2014). However, with regards to how capital requisites are put up and allowance created for counterparty credit risk regulatory treatment of SIVs should be fastened, as well as bank subordinates that could be setup in the nearest future, also other risk coming up from SIVs. (16) Putting to date, the earlier plan and applying the EU Capital Requirements Directives, capital efficiency control since the year 2007 has been centered on the Basel 2 approach (Inoue, 2010). With more distinguished groups compared to the previous risk-ratings made by agencies of credit rating, having a regularized system for minute financial institutions

following a risk-weighting system. Major UK financial institutions can make use of internal risk models as a source for distributing capital and also for more intricate financial institutions (Corvasce, 2011). In the “advanced” approach financial institutions draw up models with their own factors and thereby possess overall control of the variables deciding their capital distribution Mukherjee and Pana, (2018), although, the financial institution approximate the possibility of failures with supply of input supervision. . The implementation of Basel 2 enhanced merged growth in the money markets, coupled with securitization, credit derivatives, quality of collateral, guarantees and netting (International Monetary Fund, 2010). The introduction of the new structure failed to result in a decrease of capital amount held for regulating function for the UK; the implementation of the approach not resulting into a decrease for some institution. In the fresh structure the dependence on the two internal models for risk assessment and credit rating agencies perhaps weak, given the issue posed by the former crunch and the test of data provided on modeling risk. So many theories on credit risk and correlation, for instance, may have been made use of by rating agencies in the analysis of collateral debt function with a non-direct implication on financial institution withholding sum of controlling capital and such assets that were requisite for holding. Even though from the Basel 2, there is a case for exempting rating, bank staffs and administrator should minimally use controlling caution in the application of rating in the nearest future, at least for securitization products, and they shouldn't be applied mechanically as an alternative for their own assessment (Clark and Jokung, 2015). The high shift away from customary operations by commercial financial institutions engendered banking control and difficult management. Knowing that it is difficult for controllers have an intricate institution running, control has moved to stress management of internal risk practices. The UK has further changed from rules-centered to principles-centered or process-driven controls. By this design, administrators are not participants in the arrangement of control that decides capital adequacy and rather pay concentration in ensuring that starting risk is well controlled competently. The FSA overtime has been well included in the deployment of Pillar 2

individual evaluation of a financial institution's capital base and requisites of capital extras in scenario where Pillar 1 capital base is deemed inadequate (Sulistiyandari, Said and Hastuti, 2017). The initial Pillar 2 technique is elucidated in FSA (2007c) and has since that period changed the dynamic (Pujiyono, 2018). Market management and alignment to control is focused at playing an improved fiction via greater disclosure.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

The third chapter of this thesis is dedicated to the researcher's methodology and methods for achieving the aim of this study. This section will describe the research design while stating the approach to be used and the philosophy to be adopted for the study. It will further describe the type of population and sampling technique to be used. The model specification will be stated in the subsection of this chapter and the variables will be described both explained and explanatory.

### **3.2 Research approach**

There are two main types of research approach which are namely; inductive and deductive approach. These approaches determine the type of research method to be employed for the study. However, for this study a deductive approach is used. The rationale behind this choice is because theories are going to be tested and hypotheses will be affirmed. The research is focused on examining how the theories of liquidity and profitability work in the case study context and how the concepts are manifested and at what rate they have been demonstrated in the population.

### **3.3 Research Method**

This thesis seeks to examine the nexus between profitability and liquidity of UK banks over a period of 21 years. A quantitative method of research is taken in this study. In this quantitative method both inferential and descriptive statistics will be engaged to describe the data both individually and correlatively.

### **3.4 Sample Population**

The population to be investigated is the banks in United Kingdom. The commercial banks are targeted in this study these banks will be used for the understanding of how their liquidity interrelated with their profitability measures. It is a holistic study as it will encompass all the banks in the system under the central bank and due to constriction of data availability from the bank of England, the researcher will be considering the entire

banks within the commercial sector serving commercial purposes such as deposits, lending and are controlled by the regulatory authority.

#### **3.4.1 Sampling Method**

The commercial banks in the UK are to be engaged, a non-probability sampling will be efficient. Amongst the types of non-probability sampling to be used will be stratified sampling technique. Commercial banks are a category or a segment of the entire banks my system in UK. The reason is because the phenomenon to be studied involves banks with profits motive and at the same time, are controlled by the regulations and guidelines of the central bank. Secondly, these commercial banks in their bid to attain profits are limited by their responsibility to ensure adequate cash and liquid assets are made available for their customer demands.

#### **3.4.2 Data source**

Secondary data sources will be engaged. Primarily the major collection of data will be taken from Bank of England which serves as the central bank for commercial banks in UK. Other augmented data will be taken from financial and economic websites including World Bank, St. Louis Fred and Bank of England.

### **3.5 Data Variables**

The data variables in this study are divided into two; the dependent variable and the independent variables.

#### **3.5.1 Dependent Variable**

The dependent variable is the variables upon which the model seeks to explain. It is the basis of the phenomenon of study and it is the unit of attachment to the other independent variables. The dependent variable for this study is ROA

#### **ROA-Return on Assets**

Return on Assets is one of the conventional methods of measuring profitability of a financial or monetary establishment. It is metric that is used to calculate the profit that accrues on investment metric that



measures the profitability of a business in relation to its total assets. In this study, ROA will indicate the level of profit accrued by the UK commercial banks within the period of investigation. The capital of the commercial banks, over the years will have generated financial profits over its assets. It measure profitability because the larger the ROA the more financially efficient in management of resources by the commercial banks and vice-versa. ROA is calculated by

***Return on Assets = Total Assets / Net Income***

Source: Bank's Return on Assets for United Kingdom, Percent, Annual, Not Seasonally Adjusted. Link: <https://fred.stlouisfed.org>

### **3.5.2 Independent Variables**

These are the number of variables that are used in explaining the dependent variable. These variables shed light and direction on the phenomenon of study. Statistically, they are used to regress the endogenous variable and provide inferential deductions and description of relation with the dependent variable in view to the whole phenomenon of study.

### **Liquid Liabilities**

Liquid liabilities for the United Kingdom represented in Billions of pounds held by residents in the UK with the banks. This dependent variable will be used in measuring the total liabilities held by banks in the UK financial system. This is the summation of currency and deposits with all the commercial banks including currency M1 of money supply, transferable deposits and time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), added to foreign currency time deposits, travelers' checks, a shares of mutual funds travelers' checks and commercial paper. The liquid Liability component is the totality of financial debt and obligations to be repaid by the banking institutions to organizations, private bodies, and governmental institutions at any specific amount of time.

Source: Liquid Liabilities (Broad Money) for United Kingdom, Millions of 2000 Dollars, Annual, Not Seasonally Adjusted. Citing Source: Link: <https://fred.stlouisfed.org>

### **Bank Credit**

This term also demonstrates the liquidity level of banks and their ability to extend surplus cash and fund facilities to the financial and economic agents within the system. Bank credit is the summation of amount of in form of loans made available by banks as lender too borrowers (kristijadi et al., 2013). It is means of mobilization of funds from the surplus unit of the financial system to the deficit units as loaned funds for consumption, production or business engagements (Callado Muñoz and Utrero González, 2013).

Source: Aggregate Bank and Building Society Credit in the United Kingdom, Millions of British Pounds, Annual, Not Seasonally Adjusted. Link: <https://fred.stlouisfed.org>

**Bank Assets-** The figures were obtained from total bank assets to GDP. Hence, GDP was multiplied with the ratio to obtain figures.

Source: Ratio of bank liquid reserves to bank assets is the ratio of domestic currency holdings and deposits with the monetary authorities to claims on other governments, nonfinancial public enterprises, the private sector, and other banking institutions. World Development Indicators

**Loans-** this is a variable that belongs to both liquidity and a function of profitability. The more the loans advanced by the banks the higher the proof of liquidity. However, on the other hand, the higher the loans a financial entity can generate, the higher the income in terms of profit that can be translated from those loads. The ratio or figure is derived by dividing total loans to total assets.

Source: Use of Financial Services, Assets: Outstanding Loans at Commercial Banks for United Kingdom, National Currency, Annual, Not Seasonally Adjusted. Link: <https://fred.stlouisfed.org>

### 3.6 Model Specification.

This study is using the approach of ordinary least square method to estimate and evaluate the relationship between ROA, the dependent variable and other independent variables including bank credit, liquid liabilities, loans and total assets. The technique is efficient in testing linear pattern of relationship between the explained variable and other explanatory variables. The explanatory variables help to understand the influence of these variables, in what direction, whether positive or negative and also establish the degree at which each dependent variable affects or describes the explained variable. The estimation equation written below describes the regression model of the study.

$$ROA = \beta_0 + \beta_1 BC + \beta_2 Lo + \beta_3 Liq + \beta_4 TA + \epsilon_{it}$$

In the above mathematical equation, the regression estimating variables; **ROA** is the explained term and variable which indicates profitability of commercial banks in the UK

**BC**- represents bank capital, this data

**Liq** -measuring the total liabilities held by resident banks in the UK.

**TA**- measuring total assets of resident banks in the UK.

$\epsilon_{it}$  = the error term

## **CHAPTER 4**

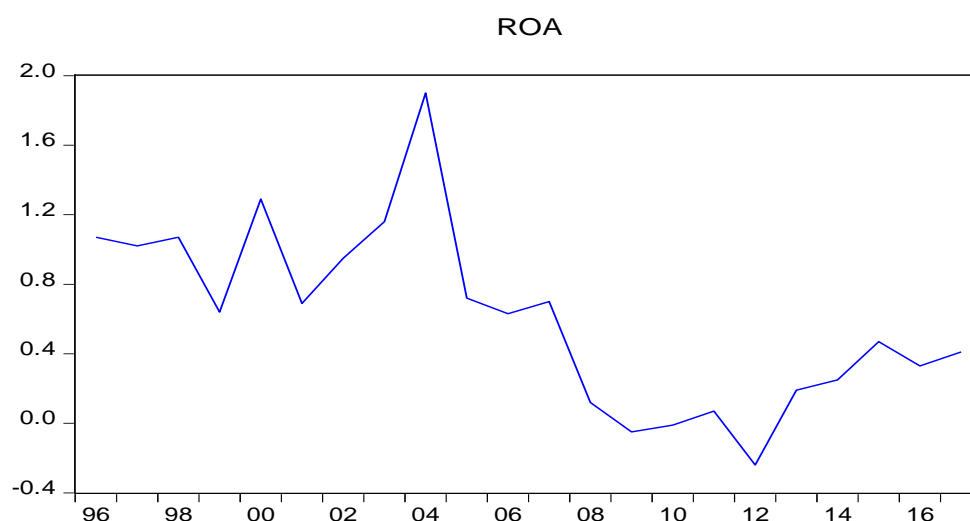
### **RESULTS AND DISCUSSION OF FINDINGS**

#### **4.1 Introduction**

Chapter three provided the basis for the analysis of this study by describing the variables and presenting the model for the regression analysis. This chapter goes further to analyze the variables from two perspectives. The first perspective is the angle of series statistics which is univariate angle of analysis and the second perspective is from group statistics which is also known and multivariate analysis.

The univariate aspect of this analysis will show description of each variable beginning from trend analysis and time discussion. Other forms of univariate analysis will include descriptive statistics and correlation. At multivariate level, cointegration test, regression estimation, normality tests and unit root analysis.

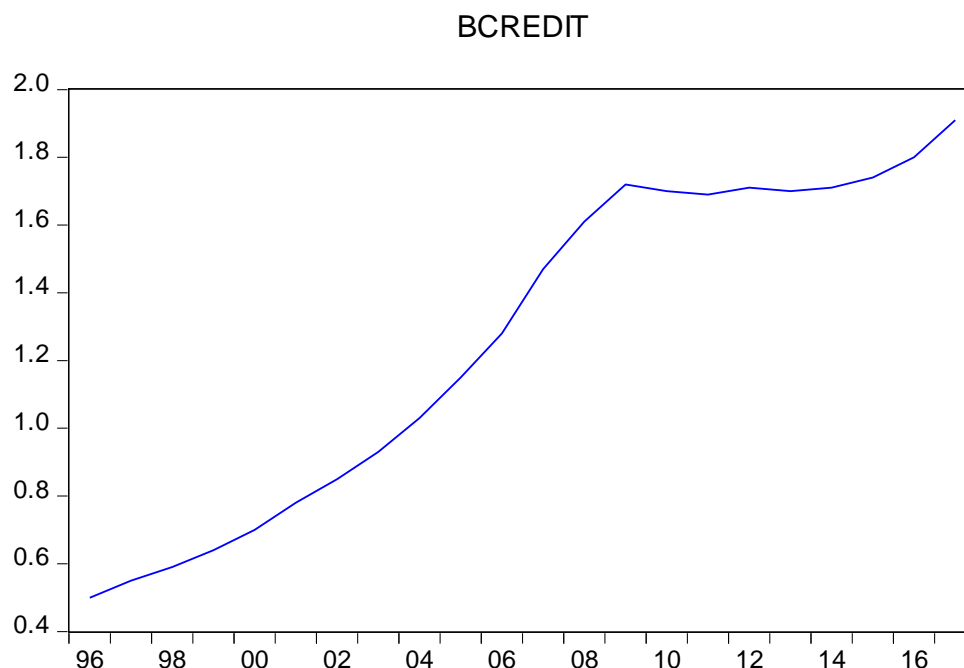
## 4.2 Trend Analysis



**Figure 2** Return on Asset

(Source: Author's computation using Eviews 10)

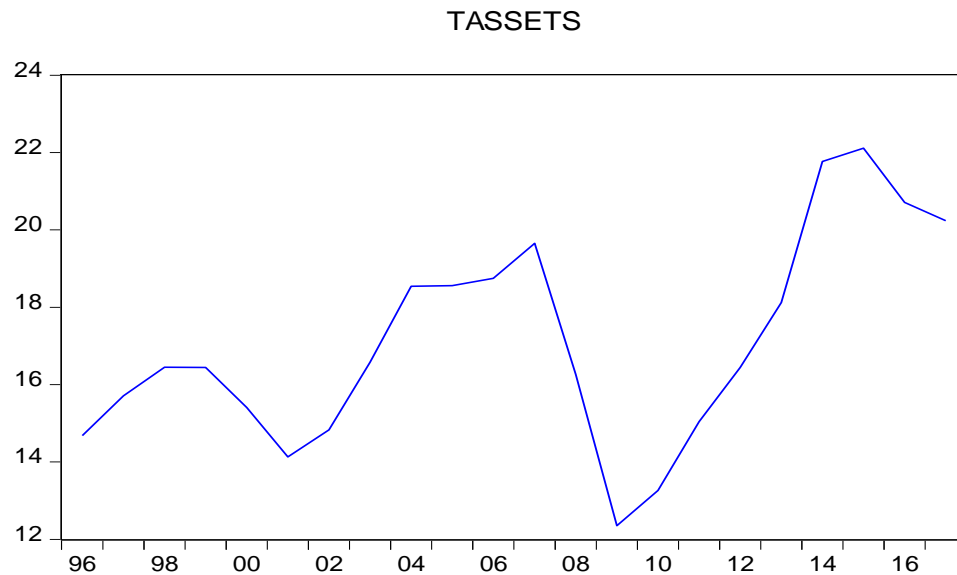
A 21 year data range for the return on assets of the commercial banks in UK shows that there has been a non-stable trend of returns in the financial sector over the years. From 1996 to 1998, there was a steady ROA ranging from 1.2 to 1.7. After then, it has a wobbling trend till the ROA reached peak in 2004.



**Figure 3** credit availability as an aggregated sum of the banks in UK

(Source: Author's computation using Eviews 10)

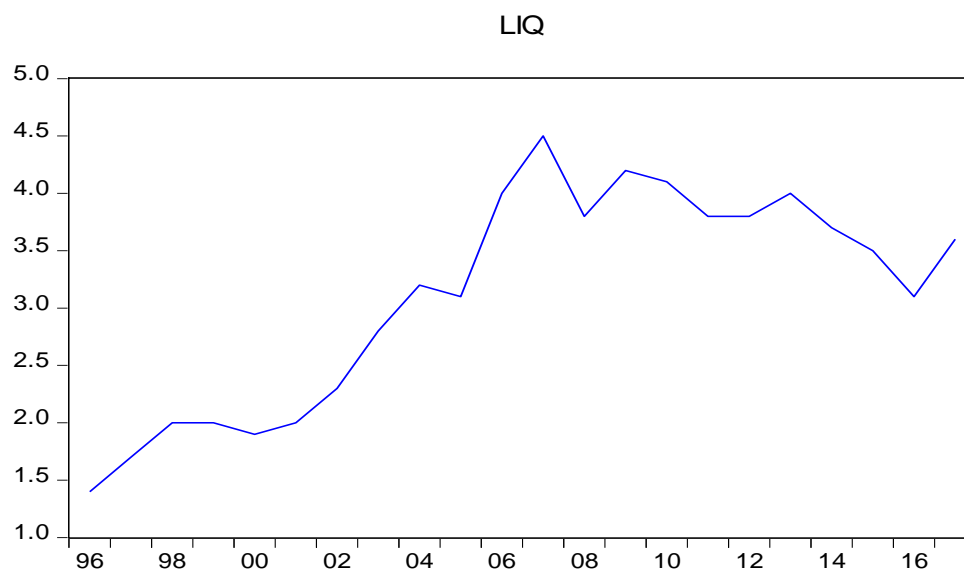
The above figure shows the trend of bank credit availability as an aggregated sum of the banks in UK. The figure shows the trend had been in an upward slope since 1996 till 2017. This is a variable that indicates the level of liquidity in the UK banking system. Averagely the bank credit in the system was around 1.268 billion pounds and the highest over the 22 year period. 1.91 and 0.55 billion pounds were recorded as the maximum and minimum values of bank credit for the whole observational period. The graph shows there is been series of upheld policies and regulations from the central bank to maintain the rise in liquidity of the commercial banks. The efforts have been consolidated and over the period of study, there was no recorded fall or backdrop in the volume of credit advanced by the banks in the UK financial system.



**Figure 4** Total Asset in millions

(Source: Author's computation using Eviews 10)

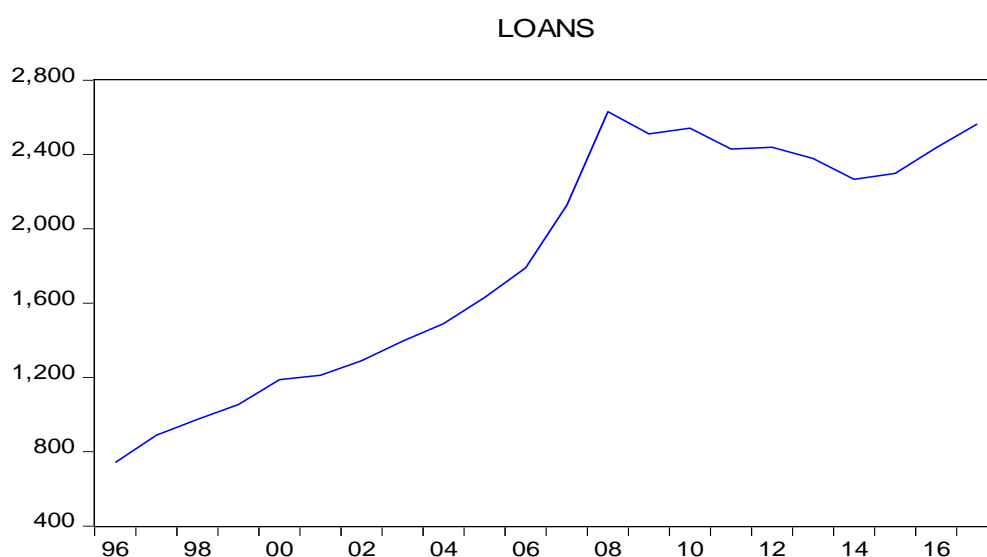
The above diagram shows the total assets of banks in the British financial sector. The trend shows an initial rise in the asset capacity of the sector and it experienced a drop from 1998 to 2001 where it began rising steadily till 2008. The total asset in the UK banking sector dropped steeply from 2008 till early 2009 signifying the global recession of the period and the economic downturns. It also indicates the recovery and trend of the UK finance sector and how efficient the monetary policies and financial regulations that have been put in place then. The steady growth in assets is evidenced until 2015-2016 where a slight drop is witnessed.



**Figure 5** liquidity level in millions

(Source: Author's computation using Eviews 10)

The liquidity level in the UK financial system is represented in the diagram above. The trend shows an upward movement of liquidity from 1996 until 2007 signifying the volume of funds circulating within the system. This is also in consonance with the total assets level of the commercial banks earlier analyzed and it shows further that in 2008, there was drop in liquidity signifying the effect of the global meltdown in the period until 2009 where levels were indicating recovery. The average liquidity level is at 3.11 billion pounds over the entire observed period.

**Figure 6** Loans in millions

(Source: Author's computation using Eviews 10)

The above graph shows the trend line of loans within the UK financial system reflecting the amount of funds advanced by banks to financial units and economic agents in UK within the period of 1996 to 2017. In similarity with other variables, it has a rising trend which can be attributed to the expansion of the financial sector in UK which precipitated a total loans figure at 742 million pounds in 1996. It peaked in 2008 with 2630



million pounds worth of loans disbursed from various banks in the UK. Due to the global meltdown, the value dropped as a result of financial crisis to 2298.07 million pounds in 2015. A significant rise was witnessed in 2016 where it assumed 2437 million pounds.

### 4.3 Correlation Result and Analysis

**Table 1:** Correlation

	ROA	TASSETS	LOANS	LIQ	BCREDIT
ROA	1	0.033435	-0.77999	-0.61864	-0.75317
TASSETS	0.033435	1	0.283905	0.294025	0.387533
LOANS	-0.77999	0.283905	1	0.892484	0.986117
LIQ	-0.61864	0.294025	0.892484	1	0.881934
BCREDIT	-0.75317	0.387533	0.986117	0.881934	1

Source: Author's computation using Eviews 10

The above table shows the correlation coefficient of the variables with one another in a two way dimension. The dependent variable ROA has high but negative correlation with bank credit, loans at 75% and 78% respectively but minimal positive with total assets at 3.3%. Similarly liquidity reserve ratio, an independent variable in the model, also a measure of liquidity, has high negative correlation coefficient with ROA at 61% but high positive correlation with loans at 89.2% and bank credit at 88.2%.

**Table 2:** Covariance Analysis: Ordinary

Covariance					
t-Statistic					
Probability	ROA	TASSETS	LOANS	LIQ	BCREDIT
ROA	0.258269				
	-----				
TASSETS	0.044768	6.941354			
	0.149611	-----			
	0.88257	-----			
LOANS	-251.887	475.3108	403799		
	-5.57403	1.324147	-----		
	1.86E-05	0.200389	-----		
LIQ	-0.28975	0.713924	522.6714	0.84936	

	-3.52136	1.375729	8.848353	-----	
	0.002146	0.184118	2.37E-08	-----	
BCREDIT	-0.18431	0.491646	301.7399	0.391384	0.231869
	-5.12028	1.880012	26.55817	8.367304	-----
	5.22E-05	0.074753	4.53E-17	5.79E-08	-----

Source: Author's computation using Eviews 10

This is a further analysis on correlation of the variables to further see the statistical significance of the correlation. The t-statistic results show that there is strong correlation among the variable as deduced in the previous table. Furthermore, all the variables show statistical significance at 1%, 5% evidencing a strong relationship between the dependent variable, ROA and the independent variables.

### Regression analysis

**Table 3:** Ordinary Least Square Regression

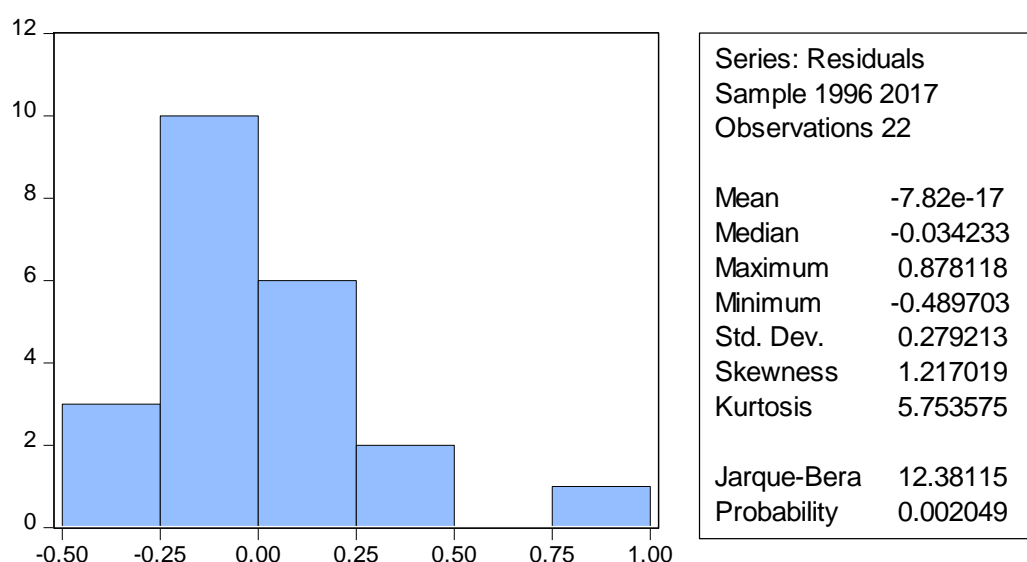
Dependent Variable: ROA				
Method: Least Squares				
Date: 02/06/21 Time: 07:35				
Sample: 1996 2017				
Included observations: 22				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TASSETS	0.0702181 7	0.03572052	1.9657655 86	0.065877 143
LOANS	- 0.0002526 65	0.00085424	- 0.2957777 82	0.770982 224
LIQ	0.1741909 77	0.160083999	1.0881223 5	0.291727 657
BCREDIT	- 0.9089996 12	1.123905092	- 0.8087868 08	0.429812 096
C	0.4751899 49	0.652059894	0.7287519 95	0.476073 752
R-squared	0.7118660 96	Mean dependent var		0.608181 818

Adjusted R-squared	0.6440698 84	S.D. dependent var		0.520161 48
S.E. of regression	0.3103277 1	Akaike info criterion		0.694340 588
Sum squared resid	1.6371558 85	Schwarz criterion		0.942304 782
Log likelihood	- 2.6377464 64	Hannan-Quinn criter.		0.752753 496
F-statistic	10.500086 49	Durbin-Watson stat		1.807803 958
Prob(F-statistic)	0.0001798 02			

Source: Author's computation using Eviews 10

The table above shows the first regression of the variables on the dependent variable ROA. The overall statistical significance of the regression indicates a 1% fit with the R-squared result of 71.1% indicating that the variables Bank credit, total assets, Loans and Liquidity reserve explain over 70% of the dependent variable ROA. However, the individual statistical reading of each independent variable shows no significance except total assets showing a 10% fit. Hence, further investigations including unit roots test, serial correlation test, co-integration test and normality distribution test have to be carried out.

#### 4.4 Normality Distribution Result and Analysis



**Figure 4**Normality Distribution test

Source: Author's computation using Eviews 10

The Jarque-Bera probability test reads 0.002049 which is within the level of significance at 1%. Hence, null hypothesis is accepted and the alternative is rejected. Hence, the residuals of the variables are normally distributed.

#### 4. 5 Unit root test result and analysis

**Table 4:** Unit root test of Bank Capital

Null Hypothesis: BCREDIT has a unit root				
Exogenous: Constant				
Lag Length: 1 (Automatic - based on SIC, maxlag=4)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-0.843822857	0.784260302
Test critical values:	1% level		-3.808545573	
	5% level		-3.02068565	
	10% level		-2.650412647	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(BCREDIT)				
Method: Least Squares				
Date: 07/06/20 Time: 15:58				
Sample (adjusted): 1998 2017				
Included observations: 20 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.

	-		-	
BCREDIT(-1)	0.0167 29026	0.019825282	0.8438 22857	0.4104 85628
D(BCREDIT(-1))	0.7183 72131	0.166541288	4.3134 77695	0.0004 71112
C	0.0425 09852	0.030294372	1.4032 26058	0.1785 50743
R-squared	0.5540 53886	Mean dependent var		0.068
Adjusted R-squared	0.5015 89638	S.D. dependent var		0.0560 63873
S.E. of regression	0.0395 80077	Akaike info criterion		- 3.4835 00669
Sum squared resid	0.0266 31902	Schwarz criterion		- 3.3341 40828
Log likelihood	37.835 00669	Hannan- Quinn criter.		- 3.4543 44059
F-statistic	10.560 59889	Durbin- Watson stat		1.5328 90027
Prob(F-statistic)	0.0010 4448			

Source: Author's computation using Eviews 10

In statistical analysis, unit root test are used to confirm if a time series variable has some properties of non-stationarity and if it has unit root. The alternative hypothesis leads to further analysis to check whether an explosive root, trend stationarity or just ordinary stationarity while the null hypothesis confirms the inherence of unit root. The ADF test also known as augmented Dickey–Fuller is frequently used in analysis of panel data and very large variable samples of time series.

$$H_0 : \phi = 0, \text{ unit root present}$$

$$H_1 : \phi < 0, \text{ unit root not present}$$

In general, a p-value of less than 5% means the null hypothesis is rejected i.e there is a unit root. The result is 0.784260302 which is above 5%, hence null hypothesis is accepted and the alternative hypothesis is rejected. Hence, there is unit-root in the dependent variable, bank capital.

**Table 5:** Unit root test of Liquidity

Null Hypothesis: LIQ has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=4)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.85558	0.3452
Test critical values:	1% level	-3.78803	
	5% level	-3.01236	
	10% level	-2.64612	
*MacKinnon (1996) one-sided p-values.			

Source: Author's computation using Eviews 10

$$H_0 : \phi = 0, \text{ unit root present}$$

$$H_1 : \phi < 0, \text{ unit root not present}$$

The result is 0.3452 which is above 5%, hence null hypothesis is accepted and the alternative hypothesis is rejected. Hence, there is unit-root in the independent variable liquidity. Hence the presence of stationarity in the variable.

**Table 6:** Unit root test of Loans

Null Hypothesis: LOANS has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=2)			
		t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		- 2.3356 3	0.176 2
Test critical values:	1% level	- 4.0579 1	
	5% level	- 3.1199 1	
	10% level	- 2.7011	
*MacKinnon (1996) one-sided p-values.			

Source: Author's computation using Eviews 10

$H_0 : \phi = 0$ , unit root present

$H_1 : \phi < 0$ , unit root not present

The result is 0.1762 which is above 5%, hence null hypothesis is accepted and the alternative hypothesis is rejected. Hence, there is unit-root in the independent variable, loans. Hence the presence of stationarity in the variable.

**Table 7:** Unit root test of Return on Assets

Null Hypothesis: ROA has a unit root			
Exogenous: Constant			
Lag Length: 0 (Automatic - based on SIC, maxlag=4)			
		t- Statisti c	Prob. *
Augmented Dickey-Fuller test statistic		- 2.0608 3	0.260 9
Test critical values:	1% level	- 3.7880 3	
	5% level	- 3.0123 6	
	10% level	- 2.6461 2	

*MacKinnon (1996) one-sided p-values.			
---------------------------------------	--	--	--

Source: Author's computation using Eviews 10

 $H_0 : \phi = 0$ , unit root present $H_1 : \phi < 0$ , unit root not present

The result is 0.2609 which is above 5%, hence null hypothesis is accepted and the alternative hypothesis is rejected. There is unit-root in the independent variable, return on assets. Hence, the presence of stationarity in the variable.

**Table 7:** Unit root test of Liquidity

Null Hypothesis: TASSETS has a unit root			
Exogenous: Constant			
Lag Length: 3 (Automatic - based on SIC, maxlag=4)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.87748	0.0677
Test critical values:	1% level	-3.85739	
	5% level	-3.04039	
	10% level	-2.66055	
*MacKinnon (1996) one-sided p-values.			

Source: Author's computation using Eviews 10

 $H_0 : \phi = 0$ , unit root present $H_1 : \phi < 0$ , unit root not present

The result is 0.0677 which is above 5%, hence null hypothesis is accepted and the alternative hypothesis is rejected. Hence, there is unit-root in the independent variable, total assets. Hence, the presence of stationarity in the variable.

#### 4.6 Heteroskedasticity Test Result and Analysis



**Table 8: Heteroskedasticity Test**

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
Null hypothesis: Homoskedasticity			
F-statistic	0.620331 965	Prob. F(4,17)	0.654142 78
Obs*R-squared	2.802129 985	Prob. Chi-Square(4)	0.591465 096
Scaled explained SS	3.976775 667	Prob. Chi-Square(4)	0.409158 046

Source: Author's computation using Eviews 10

$H_0: \rho = 0$ , Residuals are homoskedastic

$H_1: \rho \neq 0$ , Residuals are heteroskedastic.

Since the test statistic has a p-value 0.00105559 is at the threshold of ( $p < 0.05$ ) then the **null hypothesis** of homoskedasticity is accepted. Hence, we reject the alternative hypothesis  $H_1$ . There is presence of homoskedasticity in the residuals.

#### 4.6 Serial Correlation LM Test Result and Analysis

**Table 9: Serial Correlation LM Test**

Breusch-Godfrey Serial Correlation LM Test:			
Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.046620 374	Prob. F(2,15)	0.954587 4
Obs*R-squared	0.135908 284	Prob. Chi-Square(2)	0.934303 318

Source: Author's computation using E-views 10

Serial correlation is normally employed in time series analysis to investigate whether observation of similar variables have or show relationship. In a scenario where the serial correlation is tending towards 1 far from zero, it is said and assumed that the variables are correlated.

However and conversely, if the serial correlation measure zero or skewed towards zero we can say that there is no correlation. In a case

where the value is 1 or close to 1 it implies that the previous values in the time series have effect on the future or  $n+1$  time record of the values. Invariably, a variable that is serially correlated has a pattern and is not random. Likewise, serial correlation happens in time-series analysis if the errors associated with a given period carry over into future periods.

The above serial correlation result shows a P value of 0.814227197 which is skewed towards 1 which indicates that the variables have serial correlation.

#### 4.7 Co-integration Test of ROA and independent variables

**Table 10:** Co-integration Test results

Unrestricted Co-integration Rank Test (Trace)	ROA and LIQUIDITY	ROA AND TASSETS	ROA and LOANS	ROA and BCREDIT
No. of CE(s)	Prob.**	Prob.**	Prob.**	Prob.**
None	0.0259	0.2871	0.2905	0.1314
At most 1	0.0380	0.2693	0.1950	0.3996

Source: computed by author with E-views 10

Trace test indicates no co-integration at the 0.05 level, \* denotes rejection of the hypothesis at the 0.05 level.

The test result shows that the test statistic of 0.0259 for liquidity which is within the critical value at the 5% level. Hence, there is co-integration in the liquidity variable with ROA. The test result also shows statistic of 0.2871, 0.2905 and 0.1314 for total assets, loans and bank credit respectively which are larger than the critical value at the 5% level. Hence, we reject null hypothesis of co-integration for these variables.

#### 4.8 Vector Auto-regression Estimation output and Analysis

**Table 11:** Vector Autoregression Estimates

Vector Autoregression Estimates				
Date: 02/07/21 Time: 07:56				
Sample (adjusted): 1998 2017				

Included observations: 20 after adjustments				
Standard errors in ( ) & t-statistics in [ ]				
	LIQ	BCREDIT	TASSETS	LOANS
LIQ(-1)	0.439306 737	0.015151 151	1.550160 416	89.67200 299
	0.422810 291	0.035982 356	1.096812 385	86.30667 999
	[ 1.03902]	[ 0.42107]	[ 1.41333]	[ 1.03899]
LIQ(-2)	0.574100 935	0.047747 815	- 1.643400 086	34.03288 034
	0.709985 554	0.060421 786	1.841773 88	144.9266 903
	[ 0.80861]	[ 0.79024]	[- 0.89229]	[ 0.23483]
BCREDIT(-1)	6.742782 615	1.540887 171	- 3.804424 255	2777.077 725
	4.918536 943	0.418581 457	12.75917 913	1004.002 512
	[ 1.37089]	[ 3.68121]	[- 0.29817]	[ 2.76601]
BCREDIT(-2)	- 1.235290 25	- 0.123145 847	14.80252 338	- 1005.807 139
	4.903745 302	0.417322 647	12.72080 812	1000.983 15
	[- 0.25191]	[- 0.29509]	[ 1.16365]	[- 1.00482]
TASSETS(-1)	- 0.176649 466	- 0.008290 266	0.691945 835	- 20.86682 155
	0.170762 279	0.014532 355	0.442974 514	34.85706 409
	[- 1.03448]	[- 0.57047]	[ 1.56204]	[- 0.59864]
TASSETS(-2)	0.019065 12	0.006829 393	- 0.153993 112	1.584185 559

	0.123469 374	0.010507 594	0.320291 965	25.20334 062
	[ 0.15441]	[ 0.64995]	[- 0.48079]	[ 0.06286]
LOANS(-1)	- 0.002056 433	- 0.000132 416	- 0.006139 195	- 0.030347 771
	0.002477 365	0.000210 831	0.006426 535	0.505695 314
	[- 0.83009]	[- 0.62807]	[- 0.95529]	[- 0.06001]
LOANS(-2)	- 0.001975 622	- 0.000276 199	- 0.000509 189	- 0.532085 344
	0.001904 872	0.000162 11	0.004941 43	0.388834 456
	[- 1.03714]	[- 1.70378]	[- 0.10304]	[- 1.36841]
C	2.818367 567	0.081089 156	6.795853 824	592.7171 382
	2.143411 547	0.182410 408	5.560224 959	437.5265 66
	[ 1.31490]	[ 0.44454]	[ 1.22223]	[ 1.35470]
ROA	0.356388 165	0.022463 278	1.221495 785	- 65.22492 296
	0.325899 349	0.027734 96	0.845415 663	66.52461 268
	[ 1.09355]	[ 0.80993]	[ 1.44485]	[- 0.98046]
R-squared	0.883281 726	0.997129 485	0.927793 684	0.990235 832
Adj. R-squared	0.778235 279	0.994546 021	0.862808	0.981448 081
Sum sq. resids	1.547917 753	0.011210 784	10.41649 177	64497.90 453
S.E. equation	0.393435 859	0.033482 509	1.020612 158	80.31058 743
F-statistic	8.408487 409	385.9660 967	14.27689 339	112.6836 456
	- 2.790554 358	- 46.48734 332	- 21.85535 09	- 109.1653 281
Log likelihood				

Akaike AIC	1.279055 436	- 3.648734 332	3.185535 09	11.91653 281
Schwarz SC	1.776921 573	- 3.150868 195	3.683401 227	12.41439 894
Mean dependent	3.27	1.3355	17.282	1932.288
S.D. dependent	0.835463 943	0.453378 835	2.755474 169	589.6283 851
Determinant resid covariance (dof adj.)		0.117036 983		
Determinant resid covariance		0.007314 811		
Log likelihood		- 64.33654 247		
Akaike information criterion		10.43365 425		
Schwarz criterion		12.42511 879		
Number of coefficients		40		

Source: computed by author with Eviews 10

### Interpretation

Among all the variables Bank credit was found to be significant at first level difference in the previous year with itself and loans while other variables were not to be statistically significant with other variables as their t-statistic reading were below 2.0. However liquidity was found to be strongly and positively endogenous with itself and other variables with a higher positive relationship with loans. Total assets is found to be negatively endogenous with other variables except with itself a first level difference. Loans are found to be negatively endogenous in the model with other variables and itself.

Table 12 Serial Autocorrelation Test

VAR Residual Serial Correlation LM Tests						
Sample: 1996 2017						
Included observations: 20						

Null hypothesis: No serial correlation at lag h						
Lag	LRE* stat	d f	Prob.	Rao F- stat	df	Prob.
1	20.81 736	1 6	0.185 638	1.488 981	(16, 12.9)	0.238 332
2	27.39 844	1 6	0.037 261	2.389 811	(16, 12.9)	0.060 614
Null hypothesis: No serial correlation at lags 1 to h						
Lag	LRE* stat	d f	Prob.	Rao F- stat	df	Prob.
1	20.81 736	1 6	0.185 638	1.488 981	(16, 12.9)	0.238 332
2		3 2			(32, NA)	
*Edgeworth expansion corrected likelihood ratio statistic.						

Source: computed by author with Eviews 10

The above result shows that there is no element of serial autocorrelation in the variables after vector auto regression. The p value of 0.238332 is above 1%, 5% and 10% statistical significance.

**Table 12:** Granger Causality of Variables

Pairwise Granger Causality Tests			
Date: 02/06/21 Time: 09:21			
Sample: 1996 2017			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
TASSETS does not Granger Cause ROA	20	0.801484125	0.466972615
ROA does not Granger Cause TASSETS		0.652195776	0.535056901
LOANS does not Granger Cause ROA	20	3.523423445	0.055665459

ROA does not Granger Cause LOANS		0.699141333	0.512503317
LIQ does not Granger Cause ROA	20	4.66786955	0.026536912
ROA does not Granger Cause LIQ		3.47356513	0.057590571
BCREDIT does not Granger Cause ROA	20	2.454743988	0.11960071
ROA does not Granger Cause BCREDIT		3.295665045	0.065101196
LOANS does not Granger Cause TASSETS	20	5.268844713	0.018485127
TASSETS does not Granger Cause LOANS		2.234615216	0.141438797
LIQ does not Granger Cause TASSETS	20	0.435117545	0.655102478
TASSETS does not Granger Cause LIQ		0.58086886	0.571510263
BCREDIT does not Granger Cause TASSETS	20	1.736059413	0.209801742
TASSETS does not Granger Cause BCREDIT		5.554763239	0.015656402
LIQ does not Granger Cause LOANS	20	4.945217327	0.022409947
LOANS does not Granger Cause LIQ		0.711927743	0.506548554
BCREDIT does not Granger Cause LOANS	20	18.45052966	9.05E-05
LOANS does not Granger Cause BCREDIT		8.113569876	0.004089714
BCREDIT does not Granger Cause LIQ	20	1.371767073	0.283715781
LIQ does not Granger Cause BCREDIT		0.045688795	0.955471643

Source: computed by author with Eviews 10

The result above shows that liquidity granger causes ROA with p value of 0.026536912 as an acceptance of alternative hypothesis. Likewise, loans granger causes total assets with a p value of 0.018485127 which informs rejection of null hypothesis. In the same vein, total assets granger causes bank credit with a probability value of 0.015656402 signifying 1% statistical relevance. Also there is bi-directional relationship between bank credit and loans as both granger causes each other. Bank credit granger cause loans at 9.05e-05 p value and at 0.0004 p-value, loans granger cause bank credit.

In explaining the concept of liquidity and profitability in the Uk commercial banks, a number of test and empirical investigations have been carried

out to examine the relationship between liquidity and profitability variables. In the short run, variables of liquidity including loans, liquidity ratio, total assets and bank credit have all evidenced unit roots. Hence, the use of Vector auto regression for further analysis which also proved stationarity at 1st difference. The Granger causality test showed that liquidity reserve levels creates impulse for changes in ROA which is very important for our study. In a similar fashion, loans in the model has a greater effect on more than one variable including bank credit and total assets. Bank credit forecasts future values of loans. In a corresponding manner, the model informs that profitability variable, ROA which is the dependent variable is only triggered from the values of liquidity reserves in the commercial banks of UK. This is an important profitability-liquidity relationship to be held which shows that ROA by UK banks is induced by the impulses of liquidity levels before 1996, and likewise, the future values of ROA beyond 2017 of the observational period is also explained by the liquidity levels within the period of observation by a lag of one year.

#### **4.11 Further Discussion with the actions of Bank of England**

From the beginning, the apex bank of the UK economy, bank of England have been inducing straightforward expansionary monetary measures to level up GDP – money supply ratio as at 2007 (Monteiro, 2013). This can explain the increase in bank credit in the system. However, in the following year, the worldwide recession struck every country and paralyzed financial institutions which explains the drastic fall in ROA, ROE, bank credit and total assets value which was worst affected. The money supply pressure ensued till 2012 after the 2008 global financial crisis. This period of crisis saw the central bank slow down the loan multiplier which is derived from the ratio of money supply to loans ratio as this occurred in the first two quarters of 2008. This occurred despite a vigorous financial policy stance, which may presumably be comprehended as a series of challenges of financial stance to stimulate the economy. As will be discovered, for three years leading to 2007 was characterized by a sustained growth in financial leverage in each currency areas as measured by the Fin Assets/GDP ratio on the



rear of laxer credit policies, as mirrored within the persistent rise in the loans-to-GDP numerical proportion.

Another study provided strong empirical evidence that there is variable funding pressure across the British banks which predicted small volume of liquidity inducing a proportional fall in expected cash flow (Yan, 2012). While liquidity remains a strong determinant in the model, other studies indicate that resultant effect of liquidity on profitability is bi-dimensional. A study argued that liquidity has a positive impact on ROA (Pasiouras and Kosmidou, 2007) while another proved negative on bank profits and profitability ratio (Molyneux and Thornton, 1992).

## **CHAPTER 5**

### **CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

The completed previous section of this work entailed the empirical findings of the study and further explained the statistical outcomes of the investigations carried out on the sampled population of UK banks. It is worthy to note that diagnostic tests have been carried out on the model and the variables used before regression. This section of the study will delve into the conclusion of the work and will present the summary of the findings and discussions presented in the previous chapter.

#### **5.2 Conclusion based on research Aim**

The research aim of this study is to examine how maintaining liquidity levels affect profitability in British banks.

The study so far, has shown based on the length of observation on the commercial banks in UK that liquidity predicts the profitability of the banks in the system because of our autoregression investigation which shows that the amount of funds used as liquidity reserve held by the Bank of England for the commercial banks gives impulses to the amount of profit that the banks will make in the future as a result of Granger causality phenomenon detected in the variables.

#### **5.3 Conclusion on Research Objectives**

The research study objective includes finding out the trend of liquidity and profitability in British banks over time. Empirical investigations show that liquidity has been maintained at high levels. Even with upward trends in liquidity levels of the British banks, there are still some drawbacks over

the study period. Conversely and comparatively, profitability levels have not been maintained at high levels. Other external factors have been militating against profitability such as the global recession of 2008 and other factors that have not been studied in this work that may be related to economic or institutional regulations. Despite these shocks the trend of profitability has been on the rise while the trend of liquidity has been on a corresponding rise as well

#### **5.4 Conclusions based on Research Questions**

The research questions of this study seeks to know the determinants of liquidity and profitability in British banks. In explanation, the phenomenon in play is beyond the regular direct relationship between profitability and liquidity. The empirical investigation shows that the variables gathered in the literature to be the frequent determinants of liquidity such as bank credit size, total assets, loans and liquidity levels have evidenced their singular capacities to explain liquidity in general from the scenario of UK banks within the period. Similarly, the rising trend of ROA has also explained the high levels of profitability in the UK banking system.

Secondly, is to understand the drawbacks or the balance mechanism through the variables to establish equilibrium between liquidity and profitability. The pair-wise correlation analysis done in the previous chapter showed that there is a negative coefficient of 0.4172 which implies almost 42% inverse relationship between ROA and Liquidity. The conclusion of the analysis made so far demonstrated that cointegration is found among the variables implying that long run association is existent between the variables of profitability and liquidity. In both short and long run, liquidity conversely affects the propensity of profitability in UK banks. However, the granger causality test initiated after the VAR estimation indicated that there is unidirectional causal relationship between profitability and liquidity variables in UK bank as liquidity granger cause changes in ROA which is consistent with previous studies (Dabiri et. Al, 2017).

Thirdly, the research question seeks to understand impact of liquidity levels on the profits taken by British Banks. Conclusively, the analysis made so far demonstrated that ordinary regression analysis does not explain the relationship between these two variables as the result do not conform with individual statistical significance of each of the variables. Further investigations were conducted by the researcher and it showed that all variables possess unit roots implying stationarity is found among the variables with cointegration existent in the variables. In both short and long run, liquidity conversely affects the propensity of profitability in UK banks. However, the granger causality test initiated after the VAR estimation indicated that there is unidirectional causal relationship between profitability and liquidity variables in UK bank as liquidity granger cause changes in ROA.

However, our results show immediate and short run inverse relationship between liquidity and profitability but in the long run also proves that liquidity granger causes ROA.

### **5.5 Policy Recommendation**

As a cursor from the findings and conclusion earlier reached in this study, it is recommended that the Bank of England in activity and measures should be conscious and responsive of the impulses in liquidity reserve levels of the banks in order to sustain higher profitability levels banks in the system. Caution should be taken as other factors such as total assets, loans and bank credit play their primary role in liquidity sustenance and should not be neglected because they don't play impulsive roles on profitability of UK banks

### **5.6 Limitations of the Study**

The following limitations should be noted for the study.

1. The investigation of profitability and liquidity as gathered and reflected by the data available for the variables.

2. The researcher is limited from assessing individual banks and their statistical figures for liquidity and profitability variables. However, the researcher relied on aggregate data on total loans, total bank credit, total assets reflected by the entire banks in UK and as found on statistical websites of World Bank Indicators and St FredLouis.

3. Other components that also affect and impact both profitability and liquidity such as current assets, total liabilities were not incorporated in study model as data were not easily found/readily available.

### **5.7 Further Study Recommendations**

1. Profitability and liquidity preferences can be studied from the angle of other non-financial firms such as companies, businesses n stock exchange market etc.
2. Other components such as total liability, current assets, market share, and capital ratio can be incorporated into the model to capture a more robust study.

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## APPENDICES

### Appendix 1: Data

year	roa	bank credit	total liquidity	bank assets	loans	roe
1996	1.07	0.50	1.4	14.68	742.81	20.97
1997	1.02	0.55	1.7	15.71	888.31	17.34
1998	1.07	0.59	2	16.45	973.49	17.95
1999	0.64	0.64	2	16.44	1054.74	10.24
2000	1.29	0.70	1.9	15.41	1188.25	18.04
2001	0.69	0.78	2	14.13	1211.69	8.47
2002	0.95	0.85	2.3	14.83	1289.26	9.90
2003	1.16	0.93	2.8	16.58	1395.25	10.81
2004	1.90	1.03	3.2	18.54	1489.30	34.46
2005	0.72	1.15	3.1	18.56	1630.39	16.55
2006	0.63	1.28	4	18.75	1790.00	17.43
2007	0.70	1.47	4.5	19.65	2128.45	19.69
2008	0.12	1.61	3.8	16.26	2630.30	4.02
2009	-	1.72	4.2	12.35	2511.48	-1.55
2010	-	1.70	4.1	13.26	2541.57	-0.29
2011	0.07	1.69	3.8	15.04	2428.79	1.37
2012	-	1.71	3.8	16.44	2439.18	-4.77
2013	0.19	1.70	4	18.12	2378.20	3.79
2014	0.25	1.71	3.7	21.77	2266.47	4.60
2015	0.47	1.74	3.5	22.11	2298.07	7.31
2016	0.33	1.80	3.1	20.71	2436.94	4.03
2017	0.41	1.91	3.6	20.24	2563.94	6.17

### Appendix 2: Correlation Result

	ROA	TASSETS	LOANS	LIQ	BCREDIT
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ROA	1	0.033435	-0.77999	-0.61864	-0.75317
TASSETS	0.033435	1	0.283905	0.294025	0.387533
LOANS	-0.77999	0.283905	1	0.892484	0.986117
LIQ	-0.61864	0.294025	0.892484	1	0.881934
BCREDIT	-0.75317	0.387533	0.986117	0.881934	1

### Appendix 3: Regression results

Dependent Variable: ROA				
Method: Least Squares				
Date: 02/06/21 Time: 07:35				
Sample: 1996 2017				
Included observations: 22				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TASSETS	0.0702181 7	0.03572052	1.9657655 86	0.065877 143
LOANS	- 0.0002526 65	0.00085424	- 0.2957777 82	0.770982 224
LIQ	0.1741909 77	0.160083999	1.0881223 5	0.291727 657
BCREDIT	- 0.9089996 12	1.123905092	- 0.8087868 08	0.429812 096
C	0.4751899 49	0.652059894	0.7287519 95	0.476073 752
R-squared	0.7118660 96	Mean dependent var		0.608181 818
Adjusted R-squared	0.6440698 84	S.D. dependent var		0.520161 48
S.E. of regression	0.3103277 1	Akaike info criterion		0.694340 588
Sum squared resid	1.6371558 85	Schwarz criterion		0.942304 782
Log likelihood	- 2.6377464 64	Hannan-Quinn criter.		0.752753 496
F-statistic	10.500086 49	Durbin-Watson stat		1.807803 958
Prob(F-statistic)	0.0001798 02			

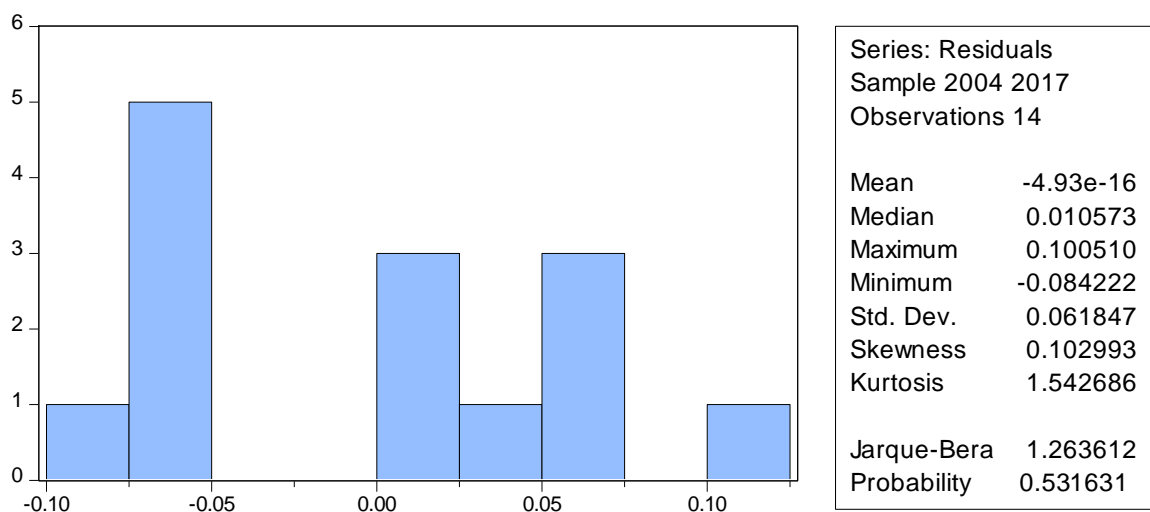
### Appendix 4: Unit Root Result



Null Hypothesis: BCREDIT has a unit root				
Exogenous: Constant				
Lag Length: 1 (Automatic - based on SIC, maxlag=4)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-0.843822857	0.784260302
Test critical values:	1% level		-3.808545573	
	5% level		-3.02068565	
	10% level		-2.650412647	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(BCREDIT)				
Method: Least Squares				
Date: 07/06/20 Time: 15:58				
Sample (adjusted): 1998 2017				
Included observations: 20 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BCREDIT(-1)	-0.016729026	0.019825282	-0.843822857	0.410485628
D(BCREDIT(-1))	0.718372131	0.166541288	4.313477695	0.000471112

C	0.0425 09852	0.03029437 2	1.4032 26058	0.1785 50743
R-squared	0.5540 53886	Mean dependent var		0.068
Adjusted R-squared	0.5015 89638	S.D. dependent var		0.0560 63873
S.E. of regression	0.0395 80077	Akaike info criterion		- 3.4835 00669
Sum squared resid	0.0266 31902	Schwarz criterion		- 3.3341 40828
Log likelihood	37.835 00669	Hannan- Quinn criter.		- 3.4543 44059
F-statistic	10.560 59889	Durbin- Watson stat		1.5328 90027
Prob(F-statistic)	0.0010 4448			

### Appendix 5: Normality Distribution Results



### Appendix 6: Heteroskedasticity Test Result

Heteroskedasticity Test: Breusch-Pagan-Godfrey				
Null hypothesis: Homoskedasticity				
F-statistic	13.274 75133	Prob. F(5,8)		0.0010 5559

Obs*R-squared	12.494 09247	Prob. Chi-Square(5)		0.0286 10221
Scaled explained SS	1.1069 99883	Prob. Chi-Square(5)		0.9534 82213
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 07/06/20 Time: 16:17				
Sample: 2004 2017				
Included observations: 14				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.0159 10058	0.00549062 8	2.8976 75499	0.0199 62735
BCREDIT	0.0093 28107	0.00527685 4	1.7677 40352	0.1150 81779
LOANS	-8.05E- 06	3.46E-06	- 2.3272 01981	0.0483 72515
LIQ	- 0.0023 61824	0.00090119	- 2.6207 83969	0.0306 1317
ROE	0.0001 32195	7.53E-05	1.7544 55958	0.1174 33812
TASSETS	-6.96E- 05	0.00018616 1	- 0.3736 90632	0.7183 43488
R-squared	0.8924 35177	Mean dependent var		0.0035 5188
Adjusted R-squared	0.8252 07162	S.D. dependent var		0.0027 15345
S.E. of regression	0.0011 35238	Akaike info criterion		- 10.426 42185
Sum squared resid	1.03E- 05	Schwarz criterion		- 10.152 54014

Log likelihood	78.984 95298	Hannan- Quinn criter.		- 10.451 77461
F-statistic	13.274 75133	Durbin- Watson stat		1.5682 82362

### Appendix 7: Serial AutoCorrelation Test

Breusch-Godfrey Serial Correlation LM Test:				
Null hypothesis: No serial correlation at up to 2 lags				
F-statistic	0.2127 18838	Prob. F(2,6)		0.8142 27197
Obs*R-squared	0.9269 60586	Prob. Chi-Square(2)		0.6290 90412
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 07/06/20 Time: 16:20				
Sample: 2004 2017				
Included observations: 14				
Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BCREDIT	0.0409 76268	0.49411144 1	0.0829 29204	0.9366 05308
LOANS	- 2.17E- 05	0.00036860 6	- 0.0588 42651	0.9549 88279
LIQ	0.0018 17567	0.09564152 4	0.0190 03949	0.9854 54153
ROE	0.0002 49672	0.00651155 3	0.0383 42879	0.9706 58235
TASSETS	0.0004 41277	0.01444614 4	0.0305 46377	0.9766 22042
C	- 0.0316 39542	0.59871543 1	- 0.0528 45709	0.9595 70382

RESID(-1)	0.1868 40839	0.65412989 9	0.2856 32623	0.7847 64036
RESID(-2)	- 0.2397 85948		- 0.3194 25993	0.7602 32477
R-squared	0.0662 1147	Mean dependent var		- 4.93E- 16
Adjusted R-squared	- 1.0232 08481	S.D. dependent var		0.0618 47404
S.E. of regression	0.0879 71459	Akaike info criterion		- 1.7280 49344
Sum squared resid	0.0464 33866	Schwarz criterion		- 1.3628 73727
Log likelihood	20.096 34541	Hannan- Quinn criter.		- 1.7618 53023
F-statistic	0.0607 76811	Durbin- Watson stat		1.8913 03941
Prob(F-statistic)	0.9991 68323			

Vector Autoregression Estimates				
Date: 02/07/21 Time: 07:56				
Sample (adjusted): 1998 2017				
Included observations: 20 after adjustments				
Standard errors in ( ) & t- statistics in [ ]				
	LIQ	BCREDIT	TASSETS	LOANS
LIQ(-1)	0.439306 737	0.0151511 51	1.5501604 16	89.67200 299
	0.422810 291	0.0359823 56	1.0968123 85	86.30667 999
	[ 1.03902]	[ 0.42107]	[ 1.41333]	[ 1.03899]
LIQ(-2)	0.574100 935	0.0477478 15	- 1.6434000 86	34.03288 034

	0.709985 554	0.0604217 86	1.8417738 8	144.9266 903
	[ 0.80861]	[ 0.79024]	[-0.89229]	[ 0.23483]
BCREDIT(-1)	6.742782 615	1.5408871 71	- 3.8044242 55	2777.077 725
	4.918536 943	0.4185814 57	12.759179 13	1004.002 512
	[ 1.37089]	[ 3.68121]	[-0.29817]	[ 2.76601]
BCREDIT(-2)	- 1.235290 25	- 0.1231458 47	14.802523 38	- 1005.807 139
	4.903745 302	0.4173226 47	12.720808 12	1000.983 15
	[- 0.25191]	[-0.29509]	[ 1.16365]	[- 1.00482]
TASSETS(-1)	- 0.176649 466	- 0.0082902 66	0.6919458 35	- 20.86682 155
	0.170762 279	0.0145323 55	0.4429745 14	34.85706 409
	[- 1.03448]	[-0.57047]	[ 1.56204]	[- 0.59864]
TASSETS(-2)	0.019065 12	0.0068293 93	- 0.1539931 12	1.584185 559
	0.123469 374	0.0105075 94	0.3202919 65	25.20334 062
	[ 0.15441]	[ 0.64995]	[-0.48079]	[ 0.06286]
LOANS(-1)	- 0.002056 433	- 0.0001324 16	- 0.0061391 95	- 0.030347 771
	0.002477 365	0.0002108 31	0.0064265 35	0.505695 314
	[- 0.83009]	[-0.62807]	[-0.95529]	[- 0.06001]
LOANS(-2)	- 0.001975 622	- 0.0002761 99	- 0.0005091 89	- 0.532085 344
	0.001904 872	0.0001621 1	0.0049414 3	0.388834 456

	[- 1.03714]	[-1.70378]	[-0.10304]	[- 1.36841]
C	2.818367 567	0.0810891 56	6.7958538 24	592.7171 382
	2.143411 547	0.1824104 08	5.5602249 59	437.5265 66
	[ 1.31490]	[ 0.44454]	[ 1.22223]	[ 1.35470]
ROA	0.356388 165	0.0224632 78	1.2214957 85	- 65.22492 296
	0.325899 349	0.0277349 6	0.8454156 63	66.52461 268
	[ 1.09355]	[ 0.80993]	[ 1.44485]	[- 0.98046]
R-squared	0.883281 726	0.9971294 85	0.9277936 84	0.990235 832
Adj. R-squared	0.778235 279	0.9945460 21	0.862808	0.981448 081
Sum sq. resids	1.547917 753	0.0112107 84	10.416491 77	64497.90 453
S.E. equation	0.393435 859	0.0334825 09	1.0206121 58	80.31058 743
F-statistic	8.408487 409	385.96609 67	14.276893 39	112.6836 456
Log likelihood	- 2.790554 358	46.487343 32	- 21.855350 9	- 109.1653 281
Akaike AIC	1.279055 436	- 3.6487343 32	3.1855350 9	11.91653 281
Schwarz SC	1.776921 573	- 3.1508681 95	3.6834012 27	12.41439 894
Mean dependent	3.27	1.3355	17.282	1932.288
S.D. dependent	0.835463 943	0.4533788 35	2.7554741 69	589.6283 851
Determinant resid covariance (dof adj.)		0.1170369 83		
Determinant resid covariance		0.0073148 11		
Log likelihood		- 64.336542 47		
Akaike information criterion		10.433654 25		

Schwarz criterion		12.42511879		
Number of coefficients		40		
Pairwise Granger Causality Tests				
Date: 02/06/21 Time: 09:21				
Sample: 1996 2017				
Lags: 2				
Null Hypothesis:	Obs	F-Statistic	Prob.	
TASSETS does not Granger Cause ROA	20	0.801484125	0.466972615	
ROA does not Granger Cause TASSETS		0.652195776	0.535056901	
LOANS does not Granger Cause ROA	20	3.523423445	0.055665459	
ROA does not Granger Cause LOANS		0.699141333	0.512503317	
LIQ does not Granger Cause ROA	20	4.66786955	0.026536912	
ROA does not Granger Cause LIQ		3.47356513	0.057590571	
BCREDIT does not Granger Cause ROA	20	2.454743988	0.11960071	
ROA does not Granger Cause BCREDIT		3.295665045	0.065101196	
LOANS does not Granger Cause TASSETS	20	5.268844713	0.018485127	
TASSETS does not Granger Cause LOANS		2.234615216	0.141438797	
LIQ does not Granger Cause TASSETS	20	0.435117545	0.655102478	
TASSETS does not Granger Cause LIQ		0.58086886	0.571510263	
BCREDIT does not Granger Cause TASSETS	20	1.736059413	0.209801742	
TASSETS does not Granger Cause BCREDIT		5.554763239	0.015656402	
LIQ does not Granger Cause LOANS	20	4.945217327	0.022409947	
LOANS does not Granger Cause LIQ		0.711927743	0.506548554	
BCREDIT does not Granger Cause LOANS	20	18.45052966	9.05E-05	
LOANS does not Granger Cause BCREDIT		8.113569876	0.004089714	
BCREDIT does not Granger Cause LIQ	20	1.371767073	0.283715781	
LIQ does not Granger Cause BCREDIT		0.045688795	0.955471643	



## **PLAGIARISM REPORT**

# Thesis MM

*by* Thesis Mm Thesis Mm

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## ETHICS COMMITTEE APPROVAL

### ETHICS LETTER

TO GRADUATE SCHOOL OF SOCIAL SCIENCES

1- REFERENCE: MOHAMED OMED IKRAM (20193789)

I would like to inform you that the above candidate is one of our postgraduate students in the Department of Banking and Accounting . He has taken his thesis under my supervision and the thesis titled: Bank Profitablity and Impact of Liquidity Management: Case of Birtish Banks

- The data used in his study was obtained from World Bank Database.
- Please do not hesitate to contact me if you have any further queries or questions.

Sincerely yours,

*Assoc. Prof. Dr. Turgut Türsoy*

Assoc Prof. Dr Turgut Türsoy

**Head of Department of Banking and Finance,  
Faculty of Economics and Administrative Sciences,**