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**THE EFFECT OF MACRO ECONOMIC VARIABLES ON PERFORMANCE OF
UGANDA'S BANKING SECTOR (2008 Q3 – 2018 Q1)**

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DEDICATION

TO MY PARENTS, MR. & MRS. BYORUGANDA;

My rocks,

My strength,

My daily blessings,

I love you to the moon & beyond.

TO MY SIBLINGS; BARBARA, PAMELA, VICTOR, MOSES & EDGAR;

When I count my blessings, I count you more than once.

TO GOD;

Who gives me wisdom, &

Blesses me more and more each moment,

I love you every day.

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ACRONYMS

BIS – Bank of International Settlements

BOU – Bank of Uganda

CPI – Consumer price index

IMF - International Monetary Fund

FSIs - Financial Soundness Indicators

FSR – Financial Stability Report

GDP – Gross Domestic Product

GFC – Global Financial Crisis

MFI – Microfinance Institutions

NIM - Net Interest Margin

OLS – Ordinary Least Squares

PwC – PricewaterhouseCoopers

REER – Real Effective Exchange Rate

ROA – Return on Assets

ROE - Return on Equity

USD – United States Dollar

USh – Uganda Shillings

ABSTRACT

Back in the 1930s, a fall in stock prices led to a drop in worldwide GDP, thereby highlighting the relationship between the macro-economy and the financial sector. Particularly for banking sectors, literature (for example Qinhuo and Meiling, 2014) often concludes that Macroeconomic policy is crucial for the development of a sound banking system. While it is evident that past research has been carried out to assess the impact of macroeconomic factors on bank profitability in various parts of the world, research that aims to explore the effect of macroeconomic dynamics on bank profitability in East Africa, Uganda in particular, is limited.

Based on this back ground, the study employed ordinary least squares method (OLS) to assess the effect of macroeconomic variables namely; gross domestic product, inflation rate, real effective exchange rate, lending rate and the 91-day Treasury bill rate, on performance (proxied by return on equity) of Uganda's banking sector. The study covered a time period from September, 2008 to March, 2018.

Overall, the study findings from the multiple linear regression specified that GDP, real effective exchange rate and 91-day treasury bill rate had a negative effect on bank profitability while inflation rate and the lending rate positively influenced profitability within Uganda's banking sector between September, 2008 and March, 2018. Evidently though, only the effects of GDP and inflation rate were found to be significant at 5 percent, while lending rate was significant at 10 percent. The main recommendation from the study is the need for commercial banks to put in place measures that can ably help them forecast the inflation rate so that they can benefit from a higher inflation rate and increase their profitability.

CHAPTER ONE

GENERAL INTRODUCTION

1.0 Introduction

The relationship between the macro economy and the financial system dates as far as the 1930s when a fall in stock prices resulted into a decline of worldwide Gross Domestic Product (GDP) by 15 percent and eventually, the Great depression. The global financial crisis (GFC) which is commonly believed to have begun in July 2007 with the credit crunch, when a loss of confidence by US investors in the value of sub-prime mortgages caused a liquidity crisis is also testimony to the relationship between the financial sector and the macro economy.

Focusing particularly on banking sectors and the macro economy, the link between them is also evident from multiple research studies carried out (for example Qinhua and Meiling, 2014) which often concluded that Macroeconomic policy and prudent management decisions in relation to macroeconomics are crucial for the development of a sound banking system. These studies also showed that the more developed a banking system was, the more efficient and healthy was that nation's economic growth.

In Uganda, just like in all other East African countries, the banking sector dominates the financial system. However, banks are faced with several challenges such as delayed loan repayment and non-payment by borrowers, which eventually reduce banks' interest incomes and profits in general. The risk of defaulting on bank loans can be caused by macroeconomic as well as microeconomic factors. Understanding the effect of macroeconomic variables on the performance of Uganda's banking sector therefore is important for the soundness of the sector. Whereas Macroeconomic variables are not, of course the only influence on the performance of banking sectors, they have a major impact on it.

While several studies that have been conducted on the correlation between the macro economy and the financial sector show that most macroeconomic variables indeed affect the performance of banks world over (for example Afanasieff et al., 2002; Ćuraka et al., 2012; Martinho et al., 2017), empirical evidence clearly shows that findings focusing on Uganda's banking sector are still scanty and limited (Mugume, 2010), while the few studies which have been undertaken highlight a need for further investigation. The study therefore, was meant to bridge this gap by establishing the effect of macroeconomic variables on the performance of Uganda's banking sector over the period 2008 to 2018.

This study was also appropriate given that Uganda's banking industry has faced several challenges in the recent past, including the closure of a Domestic Systemically Important Bank (D-SIB)¹, yet no known study has investigated the impact of either internal (microeconomic) or external (macroeconomic) factors on banks' performance. Understanding the effect of macroeconomic variables on performance of the banking sector would therefore go a long way to informing policy decisions.

The rest of the chapter is organised as follows; background of the study, followed by statement of the problem, objectives of the study, research questions, hypotheses, scope of the study, justification of the study, significance of the study, structure of the study and finally the conceptual framework.

1.1 Background of the study

1.1.1 Evolution of banking sectors

¹ A D-SIB is a bank that may not be significant from an international perspective, but nevertheless could have an important impact on the domestic financial system and economy compared to a non-systemic one.

Historically, banking sectors, as we know them today, are the result of a long process. At the beginning, there was no money hence there were no banks. People engaged in barter trade, that is; the exchange of merchandise for merchandise, without value equivalence. This exchange, however, had its short comings, since there was no a common measure of value among the items bartered (Central Bank of Brazil, 2011). With time, trade moved away from barter trade to use of commodity money. Some commodities, for their utility, came to be more sought after than others. Salt for example was used as commodity money. Later however, commodity money became inconvenient for commercial trade due to changes in the value of commodities and their very perishable nature.

When man discovered metal, it became the new main standard of value. This was because of its possibility of appreciating, its divisibility, ease of transportation and beauty. In the 7th century B.C., metal was then transformed into coins as a new form of currency. The first metals used in coinage were gold and silver. These metals were employed for their rarity, beauty, immunity to corrosion, economic value, and for old religious habits. Coins came to circulate for their face value, which is independent of their metal content. In the middle ages, it was common to keep values with goldsmiths and persons trading with gold and silver items. The goldsmith, as a guarantee, delivered receipts which came to be used to make payments, circulating from hand to hand, hence giving origin to paper money. In Brazil, the first bank notes were issued by Banco do Brazil in 1810. (Central Bank of Brazil, 2011)

Eventually, different governments came to conduct the issue of notes, controlling counterfeits and securing the power to pay. Today, all countries around the world have Central Banks which are in charge of issuing coins and notes. The set of coins and bank notes used by a country form its monetary system. The system is regulated by appropriate legislation and organized from a monetary unit, its base value. Countries, through their central banks, control and guarantee the issue of money and through their banking sectors; they play an important role of

being financial intermediaries. They accept deposits and avail credit to those who do not have enough (borrowers) to carry out a desired activity.

Therefore, banking sectors were not invented by a stroke of genius, but originated from a need, and their evolution reflects the willingness of man to harmonize monetary instruments to the reality of economies.

1.1.2 Banking sectors in Sub-Saharan Africa

In sub-Saharan Africa (SSA), financial sectors are generally underdeveloped with banking systems accounting for the majority of financial sector assets and activities. A recent World Bank study notes that SSA typically scores lowest among the world's developing sub regions on various dimensions of financial development, such as depth and efficiency of financial institutions (Čihák et al., 2012).

Nonetheless, SSA banking systems were well positioned to handle the financial turmoil created by the onset of the global financial crisis in 2008, given low leverage, generally healthy capitalization levels, ample liquidity, little reliance on external funding, and little if any exposure to toxic financial assets. Banking systems in SSA, in the main, came under pressure indirectly via international trade linkages, as the global economic downturn fed into reduced exports and slower domestic economic growth, in turn adversely affecting borrowers and contributing to rising levels of non-performing loans (NPLs). These effects were more marked in countries where income growth slowed substantially, as happened in several middle-income countries, but also occurred in some countries where aggregate growth remained robust throughout. Also, sharp exchange rate depreciations in a number of countries during 2008–09 created difficulties for bank clients with significant net open foreign exchange positions. The impact of these developments on financial sector soundness in the region was relatively modest in the aggregate, although banks in some countries experienced significant adverse shocks.

Financial soundness indicators point to a modest decline in capital adequacy ratios in 2010, with rising NPLs taking a toll on profitability. There was some recovery in capital adequacy ratios in 2011, along with a reported drop in the NPL ratio. Although bank profitability levels in the region have typically been quite high, the data point to a trend decline in returns on assets and on equity over the past several years, with 2009 being a particularly bad year (Montfort et al, 2013).

In Kenya, the History of Banking traces its roots to early European trade of East African Coast and in Zanzibar. The setting up of the Imperial British East Africa Company (IBEAC) captured the attention of National Bank of India (NBI) which sought to be its banking agent.

Today, Kenya's financial system comprises of several commercial banks, non-bank financial institutions, a range of insurance companies and a stock exchange. There has been a three-fold growth in the number of commercial banks in Kenya over the last thirty years. There has also been a phenomenal growth of non-bank financial intermediaries and the insurance industry has similarly experienced a rapid expansion, both in terms of numbers and services offered. The country also has thousands of savings and credit associations to which most Kenyan workers belong and which have become important avenues for mobilization of savings (Evans, 2008; Ongore, 2009)

1.1.3 Evolution of Uganda's banking sector

Prior to independence in 1962, Uganda's banking sector was dominated by foreign owned commercial banks. In 1966, the Bank of Uganda became the Central Bank, controlling all currency issues and foreign exchange management (Nsambu, 2015). The banking sector in Uganda underwent significant restructuring in the early 2000s, when several indigenous commercial banks were then declared insolvent, taken over by the Central Bank and eventually

either sold or liquidated. Therefore in the passage of the banking bill of 2004 in parliament, new banking institution classification guidelines were established. The halt on new banks was lifted in July 2007 and new commercial banks were licensed. During 2008 and 2009, several existing banks went on an accelerated branch expansion either through mergers and acquisition or through new branch openings and this was recorded to be the highest growth in the years (Bank of Uganda, 2013).

Currently, Uganda's financial system is composed of formal institutions, semi informal institutions and informal institutions. The formal institutions include commercial banks, Microfinance Deposit-taking institutions (MDIs), Credit institutions (CIs), Insurance companies, Development Banks, Pension Funds and Capital Markets. Semi informal institutions include savings and Credit Cooperative Associations (SACCO) and the other Microfinance institutions, whereas the informal ones are mostly village savings and loans associations. Formal institutions are less prominent in rural areas than urban areas, only serving 14 percent of the rural population. Informal institutions play an important role in the rural service provisions, serving approximately 12 percent of the rural population (ABC Capital Bank, 2012).

In the year to December 2018, Uganda's banking sector comprised of 24 commercial banks with total assets of US\$24.9 trillion, 570 bank branches and 860 automated teller machines (ATMs) were operated by commercial banks. There was deterioration in loan quality, with the level of non-performing loans (NPLs) to total gross loans rising from 5.3 percent to 10.5 percent between December 2015 and December 2016. This led to a slowdown of private sector credit growth and a drop in banking sector profitability. (BOU Annual report, 2016).

Banks' annual after tax profits reduced by 44.2 percent or US\$239.1 billion from US\$541.2 billion during 2015 to US\$302.1 billion during 2016. As a result, the industry average return

on total equity (ROE) dropped from 16.0 percent to 8.3 percent while average return on assets (ROA) halved to 1.3 percent during that period. Increased provisioning for bad debts also reduced the banking sector's earnings for the year under review. The provisions rose by more than 100 percent (US\$419.4 billion) to reach US\$637.2 billion in 2016 (BOU Annual Supervision Report, 2016).

1.1.4 Conceptual background

Description of macroeconomic variables

Conceptually, the study constituted four macroeconomic variables which also acted as the independent variables. These were gross domestic product, rate of inflation, interest rates and the exchange rate.

Economic theory defines Gross Domestic Product (GDP) to mean the monetary value of final goods and services produced in a country in a given period of time for example a quarter or a year. GDP is composed of goods and services produced for sale in the market and, also include some non-market production, such as defence or education services provided by the government. However, not all productive activity is included in GDP for example, unpaid work (such as that performed in the home or by volunteers) and black-market activities because they are difficult to measure and value accurately. Gross Domestic Product was employed in this study because it has an effect on bank profitability based on economic theory. A growing economy promotes consumer and social investment, thereby increasing the demand for bank credit. In turn, banks generate more interest income, thereby increasing profits. In addition, economic growth, as measured by GDP, promotes more trading activity, which increases the intermediate business income of banks, and also leads to profits increasing. (IMF, 2008)

Operationally in this study, GDP was measured as quarterly real GDP. Since Gross Domestic Product is collected at current or nominal prices, it is not possible to compare different time

periods without making adjustments for inflation. Real GDP is a measure of productivity that is not affected by rising prices. To determine real GDP therefore, the nominal value must be adjusted to take into account price changes and hence ascertain whether the total value of output has increased either because more is being produced or simply because prices have increased. Quarterly real GDP was employed in the study to make it comparable with the other variables in this study. Mathematically, real GDP is represented by;

$$Real\ GDP = \frac{Nominal\ GDP}{GDP\ Deflator^2}$$

Contextually, Uganda's economic activity strengthened during 20017/2018 with estimated growth of 5.8 percent, higher than the 3.9 percent achieved in the financial year of 2016/2017. The growth was strong in all domestic sectors of the economy. Real GDP growth is projected to strengthen further supported by a more relaxed monetary policy stance, recovery in external demand and Foreign Direct Investment (BOU Annual Report, 2017/2018).

Inflation Rate is the second macroeconomic variable that was employed in this study. Inflation Rate is defined as the persistent increase in the prices of goods and services over time. It cannot be measured by an increase in the cost of one product or service, or even several products or services but rather, inflation is a general increase in the overall price level of the goods and services in the economy. Inflation can also be used to describe a rise of average prices through the economy which then means that money is losing its value. The underlying cause is usually that too much money is available to purchase too few goods and services, or that demand in the economy is outpacing supply. In general, this situation occurs when an economy is so buoyant that there are widespread shortages of labour and materials. People can charge higher

² GDP deflator is a price index that measures the overall level of prices of goods and services included in GDP. It is the amount by which nominal GDP must be divided to obtain real GDP.

prices for the same goods or services. The interest in using inflation was drawn from the fact that the persistent increase in prices of goods and services can affect the profitability of commercial banks by reducing the real income of consumers, hence making consumers more willing to invest in other financial products that have higher rate of return. Inflation also affects fiscal policy and results into tight monetary policy which slows down economic growth, thus reducing bank profitability (Liu, 2011).

Operationally, inflation was considered as headline inflation which was measured by the Consumer Price Index (CPI). The CPI reflects the percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specific intervals, such as quarterly or annually (IMF). In this study, the percentage change in the CPI over a given quarter was used to derive the amount of inflation over that quarter.

Contextually, during the financial year 2017/18, Uganda's inflation remained subdued. However it is projected to increase to 5 percent (Central Bank's target in the medium term). Nonetheless, outlook for inflation is subject to several external environment and domestic economy risks. (BOU Annual Report, 2017/2018)

The third macroeconomic variable that was employed in this study as an explanatory variable was the rate of foreign exchange. Rate of foreign exchange is regarded as the value of one country's currency in terms of another currency. Exchange rates are quoted as foreign currency per unit of domestic currency or domestic currency per unit of foreign currency. The rate of foreign exchange highlights a depreciation or appreciation of one currency against another. Appreciation is an increase in the value of a currency relative to another currency. An appreciated currency is more valuable (more expensive) and therefore can be exchanged for or can buy a larger amount of foreign currency. If two governments let the exchange rate between their countries be determined by free market forces, then it is said to be a floating exchange

rate. It is common for countries supposedly adopting a floating exchange rate to set monetary policy with at least some concern for the value of their currency so the concept of a pure float is an idealized concept. The advantage of adopting a floating exchange rate is that a country is then isolated from business cycle shocks in other countries. Exchange rate affects bank profitability by increasing the total non-performing loans in case of loan default following depreciation in the domestic currency. In addition, when banks lend to customers who do not have a direct source of income denominated in foreign currency, a more expensive foreign currency due to a decline in the local currency makes it hard for borrowers to meet their obligations (Beck et al., 2013).

Operationally, rate of foreign exchange was represented by the real effective exchange rate (REER). REER is a measure of the value of a currency against a weighted average of several foreign currencies (nominal effective exchange rate), divided by a price deflator or index of costs. An increase in REER implies that exports have become more expensive and imports have become cheaper. Therefore, an increase in the REER indicates a loss in trade competitiveness. (IMF, 2015)

Contextually, year on year analysis shows depreciation in the Uganda shilling by 6.9 percent in June 2018. The Shilling continued to be affected by both external and domestic factors on account of the open economy. During the 2017/2018 financial year, the Uganda shilling depreciated by 4 percent to USh.3,659.2 against the US Dollar, from USh.3,529.7 against the UA Dollar in the previous financial year. Similarly, real effective exchange rate (REER) depreciated by 7 percent in June 2018 compared to a depreciation of 3.1 percent in June 2016. (BOU, 2018)

The forth independent variable employed for the study was the interest rate. According to the World Bank, an interest rate is the bank rate which normally meets the short and medium term

funding needs of the private sector. It is the degree at which interest is paid by borrowers for the use of money that they borrow from lenders. Particularly, interest rate is a percentage of principal paid a certain number of times per period for all periods during the total term of the loan. Like GDP, interest rates have nominal and real versions. The nominal interest rate is the cost of a loan that is not adjusted for inflation. The nominal interest rate, like nominal price, is the price we see on the “price tag” of the loan. A rise in interest rates could reduce the number of loans, thereby leading to changes in profitability of a commercial bank. (Zhang, 2012)

Two distinct operational definitions of interest rates were used in this study that is; the 91-day Treasury bill rate and the shilling lending rate. These were intended to capture the two different sources of income for banks. The 91-day Treasury bill is a short term debt instrument issued by national governments purposefully to generate quick funds needed to finance outstanding obligations (IMF). In Uganda, the 91-day Treasury bill rate is defined as a weighted average rate of the bi-weekly auctions of 91-day treasury bills (Bank of Uganda). This rate was used to weigh the amount of banks’ funds earned from the government securities’ market. The shilling lending rate was used in this study to provide a measure for level of income generated by banks from customer borrowing.

Contextually, the 91-day Treasury bill rate was 8 percent at the end of December 2017, down from 13 percent in the previous year. The prime lending rates on shilling denominated loans trended downwards during 2017, reflecting a combination of factors, including lower costs of doing business, ease in evaluating credit worthy borrowers as well as the reduction in the Central Bank Rate (CBR). The CBR reduced from 12 percent to 9.5 percent during the period under review while the Weighted Average Lending Rates on shilling loans, fell from 22.7 percent in December 2016 to 20.3 percent in December 2017 (BOU, 2018)

Other macroeconomics variables that could have be considered for this study include terms of trade, rate of unemployment, and balance of payment, among others.

Terms of trade (TOT) refers to the relative price of exports in terms of imports. It is the ratio of export prices to import prices and can be interpreted as the amount of import goods an economy can purchase per unit of export goods. (Bureau of Economics Analysis, 2009)

Mathematically, terms of trade can be represented as;

$$TOT = \frac{\text{Index of Export price}}{\text{Index of Import price}}$$

Rate of unemployment refers to the percentage of the total workforce that is unemployed but are actively looking for employment. It is the number of unemployed persons divided by the labor force, where the labor force is the number of unemployed persons plus the number of employed persons. Unemployment rate is one of the most closely watched statistics due to its effect on the economy. A rising rate for example is seen as a sign of a weakening economy that may call for reduction in interest rates. A falling rate, similarly, indicates a growing economy which is usually accompanied by higher inflation rate and may result in an increase in interest rates (Gregory, 2010). Unemployment was not used in this study due to data challenges.

The balance of payments is an accounting of a country's international transactions over a certain time period, typically a calendar quarter or year. It shows the sum of the transactions—purely financial ones, as well as those involving goods or services—between individuals, businesses and government agencies in that country and those in the rest of the world. Every international transaction results in a credit and a debit. Transactions that cause money to flow into a country are credits, and transactions that cause money to leave a country are debits. (Gregory, 2010)

Description of the dependent Variable

The dependent variable, performance of Uganda's banking sector, was measured by profitability of the sector. Bank profitability can be measured by several indicators such as Return on Equity (ROE), Return on Assets (ROA) and Net Interest Margin (NIM).

Operationally, in this study, bank profitability was measured based on return on equity (ROE). Return on Equity is a profitability indicator that is intended to measure a bank's efficiency in using its shareholder's equity. It measures the rate of return earned or lost from the business vis-a-vis the amount of capital invested into the business. ROE reflects how effectively a bank's management is using investors' funds. As such, it can be deduced from the above statement that a large ROE shows better utilization of capital. ROE was employed to measure bank profitability because a high return on equity shows that the bank is generating more income internally while a low return on equity shows that the bank is earning less from its investment. Thus, the higher the ROE the better the company is in terms of profit generation. (Irina and Zelgalve, 2014)

Return on equity is calculated by dividing net income before extraordinary items and taxes, from the beginning of the year to the end of the reference period, by the average value of shareholders' equity over the same period. (IMF FSIs compilation guide, 2006)

$$ROE = \frac{\text{Net income before tax}}{\text{Average equity}}$$

Contextually, profitability of Uganda's banking industry reduced in the year to June 2017, mainly due to increased provisioning and an overall rise in operating costs. On the income side, net interest margins widened, driven by interest incomes from increased investment in government securities and reduced interest expenses, and despite the drop in income from loans and advances. Banking industry aggregate net after-tax earnings declined by 16.7 percent, from

US\$485.6 billion in the year to June 2016 to US\$404.5 billion in the year to June 2017. The decline was mainly as a result of increased costs, particularly through provisioning for bad debt which increased by 14.5 percent, from US\$364.1 billion in the year to June 2016 to US\$531.1 billion in the year to June 2017 (BOU Financial Stability report, 2017)

On the other hand, Return on Assets (ROA) is a profitability ratio that is aimed at computing a bank's competence in using its assets. It measures the earnings or losses from the business given the amount of assets invested into the business. ROA also measures the ability of the bank management to generate income by utilizing company assets at their disposal. In other words, it shows how resources of a company are used to generate income. It further indicates efficiency of the management of a company in generating income from all the resources of the institution (Khrawish, 2011).

Net Interest Margin is a measure of the difference between the interest income generated by banks and the amount of interest paid out to their lenders (for example, deposits), relative to the amount of their interest earning assets. It is usually expressed as a percentage (Gul et al., 2011). Net interest margin measures the gap between the interest income the bank receives on loans and securities and interest cost of its borrowed funds. It reflects the cost of bank intermediation services and the efficiency of the bank. The higher the net interest margin, the higher the bank's profit and the more stable the bank is. Therefore, it is one of the key measures of bank profitability.

1.2 Statement of the Problem

Uganda's banking sector, as with several countries world over that are characterized by bank based financial sectors, plays a significant role in the economic growth of the country. When economic conditions are favourable, the level of financial transactions in the country is positively impacted. In addition, well managed banks earn from loans and the sale of securities

thus increasing their profitability, while good anticipation of inflation enables banks to generate profits using high interest rates on loans in times of the high inflation. Generally, a well supervised banking sector coupled with good policy decisions in the economy ought to have a positive and significant effect on the level of profits.

However, Uganda's economy and banking sector are far from the desired situation. Factors such as high inflation and high interest rates have had a considerable negative impact on the performance of the banking sector in the recent past. Domestically, customers who do not have a direct source of foreign currency income tend to borrow foreign currency denominated loans because these loans have lower interest rates than loans denominated in the local currency (Bank of Uganda). When the shilling depreciates therefore, as has been in the past, the repayment burden for these customers is huge. This results into loan defaults that in turn increase banks' non-performing loans, which wipe out banks' profits thereby reducing their profitability.

Therefore, this study was an important reference not only for the correct and comprehensive understanding of the status of commercial banks, but also the future direction of Uganda's development. The study was aimed at providing timely policy measures where required, since these are vital in developing a resilient banking system that can eventually support the economic growth of Uganda.

1.3 Objectives of the study

1.3.1 Main objective

The major purpose of the study was to examine the effect of Macroeconomic variables on the performance of Uganda's banking sector.

1.3.2 Specific objectives

Specific objectives of the study were to:

- i. Establish the effect of Gross Domestic Product on the performance of Uganda's banking sector.
- ii. Investigate the effect of inflation rate on the performance of Uganda's banking sector.
- iii. Determine the effect of exchange rate on the performance of Uganda's banking sector
- iv. Evaluate the effect of interest rates on the performance of Uganda's banking sector.

1.4 Hypothesis

The study was guided by different hypotheses based on the specific objectives;

- i. Gross Domestic Product has no significant effect on the performance of Uganda's banking sector.
- ii. Inflation rate has no significant effect on the performance of Uganda's banking sector.
- iii. Exchange rate has no significant effect on performance of Uganda's banking sector.
- iv. Interest rates have no significant effect on the performance of Uganda's banking sector.

1.5 Scope of the study

1.5.1 Content scope

The study examined the effect of real gross domestic product, inflation rate, exchange rate and interest rate on the profitability of Uganda's banking sector. The independent variables in this study were gross domestic product measured by real gross domestic product, inflation rate measured by CPI headline inflation, exchange rate measured by real effective exchange rate and interest rate measured by the shilling lending rate and the 91-day treasury bill rate. The dependent variable was performance of Uganda's banking sector, measured by return on equity of the sector.

1.5.2 Geographical scope

The study considered data for Uganda's banking sector which covered all commercial banks that had been operational in the sector from September 2008 to March 2018. The analysis was confined to only commercial banks (tier 1 financial institutions) because they represent the bulk of the banking sector in Uganda.

1.5.3 Time scope

The study was based on quarterly aggregate banking sector and macroeconomic data covering a period from September 2008 to March 2018 (2008Q3-2018Q1). The time period was restricted by lack of a longer time series on some of the variables under review for example the quarterly GDP. Nonetheless, this time series data was used because it was broad enough to address the objectives of the study and the period spanned different economic cycles within Uganda's economy and beyond.

1.6 Limitations of the study

Uganda's banking sector has undergone several changes such as introduction of new guidelines for regulating and supervising the sector (FIA, 2004). As such, during the period under analysis, a few banks were closed, new banks were granted licences to operate in the sector, while some institutions that had formally operated as tier 2 institutions were converted into tier 1 institutions. In this regard, the secondary data which was used in the study could have been affected by data anomalies especially in the dependent variable due to the differences in the number of banks. The researcher addressed this limitation by concentrating only on the time period from September 2008 to March 2018 when only three bank closures were witnessed, in order to minimise the problem of data inconsistencies.

1.7 Justification of the study

In the current past, Uganda witnessed a rise in the cost of living, continued depreciation of the local currency, an increase in inflation and the introduction of the Central Bank rate in June 2011 to check interest rates (BOU, 2011). All these were indicators for the need to analyse the potential impact of a prolonged upsurge in these Macroeconomic variables on the performance of Uganda's banking sector. This was mainly because a large percentage of Uganda's population depends on the banking sector to provide them with credit to finance their day to day activities while also depending on it to keep their monies safe. This study therefore was aimed at providing empirical evidence about how changes in different macroeconomic variable can have an impact, both positive and negative, on the performance of Uganda's banking sector and eventually on people's livelihoods.

1.8 Significance of the study

The findings from this study were expected to assist Bank of Uganda in formulating effective policies related to the macro economy and performance of the banking sector for example, policies to curb inflation which do not negatively affect the performance of banks. In addition, the results of this study were projected to contribute to existing literature and in turn inspire potential researchers to further examine the effect of Macroeconomic variables and the performance of banking sectors.

It was also anticipated that the conclusions from this study would be important and valuable to bank managers who are interested in understanding how macroeconomic policies influence bank returns, market requirements and company objectives.

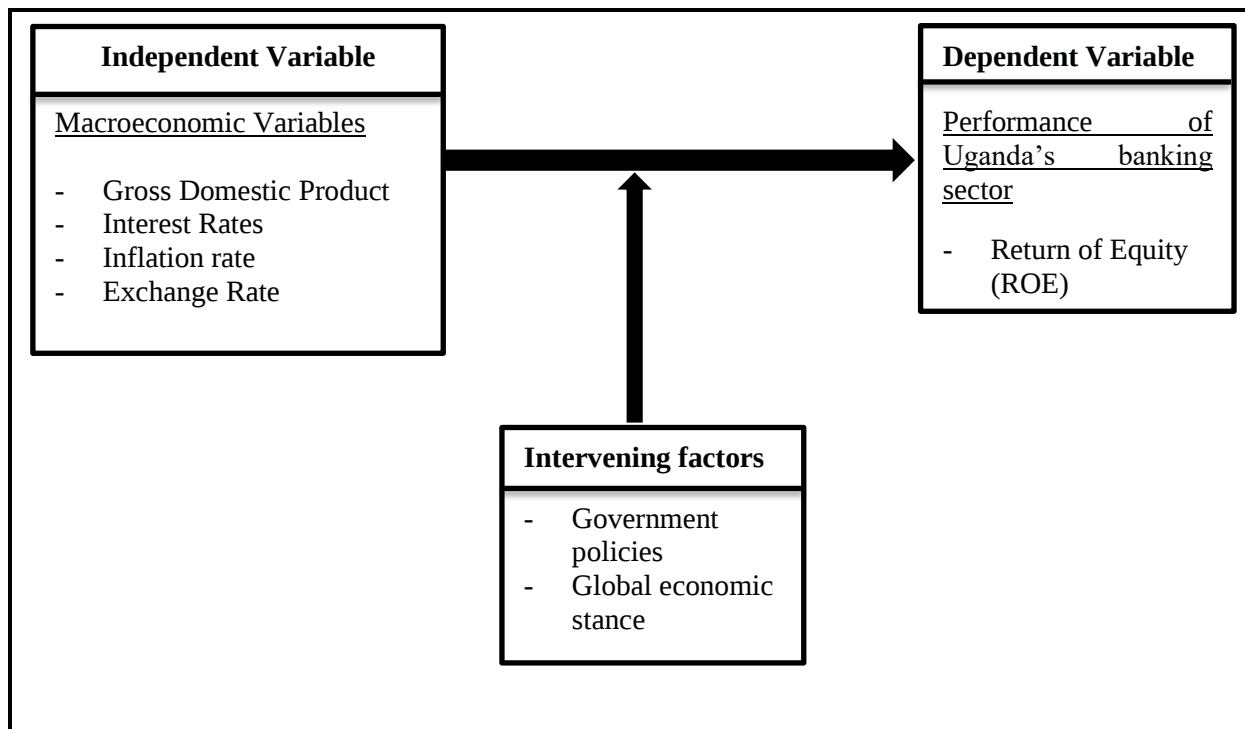
Furthermore, the study results can be used by policy makers who can adjust the appropriate regulations in order to address the issues that are related to the levels of growth in enterprises.

In a nutshell, the study was conducted to bridge the gap between macroeconomic policies and financial stability.

1.9 Structure of the Study

Chapter one presents the background and study motivation and chapter two presents a discussion of the reviewed literature relating to studies on the same area of study. The methodology is discussed in chapter three while chapter four presents analysis and discussion of findings, as chapter five gives the conclusion and recommendation.

Figure 1.1: Conceptual framework



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents results and work from other researchers who carried out studies in the areas of macroeconomic variables and bank profitability. A close distinction between the effect of macroeconomic variables on bank profitability in Africa and the rest of the world is also

emphasized herein. According to Souza and Feijó (2011), macroeconomic factors are mainly associated with the overall state of an economy and in turn affect the economic parameters that are employed in analysis of bank performance. These macroeconomic variables include annual growth in GDP, unemployment rate, real interest rate, broad money supply, inflation rate, per capita GDP, CPI, stock price index, industrial production, credit growth, FDI, exports and real exchange rate (Ahmad and Bashir, 2013).

2.2 Empirical literature

Studies that concentrated on Africa include Simiyu and Ngile (2015) who employed a Panel data model to assess the impact of major macroeconomic variables namely; Gross Domestic Product (GDP), Exchange rates, and interest rates on profitability (return on assets-ROA) of commercial banks in Kenya that are listed on the Nairobi Stock Exchange (NSE). Using fixed effects model, results from the study showed that real interest rates and the exchange rate had a significant effect on profitability of the banks. However, real GDP growth rate was found to have an insignificant impact on the banks' profitability. In addition, real GDP growth rate and exchange rate had a positive effect while real interest rates had a negative impact on Return on Assets (ROA).

Further to studies conducted on Kenya, Kiganda (2014) used economic growth (real GDP), inflation and exchange rate in his study on the Effect of Macroeconomic Factors on Commercial Banks Profitability in Kenya: Case of Equity Bank Limited. Findings from the author's ordinary least squares regression established that economic growth (real GDP) and inflation had a positive but insignificant effect on bank profitability. While the exchange rate also had an insignificant effect on bank profitability this impact was negative. Overall, the study concluded that macroeconomic variables do not affect bank profitability in Kenya.

Conversely, Ongore and Kusa (2013) found that the total impact of macroeconomic variables on commercial banks in Kenya was inconclusive at 5 percent level of significance. The study engaged a linear multiple regression model and Generalized Least Square on panel data to approximate the parameters.

Similarly, Osamwonyi and Chijuka (2014) used Pooled Ordinary Least Squares to evaluate the link between macroeconomic dynamics and profitability of listed commercial banks in Nigeria. Three macroeconomic factors namely; gross domestic product (GDP), interest rate (INTR) and inflation (INFR) were used as explanatory variables while Return on Equity (ROE) was taken as a measure for profitability. GDP was recognized to have a positive and significant impact on ROE while interest rate and inflation each had a negative influence, although inflation's effect was found to be insignificant.

Further to the above studies, Sheefeni (2015) analysed the macroeconomic determinants for commercial bank's profitability covering the period 2001 to 2014 in Namibia. The study utilized forecast error variance decomposition within the vector auto regression (VAR) framework on the quarterly data. Gross domestic product, inflation rate and interest rate were used to represent macroeconomic dynamics while commercial bank's profitability was measured by three distinct indicators namely; Return on Assets (ROA), Net Interest Margin (NIM) and Return on Equity (ROE). The results suggested that the macroeconomic environment does not play a vital role in the profitability of the commercial banks in Namibia. This is because the regressors employed in the analysis were found to have a non-significant impact on all three measures (ROA, ROE and NIM) of the dependent variable.

Likewise, utilizing a sample of 389 banks in 41 Sub-Saharan Africa (SSA) countries, Flamini et al. (2009) examined determinants of commercial bank profitability (Return on Assets (ROA) in Sub-Saharan Africa from 1998 to 2006 based on an unbalanced panel data set. A GMM

approach was used for estimation and findings highlight a significant impact of macroeconomic variables on bank profitability in Sub-Saharan Africa. Particularly, inflation had a positive effect bank profits indicating that banks correctly predict future changes in inflation and adjust interest rate accordingly. Similarly, output growth had a positive and significant relationship with ROA while GDP per capita highlighted a non-significant impact on bank profits.

In addition to the above, Ayadi and Ellouz (2014) sought to analyse the determinants of the Tunisian banking system performance by applying on a panel data technique. The study was based on a period from 2003 to 2012 and utilized both macroeconomic and bank specific factors which included inflation rate, size of the bank, non-interest income, net interest income and dummy variables for the status of the stock exchange listing of bank, ownership structure of the bank and for the Tunisian revolution. The Return on Assets ratio was used to represent performance of the Tunisian banking sector. Findings from the study show that inflation rate (the only macroeconomic factor used for the study) had a positive relationship with performance of Tunisian banking performance, similar to findings by Flamini et al. (2009) for SSA countries. However, this impact was found to be non-significant implying that inflation had no effect on the performance of the Tunisian bank employed in the study.

In the same way, Combey and Togbenou (2017) examined the performance of the banking sector and the macroeconomic environment in Togo from 2006 to 2015. A Pooled Mean Group estimator was used to assess the short-run and long-run association of the macro economy and Togolese banking sector profitability. The macroeconomic environment was measured by gross domestic product growth, real effective exchange rate and inflation while return on assets (ROA) and return on equity (ROE) captured the profitability of the sector. In the short-run, it was noted that macroeconomic variables do not affect return on assets and return on equity of banks. In the long-run however, real gross domestic product growth and real effective exchange

rate were found to negatively and significantly affect banks' return on assets, while inflation was found to have no effect on the same profitability ratio. With regard to the ROE, empirical evidence shows that all three macroeconomic variables employed in the study negatively influence return on equity of banks in the long run.

Away from Africa, studies that focussed on the individual countries from the rest of the world include Pan and Pan (2014) who concentrated on a period from 1998 to 2012 and employed a panel of 10 listed Chinese banks to examine the impact that external factors might have on China's capital market. Gross Domestic Product (GDP), money supply growth, loan interest rates, inflation rates and gross stock prices were used to assess the impact that macroeconomic dynamics have on profitability of commercial banks. Empirical evidence showed that macroeconomic factors indeed influence the Return on Assets (ROA) of commercial banks. Results indicate that Gross Domestic Product (GDP), money supply growth, loan interest rates had a positive and significant relationship with banks' ROA while the impact from inflation rates and gross stock prices was non-significant.

Further of the above, Mamatzakis and Remoundos (2003) assessed profitability of Greek commercial banks from 1989 to 2000. A sample 17 Greek commercial banks was examined based on dynamic panel data estimation, using Return on Assets (ROA) and Return on Equity (ROE) as measures of profitability. The study focused on bank internal factors and external factors such as the growth rate of money supply, the consumer price index (CPI), the stock market performance, and the concentration of the market. Their findings highlight a positive and significant relationship between money supply and profitability while a negative but non-significant link was found between CPI and banks' ROA and ROE.

As highlighted by the literature presented before, Athanasoglou et. al. (2008) applied a generalized method of moments (GMM) approach to evaluate bank-specific, industry-specific

and macroeconomic determinants of bank profitability in Greece from 1985 to 2001. An unbalanced panel of Greek banks was analysed using expected inflation, 10-year government bond yield and the business cycle to represent macroeconomic factors and Return on Assets (ROA) as the profitability variable. Results revealed that the business cycle, inflation and real interest rate positively and significantly affected profitability of Greek banks. The positive impact revealed by the inflation displays the ability of Greek banks' management to correctly forecast future inflation, thereby appropriately adjusting the interest rates to achieve higher profits.

Adding onto the above reviewed literature, Rumler and Waschiczek (2010) relied on balance sheet data at the individual bank level, alongside macroeconomic variables in order to examine the effect that changes in macroeconomic conditions (economic growth, the slope of the yield curve and inflation) have on bank profits. Focusing on Austrian banks, the authors employed a panel regression analysis and covered a period of 15 years from 1995 to 2009. The dependent variable was estimated by two distinct measures that is; earnings before tax as a percentage of core capital (ROE-1) and operating profit as a percentage of core capital (ROE-2). Results from the study indicate that GDP growth, inflation and the yield curve (difference between long-term and short-term interest rates) positively and significantly affect ROE-1 while ROE-2 was seen to be influenced significantly by inflation rate and GDP. Conversely, the effect of the yield curve on ROE-2 was positive and insignificant. Micro-economic factors such as the degree of concentration in the banking sector were found to positively impact bank profits while ownership structure and increased lending in foreign currency did not significantly affect Austrian bank profitability.

Employing the index of shares price (TEPIX), GDP, unemployment rate and share price in the exchange market, Mokhtarifar and Sales (2015) explored the impact of macroeconomic

variables on profitability of Iranian banks. The research comprised of nine Iranian banks that were listed on the Tehran Stock Market between 2009 and 2013. Descriptive statistics were mainly used for the research which included dispersion and central index. In addition, inferential statistics comprising univariate linear regression and Pearson correlation test were also relied on for analysis. Empirical outcomes from the study reveal that on the whole, index of shares price (TEPIX) and GDP significantly influence the profitability and predictability of the banking industry. On the other hand, unemployment rate and index of shares prices in Tehran Stock Market had no significant association with profitability and predictability of the Iranian banking industry.

Equally, Kanwal and Nadeem (2013) set out to examine the impact of macroeconomic variables on public limited commercial banks' profitability in Pakistan, using pooled Ordinary Least Squares (OLS) method. The study focused on a time frame from 2001 to 2011 and employed inflation rate, real gross domestic product (GDP) and real interest rate as the independent variables. Three separate indicators were also used for profitability namely; return on assets (ROA), return on equity (ROE) and equity multiplier (EM) hence resulting into three distinct models. Findings from the study showed that real interest rate had a positive and significant relationship with all three profitability measures while the inflation rate had a negative and significant influence on them. Real GDP's impact was insignificant on all three profitability ratios, with the coefficient for ROA being positive and negative for ROE and EM.

In the same way, Ćurak et al. (2012) employed dynamic panel analysis to explore bank-specific, industry-specific and macroeconomic drivers of bank profitability in Macedonia. Basing on a sample of 16 commercial banks and a period between 2005 and 2010, the authors used bank size, ratio of equity to total assets (as a proxy for solvency risk), ratio of loans to total assets (as a proxy for liquidity risk) and operating expenses management as indicators for

bank-specific dynamics. Banking system reform (EBRD index), concentration (HHI) and growth of economic activity were taken as external variables that is; industry-specific and macroeconomic. The study outcomes suggest that Macedonia banking system profitability was influenced by operating expense management, solvency risk and liquidity risk. Concerning external determinants, all three variables (economic growth, banking sector reform and concentration) highlighted a positive and significant impact on profitability of banks in Macedonia.

Studies that aimed at exploring a group of countries include Petriaa et al. (2015) who evaluated the main determining factors of banks' profitability in commercial banks of 27 European Union member countries (EU27) from 2004 to 2011. The authors focussed on internal factors (bank specific) such as bank size, liquidity risk (as measured by loans to deposits ratio), income-expenditure structure and capital adequacy, as well as external factors (industry specific and macroeconomic) like market concentration (proxied by the Herfindhal-Hirschman Index), economic growth and inflation. Return on average assets (ROAA) and the return on average equity (ROAE) were employed as indicators for bank profitability. It was then observed from the findings that economic growth, credit and liquidity risk, management efficiency, business diversification, and market concentration/competition had an impact on bank profitability as measured by both ROAA and ROAE in EU27. Most notable result was the positive influence of competition on bank profitability in the region under review. However, the size of the bank was seen not to matter in the case of ROAE, but had a small and weak significant effect in the case of ROAA.

Similarly, Martinho et al. (2017) used panel data on a sample of 110 banks from the EU-15 Member states in order to assess the response of bank profitability to macroeconomic factors from 2001 to 2015. GDP growth rate, reference rates and the yield curve were some of

the variables that were taken as regressors while return on average assets (ROA) was used as a proxy for bank profitability. Results from the research show that GDP growth and short-term interest rate had a positive relationship with return on average assets while a country's risk premium negatively influenced profits in banks. In addition, a decrease in total credit-to-GDP was found to be weakly associated to a decrease in ROA.

In addition, a dynamic System Generalized Method of Moments (S-GMM) panel methodology was employed by Borio et. al. (2015) to examine the influence of monetary policy on profitability of banks. Concentrating on a period from 1995 to 2012, the authors studied 109 large international banks that are headquartered in 14 different countries, using a three-month interbank rate and slope of the yield curve as the regressors. Return on Assets (ROA) was used as a proxy for bank profitability alongside control variables such as the growth rate of nominal GDP, stock market indices, house prices, loan demand and loan supply. The study results show that there was a positive correlation between ROA and the level of interest rates and the steepness of the yield curve.

It is evident from the literature reviewed that a lot of research on the determinants (both internal and external drivers) of bank profitability in various parts of the world has been carried out. However, the short comings of these reviews is that while some studies have based on developing countries, more studies have been conducted on developed and emerging economies (for example Rumler and Waschiczek, 2010 conducted a study on Austria; Athanasoglou et. al., 2008 reviewed Greece; Pan and Pan, 2014 examined China) while other studies focus on a group of countries and regions (for example Martinho et al., 2017; and Petriaa et al., 2015 studied EU member states; Flamini et al., 2009 assessed sub-Saharan Africa).

Save for a few studies that have been carried out on Kenya (Simiyu and Ngile, 2015; Kiganda, 2014), research that aims to explore the relationship between macroeconomic dynamics and bank profitability in East Africa, Uganda in particular, is limited. It is therefore against this backdrop that this study on examining the effect of macroeconomic variables on profitability of the banking sector was conducted. In addition, the effect of macroeconomic factors on bank profitability is inconclusive based on the literature presented as some researchers found insignificant effects of macroeconomic dynamics on bank profitability while others established significant relationships between the two.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

Further to the discussion presented in the previous chapters, profitability of Uganda's banking sector, as measured by the return on equity (ROE), has been on a declining trend in the recent past. However, while empirical evidence shows that a number of studies that focus on the drivers of bank profitability mainly concentrate on developing economies including Sub-Saharan Africa, studies about East Africa and Uganda's banking sector in particular, are limited. As a result, inference drawn from these findings can provide misleading information for policy makers in Uganda. It is against this back ground that the study aimed to examine the effect of macroeconomic variables on profitability of Uganda's banking sector so as to provide recommendations that are feasible for the country.

3.2 Research design

The study was based on a longitudinal research design. Particularly, a descriptive correlational study that was based on secondary data was conducted and it was aimed at evaluating the effect of Macroeconomic variables on the performance of Uganda's banking sector. This research design was employed to determine whether there exists an association between the dependent and the independent variables, and further determine the strength and direction of the relationship.

3.3 The Data Variables and their Measurements

The study employed quarterly time series data for a period of nine years and nine months from September 2008 to March 2018. The variables under consideration were Return on Equity (ROE), Real Gross Domestic Product, Inflation Rate, Real Effective Exchange Rate, the 91-day treasury bill rate and the lending interest rate. The research relied mainly on secondary data. Data on all the variables was obtained from Bank of Uganda and Uganda Bureau of Statistics (UBOS) as below:

Table 3.1: Description of variables

<i>Variable</i>	<i>Source</i>	<i>Definition</i>	<i>Expected sign</i>
Return on equity	Bank of Uganda	<i>ROE measures the rate of return earned or lost Vis-a-Vis the amount of capital invested by shareholders</i>	
Real gross domestic product	UBOS	<i>GDP is the monetary value of final goods and services produced in a country in a given period of time</i>	<i>Positive</i>
Inflation rate	UBOS	<i>Inflation Rate is defined as the persistent increase in the prices of goods and services over time.</i>	<i>Negative/positive</i>
Real effective exchange rate	Bank of Uganda	<i>This is a measure of the trade-weighted average exchange rate of a currency against a basket of currencies</i>	<i>Positive</i>

91-day treasury bill rate	Bank of Uganda	<i>The 91-day Treasury bill is a short term debt instrument issued by national governments purposefully to generate quick funds needed to finance outstanding obligations</i>	<i>Positive</i>
Lending rate	Bank of Uganda	<i>Lending rate is the bank rate that meets the short and medium-term financing needs of the private sector</i>	<i>Negative/positive</i>

3.3.1 Gross Domestic Product (GDP)

GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (IMF, 2008). Similar to literature that has been reviewed (for example Sheefeni, 2015; Kanwal and Nadeem, 2013), GDP was expected to have a positive relationship with bank profitability.

This implies that during upswings there should be an increase in the interest income for banks, aided by growth in demand for credit since income to households and firms increases during upswings, enabling them to service their loans. However during a downturn, real GDP growth and bank profitability are expected to have a negative association as demand for credit is expected to slow down. Accordingly, real GDP was expected to have a positive effect on bank's profitability (Return on Equity-ROE). For this study, real GDP was estimated as the quarterly real gross domestic product.

3.3.2 Inflation (INF)

Inflation as measured by the consumer price index (CPI) and it reflected the percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly or quarterly. The Laspeyres formula is generally used to compute the CPI (WDI, 2015).

Inflation rate (INF) may have a positive or negative effect on bank profitability. This is because a rise in the inflation rate for example reduces the net present value of future cash flow, thereby eroding the real value of money reserves (Sheefeni, 2015). Similarly, if inflation is unanticipated, banks would not adjust rates in a timely manner and overhead costs would rise quicker than inflation, resulting in reduced profits. This points to a negative association between inflation rate and bank profits.

However, if the inflation rate is fully anticipated, it raises profits because banks are able to adjust their interest rates accordingly in order to increase their revenue. This therefore shows that an increase in the inflation rate results into an increase in banks' profits. As such, the expected impact of the inflation rate on bank profitability was uncertain. For this study, inflation rate was measured as the quarterly percentage change in the consumer price index (CPI).

3.3.3 Real Effective Exchange Rate (REER)

The real effective exchange rate (REER) is a measure of the trade-weighted average exchange rate of a currency against a basket of currencies after adjusting for inflation differentials with regard to the countries concerned and expressed as an index number relative to a base year (IMF, 2015).

Economic theory suggests that an appreciation of the local currency may increase domestic consumer purchasing power, as imported goods become less expensive. The increased purchasing power may result in additional demand for loans and increased profits for banks. Conversely, depreciation in the country's currency diminishes the country's exports as they become more expensive for international customers. This reduces sales and may increase loan losses which in turn negatively affect banks' profitability. It was against this back drop that the effect of the exchange rate was expected to be positive.

3.3.4 91-day Treasury Bill Rate (91-TBill rate)

The 91-day Treasury bill rate is a short term debt instrument issued by national governments purposefully to generate quick funds needed to finance outstanding obligations. In Uganda, the 91-day Treasury bill rate is defined as a weighted average rate of the bi-weekly auctions of 91-day treasury bills (Bank of Uganda).

An increase in the 91- day Treasury bill rate as the government increases its borrowing from the public is expected to generate more interest income for the banks. On the other hand, a drop in the rate highlights a reduction in government borrowing and thus reduces banks' interest income and profits on the whole. The 91-day Treasury bill rate was therefore expected to have a positive impact on profitability of Uganda's banking sector.

3.3.5 Lending rate

Lending rate is the bank rate that usually meets the short- and medium-term financing needs of the private sector. This rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. The terms and conditions attached to these rates differ by country, however, limiting their comparability (World Development Indicators, 2015).

Similar to the inflation rate, interest rates can both negatively and positively influence banks' profits. A rise in the interest rate for example can increase the amount of interest income generated by banks. However, a very high interest rate can also discourage borrowers from borrowing thereby reducing the interest income earned by banks. For this reason, a high interest rate can be associated with both higher or lower interest margins and profitability. On the other hand, low interest rates can encourage more borrowing and if the spread remains constant over time, banks are expected to benefit from increased interest earnings. It was against this backdrop that the impact of the lending rate was indeterminate.

3.3.6 Return on Equity (ROE)

Return on equity is the amount of net income returned as a percentage of shareholders equity, thus revealing how much profit a company earned in comparison to the total amount of shareholder equity found on the balance sheet.

3.4 Data Analysis and Model Specification

In order to assess the relationship between macroeconomic variables and bank profitability, the study employed ordinary least squares (OLS) linear regression. Ordinary Least Squares was used in this analysis because it produces coefficient estimates that are BLUE that is; best, linear, and unbiased estimates. In addition, OLS has seven assumptions for linear regression which were based on to guide the process of this analysis. Once all assumptions of OLS have been met by the model, then it is evident that the estimates produced are BLUE in nature. These assumptions are; linearity-the basic linear regression requires the model to be linear in parameters, population mean of the error term is expected to be equal to zero (strict exogeneity), there should be no linear relationship among independent variables (no multicollinearity), all independent variables are uncorrelated with the error term, the error terms are uncorrelated with each other (no autocorrelation), the error terms have the same variance in each observation (homoscedasticity), the error terms are normally distributed with mean zero and constant variance.

Data was then analysed at three different levels; univariate, bivariate and multivariate. Under Univariate analysis, descriptive Statistics such as trends, means, standard deviation and a summary of all variables of interest was focussed on. Bivariate analysis involved the assessment of two variables (denoted as X, Y), for the purpose of determining the linear relationship between them. This was carried out to determine whether each independent variable, in isolation, had an influence with the dependent variable. This relationship was tested using Pearson's Correlation Coefficient which is widely used in statistics to measure the degree

of relationship between linear related variables rather than Spearman correlations. Pearson (r) correlation was used in this analysis because it follows the assumptions that both variables are normally distributed, it assumes a straight line relationship between each of the variables in the analysis (linearity) and homoscedasticity. On the third level of analysis, multivariate analysis (multiple regression analysis) was carried out in order to assess the overall relationship between the dependent variable and all the independent variables.

3.4.1 Model Specification

The study employed a multiple linear regression analysis technique to achieve the main study objective (examining the effect of macroeconomic dynamics on profitability of the banking sector). This method was adopted from a study conducted by Osamwonyi and Chijuka (2014) to evaluate the link between macroeconomic dynamics and profitability of listed commercial banks in Nigeria. The econometric model from that study was expressed as:

$$ROE = \beta_0 + \beta_1 GDP + \beta_2 INTR + \beta_3 INF + \varepsilon.$$

Where: β_0 = Intercept; β_1 – β_3 = Coefficients of the regressors; ε = stochastic term.

From the above equation, the basic Ordinary Least Squares equation for this study was then expressed in the following functional form;

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \varepsilon_t \dots \dots \dots (1)$$

Where; β_0 - is the intercept

(β_1 – β_5)– are coefficients of the regressors /independent variables

t – is the time period

Y – is the dependent variable

(X_{1t} – X_{5t}) – are independent variables

ε_t – is the error term

This study employed a data set that comprised of one dependent variable and five macroeconomic variables (as the independent dynamics). The independent variables were; Quarterly GDP, 91-day Treasury bill rate (91TBill rate), Lending rate (LEND), Real Effective Exchange Rate (REER) and Inflation Rate (INF). The regressors were selected based on the empirical literature that was reviewed which concluded that the same macroeconomic variables presented a notable impact on banking sector profitability in different types of economies. As a result, the overall model for the study was specified as follows;

$$ROE_t = \beta_0 + \beta_1 GDP_t + \beta_2 91\ TBill_t + \beta_3 REER_t + \beta_4 INF_t + \beta_5 LEND_t + \varepsilon_t \dots \dots (2)$$

Where;

β_0 - is the intercept

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ - are respective coefficient terms for the independent variables

t - is the time period 2008Q3 to 2018Q1

ROE - is the Return on Equity for Uganda's banking sector,

GDP – is the quarterly Real Gross Domestic Product,

$91\ TBill$ – is the 91-day Treasury bill rate,

$REER$ – is the Real Effective Exchange Rate,

INF – is the inflation Rate,

$LEND$ – is the lending rate, ε_t - is the error term at time t .

3.5 Model Diagnostic Tests

A number of diagnostic tests were conducted to ensure that the model fulfilled the assumptions of the ordinary least squares. These tests included; test for normality, test for stationarity, test for serial correlation (autocorrelation), test for multicollinearity, and a test for heteroscedasticity.

The test for normality was carried out to verify if the residuals were normally distributed. This was ascertained using the Jacque-Bera (JB) test statistic and was based on the null hypothesis that the residuals were normally distributed, against the alternative that they were not normally distributed.

The study variables were assessed for unit root to ensure that they were stationary. This test was conducted using the Augmented Dickey-Fuller test, and was based on the null hypothesis that the study variables were non-stationary (have unit roots) against the alternative that they were stationary (do not have unit roots).

The independent variables were also examined to ensure that there was no linear relationship between them hence eliminating the possibility of the problem of multicollinearity. This test was conducted using the correlation matrix and was based on the rule of thumb that if the pairwise correlation coefficient is below 0.8 then multicollinearity does not exist. The correlation matrix was preferred to the variance inflation factor (VIF) for assessing multicollinearity because the VIF does not shed more light on the number of dependencies among the explanatory variables.

Autocorrelation or Serial correlation, another assumption of the OLS was tested for among the error terms using both the Durbin-Watson test and the Breusch-Godfrey serial correlation LM test. These tests were based on the null hypothesis of no serial correlation among the residuals, against the alternative of serial correlation among the errors. The Durbin-Watson statistic ranges from 0 to 4 in value. A value close to 2 indicates non-autocorrelation; a value toward 0 indicates positive autocorrelation; and a value toward 4 indicates negative autocorrelation.

Since OLS regression aims at attaining residuals that have a constant variance for all observations (homoscedasticity), a test for heteroscedasticity was conducted to ensure that the variance of the residuals from the estimated model was constant. While there are many ways

to detect the existence of heteroscedasticity in the model, the study made use of both White's General Heteroscedasticity Test and the Breusch-Pagan-Godfrey Test. These tests were based on the null hypothesis of no heteroscedasticity or homoscedasticity (the variance of residuals is constant).

After running the multiple linear regression OLS model, post estimation tests were also carried out to test the significance of the model. These included the CUSUM test that was used to test for the stability of the model, Ramsey RESET test that was used to test for the model specification problems (whether the model was specified correctly or mis-specified) and the Wald test that was used to test the overall/joint significance of the explanatory variables that is; whether the explanatory variables add something to the model.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents findings from the analysis of the data, along with the outcomes of model estimates. In addition, a discussion of the study results that were attained from examining the effect of macroeconomic variables on profitability of Uganda's banking sector are emphasized herein.

4.2 Univariate analysis

The Univariate analysis was carried out to provide an overview of the data through trend analysis and descriptive statistics.

4.2.1 Trend analysis

Preliminary examination of the dataset indicates a decline in the profits of the banking sector especially between 2012 and 2014 and during 2016; (refer to figure A.1 in the appendix). This

downward trend was driven by a decline in both the lending rate and the 91-day Treasury bill rate, coupled with a rise in inflation during that same time period. Particularly, profitability of the banking sector dropped from 29.5 percent in June 2012 to 12.8 percent in the quarter ending June 2014, as inflation (quarterly percentage change in the consumer price index) increased from -0.7 percent in June 2012 to 2.6 percent at the end of September 2013. However, in a bid to encourage borrowing and thus increase their profits, banks reduced the cost of borrowing from 27.2 percent in March 2012 to 20.9 percent, while the 91-day Treasury bill rate followed a similar downward trend declining from highs of 19.5 percent in December 2011 to 8.9 percent in March 2014, reflecting a reduction in government borrowing. As a result, bank profitability, as shown by the ratio of return on equity, picked up slightly between September 2014 and September 2016, before dropping again in the last quarter of 2016. This further reduction in profits was due to a fall in the interest income received by banks from their investment. An increase in the quarterly consumer price index (inflation) from 0.4 percent to 2.7 percent and reduction in the 91-day Treasury bill rate all led to a drop in banks' interest income during the period under review.

4.2.2 Descriptive data analysis

Descriptive statistics give an initial indication of variables to be used in regression analysis, highlighting different summary statistics for each variable, such as number of observations, mean, median, standard deviation, minimum and maximum values.

Results in Table 4.1 show a summary of the quarterly time series data which comprised of 39 observations ranging from September 2008 to March 2018. Paying particular focus to the dependent variable that is; profitability of Uganda's banking sector, as measured by the return on equity (ROE), results showed a mean value of 18.6 percent with a minimum value of 8.3 percent, a maximum value of 29.5 percent and standard deviation of 5.8.

Table 4.1: Descriptive Statistics of the study variables

	ROE	INF	GDP	REER	TBILL_RATE	LEND_RATE
Mean	18.56307	1.771133	12,381.11	102.8415	10.64782	22.28668
Median	17.06774	1.514214	12,135.19	103.0343	9.563044	21.80933
Maximum	29.49651	10.08521	16,266.13	116.6079	19.49093	27.21843
Minimum	8.327371	-0.891283	9,056.414	87.30648	4.141035	19.51454
Std. Dev.	5.753097	2.096370	1,836.527	8.153325	3.877698	2.029734
Skewness	0.151331	1.745364	0.097923	-0.045427	0.490705	0.697472
Kurtosis	2.190026	7.599461	2.088007	1.979099	2.682924	2.700276
Jarque-Bera	1.214951	54.17787	1.413892	1.707052	1.728517	3.308022
Probability	0.544724	0.000000	0.493148	0.425910	0.421364	0.191281
Sum	723.9598	69.07419	482,863.4	4010.817	415.2650	869.1806
Sum Sq. Dev.	1257.729	167.0012	1.28E+08	2526.115	571.3887	156.5532
Observations	39	39	39	39	39	39

These results implied that on average, Uganda's banking sector made a profit of 18.6 percent from the investment that was made using bank shareholders' equity, between September 2008 and March 2018. With regard to the value of the standard deviation, this indicated that there was a deviation in the sector's profitability equivalent to 5.8 percent. On the whole, the highest profits made by the banking sector were 29.5 percent of the investment while the lowest earnings from shareholders' investment made during the period under review was 8.3 percent. Profitability of the sector (ROE) had skewness of 0.2 highlighting that performance of the sector was fairly symmetric between September 2008 and March 2018.

Regarding the regressors, the inflation rate, as measured by the quarterly percentage change in the consumer price index, and gross domestic product (as indicated by the quarterly gross domestic product) had average values of 1.8 percent and USh.12.4 trillion respectively. A mean real effective exchange rate of 102.8 was observed while the lending rate and the 91-day Treasury bill rate were on average 22.3 percent and 10.6 percent respectively, during the period under assessment. In addition to the above observation, analysis of the skewness of the data showed that the REER, GDP and 91-Tbill rate were fairly symmetrical while the lending rate and inflation rate were moderately skewed and high skewed respectively.

Test for Normality

Results from the Jarque-Bera (JB) test statistic (refer to Table 4.1) showed that save for the inflation rate, all other study variables (both the dependent and the independent) were normally distributed. Regarding ROE, REER, LGDP, LEND, and TBILL, probability values of the JB statistic indicate that we fail to reject the null hypothesis for these variables since the p-values are greater than the 5 percent level of significance. For the inflation rate, the p-value=0.000000 highlights that we reject the null hypothesis that the distribution is normal in favour of the alternative that the inflation rate is not normally distributed.

Unit root test

Further to the above, unit root tests were also conducted to assess the stationarity of the variables using the Augmented Dickey-Fuller test, before running any regressions. The Augmented Dickey-Fuller test was based on the null hypothesis that the study variables have unit roots (are non-stationary) against the alternative that they are do not have unit roots (are stationary).

Table 4.2: Unit root test results of the study variables

	level	1st difference
ROE (<i>intercept</i>)	-0.7983 (0.8061)	-4.4628*** (0.0012)
(<i>intercept and trend</i>)	-3.7496** (0.0327)	-
INF (<i>intercept</i>)	-3.8155*** (0.0062)	-
(<i>intercept and trend</i>)	-4.2152** (0.0105)	-
GDP (<i>intercept</i>)	-0.5018 (0.8788)	-3.1038** (0.0370)
(<i>intercept and trend</i>)	-3.8168** (0.0286)	-
REER (<i>intercept</i>)	-2.2138 (0.2049)	-5.9600*** (0.0000)
(<i>intercept and trend</i>)	-2.8097 (0.2028)	-5.8739*** (0.0001)
Lending rate (<i>intercept</i>)	-2.8334* (0.0636)	-4.0820*** (0.0002)
(<i>intercept and trend</i>)	-2.6781	-5.1835***

	(0.2510)	(0.0008)
TBill rate (<i>intercept</i>)	-2.5757	-3.7838***
	(0.1070)	(0.0066)
(<i>intercept and trend</i>)	-2.7964	-3.7270**
	(0.2075)	(0.0328)

P-values in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From the results obtained (refer to Table 4.2), return on equity (ROE), inflation rate and the GDP were found to be integrated of order 0 or I(0). This was based on the result of both the intercept and trend, as used by most researchers as a rule of thumb. More specifically, the inflation rate was stationary with an intercept and with both an intercept and trend at the 5 percent significance level, while ROE and GDP were only stationary with an intercept and trend. On the other hand, at the conventional 5 percent level of significance, the REER, lending rate and Tbill rate were found to be non-stationary at level (with an intercept only) and with both an intercept and trend. Taking the first difference of the non-stationary variables ensured stationarity of the variables making them integrated of order 1; I(1).

Test for Multicollinearity

Before embarking on bivariate and multivariate analysis, the explanatory variables (GDP, INFL, REER, LEND, TBILL) were assessed for multicollinearity using the correlation matrix. This was aimed at ensuring that the regressors did not have perfect or exact linear depiction of one another. Multicollinearity arises when explanatory variables are highly correlated with each other and it results into an increase in the p-values, thus making variables insignificant. The correlation matrix below shows that the independent variables were not correlated with each other since all values are below the conventional 0.8.

Table 4.3: Correlation matrix of explanatory variables

	INF	GDP	REER	LEND_RATE	TBILL_RATE
INF	1.000000				
GDP	-0.227733	1.000000			
REER	0.137449	0.651417	1.000000		
LEND_RATE	-0.050607	0.265182	0.035425	1.000000	

TBILL_RATE	0.130567	0.408704	0.275304	0.638664	1.000000
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4.3 Bivariate analysis

Bivariate analysis was carried out in order to evaluate the correlation that exists between the dependent variable (profitability of Uganda's banking sector) and each of the independent variables. The Pearson's Correlation Coefficient was employed to analyse the degree of relationship or association between profitability of Uganda's banking sector and each individual macroeconomic variable. Unlike the Spearman correlation which is a non-parametric test, does not follow the linear trend or assume any assumptions about the distribution of the data, the Pearson Correlation is widely used in statistics to measure the degree of relationship between linear related variables. This is because it follows the assumptions that both variables are normally distributed, assumes linearity (a straight line relationship between each of the variables in the analysis), and assumes homoscedasticity (that data is normally distributed about the regression line).

Table 4.4: Pearson Correlation between ROE and Macroeconomic Variables

Variables	Pearson Coefficient	p-value
GDP	-0.573366	0.0002***
INF	0.346602	0.0330**
DTbill	0.071098	0.6714
DREER	-0.088695	0.5964
DLEND	0.274622	0.0952*

***significant at 1 percent, ** significant at 5 percent, *significant at 10 percent

Results from the Pearson correlation coefficient (Table 4.4) indicate that only two macroeconomic variables (GDP and inflation rate) had a significant relationship with profitability of Uganda's banking sector. This is as indicated by their p-values which were less than 0.05. Particularly, GDP was found to have a negative relationship with ROE while the inflation rate had a positive effect on bank profitability. On the other hand, the 91-day Treasury bill Rate, Real Effective Exchange Rate and lending rate were seen not to significantly impact

the profitability of Uganda's banking sector as highlighted by their probability values which were greater than the 5 percent conventional level of significance. Particularly, the interest rates (91-day Treasury bill rate and lending rate) portrayed a positive influence on banks' return on equity while the exchange rate, as proxied by the real effective exchange rate showed a negative relationship with banking sector profits.

4.4 Multivariate analysis

To examine the link between macroeconomic dynamics and profitability of Uganda's banking sector, multiple regression analysis using Ordinary Least Squares (OLS) was carried out in order to reveal the overall relationship of the variables. Table 4.5 presents results of the OLS regression and it can be observed that the inflation rate and lending rate had a positive impact on profitability of Uganda's banking sector while GDP, REER and 91-day tbill rate had a negative effect on the return on assets. In addition, only GDP displayed a significant effect on profitability, at the 5 percent significance level. Inflation rate and the lending rate were seen to be significant at the 10 percent level of significance while the remaining variables that were employed in the regression analysis did not present a significant outcome.

Table 4.5: Multiple Regression Model (OLS)

Dependent Variable: ROE				
Sample (adjusted): 12/01/2008 3/01/2018				
Included observations: 38 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	204.0853	47.91066	4.259705	0.0002
GDP	-19.85632	5.073604	-3.913653	0.0004
INF	0.820841	0.409831	2.002880	0.0537
DREER	-0.097229	0.144252	-0.674022	0.5051
DLEND_RATE	1.244401	0.712978	1.745357	0.0905
DTBILL_RATE	-0.523836	0.448720	-1.167399	0.2517
R-squared	0.546628	F-statistic		5.591492
Adjusted R-squared	0.475789	Prob(F-statistic)		0.000821
		Durbin-Watson stat		0.874602

Further to the above, the value of R-squared (0.546628) indicated that the regressors (macroeconomic dynamics) accounted for 54.6 percent of the total variations in the dependent

variable (profitability of the banking sector). The probability of the F-statistic was below 0.05, implying that all the dependent variables employed in the model were important to explain changes in bank profitability. Therefore, the OLS equation is;

$$ROE = 204.1 + 0.82INF - 19.86GDP - 0.10REER + 1.24LEND - 0.52TBILL$$

The model was then tested for serial correlation and heteroscedasticity to ascertain that it conformed to the assumptions of the OLS model.

Test for heteroscedasticity

Test for heteroscedasticity was conducted in order to assess whether the variance of the error terms was constant, as per the OLS assumptions. The test for heteroscedasticity was conducted using the Breusch-Pagan-Godfrey test and the White's General Heteroscedasticity test. Both tests were based on the null hypothesis of homoscedasticity or no heteroscedasticity against the alternative of heteroscedasticity.

Table 4.6: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.862907	Prob. F(5,32)	0.5165
Obs*R-squared	4.514787	Prob. Chi-Square(5)	0.4779
Scaled explained SS	5.080037	Prob. Chi-Square(5)	0.4062

Table 4.7: Heteroskedasticity Test: White's General

F-statistic	0.586439	Prob. F(5,32)	0.7102
Obs*R-squared	3.189707	Prob. Chi-Square(5)	0.6708
Scaled explained SS	3.589058	Prob. Chi-Square(5)	0.6100

The probability value from the Breusch-Pagan-Godfrey (Prob. Chi-Square (5) = 0.4779) as in Table 4.6 indicates that we fail to reject the null hypothesis of homoscedasticity at the 5 percent level of significance. In addition, the probability value obtained from the White's general test (Prob. Chi-Square (5) = 0.6708) as in Table 4.7 also confirms that we fail to reject the null hypothesis at the same level of significance. As such, both test confirmed that there is no heteroscedasticity in the model.

Test for serial correlation

The test for autocorrelation or Serial correlation was carried out using Breusch-Godfrey serial correlation LM test and the Durbin Watson test statistic. The tests were aimed at ascertaining that the residuals were not linked to each other. As such, the tests were based on the null hypothesis that there is no serial correlation among the residuals.

Table 4.8: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	8.574374	Prob. F(2,30)	0.0011
Obs*R-squared	13.82120	Prob. Chi-Square(2)	0.0010

From the results of the Breusch-Godfrey serial correlation LM test (Table 4.8), the probability value (Prob. Chi-Square (2) = 0.0010) implies that we reject the null hypothesis of no serial correlation, in favour of the alternative at the 5 percent level of significance. In addition, the value of the DW (Durbin-Watson) statistic of 0.875 obtained in the Multiple Regression Model (refer to Table 4.5), also confirmed that the residuals from the regression model were found to be serially correlated, since the DW static was toward 0.

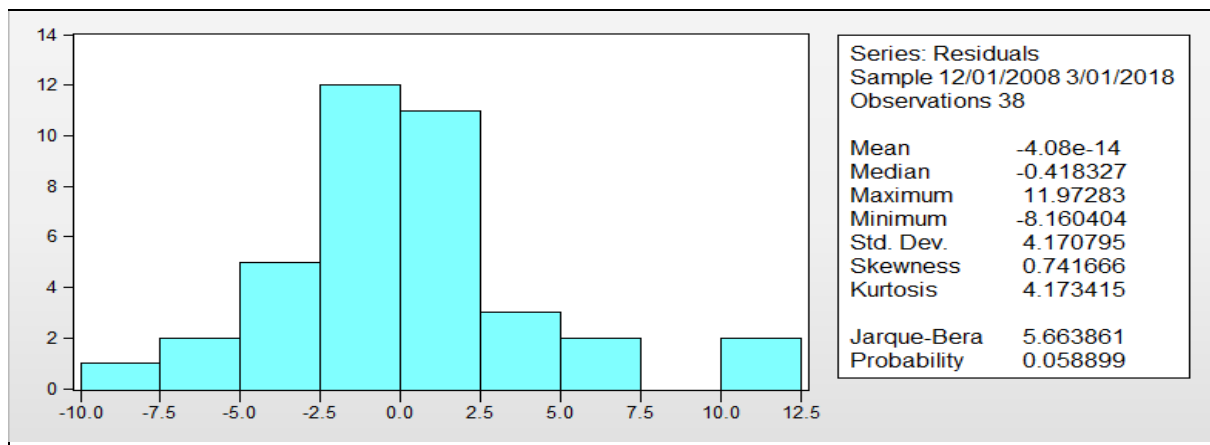
Removing Serial Correlation from the model

In order to remove serial correlation from the model, literature (CFA institute, 2016) recommends that the coefficient standard errors of the linear regression parameter estimates be adjusted to account for the serial correction or the regression equation be modified to eliminate the serial correlation, among other methods. For this study, the Newey-West method, developed by Newey and West (1987), was employed to adjust standard errors. Table 4.9 shows the results of correcting the standard errors. The robust standard errors are now much larger than the OLS standard errors. It should also be noted that the standard errors have been corrected to account for the autocorrelation.

Test for normality

Further to the above tests, the residuals from the OLS model in Table 10 were examined to find out whether they were normally distributed. This test was based on the Jarque-Bera statistic. From the results in Figure 4.2, the probability of the Jarque-Bera statistic ($p=0.058899$) implies that we fail to reject the null hypothesis of residual being normally distributed. This is because the p-value is greater than the 5 percent level of significance.

Figure 4.1: Testing for Normality



4.5 Multiple Regression (OLS) model results

Table 4.9 presents results from estimation of the multiple regression model once assumptions of the ordinary least squares (OLS) had been met. Overall, it can be observed from the value of the R-squared ($R\text{-sq} = 0.546628$) that the regressors (macroeconomic variables) accounted for 54.6 percent of disparities in the profitability of Uganda's banking sector between September 2008 and March 2018.

Table 4.9: Multiple linear regression after correcting standard errors for serial correlation

Dependent Variable: ROE				
Sample (adjusted): 12/01/2008 3/01/2018				
Included observations: 38 after adjustments				
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	204.0853	56.79668	3.593261	0.0011

GDP	-19.85632	5.962428	-3.330241	0.0022
INF	0.820841	0.353234	2.323787	0.0266
DREER	-0.097229	0.093561	-1.039206	0.3065
DLEND_RATE	1.244401	0.552182	-0.948664	0.3499
DTBILL_RATE	-0.523836	0.682751	1.822628	0.0777
R-squared	0.546628	F-statistic		5.591492
Adjusted R-squared	0.475789	Prob(F-statistic)		0.000821
		Durbin-Watson stat		0.874602

The probability value of the F-statistic (Prob(F-statistic) = 0.000821) also indicates that the macroeconomic variables (GDP, inflation rate, lending rate, real effective exchange rate and the 91-day Treasury bill rate) jointly were useful in explaining the profitability of Uganda's banking sector, at the 5 percent level of significance. In addition, the F-statistic also illustrates that the regression model fit the data well.

From the study findings in Table 10, the model was fitted as;

$$ROE = 204.1 - 19.86GDP + 0.82INF - 0.097REER + 1.24LEND_RATE - 0.524TBILL_RATE$$

Based on the hypotheses that guided the study, the following conclusions were drawn from the results of the OLS model.

Gross Domestic Product and performance of Uganda's banking sector

Results from assessing the effect of gross domestic product (GDP) on profitability of Uganda's banking sector show that Real GDP had a negative impact on return on equity (ROE). The resultant probability value (p-value = 0.0022) highlights that this negative impact was also significant at 1 percent. As such, the null hypothesis that Gross Domestic Product has no significant effect on the performance of Uganda's banking sector was rejected. More specifically, between September 2008 and March 2018, an increase in the economic growth, as measured by the real quarterly gross domestic product led to a reduction in the profitability of Uganda's banking sector. Particularly, a 1 unit increase in the quarterly GDP resulted into a decline in the profitability of the sector by 19.86 percentage points.

The negative relationship between economic growth and bank profitability can occur in cases when people choose to reduce their investment and consume more instead. As disposable incomes increase, resulting from increased growth in the economy, customers may decide to borrow less hence reducing banks' income and profits. In addition, the government may issue fewer treasury bills (another source of banks' interest income) when the economy is growing positively and this too would reduce profits generated by banks.

The findings were in line with Kanwal and Nadeem (2013) who conducted a study in Pakistan and Combey and Togbenou (2017) who examined Togo and found that GDP had a negative impact on return on equity (bank performance). The significant association was also in line with Pan and Pan (2014) who studied China and Osamwonyi and Chijuka (2014) who assessed Nigeria. However, the results contradicted with Flamini et al. (2009) who studied countries in Sub Saharan Africa and found an insignificant association. In addition, findings by (Simiyu and Ngile, 2015; Kiganda, 2014; Ongore and Kusa, 2013) who studied Kenya's banking sector, portrayed a positive but insignificantly relationship between real GDP and bank performance.

Inflation rate and performance of Uganda's banking sector

Assessment of the effect of inflation rate on the performance of Uganda's banking sector found that inflation positively affected return on equity. This indicates that an increase in the inflation rate resulted into an increase in profitability of Uganda's banking sector between September 2008 and March 2018. The probability value ($p\text{-value} = 0.0266$) showed that this effect was significant at the 5 percent level of significance. On the whole, this result implied that a 1 unit increase in the inflation rate led to a rise in Uganda's banking sector profitability by 0.82 percentage points. Given the significant result, it was possible to conclude that inflation rate had a positive impact on bank profitability. Accordingly, the null hypothesis that inflation rate has no significant effect on the performance of Uganda's banking sector was rejected.

As noted in the literature that was reviewed, an increase in the inflation rate would result in an increase in bank profits when the inflation rate is fully anticipated, causing banks to ably adjust their interest rates accordingly in order to increase their revenue. Therefore, Ugandan banks were able to forecast changes in the inflation rate during the period under review thus adjusting interest rate and raising their profits.

The positive significant relationship between inflation and banking sector performance was consistent with findings by Athanasoglou et al (2008) who analysed Greece. In addition, studies by Flamini (2009) for SSA, Ayadi and Ellouz (2014) for Tunisia also established a positive association between the two variables. Conversely, Osamwonyi and Chijuka, 2014; Combey and Togbenou, 2017; Mamatzakis, 2003 studied Nigeria, Togo and Greece respectively and all found a negative and insignificant link between bank performance and the inflation rate.

Exchange rate and performance of Uganda's banking sector

Conclusions drawn from investigating the effect of the Real Effective Exchange Rate (an indicator of the exchange rate), on performance of Uganda's banking sector portray a negative association between the two variables. This revealed that an appreciation/depreciation in the local currency against other major currencies (REER) resulted into a decrease/increase in the profitability of the sector. More specifically, a 1 unit increase in the Real Effective Exchange Rate resulted into a decline in bank profitability by 0.1 percentage points between September 2008 and March 2018.

Notably, this relationship was found to be insignificant ($p\text{-value} = 0.3065$) at the different levels of significance (1 percent, 5 percent and 10 percent). Given that the generated result was insignificant, there was no evidence to conclude that exchange rate affects performance of Uganda's banking sector. As such, the third hypothesis that exchange rate has no significant effect on performance of Uganda's banking sector was not rejected.

Nonetheless, the findings were consistent with Kiganda (2014) for Kenya, who found a negative and insignificant association between exchange rate and profitability of Kenyan commercial banks. However, they contradicted results by Simiyu and Ngile (2015) who studied financial profitability of listed commercial banks in the Nairobi Securities Exchange (NSE) and generated a positive and significant effect between the two variables.

Interest rates and performance of Uganda's banking sector

Outcomes of exploring the relationship between interest rates and performance of Uganda's banking sector were two fold. First, the interest rates, as measured by the 91-day treasury bill rate had a negative impact on return on equity implying that an increase in the 91-day Treasury bill rate by 1 percent resulted into a drop in bank profits by 0.52 percentage points. Similar to the exchange rate, the resultant p-value = 0.3499, proved that the association between the 91-day treasury bill rate and profitability of the sector was insignificant at the different levels of significance. The negative effect was in line with Simiyu and Ngile, 2015 and Osamwonyi and Chijuka, 2014 who evaluated Kenya and Nigeria respectively and found a negative association between interest rates and bank profitability.

Secondly, interest rates as measured by the lending rate established a positive influence on bank profitability, highlighting that a 1 unit increase in the lending rate led to a rise in return on equity by 1.24 percentage points during the period under assessment. The obtained p-value (prob = 0.0777) highlights that this impact was insignificant at the conventional 5 percent level of significance but significant at the 10 percent level of significance. The conclusion drawn was similar to findings by Pan and Pan, 2014; Athanasoglou et al, 2008; Kanwal and Nadeem, 2013 who studied China, Greece and Pakistan respectively and established a positive and significant correlation between interest rates and bank profitability.

However, given the inconsistent outcomes portrayed by the two measures of interest rates, we cannot therefore ably conclude that interest rates have a significant effect on the performance of Uganda's banking sector. As such, the null hypothesis was not rejected.

Overall, the study findings specified that GDP, real effective exchange rate and 91-day Treasury bill rate had a negative effect on bank profitability while inflation rate and the lending rate positively influenced profitability within Uganda's banking sector between September, 2008 and March, 2018. Evidently though, only GDP and inflation rate were found to be significant at the conventional 5 percent significance level. Lending rate on the other hand was seen to be significant at the 10 percent level. Therefore, only these three macroeconomic dynamics could ably explain deviations in the return on equity of Uganda's banking sector during the period under review.

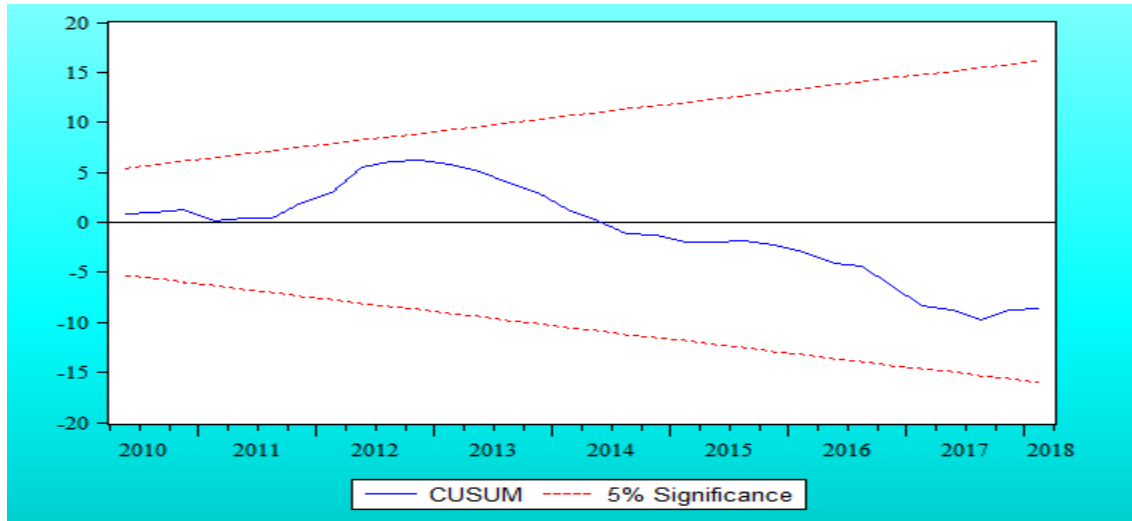
4.6 Stability Tests for the Multiple Regression (OLS) model

In order to assess the significance of the model in Table 4.9, a number of post estimation methods were applied to the multiple regression OLS model and these included; Stability tests using the Recursive Estimates (OLS only) test, Ramsey RESET test and the Wald Coefficient test.

4.6.1 Recursive Estimates (OLS only)

The CUSUM test was based on the cumulative sum of the equation errors in regression and it was used to test the stability of the equation parameters. Figure 4.3 presents the cumulative sum of errors together with critical lines of 5 percent level of significance. The equation parameters were seen to be stable since the cumulative sum was within the two critical lines. Accordingly, the parameters were said to be stable thus the model used for the study was stable.

Figure 4.2: Recursive Estimates Stability test



4.6.2 Wald Test (test for Joint Significance)

The Wald test was employed to examine the joint significance of the explanatory variables (quarterly GDP, inflation rate, real effective exchange rate, lending rate and the 91-day Treasury bill rate). The test was based on the null hypothesis that the parameters associated with a group of explanatory variables are zero (indicating that the macroeconomic variables do not affect bank profitability), against the alternative that they are not zero. From the study findings presented in Table 4.10, the probability of the chi-square ($p=0.0000$) indicates that we reject the null hypothesis at the 5 percent level of significance. This implies that the parameters associated with the explanatory variables were not zero and therefore it was concluded that the macroeconomic variables do affect bank profitability and it was correct to include them in the model.

Table 4.10: Wald Coefficient Test

Wald Test:			
Equation: EQ01			
Test Statistic	Value	df	Probability
F-statistic	266.7019	(6, 32)	0.0000
Chi-square	1600.211	6	0.0000
Null Hypothesis: $C(1)= C(2)= C(3)= C(4)= C(5)= C(6)=0$			
Null Hypothesis Summary:			
Normalized Restriction (= 0)	Value	Std. Err.	

C(1)	204.0853	56.79668
C(2)	0.820841	0.353234
C(3)	-19.85632	5.962428
C(4)	-0.523836	0.552182
C(5)	-0.097229	0.093561
C(6)	1.244401	0.682751

Restrictions are linear in coefficients.

4.6.3 Ramsey RESET Test

For model selection purposes, the Ramsey RESET test statistics was used to assess specification problems within the model. The test was based on the null hypothesis that the model was correctly specified, against the alternative that the model was mis-specified. From Table 4.11 for the test statistics, the probability value of the F-statistic (p-value = 0.4949) shows that we fail to reject the null hypothesis at the 5 percent significance level. Therefore, the linear model used in the study was correctly specified.

Table 4.11: Ramsey RESET Test

Ramsey RESET Test			
Equation: EQ01			
Specification: ROE C INF LGDP DTBILLRATE DREER DLEND			
Omitted Variables: Squares of fitted values			
	Value	df	Probability
t-statistic	0.690623	31	0.4949
F-statistic	0.476960	(1, 31)	0.4949
Likelihood ratio	0.580208	1	0.4462

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study was carried out in order to examine the effect of macroeconomic variables on the performance of Uganda's banking sector. The study employed the return on equity as the dependent variable while Gross Domestic Product (GDP), inflation rate, real effective exchange rate (REER), 91-day Treasury bill rate and lending rate were used as the explanatory variables.

5.2 Summary of findings

Before embarking onto the regression analysis, the study variables were first evaluated for stationarity and multicollinearity using the Augmented Dickey-Fuller test and the correlation matrix respectively. The unit root test (stationarity test) assessed stationarity of the study variables in line with the ordinary least squares methodology while the multicollinearity test was aimed at ensuring that the regressors (explanatory variables) did not have perfect or exact linear depiction of one another while.

From the Augmented Dickey-Fuller test, return on equity (ROE), inflation rate and the quarterly GDP were found to be integrated of order 0 or I(0). Taking the first difference also ensured that the rest of the variables were stationary, making them integrated of order 1 or I(1). Based on the correlation matrix, it was established that the independent variables were not correlated with each other since all values were below 0.8.

Bivariate analysis was conducted using the Pearson (r) correlation coefficient and it was noted that quarterly GDP and the real effective exchange rate had a negative correlation with banking sector profitability while inflation rate, lending rate and the 91-day Treasury bill rate had a positive correlation with ROE. However, further analysis indicated that only quarterly GDP and inflation rate had a significant correlation with profitability of Uganda's banking sector at 5 percent level of significance.

Results from running the multiple regression analysis using ordinary least squares (OLS) method further confirmed that GDP and inflation rate were the only macroeconomic variables that had a significant effect on the profitability of Uganda's banking sector. In addition, GDP, real effective exchange rate and the 91-day Treasury bill rate had a negative influence on profitability of the sector while the inflation rate and the lending rate had a positive effect.

The value of the R-squared ($R^2 = 0.546628$) showed that overall, the regressors (macroeconomic variables) accounted for 54.6 percent of disparities in the profitability of Uganda's banking sector between September 2008 and March 2018. The 46.4 percent of the disparities in the dependent variable (profitability of the sector) that were not explained by the independent variables employed for the study could be due to other factors for example bank specific factors (size of the banks, cost of capital, asset growth), Central Bank policies, and government policies, which were not the focus of this study.

The probability value of the F-statistic (Prob (F-statistic) = 0.000821) also indicated that the macroeconomic variables (GDP, inflation, real effective exchange rate, the 91-day Treasury bill rate and lending rate) jointly were relevant in explaining changes in profitability of Uganda's banking sector, at the 5 percent level of significance.

5.3 Conclusion

Gross domestic product (GDP) growth rate was found to negatively influence profitability of Uganda's banking sector, hence depicting that an increase in the level of economic activity reduced the profitability of the sector in general. This effect was found to be significant at the significance level of 1 percent, and was in line with Kanwal and Nadeem (2013) who conducted a study in Pakistan and Combey and Togbenou (2017) who examined Togo and found that GDP had a negative impact on return on equity (bank performance).

Inflation rate was found to have a positive and significant impact on bank profitability. The positive significant relationship between inflation and banking sector performance was consistent with findings by Athanasoglou et al (2008) who analysed Greece.

Similar to quarterly GDP, exchange rate was found to have a negative association with bank profitability. This result highlighted that a depreciation/appreciation of the local currency against the US dollar translated into an increase/decline in return on equity in Uganda's banking industry. This conclusion was in line with Kiganda (2014) for Kenya, who found a negative and insignificant association between exchange rate and profitability of Kenyan commercial banks.

The impact of interest rates on bank profitability was twofold. First, the interest rates, as measured by the 91-day Treasury bill rate had a negative but insignificant impact on return on equity. Secondly, interest rates, as measured by the lending rate, established a positive influence on bank profitability and was significant at the 10 percent level of significance.

However, the inconsistent results portrayed by the two measures of interest rates implied that the researcher could not conclude that interest rates have an effect on the performance of Uganda's banking sector.

5.4 Recommendations

From the study findings and results, the researcher recommends that commercial banks should put in place measures that can ably help them forecast the inflation rate so that they can benefit from a higher inflation rate and increase their profitability. This is because the inflation rate had a positive significant impact on return on equity, implying that an increase in the inflation rate resulted into an increase in the profitability of the sector. As noted in the literature, if commercial banks fully anticipate the inflation rate, they are able to adjust their interest rates accordingly in order to increase their revenue thus raising their profits.

In addition, since the findings also showed that an increase in GDP would reduce bank profits while a decline in GDP would rise the profits, commercial banks need to take note of times when Gross Domestic Product of the economy drops, perhaps as people decide to consume more and invest less, in order to boost their earnings.

5.5 Suggestions for further research

To examine the effect of Macroeconomic variables on the performance of the banking sector, using VECM.

The researcher recommends that further research should be conducted to investigate the effect of macroeconomic variables and the performance of Uganda's banking sector using Vector Error Correction Model (VECM). If a set of variables are found to have one or more co-integrating vectors, then a suitable estimation technique is a VECM (Vector Error Correction Model) which adjusts to both short run changes in variables and deviations from the equilibrium.

To examine the effect of bank-specific and Macroeconomic variables on the performance of Uganda's banking sector, using Panel data

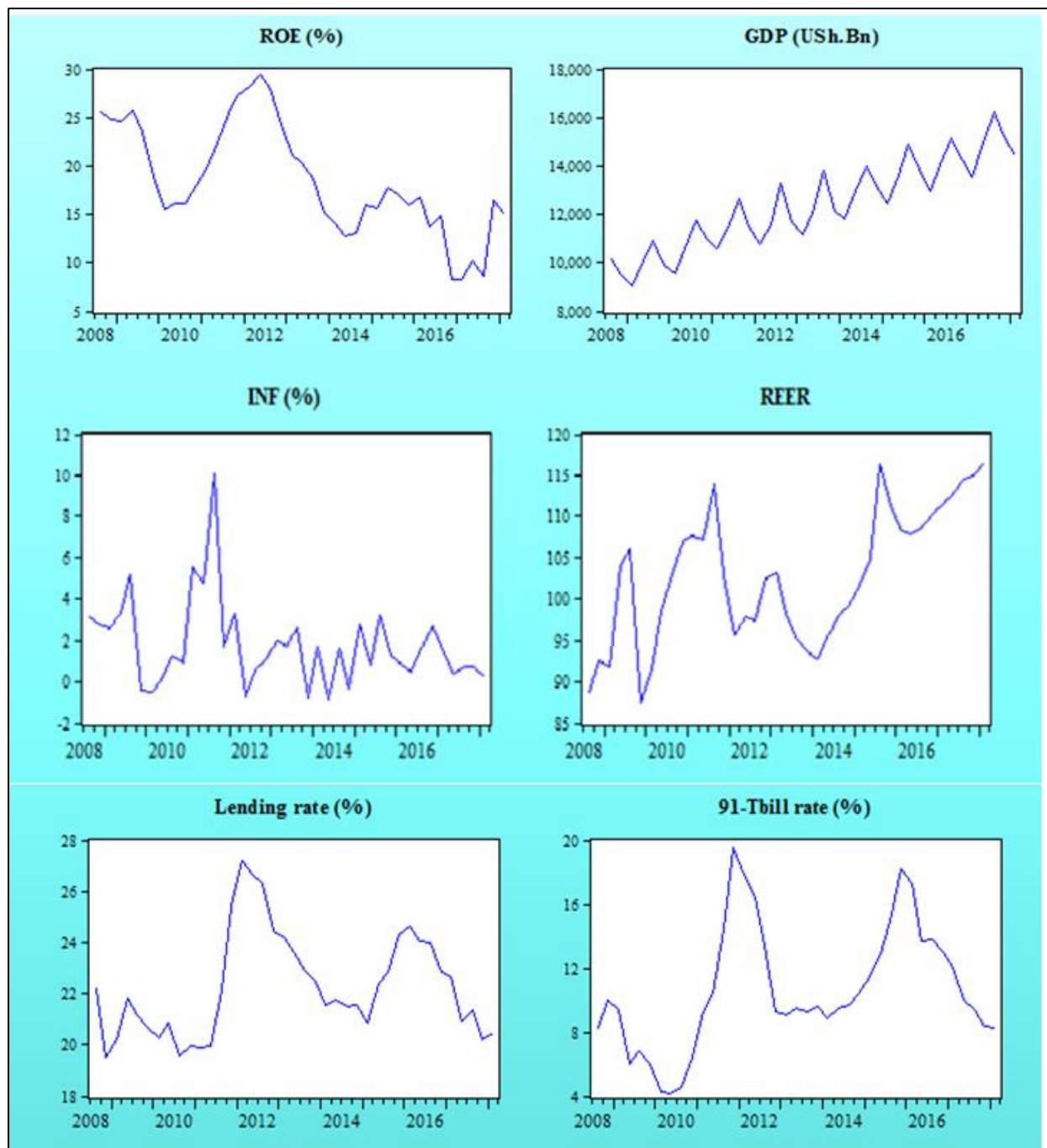
The researcher also recommends that further research should be conducted to examine the effect of microeconomic (bank-specific) and macroeconomic variables, on the performance of Uganda's banking sector using panel data. Individual bank data should be employed to further explore the effect that it has on the performance of the sector and on each bank. In addition, panel data would provide the researcher with a large number of data points, hence increasing the degrees of freedom and reducing the possibility of collinearity among explanatory variables. Panel data would also allow the researcher to answer some important economic questions that cannot be addressed using time-series data as was used in this study.

To examine the effect of Macroeconomic variables on the performance of East African regional countries

The researcher recommends additional research to assess the effect of macroeconomic variables on the performance of other regional countries in East Africa. This would be contribute to policy formulation within the region.

APPENDIX

Figure A.1: Trend analysis of the study variables



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