EFFECT OF MACROECONOMIC FACTORS ON THE PROFITABILITY OF COMMERCIAL BANKS LISTED AT THE NAIROBI SECURITIES EXCHANGE IN KENYA

By

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ABSTRACT

Due to the vast contribution of commercial banks to the economic development in Kenya, this study examined the effect of macroeconomic variables on profitability of Commercial Banks listed in the Nairobi Securities Exchange (NSE) for years 2009 to 2016. Panel data regression analysis with fixed effects was utilized on the data to examine the effects of four macroeconomic variables which included: Gross Domestic Product (GDP), Real interest rate, Inflation rate and Exchange rate on Return on Asset (ROA) which proxies profitability.

The study findings indicated that real GDP growth rate had positive significant effect on profitability of commercial banks as measured through Return on Assets (ROA). Real interest rates had a significant positive influence on profitability of listed commercial banks in Kenya. Inflation rate had a significant positive influence on profitability of listed commercial banks in Kenya. While the exchange rate had a negative significant effect on the profitability of listed commercial banks on Nairobi Securities Exchange.

Key Words: Macroeconomic Variables, Commercial Bank Profitability

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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

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And have certified that all revisions that the dissertation recommended have been adequately addressed.

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DEDICATION

I dedicate this research to my late parents Mr. & Mrs. Emase for teaching me the value of education, which is a very important tool in this contemporary society in order to succeed. I honestly feel in the absence of their encouragement, inspiration and constant dedication I would not be going through this research process.

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ACRONYMS AND ABBREVIATIONS

CKB   Central Bank of Kenya

CPI   Consumer Price Index

GMM   General Method Moments

GDP   Gross Domestic Product

IFE   International Fisher Effect

KNBS   Kenya National Bureau of Statistics

ROA   Return on Assets

ROE   Return on Equity

VIF   Variance Inflation Factor

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Macroeconomics is a study on how the aggregate economy performs as a whole. A macroeconomic factors are relevant to a broad economy at the regional, national level and local level as it affects a large population rather than a few select individuals. Macroeconomic factors such as economic output, price levels, unemployment, inflation, national income, gross domestic product, savings and investment are the key determinants of economic performance which are closely monitored by governments and financial institutions (Cooper & John, 2009). Economists often look at macroeconomic factors when they are exploring ways to explain meet economic policy goals and create economic stability. In doing so, they are often able to predict future levels of employment, inflation and other key macroeconomic factors. These predictions influence decisions made today by governments, individuals and companies. (Bayoumi, 1993)

Financial institutions largely influence the economy since they act as financial intermediaries between people with financial surplus (lenders) and those with financial deficit (borrowers) (Alper & Anbar, 2011). The key functions of financial intermediaries range from matching demand & supply, dealing with financial instruments, offering payment mechanism, facilitating financial markets, providing transparency in the market and risk management (Alper & Anbar, 2011). Commercial banks participate to the economic growth of a country by availing funds for investors and at the same time enhance financial growth in the country (Otuori 2013). Beyond the common intermediation function of commercial banks, they also ensure good financial performance which is a reward to the shareholders and eventually promotes the general economic growth of the country (Ongore & Kusa, 2013).

A well-developed banking system is critical for the economic development of a country. For instance, the Industrial Revolution in Europe in the 19th century would have been impossible in the absence of a sound system of commercial banking. According to the Pakistan 10 year strategy paper for banking sector reforms, the banking sector represents the core of the financial sector in Pakistan indicating an 88 % share which greatly enhances the economic growth of the country (Kanwal & Nadeem, 2013). According to Aysan and Ceyhan (2007), Turkish banking system has in history held a vital position in Turkish financial system which is based on universal banking framework that legally authorizes commercial banks to service various kinds of activities in financial markets. A great percentage of transactions and activities of money markets are handled by banks indicating that the banking sector is an important financing channel for economic growth in Turkey.

In Africa, South Africa is the country with the best performing economy in relation to gross domestic product followed by Nigeria. Since the year 2003, GDP growth of Nigeria has averaged from 6 to 7%. GDP per capita has moved from below 700$ in 2004 to $1418 in December 2009 showing a trend of economic growth in the country which a greater share was attributed to commercial banks in Nigeria (Osamwonyi & Michael, 2014). In Sub-Saharan Africa commercial banks are denoted to be more profitable than the rest of the world with an average Return on Assets of 2 percent (Flamini et al., 2009). The reasons for the high returns in commercial banks were investment in risky ventures where high risk is related to high returns.

In developing countries like Kenya, commercial banks are considered to be the foundation of the economy (World Bank, 2016). Most importantly the Commercial Banks listed in the Nairobi Securities Exchange namely Equity bank Ltd, Barclays Bank Ltd, Kenya Commercial Bank, Standard Chartered Bank, National Bank, Cooperative bank, CFC

Stanbic, I & M Bank, NIC Bank, Diamond Trust Bank Kenya and Housing Finance Bank have contributed tremendously to the financial growth of Kenya as a country. According to The Bank Annual Supervision Report (2015), collectively these commercial banks have retained stability and resilience indicating a growth of 9.2 per cent in assets which is a difference from Ksh. 3.2 trillion in December 2014 to Ksh. 3.5 trillion in December 2015 as evident by the financial statements. This increase was attained regardless of the fact that the economy as a whole experiences a downshift due to the slowdown growth in China plus the slow recovery in the Eurozone characterized by a drop from 3.5 per cent growth in 2014 to 3.1 per cent growth in 2015.

The global financial markets were also affected in 2015 following uncertainty of increase in interest rates in the U.S and the easing of monetary policy in the Eurozone. The impact of the adverse global developments has however remained minimal in Kenya due to the diversification of the economy and a stable financial sector. As a result, the key macroeconomic indicators remained relatively stable and supportive of the growth in 2015. The overall inflation level reduced from 6.9 per cent in 2014 to 6.6 per cent in 2015 as a result of energy and transport prices reducing. On the other hand the GDP is estimated to have increased by 5.6 per cent in 2015 from 5.3 per cent growth in 2014. This growth was mainly aided by a sustainable macroeconomic environment and advancement in outputs of agriculture, construction, real estate, finance and insurance sectors (The Bank Annual Supervision Report 2015)

The financial performance of commercial banks can be influenced by internal and macroeconomic (external) factors (Ongore, 2013). The internal factors are individual characteristics determined by the management and board of directors. The external factors are sector wide or country wide factors which are beyond the control of the company. Ownership

identity can also influence the performance of firms (Ongore, 2011). Macroeconomic variables form a huge portion of the external profit determinants in most studies carried out. The most common macroeconomic factors that have been identified among others are GDP growth, inflation, interest rate, exchange rate (Haron, 2004). To determine the profitability of commercial banks, the most commonly used measures are Return on Equity and Return on Assets (Alexandru et al., 2008). Profitability analysis of commercial banks has attracted much attention on academic research since the Great Depression.

The banking industry has also experienced major transformation all over the world under the impact of innovation in technology, deregulation and globalization. Both internal and external factors have one way or another affected the structure and performance of banking industry (Ally 2014). Despite this increased trend, the banking industry is better able to withstand negative shocks and still contribute to the financial sector of a country. Hence the factors that influence profitability have attracted the interest of academic researchers, analysts, bankers, policy makers and regulators.

1.2 Statement of the Problem

In developing countries like Kenya, commercial banks are considered to be the foundation of the economy thus a well-developed banking system is critical for the economic development of a country. In relation to this all the commercial banks strive to contribute towards a higher participation in the system hence the factors that influence profitability has attracted the interest of academic researchers, analysts, bankers, policy makers and regulators. There are some studies that have being carried out on the effect of macroeconomic factors on profitability but some level of inconsistency and mixed reactions have been obtained.

A number of international studies have been done in this regard for instance a study by Zhang and Dong (2011) analyzed the profitability of the banking sector in U.S which included bank

specific characteristic as well as macroeconomic factors and concluded that GDP and interest rate change were significant in explaining bank profits. Solnik (2000) conducted a study in UK and US on the relationship of nominal interest rates and the rate of inflation on returns and it was established that high interest rates adversely affect the demand for credit which hinders growth. Booth and Ciner (2001) studied the long-run relationship between inflation rate and Eurocurrency interest rate in US and study found that there is a direct relationship between interest rates and expected inflation indicating that market participants should incorporate a high predictable portion of the inflation rate into the nominal interest rate to increase returns. Osamwonyi and Michael (2014) in their study on profitability of banks in Nigeria argued that GDP and interest rate have a significant effect on Return on Equity.

However, Kanwal and Nadeem (2013) studied on profitability of public listed commercial banks in Pakistan and concluded that in order to maximize the returns banks have to focus more on other external factors or devise policies to improve the internal factors. The results argued GDP, real interest rate and inflation have a negligible impact on profitability of commercial banks. Ally (2014) study on the effect of macroeconomic factors on banks profitability in from 2009-2013 concluded that macroeconomic factors do not significantly affect banks profitability and that profitability performance is influenced by management decisions

In Kenya there are various studies that have been carried out like Otuori (2013) explored the performance of commercial banks and found that interest rate had a positive effect on bank performance which concludes that higher levels of interest rate lead to higher profitability in commercial banks. Kiganda (2014) as well studied on profitability of commercial banks and concluded that increase in exchange rate and inflation rate has a negligible effect on bank profitability. Simiyu and Ngile (2015) also studied on profitability of commercial banks and

the findings indicated that real interest rate and exchange rate should be well managed with a keen focus on interest rate risk and foreign exchange fluctuations because they have an adverse effect on returns while GDP is not significant. Maigua and Mouni (2016) in their study as well observed that exchange rate has a significant effect on profitability. Although studies have been conducted the research is still scarce with inconsistencies and mixed reactions which can be probably attributed to methods, approaches to the investigation and the environment of the banks thus a need for a more recent collective study on the impact of macroeconomic factors on profitability of commercial banks in Kenya. This study therefore seeks to contribute to the literature by narrowing the indecisive rift on the implication of macroeconomic variables on bank profitability and advice on what policies to adopt to further boost returns.

1.3 Objectives of the Study

1.3.1 Main Objective

The purpose of this study is to establish the effect of macroeconomic factors on the profitability of commercial banks listed at Nairobi Securities Exchange in Kenya.

1.3.2 Specific Objectives

The specific objectives of this study are to:

i. Determine the effect of real Gross Domestic Product on the profitability of commercial banks listed at Nairobi Securities Exchange in Kenya.

ii. Examine the effect of real interest on the profitability of commercial banks listed at Nairobi Securities Exchange in Kenya.

iii. Evaluate the effect of inflation rates on the profitability of commercial banks listed at Nairobi Securities Exchange in Kenya.

iv.   Establish the effect of exchange rate on the profitability of commercial banks listed at Nairobi Securities Exchange in Kenya.

1.4 Research Questions

i.   What is the effect of real Gross Domestic Product on the profitability of commercial banks listed at Nairobi Securities Exchange in Kenya?

ii.   What is the effect of real interest on the profitability of commercial banks listed at Nairobi Securities Exchange in Kenya?

iii.   What is the effect of inflation rates on the profitability of commercial banks listed at Nairobi Securities Exchange in Kenya?

iv.   What is the effect of exchange rate on the profitability of commercial banks listed at Nairobi Securities Exchange in Kenya?

1.5 Significance of the Problem

The findings of this study will beneficial to commercial bank stakeholders, investment managers, researchers, professional analysts, government bodies and policy makers. Commercial bank stakeholders will be able to evaluate their equity investments and help them make informed decisions based on macroeconomic variables. Management will be able to establish the effect of macroeconomic factors on returns and know how to adjust their investment portfolio. Academic researchers will utilize this study as it will provide new insights of areas that need more research through its research gaps and the study can also be a significant reference point in its theoretical frame work. Professional Analysts will be able to evaluate macroeconomic trends and set financial policies to build long-term plans for business activity. The Government and policy makers will acquire a useful basis that may guide them in making decision and formulating national policies on interest rates and inflation-adjusted measure that reflects the value of all goods and services.

1.6 Scope of the study

This study on the effect of macroeconomic factors on the profitability of commercial banks listed at the Nairobi securities exchange in Kenya was based on annual data for the period 2009 to 2016. It focused on a population of the 11 banks listed namely Equity bank Ltd, Barclays Bank Ltd, Kenya Commercial Bank, Standard Chartered Bank, National Bank, Cooperative bank, CFC Stanbic, I & M Bank, NIC Bank, Diamond Trust Bank Kenya and Housing Finance Bank.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter examines the summary of literature review, critiques and research gaps of the past findings. It also looks into theoretical and empirical review of the literature ending with an illustration of the conceptual frame work of the study.

2.2 Theoretical review

2.2.1 The Theory of Interest

This theory was proposed by Fisher in 1930. It explains the relationship between inflation and the real and nominal interest rates. This relationship is usually known as the Fisher effect which states that increase in the growth rate of money supply results in increase in inflation and increase in nominal interest rate which matches an increase in the inflation rate. It was later simply put that Fisher Effect is the relationship between interest rates and inflation. It suggests that the nominal interest rate in any particular period is equal to the summation of the real interest rate and expected rate of inflation. It was established that nominal interest rate could be split into two different components which are the real rate and an expected inflation rate. Fisher also indicated that in the perfect world there is a minimal relationship between interest rate and inflation where by much difference on the interest rate is influenced by real factors in the economy such as investor time preference and capital productivity (Fisher 1930).

The fisher effect theory has the same inference with the International Fischer Effect (IFE). IFE theory postulates that foreign currencies with comparatively high interest rates will tend to depreciate because the high nominal interest rates display the expected rate of inflation. This theory also suggests that a change in the spot exchange rate between two countries also

has likelihood to equate the differences in their nominal interest rates (Moore & Craigwell, 2000).

A study was conducted on the relationship between nominal interest rates and the rate of inflation in U.S with annual data for the period 1890 to 1927 and in U.K. for the period 1820 to 1924. Fisher established that inflationary supposition was not instantly factored in the interest rates. In the US there was a correlation of 0.86 between long-term interest rates and price changes in a spread of 20 years while in the UK there was a correlation of 0.98 in a spread of over 28 years. High interest rates adversely affect the demand for credit which hinders economic growth and consequently hurt the economy. In the linkage of exchange rates with changes in interest rates and inflation rates, IFE theory stipulates that the future spot exchange rate can be established from the differential of the nominal interest (Solnik, 2000).

Booth and Ciner (2001) studied the long-run relationship between inflation rate and Eurocurrency interest rate in 9 European countries and the US. The study found that there is a direct relationship between interest rates and expected inflation hence the notion that market participants incorporate a high predictable portion of the inflation rate into the nominal interest rate. Alexander (2006) also investigated the relationship between inflation and nominal interest rates in South Africa in relation to the extent the Fisher effect hypothesis holds. The analysis used the 3 month bankers' acceptance rate and the 10-year government bond rate. Data utilized was for the period April 2000 to July 2005. The short-run Fisher effect was not empirically verified but there was a long-run co-integrating relationship established between long-term interest rates and expected inflation. The long-run adjustment was attributed to the credibility of the inflation targeting framework.

Fisher's rate of interest is vital to this study because it brings out the relationship between interest rate and inflation which provides a platform for the idea that monetary policy should mainly focus with managing inflation expectations in order to keep real interest rates at a stable level which promotes saving, investment and economic growth.

2.2.2 The Balance of Payments Theory

The Balance of Payments Theory was proposed by David Hume in1930s. The theory is also known as the general equilibrium theory of exchange rate. The theory suggests that a country's currency exchange rate depends on the supply and demand of foreign exchange. If the demand foreign exchange is higher than its supply, the price of foreign currency will go up. In case, the demand of foreign exchange is lesser than its supply, the price of foreign exchange will decline. The demand and supply of foreign exchange comes from the debit and credit items particularly in the balance of payments. The demand for foreign exchange comes from the debit side of balance of payments which is made up of Loans & investments made abroad and import of goods & services. The supply of foreign exchange arises from the credit side of the balance of payments which is made up of the capital receipts and exports of goods & services (Kanamori & Zhao, 2006).

If a country is experiencing unfavorable balance of payments the rate of foreign exchange drops and on the other hand if favorable balance of payments is present the rate of exchange will go up. Adverse balance of payments occurs when the exchange rate of a country falls below the equilibrium exchange rate. When the exports increase it eliminates the adverse balance of payment and the equilibrium rate is restored. At the level when the balance of payments becomes favorable again, the exchange rate rises above the equilibrium exchange rate resulting in the decline of exports (Kanamori & Zhao, 2006).

When all components of the balance of payment accounts are incorporated they must add up to zero with no surplus or deficit. If a country's imports are more than the exports, its trade balance will be in deficit and this will have to be neutralized by funds earned from its foreign ventures, borrowing funds from other countries or running down central bank reserves (Kipngetich, 2002). Balance of payments deficits have been a common occurrence in the Kenyan economy from the 1960s. The government has over the years put into practice various policy measures with the aim of rectifying the situation but the balance of payments position does not seem to have improved despite these policy measures (Mungami, 2012). The key practical significance of this theory is that, it demonstrates that disequilibrium in the balance of payments can be rectified by marginally adjusting the exchange rate by devaluation or revaluation.

2.2.3 Modern Monetary Theory

Modern monetary theory explains solely how commercial banking sectors, central bank and the government interacts with a number of economists illustrating that reserve accounting is vital to understanding monetary policy options. This theory was developed by a group of economist including Randall Wray (Wray, 1998). All commercial banks have an account with the central bank and this permits the banks to manage their reserve which is the amount of available money in the short term that a particular bank maintains. Government expenditure is debited to treasury's cash operating account at the central bank and the money is deposited into private bank accounts and eventually into the commercial banking system. This money contributes to the total reserves of the commercial bank sector. This theory argues that taxes and bond offerings are not best visualized as funding sources for the Treasury, but rather as reserve draining items to maintain price and interest-rate stability (Tymoigne, 2013).

In most countries, reserve accounts with the central bank by the commercial banks must have a balance that is positive at the end of every day. In some countries, a reserve requirement is set which is a proportion of the liabilities a bank has that is on its customers. This will have to be followed by continuous monitoring every day in that a commercial bank will have to evaluate the status of their reserve accounts. Commercial banks that are in deficit have the option of borrowing the required funds from the central bank, under the condition that they will be charged a lending rate on the amount they borrow which is also referred to as the discount rates (Palley, 2012).

Carpenter & Demiralp (2010) studied the role of reserves, money and the transmission of monetary policy in the US. The study highlighted that money multiplier gives bank reserves a causal role in determining the quantity of money and bank lending thus the transmission mechanism of monetary policy. Reserve requirements provide a tight direct linkage between money and reserves where by central bank controls the money supply by adjusting reserve quantity through open market operations. Empirically changes in reserves are unrelated to changes in lending and open market operations do not have a direct impact on lending. This theory highlights that low level of interest rates leads to demand for loans which leads to increased lending. This denotes that interest regulation rate play a vital role in bank revenues but the money multiplier does not appear to be useful in assessing the implications of monetary policy for future money growth or bank lending.

2.2.4 Interest Rate Parity Theory

Interest Rate Parity theory (IPRT) is based on the assumption that differences in interest rates between a country and its trading partners account for the rate of change in the nominal exchange rate. The theory of interest rate parity relates to the difference between foreign interest rates and domestic interest rates with changes brought about by the spot and future

exchange rates. This parity condition states that the domestic interest rate should equal the foreign interest rate plus the expected change of the exchange rates. The difference in interest rate between domestic country and world is equal to the expected change in the domestic exchange rate. This theory further states that interest rate differentials between two different currencies will be reflected in the premium or discount for the forward exchange rate on the foreign currency if there is no activity of buying shares or currency in one financial market and selling it at a profit in another (Bhole & Dash, 2002).

A policy which promotes high interest rate leads to a decrease in demand for lending which results to increase in price level. This is because an increase in interest rate indicates an increase in government debt. If investors are risk-neutral and have rational expectations, the future exchange rate should perfectly adjust given the present interest rate differential (Sargent & Wallace, 2001).

Interest rates in base countries have an effect on the real economies of other countries but this impact only exists for pegged countries. Countries without a fixed exchange rate denote no relationship between annual real GDP growth and the base interest rate. The countries with a fixed exchange rate grow 0.1 to 0.2 percentage points slower when base interest rates are 1 percentage point higher. Controlling on time, income, base country GDP growth, region and others all present the same picture. Pegged countries do not focus to on world interest rate, they only respond to the rate of the country they are pegged with indicating the importance of the peg in this relationship. Variation in base rates techniques bring about better identification and increase confidence in the robustness results (Giovanni & Shambaugh, 2007)

In the relationship between interest rate and the exchange rate, the measurements of the two variables are affected by their respective lagged values. The errors in the forecast of both the exchange rate and interest rate are dominated by it and also attributed to other variables.

There is no relationship between interest rate and exchange rate however a uni-causal relationship exists between the exchange rate and inflation rate. Policy makers should consider the inflation rate for forecasting and policy planning. (Wilson & Sheefeni, 2015)

This theory demonstrates the fact that monetary authorities should be flexible when monitoring and regulating interest rates. This is a change in interest rate affect the demand for borrowing funds which is a contributing factor in macroeconomic policy making.

2.3 Empirical review

There exists literature on profitability of banks based on the number of countries and types of banks. ROA, ROE and EM are the widely considered profitability measures by researchers. As discussed below this literature has produced mixed findings.

2.3.1 Real Gross Domestic Product and Profitability of Commercial Banks

GDP can be defined as the total economic activity measurement of a country which is usually adjusted for inflation. It is expected to have an effect on many factors linked to demand and supply for banks loans and deposits. According to the literature financial sector profitability and economic growth, GDP growth is expected to have a positive relation on bank profitability. Bashir (2003) investigated the determinants of profitability for 14 Islamic Banks from 8 Middle Eastern Countries and he found that GDP growth has a positive and significant impact on Islamic banks profitability measured by (ROA). Zang and Dong (2011) explored profitability of commercial banks in US for the period 2000-2008 and found GDP to be significant in explaining bank profits. Osamwonyi and Michael (2014) studied on profitability of commercial banks in Nigeria and found GDP to be significant in explaining bank profits.

On the contrary Kanwal and Nadeem (2013) researched on profitability of commercial banks in Pakistan for the period 2001-2011 and observed an insignificant positive effect of GDP on

profitability. Rao & Lakew (2012) explored profitability of commercial banks in Ethiopia and found that GDP was statistically insignificant in measuring profitability though with a positive sign. Kiganda (2014) researched on profitability of commercial banks in Kenya for the year 2008-2012 and observed an insignificant positive effect of GDP on profitability. Simiyu and Ngile (2015) as well studied on profitability of commercial banks in Kenya for the period 2001-2012 and observed an insignificant positive effect of GDP on profitability.

2.3.2 Real Interest and Profitability of Commercial Banks

The rate of interest that is determined after adjusting for inflation is referred to as the real interest rate. This can be denoted by the Fisher equation which defines the real interest rate as the nominal interest rate minus the inflation rate. According to the literature in World Bank Publications profitability is expected to increase with increase in interest rate. Samuelson (1945) showed that when interest rate increases it actually effect to borrowers but it has no effect the banks performance. The borrower will tolerate the impact of high interest rate while the performance of bank would not be affected by high interest rates. Gelos (2006) studied the determinants of bank profit margins in Latin America using bank and country level data and they found out that relatively high interest rates which is a proxy for macroeconomic risk has a strong effect on the banks efficiency.

Alpha and Anber (2011) researched on profitability of commercial banks in Turkey for the period 2002-2010 and concluded that real interest rate is significantly positively related to bank performance. Zang and Dong (2011) explored profitability of commercial banks in US for the period 2000-2008 and concluded that real interest rate is significantly positively related to bank performance. Kanwal and Nadeem (2013) researched on profitability of commercial banks in Pakistan for the period 2001-2011 and concluded that real interest rate is significantly positively related to bank performance. Obillo (2015) determined to what

extent lending interest rates affect profitability of commercial banks in Kenya for the period of five years from 2010 to 2014. The study concluded that lending interest rates have significant positive effect on financial performance of commercial banks in Kenya. Sattar (2014) analyzed the effect of interest rates changes on the profitability of commercial banks in Pakistan of four major banks during 2008 to 2012. The study concluded that there is strong positive correlation between interest rate and commercial banks profitability. Osamwonyi and Michael (2014) studied on profitability of commercial banks in Nigeria for the period 1990-2013 and observed a significant but negative effect of real interest rate on profitability. Simiyu and Ngile (2015) studied on profitability of commercial banks in Kenya for the years 2001-2012 and observed a significant negative effect of real interest rate on profitability.

2.3.3 Inflation rates and Profitability of Commercial Banks

Inflation measures the overall percentage increase in Consumer Price Index (CPI) for all goods and services. Inflation affects the real value of costs and revenues. It is persistently advocated by Keynesians and others that inflation is thought to increase the profitability of business. The relationship between the inflation and profitability has been demonstrated to be positive or negative based on past literature like Flamini et al (2009) concluded policies that promote low inflation and stable output growth do boost credit expansion. Otuori (2013) explored the performance of commercial banks in Kenya to determine the relationship between inflation rate and bank profitability and found that inflation rate had a negative significant effect on bank profitability. Maigua and Mouni (2016) also observed that inflation rates had a positive influence on performance of commercial banks.

However, Rao and Lakew (2012) explored profitability of commercial banks in Ethiopia and found that inflation rate was statistically insignificant but it is positively related to bank profitability. Kanwal and Nadeem (2013) researched on profitability of commercial banks in

Pakistan for the period 2001-2011 and concluded that inflation has a negligible impact on bank profitability. Osamwonyi and Michael (2014) studied on profitability of commercial banks in Nigeria for the years 1990-2013 and concluded that inflation has a negligible impact on bank profitability. Jasmine et al (2011) investigated the profitability determinants of commercial banks in Malaysia and it was found that base inflation rate was insignificant in determining the profitability of commercial banks in Malaysia. Kiganda (2014) as well studied on profitability of commercial banks in Kenya for the year 2008-2012 and observed that inflation has a negligible impact on bank profitability.

2.3.4 Exchange rate and Profitability of Commercial Banks

Hodrick (1990) showed that the effect of the volatility of foreign exchange on stock market might result from the fact that banks in developing countries are import dependent thus a negative implication for the economy in general. Atindehou and Gueyie (2001) focused on Canadian banks and their exposure to exchange rate risk. Their findings indicated that Canadian bank stock returns were sensitive to foreign currency fluctuations. Abebe (2006) on his study estimated an index of exchange market pressure (EMP) for Ethiopia and revealed that in majority of the cases the Ethiopian foreign exchange market was characterized by depreciation pressure which affect the economic performance of different sectors and as a result the performance of commercial banks might also be indirectly affected.

Babazadeh and Farrokhnejad (2012) examined the effects of foreign exchange changes on commercial banks profitability in Iran for the period of five years from 2006 to 2010.The results explained that exchange rate had a significant impact in determining the profitability of commercial banks in Iran. Getachew (2016) examined the impact of exchange rate on the profitability (ROE) of commercial banks in Ethiopia using a panel data set of banks over the years 2000-2014. The empirical findings of this study concluded that exchange rate has statistically significant negative impact on the profitability of commercial banks in Ethiopia.

Casey et al (2014) investigated the effect of foreign exchange fluctuations on 22 large U.S. commercial banks performance over a 40-year period and found out that financial institutions are impacted by foreign currency movements where banks are exposed to foreign exchange risk and that specific bank performance is related to the value of the dollar relative to market baskets of other currencies. Maigua and Mouni (2016) investigated profitability of commercial banks in Kenya and observed that exchange rate has a positive significant effect influence on performance of commercial banks.

Manyo et al (2016) also investigated the effect of foreign exchange transaction on the profitability of Nigerian banks for the period of 2010 to 2014. The results revealed that foreign exchange income has a negative and insignificant effect on the profitability of Nigerian banks for the period. Kiganda (2014) as well studied on profitability of commercial banks in Kenya for the year 2008-2012 and concluded that exchange rate has an insignificant effect on profitability.

2.4 Conceptual Frame Work

Figure 2.1 Conceptual Frame Work

Independent Variables   **Dependent Variable**

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┌─────────────────────────────┐
│   Gross Domestic Product    │
│                             │───────┐
│  (Annual % GDP growth rate) │       │
└─────────────────────────────┘       │
                                       │
┌─────────────────────────────┐       │
│     Real Interest Rate      │       │
│                             │───────┤      ┌─────────────────────────┐
│ (Annual Inflation Adjusted  │       │      │  Profitability of Banks │
│  CBK rate)                  │       ├─────▶│  Return on Assets       │
└─────────────────────────────┘       │      └─────────────────────────┘
                                       │
┌─────────────────────────────┐       │
│       Inflation Rate        │       │
│                             │───────┤
│ (Annual average inflation   │       │
│  rate)                      │       │
└─────────────────────────────┘       │
                                       │
┌─────────────────────────────┐       │
│       Exchange Rate         │       │
│                             │───────┘
│ (Average annual USD/ Kes    │
│  exchange rate)             │
└─────────────────────────────┘
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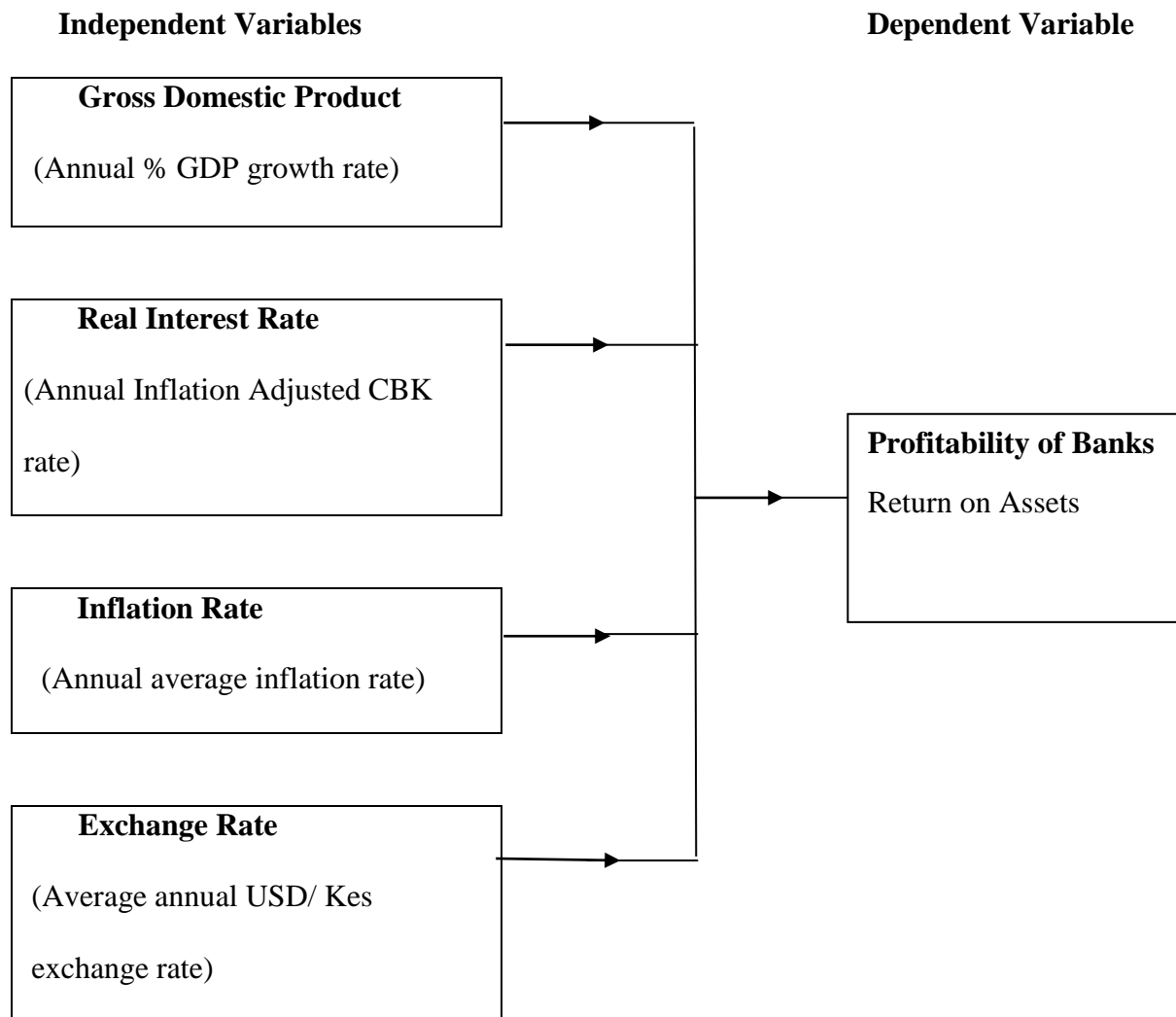
2.5 Measurement of Variable

2.5.1 Dependent Variable

2.5.1.1 Return on Average Asset (ROA)

Return on Asset (ROA) shows how much revenue a unit of asset generates and how bank managers efficiently use the assets at their disposal. ROA is expressed as a ratio of total revenue (net profit) over total average asset (Athanasoglou et al, 2005). Return on Equity (ROE) shows how much returns are made on a unit of the shareholders fund. It is expressed as a ratio of total revenue (net profit) over total average equity. The difference between ROE and ROA is that the ROE does not take into account the financial leverage (debt) while ROA does thus ROA will be employed in this study (Athanasoglou et al, 2005).

2.5.2 Independent Variables

2.5.2.1 Growth of Annual GDP

Gross Domestic Product is a measure of the volume of economic activities in a fiscal year. It can be defined as the value added and taxes by all the residents in the economy less endowment not included in the value of the products (World development indicators, 2012). In this study it will be determined as the annual % of GDP growth of Kenya for the period 2009- 2016.

2.5.2.2 Real Interest Rate

The rate of interest that is determined after adjusting for inflation is referred to as the real interest rate. Obillo (2014) highlighted that when interest rates increase or decrease; it brings about an impact on bank profitability through change in revenues. The annual inflation adjusted CBK rate will be used in this study.

2.5.2.3 Inflation (INF)

The Consumer Price Index (CPI) is used to proxy for annual inflation rate. Inflation affects both the earnings and costs. It also affects important variables like labour cost and asset prices (Garza-Garcia, 2011).

2.5.2.4 Exchange Rate

It refers to the exchange rate determined by national authorities or the rate determined in the legally sanctioned exchange market (World development indicators, 2012). The average annual US dollar to Kenya shillings exchange rate will be used in this study.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methodology that was be used in the study. It outlines the study design, variable specification, the target population, data collection methods and model specification in order to produce the desired information for the study.

3.2 Research Design

This study used descriptive research design. The descriptive study was deemed appropriate because the main interest was to establish the effect of the variables interest rates, inflation, exchange rate and GDP on performance of commercial banks in Kenya. Descriptive design is related to studies that have a main objective which describe the characteristics of a population or phenomenon being studied. This method was used because it addresses the objective of the research while investigating the relationship between the variables in the study. The design allows for descriptive statistics which gives an analysis of summarized statistics on a variable, e.g. mean, standard deviation and also often the lowest and highest observation. The trend analysis of the variables can also be evaluated to determine the general performance in terms of growth. The design takes into account aspects like the size of sample in relation to the target population, the variables under the study, methods employed in data collection and the model specification (Polit and Beck 2003).

3.3 Target Population and Sampling

A population is a clearly defined set of elements, services, people, events, things or household that is being investigated. (Obillo 2014) The target population that was used for this study is the 11 listed commercial banks in the Nairobi Securities Exchange (NSE 2016).

In this study, all the 11 listed commercial banks on NSE will be included because the target population is small and therefore a census will be utilized.

3.4 Data Collection

This research utilized secondary data in the course of the study. Data was collected from commercial banks financial statements, Kenya National Bureau of Statistics (KNBS) and Central Bank of Kenya (CBK) The secondary data collected was for the 11 listed banks in the NSE over a 8 year period (from 2009 to 2016) forming a panel data of 88 observations. The study employed panel data due to the advantage that it has as it helps to study the behavior of each bank over time and across space (Gujarati, 2003)

3.5 Diagnostic Tests

3.5.1 Normality Test

Normality tests determine if a data set is well-modelled by a normal distribution and how likely it is for a random variable underlying the data set to be normally distributed. Histogram and skewness distribution are some of the normality test carried out. Given that the graph follows a normal distribution curve, skewness lies between -3 and +3 and kurtosis for all the variables are positive it is implied that the data fits a normal distribution. (Gujarati, 2003)

3.5.2 Multicollinearity Test

Multicollinearity refers to a situation in which there is a strong correlation between independent variables in a study. This test will be employed in the study using Variance Inflation Factor (VIF). If there is no collinearity between two independent variables the VIF will be 1. As the variance of an estimator increases, also collinearity increases. A rule of thumb is that if VIF > 10 then multicollinearity is relatively high (Gujarati, 2003)

3.5.3 Heteroscedasticity Test

Heteroscedasticity is a condition that occurs when the variance of the error term is not constant. This test will be employed in the study using Breush-Pagan test using p-value. If the p-value is less than a significance level of 0.05 we conclude heteroscedasticity is present and reject the null hypothesis that the variance of the residuals is constant (Gujarati, 2003)

3.5.4 Hausman test

Hausman test was employed to find out whether the unique errors in the study are correlated with the independent variables and the null hypothesis indicates they are not. To decide between fixed or random effects a Hausman test can be run where the null hypothesis is that the preferred model is random effect vs. the alternative the fixed effect. If Prob>chi 2 is less than the 0.05 we reject the null hypothesis and use fixed effects (Greene, 2008).

3.6 Data Analysis

The data in the study was handled using Stata software (13) and analysed by panel data regression analysis. The panel data analysis model will be specified as:

$$Y_{it} = \beta_0 + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \mu_i + \varepsilon_{it}$$

Where;

i = Number of Banks (1, 2, 3 ….11)

t = 2009 to 2016

Yit = Return On Assets for bank i at time t,

X1it = Real Gross Domestic Product,

X2it = Real Interest Rates for bank i at time t,

X3it = Inflation Rate (Consumer Price Index)

X4it = Exchange Rate for bank i at time t,

β_0 = Constant (y-intercept)

$\beta1 - \beta4$ = Coefficients of the regressors

µi = are unobserved differences among the banks

εit = the error term for bank i at time t.

The results of the analysis will be presented using tables, figures, charts and graphs.

CHAPTER FOUR: FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the data analysis, interpretation and discussion of the research findings. The collected data from secondary sources was analyzed and interpreted in line with the objective of the study which was to determine, examine, evaluate and establish the effect of macroeconomic variables on 11 listed commercial banks in the Nairobi Securities Exchange. The chapter will involve descriptive statistics, normality tests, diagnostic tests and panel regression analysis.

4.2 Descriptive Statistics

Descriptive statistics gives initial indication of variables that can be used in regression analysis giving several summarized statistics on a variable, e.g. mean, standard deviation and also often the lowest and highest observation.

Table 4.1 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	88	.0271238	.0119987	-.0047276	.0552473
GDPGrowthR~e	88	.0525	.0139992	.03	.08
InterestRate	88	.0872125	.0249788	.036	.1276
InflationR~e	88	.077625	.0290716	.0396	.1402
ExchangeRate	88	.0027625	.0046693	-.0047	.0105

The descriptive statistics in table 4.1 show that the total number of data analyzed (n) is 88 which represents the eight - year data from 2009 - 2016 for the 11 listed Commercial Banks listed at Nairobi Securities Exchange in Kenya. According to Gujarati (2003), the standard deviation represents a measure of the dispersion from the mean which indicates the smaller the standard deviation the more accurate future predictions may be because there is less variability. In table 4.1, the results indicate that bank profitability ROA, GDP growth rate, interest rate, inflation and exchange rate fluctuation do not deviate much from the mean and

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the variables have smaller standard deviation thus more accurate the future predictions. The mean ROA is 2.71% with a standard deviation of 1.19% meaning that the data is clustered around the mean. GDP has a mean of 5.25% and a standard deviation of 1.4%, Interest rate has a mean of 8.72% and a standard deviation of 2.50%, inflation rate has a mean of 7.76% and a standard deviation of 2.91%. We can also see that mean of the respective variables lie between the minimum and maximum which enforces the accuracy of the data in consideration.
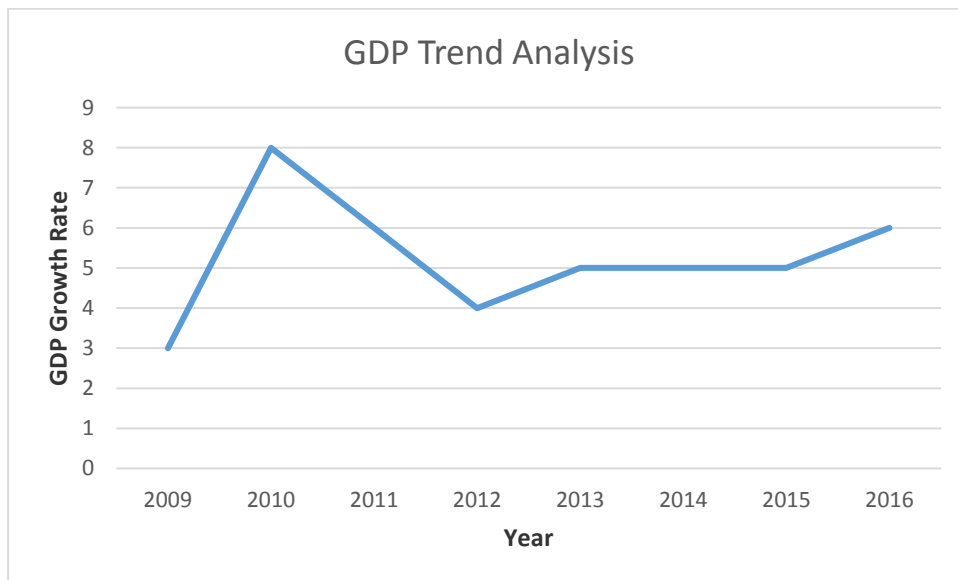
Figure 4.1 Trend Analysis for GDP

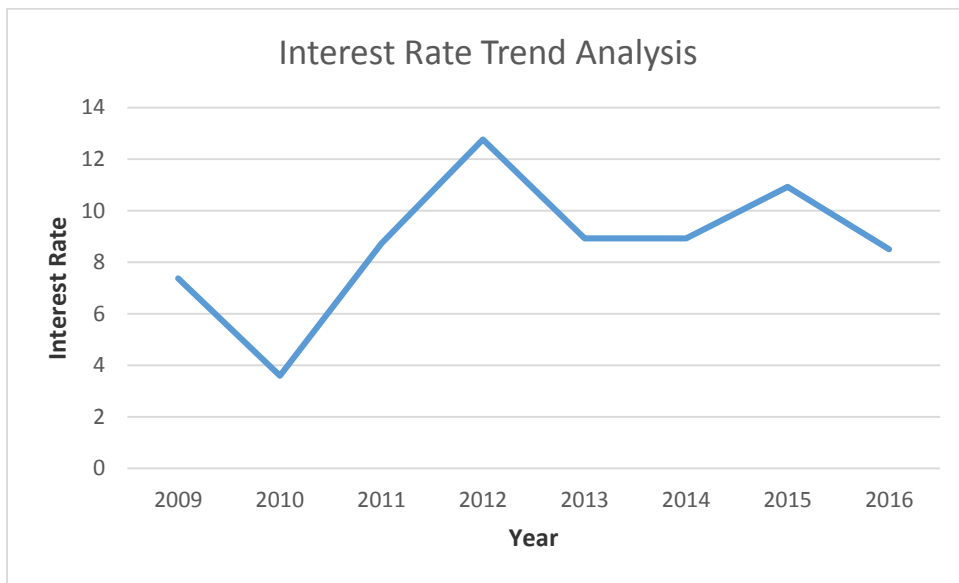**Figure 4.2 Trend Analysis for Interest Rate**

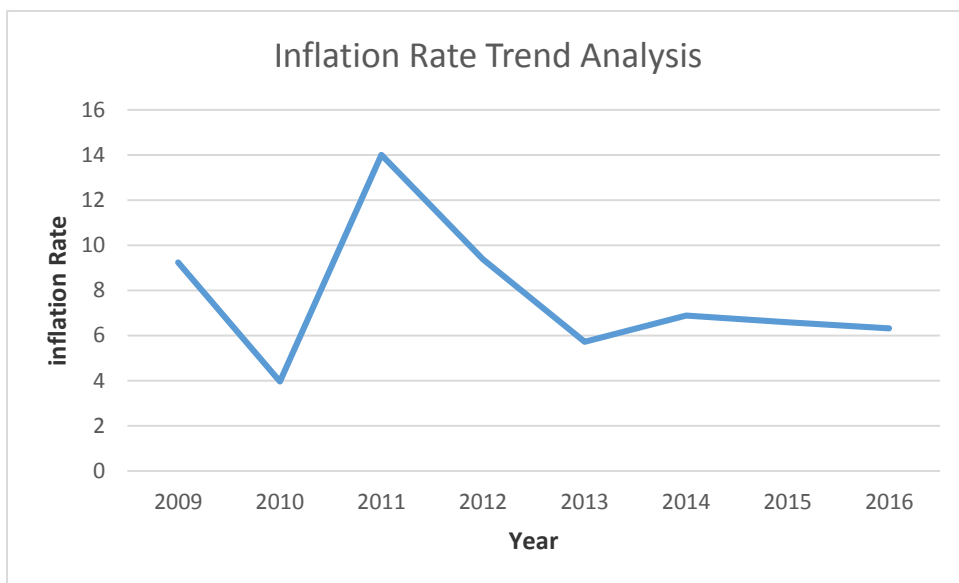**Figure 4.3 Trend Analysis for Inflation Rate**

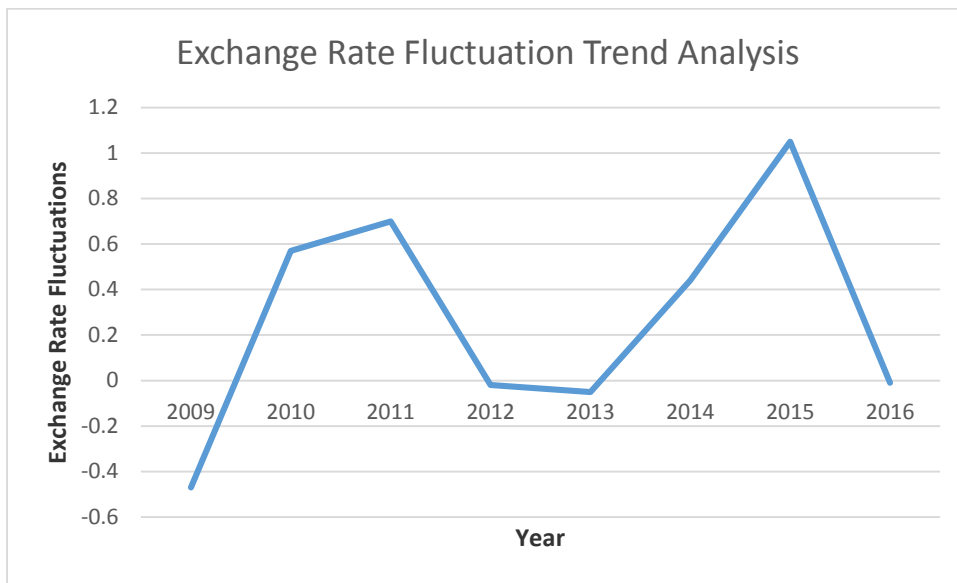**Figure 4.4 Trend Analysis for Exchange Rate Fluctuations**

Figure 4.1 -4.4 above shows the linear trend for GDP growth, interest rates, inflation rate and exchange rate fluctuation overtime. The results on Figure 4.1 suggest a growing trend of GDP from year 2009 showing the highest rate in 2010. The year 2011 recorded fall in growth rates which can be linked to shocks in the economy and it slowly stabilized from year 2013-2016. In Figure 4.2, there was a decreasing trend in the interest rates on year 2009 with the lowest real interest rate recorded in the year 2010 but later rapidly heating the highest rate in 2012. In Figure 4.3, there was a decreasing trend inflation rate on year 2009 with the lowest rate recorded in the year 2010 but later rapidly heating the highest rate in 2011. On the other hand in Figure 4.4, there was an up and down movement in exchange rates between 2009 and 2016 with the lowest exchange rate fluctuation being recorded in the year 2009. Overall, the results suggest that GDP growth, interest rates and inflation rate shows similar trends especially from the year 2010 to 2016

4.3 Normality Tests

Graph 4.1 Graphical Analysis for Return on Assets
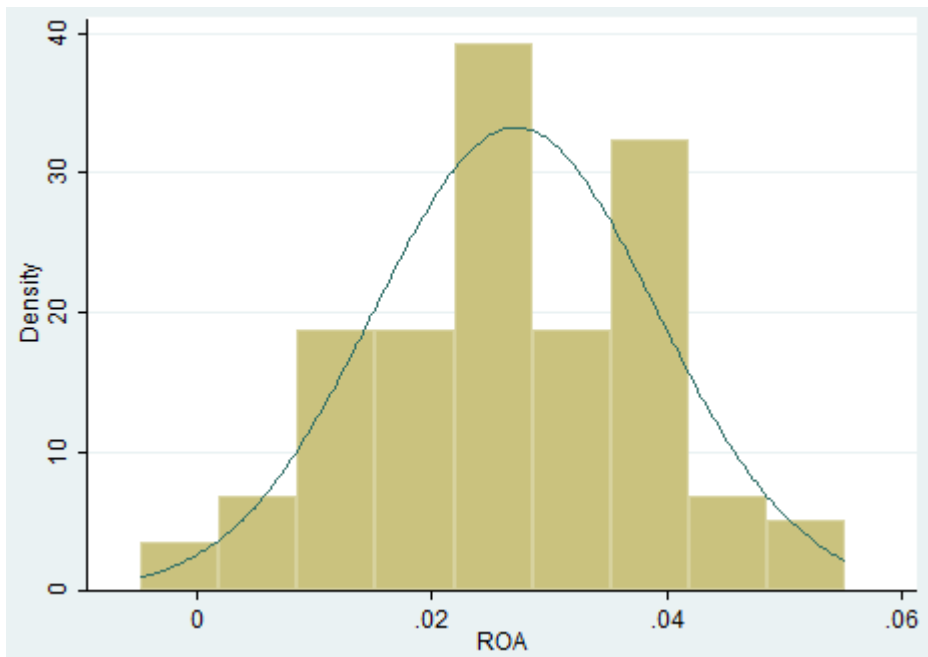
Graph 4.2 Graphical Analysis for GDP Growth Rate
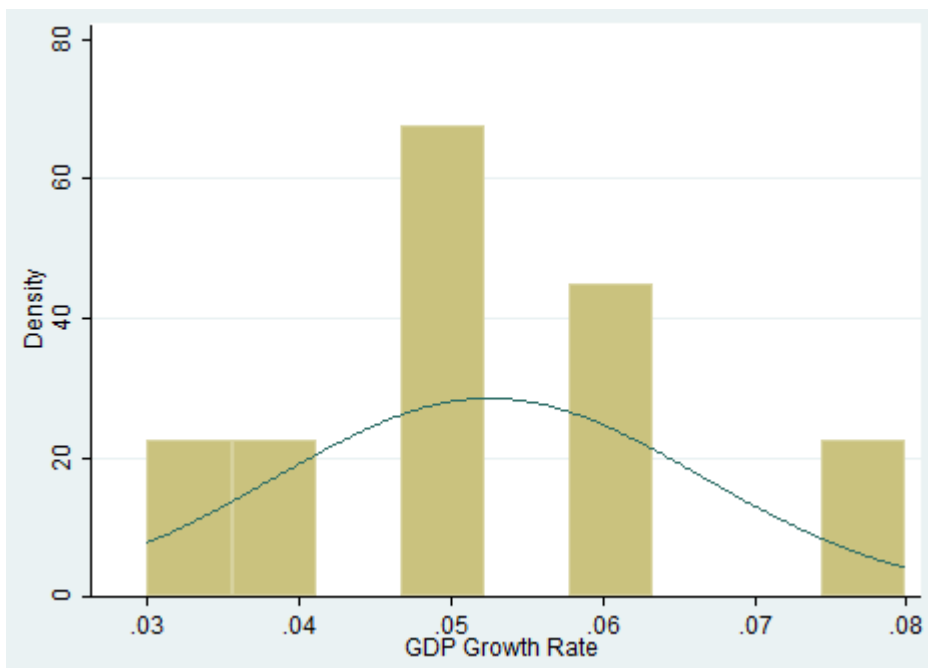
Graph 4.3 Graphical Analysis for Interest Rate
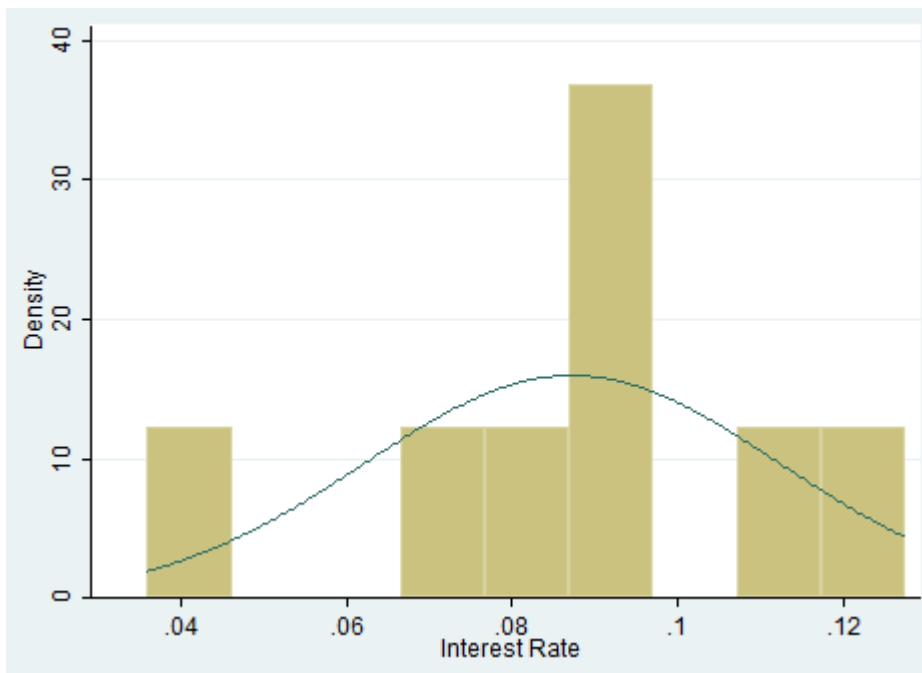
Graph 4.4 Graphical Analysis for Inflation Rate
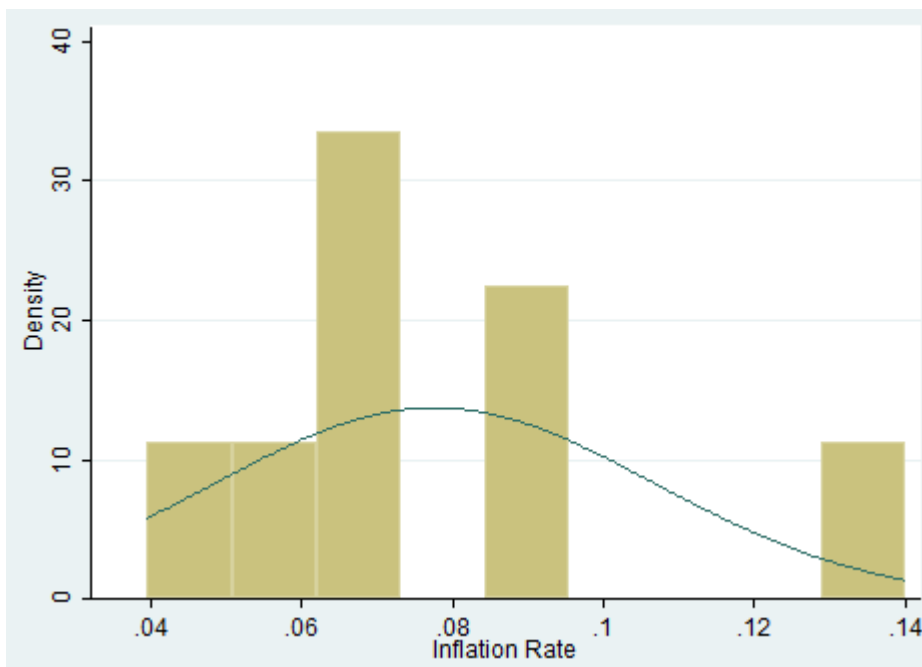
Graph 4.5 Graphical Analysis for Exchange Rate Fluctuations
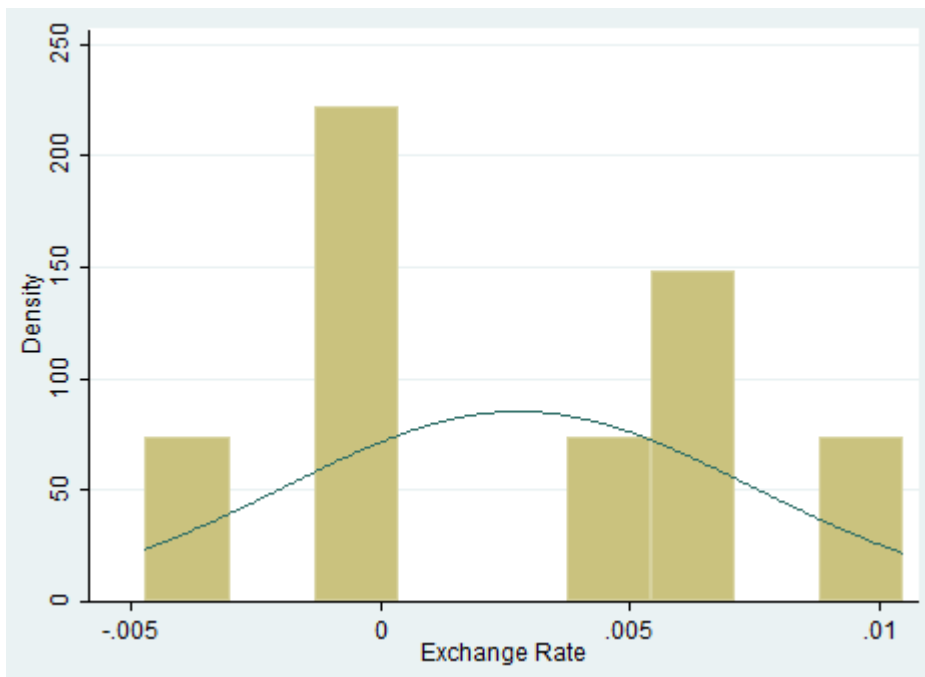
The statistics in graphs 4.1- 4.5 indicate that ROA, GDP growth rate, interest rate, inflation rate and exchange rate fluctuation are normally distributed because they follow the normal distribution curve.

Table 4.2 Skewness/Kurtosis Normality Test

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
ROA	88	0.8032	0.8521	0.10	0.9527
GDPGrowthR~e	88	0.1266	0.9765	2.41	0.3004
InterestRate	88	0.0540	0.4443	4.40	0.1108
InflationR~e	88	0.0006	0.4868	10.31	0.0058
ExchangeRate	88	0.7227	0.0003	10.99	0.0041

If skewness lies between -3 and +3 and kurtosis for all the variables are positive it is implied that the variables have normal curves with lighter tails (Gujarati, 2003). In table 4.2 we see that the skewness of all the five variables i.e. Pr (skewness) is between the range of -3 and +3

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and the values Pr (Kurttosis) are all positive thus the conclusion that data is normally
distributed.

4.4 Diagnostic Test

Table 4.3 Heteroskedasticity Test

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of ROA

        chi2(1)      =      3.77
        Prob > chi2  =    0.0521
```

If the p-value is less than a significance level of 0.05 we conclude heteroscedasticity is
present (Gujarati, 2003). In the table 4.5 we see that the p-value is 0.052 which is greater than
the significance level thus absence of heteroscedasticity.

Table 4.4 Multicollinearity Test

```
. estat vif
```

Variable	VIF	1/VIF
GDPGrowthR~e	3.21	0.311430
InterestRate	2.18	0.459490
ExchangeRate	1.95	0.511738
InflationR~e	1.22	0.820910
Mean VIF	2.14	

If there is no collinearity between two independent variables the VIF will be 1. As the
variance of an estimator increases, also collinearity increases. A rule of thumb is that if VIF >
10 then multicollinearity is relatively high (Gujarati, 2003). In table 4.6 above the VIF is 2.14
indicating a relatively low level of multicollinearity which is insignificant.

Table 4.5 Hausman test

```
hausman fe re

                      b = consistent under Ho and Ha; obtained from xtreg
        B = inconsistent under Ha, efficient under Ho; obtained from xtreg

 Test:  Ho:  difference in coefficients not systematic

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)

 =    -0.00    chi2<0
```

If prob chi2 is less than 0.05 (< 0.05) we reject the random effects model and use the fixed effects. In table 4.5 above the prob chi2 is -0.00 thus the results indicate we use the fixed effects.

4.5 Panel Data Analysis

The model specified in Chapter 3 was fitted to the data for both FE and RE using Hausman test to choose the model that best describes the data. The Hausman test gave a prob chi2 of -0.00 which is less than 0.05 suggesting that FE is the appropriate model.

Table 4.6 Fixed Effects Panel Regression

```
Fixed-effects (within) regression          Number of obs      =        88
Group variable: Bank1                       Number of groups   =        11

R-sq:  within  = 0.3995                      Obs per group: min =         8
       between = 0.0000                                      avg =       8.0
       overall = 0.1942                                      max =         8

                                             F(4,73)            =     12.14
corr(u_i, Xb)  = -0.0000                     Prob > F           =    0.0000
```

ROA	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
GDPGrowthRate	.4099651	.0971055	4.22	0.000	.216434	.6034962
InterestRate	.1155281	.044804	2.58	0.012	.0262339	.2048224
InflationRate	.1244351	.0288011	4.32	0.000	.0670345	.1818357
ExchangeRate	-1.355837	.2271165	-5.97	0.000	-1.808479	-.9031946
_cons	-.0103887	.0083923	-1.24	0.220	-.0271144	.0063371

```
       sigma_u |   .00897097
       sigma_e |   .00707597
           rho |   .6164665   (fraction of variance due to u_i)
```

F test that all u_i=0:   F(10, 73) =   12.86   Prob > F = 0.0000

From the results in Table 4.6, the within r-squared is 0.3995 which indicates that 39.95.15% of the variations within the variables were explained by the model. The overall r-squared is 0.1942 which indicates overall 19.42% of the variations in return on assets were explained by the independent variables. F (test) is included in the model to see whether all the coefficients in the model are different than zero. If Prob (F) < 0.05 this suggests that the model is ok and in this case we see that the Prob (F) is 0.0000 which indicates the model is ok.

The model established a panel regression equation of:

$Y = -0.0104 + 0.4099X1 + 0.1155X2 + 0.1244X3 - 1.35558X4$

This can be explained as follows:

1 unit increase in GDP increases the ROA by 0.4099, 1 unit increase in interest rate increases ROA by 0.1155, 1 unit increase in inflation rate increases ROA by 0.1244 and 1 unit increase

of exchange rate decreases ROA by 1.3558. If all the factors are held constant ROA will decrease by 0.0104. The model also demonstrates that all the variables GDP growth rate, Real interest rate, inflation rate and exchange rate have a significant effect on Return on assets. To test for significance the p-value has to be lower than 0.05 then you can say that the variable has a significant influence on your dependent variable. In this case p-value for GDP growth rate is 0.00 which is less than 0.05 thus indicating a significant positive influence of ROA, interest rate has a p-value of 0.012 which is less than 0.05 thus indicating a significant positive influence of ROA, inflation rate has a p-value of 0.00 which is less than 0.05 thus indicating a significant positive influence of ROA, exchange rate has a p-value of 0.00 which is less than 0.05 thus indicating a significant but negative influence of ROA.

CHAPTER FIVE: CONCLUSION AND RECOMMENDTION

5.1 Introduction

This chapter presents a summary of the findings of the study, conclusions, recommendations, limitation of the study and further areas of research.

5.2 Summary of the Findings

This study investigated the effect of macroeconomic factors on profitability of the 11 listed commercial banks in the Nairobi Securities for an 8 year period from 2009-2016. The study specifically sought to determine, examine, evaluate and establish the effect of real GDP, interest rate, inflation and exchange rate on bank profitability. The effect of macroeconomic factors on bank profitability was examined using panel regression analysis. The regression results show that macroeconomic factors have a significant effect on bank profitability in Kenya.

5.2.1 Gross Domestic Product and Profitability

The study determined that GDP growth rate has a significant positive relationship with profitability of commercial banks in Kenya. GDP is expected to have an effect on many factors linked to demand and supply for banks loans and deposits. When GDP growth increases firms hire more workers and can afford to pay higher salaries and wages leading to more consumer spending on goods and services. Firms also have the confidence to invest more when economic growth is strong and investment lays the foundation for economic growth and profitability.The findings of this study are consistent with the findings of Bashir (2003), Zang and Dong (2011), Osamwonyi and Michael (2014) who studied on profitability of commercial banks in and found GDP to have a significant positive relationship with profitability

5.2.2 Interest Rate and Profitability

The study examined and found that interest rate has a significant positive relationship with profitability of commercial banks in Kenya. The banking sector's profitability increases with increase in interest rate in that when interest rates rise profitability on loans also increases. Most banks fund their investments by the returns obtained from debt issued to customers and those anticipated earnings rises would be largely driven by an increase in their core lending margins. The findings of this study are consistent with the findings of Sattar (2014), Obillo (2015), Kanwal and Nadeem (2013), Zang and Dong (2011) and Gelos (2006)

5.2.3 Inflation Rate and Profitability

The study evaluated and concluded that inflation rate has a significant positive relationship with profitability of commercial banks in Kenya It is persistently advocated by Keynesians and others that inflation is thought to increase the profitability of business. There is a significant positive relationship between inflation and money supply in that when the social spending increases the deposits in banking sector also increases. Therefore, banks have more money to lend to private sector when money supply increases. The relationship between the inflation and profitability has also been demonstrated to be positive based on some past literature like Flamini et al (2009), Otuori (2013) Maigua and Mouni (2016)

5.2.4 Exchange Rate and Profitability

The study established that exchange rate has a significant negative relationship with profitability of commercial banks in Kenya. The effect of the volatility of foreign exchange on stock market might result from the fact that banks in developing countries are import dependent thus a negative implication for the economy in general. The findings of Hodrick (1990), Atindehou and Gueyie (2001), Abebe (2006), Babazadeh and Farrokhnejad (2012) and Getachew (2016) are consistent with my findings in this study.

5.3 Conclusion

The study found that GDP growth had a positive effect on bank performance in Kenya. The study therefore concludes that higher levels of GDP rate leads to higher profitability in commercial banks in Kenya. The study found that interest rate had a positive effect on bank performance in Kenya. The study therefore concludes that higher levels of interest rate lead to higher profitability in commercial banks in Kenya. The study found that inflation rate had a positive effect on firm performance in Kenya. It is therefore concluded that higher levels of inflation rate result in higher bank profitability in Kenya. The study found that exchange rate had a negative effect on bank profitability in Kenya. The study therefore concludes that higher levels of exchange rate volatility result in lower bank profitability in Kenya. It can therefore be concluded that macroeconomic factors have a significant effect on bank profitability in Kenya and it is therefore prudent for management to engage in formulation of better strategies which may results better performance of banks in Kenya.

5.4 Recommendations

This study shows that macroeconomic variables have a significant effect on the performance of commercial banks in Kenya. Key stakeholders in the banking industry should consider increasing the ratios that have a positive relationship to financial performance as doing so would result into increased profitability. There is need however for the management to ensure that they do so as per the statutory requirements of the regulator in this case the Central Bank of Kenya.

To begin with real GDP growth was found to have a significant effect on bank profitability, the government and regulatory agencies should ensure that this important macroeconomic variable is well managed as its growth would fuel growth in various sectors of the economy which has a multiplier effect on almost all industries.

Interest rates was also found to be a significant variable in determining the effect of macroeconomic variables on profitability. In the light of this interest rates should be managed by applying effective policies and measures by the central bank. Banks also should have effective measures to manage interest rate risks so that their profitability is not affected adversely. Interest rate risk exists in an interest-bearing asset due to the possibility of a change in the asset's value resulting from the variability of interest rates. Banks and the central bank should make use of these instruments and policies to ensure that rise in interest rates are well managed.

Inflation rate was also found to be a significant variable in determining the effect of macroeconomic variables on profitability. Banking system management should manage inflation rate by either increasing interest rates through the Federal Reserve, increasing reserve requirements on the amount of money banks are legally required to keep on hand to cover withdrawals or indirectly reduce the money supply by enacting policies that encourage reduction of the money supply.

Finally exchange rate was also considered a significant variable but with a negative impact on the bank profitability in this study. We can see that a fast depreciating local currency can create a high level of instability. This necessitates the efforts by the Central Bank of Kenya which is the pivot monetary authority in Kenya to put in place different measures at stabilizing the local currency. Banks should also place mitigating strategies to counter foreign exchange fluctuations.

5.5 Limitations of the Study

The study was faced by a number of limitations. First, only 11 commercial banks are listed in the Nairobi Securities Exchange against a total of 43 banks in the banking sector in Kenya. Secondly, this study made use of ROA as measure of financial performance. There are other

measures of financial performance including return on equity (ROE) and NIM (Net Income Margin) among others. Lastly, the study was specific to Kenya and therefore suffers from the limitations of country specific studies thus cannot be generalized to banks in other countries other than Kenya.

5.6 Suggestions for further Studies

For future research, this study can be extended to cover longer time periods. Unbalanced panel data can be used to incorporate the banks which are recently established. Quarterly data can be analyzed to reveal more precise results. Other econometric techniques can be applied to verify the relationship and more macroeconomic factors focused on.

REFERENCES

Abebe, D. 2006. "Measuring Exchange Market Pressure and the Degree of NBE's Intervention in the Foreign Exchange Market", Unpublished.

Alexander, M. 2006. The Relationship between Interest Rates and Inflation in South Africa: A thesis submitted in partial fulfillment of the requirements of the degree of Masters of Commerce in Financial Markets. Rhodes University

Alexandru, C., Genu, G., & Romanescu, M. L. 2008. The Assessment of Banking Performances: Indicators of Performance in Bank Area. MPRA Paper No. 11600.

Ally, Z. 2014. Determinants of Banks' Profitability in a Developing Economy: Empirical Evidence from Tanzania. *European Journal of Business and Management* Vol.6, No.31

Alper, D. & Anbar, A., 2011. Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey. *Business and Economics Research Journal,* 2(2), 139-152. ISSN: 1309-2448. Retrieved from www.berjournal.com

Athanasoglou, P.P., Sophocles, N.B., & Matthaios, D.D., (2005). Bank-specific, industry-specific and Macroeconomic Determinants of Bank Profitability. Working paper, Bank of Greece. 1(1), 3-4.

Atindehou, R.B., & Gueyie, J-P. (2001) "Canadian chartered banks' stock returns and exchange rate risk", Management Decision, vol. 39(4), 285-295

Aysan, A. F., & Ceyhan, S.P., 2007. What Determines the Banking Sector Performance in Globalized Financial Markets: The Case of Turkey.

Babazadeh, M., & Farrokhnejad, F., (2012). Effects of Short-run and Long-run changes in Foreign Exchange Rates on Banks' Profitability. *International Journal of Business and Management.* 7 (17), 18 – 33.

Bashir, A. H. M. 2003. Determinants of Profitability in Islamic Banks: Some evidence from
the Middle East. Islamic Economic Studies, 11, 31-57

Bayoumi, T. 1993. Financial Deregulations and Household Saving: Economic Journal, 103,
1432-1443.

Bhole, L.M., & Dash, P., 2002. Industrial Recession in India: Is Interest Rate the Cause? Vol.
43, No.2, July-Sept, 2002, pp. 268-277.

Booth, G., & Ciner, C., 2001. The Relationship between Nominal Interest rates and Inflation:
International evidence. *Journal of Multinational Financial Management* (11), pp.
269-280

Carpenter, S. B & Demiralp, S. 2010. Money, Reserves and the Transmission of Monetary
Policy: Evidence on Existence of Money Multiplier.

Casey, M.K., Fayman, A., & Ling, T. H, 2014. Bank Profitability: The Impact of Foreign
Currency Fluctuations. Journal of Applied Business and Economics vol. 16(2)

Central Bank of Kenya (2015). Bank Supervision Annual Report, Kenya.

Cooper, R., & John, A.A., 2009. Theory and Application of Macroeconomics

Fisher, I. 1930. The Theory of Interest, Macmillan, New York

Flamini, C., Valentina C., McDonald, G., & Liliana, S., (2009). The Determinants of
Commercial Bank Profitability in Sub-Saharan Africa. IMF Working Paper.

Gelos, G. (2006). "Banking Spreads in Latin America," IMF Working Paper 06/44.

Getachew, T. 2016. The Impact of Exchange Rate on the Profitability of Commercial Banks
in Ethiopia. A Thesis submitted to Department of Accounting and Finance, College of
Business and Economics, in partial fulfilment of the Requirements for the Degree of
Masters of Science in Accounting and Finance. Addis Ababa University

Giovanni, J., & Shambaugh, J. C., 2007. The Impact of Foreign Interest Rates on the Economy: The Role of the Exchange Rate Regime. Research Department, International Monetary Fund, 700 19th Street, N.W., Washington, DC

Greene, W. H. 2008. Econometric Analysis. 6th ed., Upper Saddle River, N.J.: Prentice Hall.

Gujarati, D.N. 2003. Basic Econometrics. United States Military Academy, West Point. McGraw-HiII/lrwin, The McGraw-Hili Companies, Inc. 1221 Avenue of the Americas, New York, NY, 10020.

Haron, S. 2004. Determinants of Islamic Bank Profitability. *Global Journal of Finance and Economics.* USA 1 (1), USA, No 1, 4 – 13.

Hodrick, J.H. 1990. Volatility in foreign exchange and stock market: American Economic Review, 80 (4): 186-191

Kanamori, T., & Zhao, Z., 2006. The Renminbi Exchange Rate Revaluation: Theory, Practice, and Lessons from Japan, ADBI policy papers; no. 9.

Jasmine, E., Yen, Y.K., Yun, X.S., Mohanen, S., & Ding, T.J 2011. An Empirical Analysis of Commercial Banks' Profitability Determinants in Malaysia. Universiti Tunku Abdul Rahman

Kanwal, S., & Nadeem, M., 2013. The Impact of Macroeconomic Variables on the Profitability of Listed Commercial Banks in Pakistan. *European Journal of Business and Social Sciences*, 2 (9), 186-201.

Kiganda, E.O. 2014. Effects of Macroeconomic factors on Commercial Banks Profitability in Kenya: Case of Equity Bank Limited. *International Journal of Economics and Sustainable Development*, Vol. 5, No. 2, 2014, ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)

Kipngetich, K. G. 2002. The Relationship between Fiscal Deficits and the Current Account Balance in Kenya (1964-2000). Unpublished MBA Thesis, Kenyatta University

Maigua, C., & Mouni, G., 2016. Influence of Interest Rates Determinants on the Performance of Commercial Banks in Kenya. *International Journal of Academic Research in Accounting, Finance and Management Sciences* Vol. 6, No.2, April 2016, pp. 121-133

Manyo, T. S., Sabina, N. E., & Ugochukwu, U. S., 2016. The Effect of Foreign Exchange Transaction on the Performance of Nigerian Banks. *IJRDO-Journal of Business Management* ISSN: 2455-6661. Vol 2, 11

Mitchell, H. A. 2006. The Relationship between Interest Rates and Inflation in South Africa: Revisiting Fisher's Hypothesis. A thesis submitted in partial fulfilment of the requirements of the degree of Masters of Commerce in Financial Markets. Rhodes University

Moore, W., & Craigwell, R., 2000. Market Power and Interest Rate Spreads in the Caribbean, Central Bank of Barbados

Mungami, S.E. 2012. The effects of exchange rate liberalization on the balance of payment of a developing country: a case of Kenya, Unpublished MBA Thesis, Kenyatta University

Obillo, M.A., 2014. The Relationship between Lending Interest Rate and Profitability of Commercial Banks in Kenya. Department of Finance & Accounting, School of Business, University of Nairobi.

Ongore, V.O. 2011. The relationship between Ownership Structure and Firm Performance: An Empirical Analysis of Listed Companies in Kenya. *African Journal of Business Management.* 5(6), 2120-2128.

Ongore, V. O. 2013. Determinants of Financial Performance of Commercial Banks in Kenya. *International Journal of Economics and Financial Issues*, 3 (1), 237- 252.

Ongore, V. O., & Kusa, G. B., 2013. Determinants of Financial Profitability of Commercial Banks in Kenya. *International Journal of Economics and Financial Issues*, 3 (1), 237-252.

Osamwonyi, P. I. S., & Michael, C.I., 2014. The Impact of Macroeconomic Variables on Profitability of Listed Commercial Banks in Nigeria. *European Journal of Accounting Auditing and Finance Research.* Vol.2, No.10, pp.85-95.

Otuori, O. H. 2013. Influence of Exchange rate Determinants on the Performance of Commercial Banks in Kenya. European Journal of Management Sciences and Economics, 1(2), 86-98.

Palley, T.I. 2012. Money, Fiscal Policy and Interest Rates: A Critique of Modern Monetary Theory. Mimeograph

Polit, D.F., & Beck, C.T., 2003. Key Concepts and Terms in Qualitative and Quantitative Research. Nursing research: Principles and research. Retrieved from: http://books.google.ca/

Rao, K. R. M., & Lakew, T, B. 2012. Determinants of Profitability of Commercial Banks in a Developing Country: Evidence from Ethiopia. *International Journal of Accounting and Financial Management Research,* 2 (3), 1-20.

Samuelson, P. A. 1945. The Effect of Interest Rate Increases on the Banking System. American Economic Review, 35, 16-27.

Sargent, T. J., and Wallace, N., 2001. Some Unpleasant Monetarist Arithmetic, Federal Reserve Bank of Minneapolis *Quarterly Review*, No.5, Fall, pp. 1-17.

Sattar, A. 2014. Impact of Interest Rate Changes on the Profitability of Four Major Commercial Banks in Pakistan. *International Journal of Accounting and Financial Reporting* ISSN 2162-308, Vol. 4, No. 1

Sheefeni, J. P. S., & Wilson, I., 2015. The Relationship between Interest rate and Exchange rate in Namibia. *Journal of Emerging Issues in Economics, Finance and Banking.* (ISSN: 2306-367X) Vol: 3 Issue 1

Simuyu, C.N., & Ngile, L. 2015. Effect of Macroeconomic Variables on Profitability of Commercial Banks Listed in The Nairobi Securities Exchange. *International Journal of Economics, Commerce and Management United Kingdom.* Vol. III, Issue 4.

Solnik, B. 2000. International Investments, 4th edition, Addison-Wesley Copyright Addison Wesley Longman.

Tymoigne, E., 2013. Modern Money Theory and Interrelations between Treasury and the Central Bank: The Case of the United States.

Wray, L.R. 1998. Understanding Modern Money: The Key to Full Employment and Price Stability. Northampton: Edward Elgar.

World Bank, 2016. "World Development Indicators

Zhang, C., & Dong, L. 2011. Determinants of Bank Profitability: Evidence from the U.S Banking Sector. Simon Fraser University

APPENDICES

Appendix i: Commercial Banks Listed in Nairobi Securities Exchange as at Dec 2016

1	BARCLAYS BANK
2	CFC STANBIC BANK
3	CO -OPERATIVE BANK
4	DIAMOND TRUST BANK
5	EQUITY BANK
6	HOUSING FINANCE BANK
7	INVESTMENT&MORTGAGES BANK
8	KENYA COMMERCIAL BANK
9	NATIONAL BANK OF KENYA
10	NIC BANK
11	STANDARD CHARTERED BANK

Appendix i: Data Collection Sheet

Name of the institution..............

		2009	2010	2011	2012	2013	2014	2015	2016
	Net profit after tax								
	Total Assets								
	VARIABLES								
1	ROA(Net Profit/Total Assets)								
2	GDP Growth Rate								
3	Interest Rate								
4	Inflation Rate								
5	Exchange Rate Fluctuations								

Appendix iii: Summary of Collected Data

Bank	Year	ROA	GDP Growth Rate	Interest Rate	Inflation Rate	Exchange Rate
BARCLAYS	2009	0.0369	0.0300	0.0738	0.0924	-0.0047
BARCLAYS	2010	0.0310	0.0800	0.0360	0.0396	0.0057
BARCLAYS	2011	0.0483	0.0600	0.0873	0.1402	0.0070
BARCLAYS	2012	0.0472	0.0400	0.1276	0.0938	-0.0002

BARCLAYS	2013	0.0368	0.0500	0.0893	0.0572	-0.0005
BARCLAYS	2014	0.0285	0.0500	0.0893	0.0688	0.0044
BARCLAYS	2015	0.0194	0.0500	0.1093	0.0658	0.0105
BARCLAYS	2016	0.0274	0.0600	0.0851	0.0632	-0.0001
CFC STANBIC	2009	0.0082	0.0300	0.0738	0.0924	-0.0047
CFC STANBIC	2010	0.0081	0.0800	0.0360	0.0396	0.0057
CFC STANBIC	2011	0.0137	0.0600	0.0873	0.1402	0.0070
CFC STANBIC	2012	0.0233	0.0400	0.1276	0.0938	-0.0002
CFC STANBIC	2013	0.0290	0.0500	0.0893	0.0572	-0.0005
CFC STANBIC	2014	0.0248	0.0500	0.0893	0.0688	0.0044
CFC STANBIC	2015	0.0089	0.0500	0.1093	0.0658	0.0105
CFC STANBIC	2016	0.0216	0.0600	0.0851	0.0632	-0.0001
COOPERATIVE	2009	0.0268	0.0300	0.0738	0.0924	-0.0047
COOPERATIVE	2010	0.0259	0.0800	0.0360	0.0396	0.0057
COOPERATIVE	2011	0.0309	0.0600	0.0873	0.1402	0.0070
COOPERATIVE	2012	0.0367	0.0400	0.1276	0.0938	-0.0002
COOPERATIVE	2013	0.0392	0.0500	0.0893	0.0572	-0.0005
COOPERATIVE	2014	0.0242	0.0500	0.0893	0.0688	0.0044
COOPERATIVE	2015	0.0186	0.0500	0.1093	0.0658	0.0105
COOPERATIVE	2016	0.0373	0.0600	0.0851	0.0632	-0.0001
DTB	2009	0.0242	0.0300	0.0738	0.0924	-0.0047
DTB	2010	0.0278	0.0800	0.0360	0.0396	0.0057
DTB	2011	0.0290	0.0600	0.0873	0.1402	0.0070
DTB	2012	0.0325	0.0400	0.1276	0.0938	-0.0002
DTB	2013	0.0356	0.0500	0.0893	0.0572	-0.0005
DTB	2014	0.0253	0.0500	0.0893	0.0688	0.0044
DTB	2015	0.0148	0.0500	0.1093	0.0658	0.0105
DTB	2016	0.0252	0.0600	0.0851	0.0632	-0.0001
EQUITY	2009	0.0473	0.0300	0.0738	0.0924	-0.0047

EQUITY	2010	0.0425	0.0800	0.0360	0.0396	0.0057
EQUITY	2011	0.0552	0.0600	0.0873	0.1402	0.0070
EQUITY	2012	0.0510	0.0400	0.1276	0.0938	-0.0002
EQUITY	2013	0.0531	0.0500	0.0893	0.0572	-0.0005
EQUITY	2014	0.0358	0.0500	0.0893	0.0688	0.0044
EQUITY	2015	0.0240	0.0500	0.1093	0.0658	0.0105
EQUITY	2016	0.0401	0.0600	0.0851	0.0632	-0.0001
HFCK	2009	0.0129	0.0300	0.0738	0.0924	-0.0047
HFCK	2010	0.0100	0.0800	0.0360	0.0396	0.0057
HFCK	2011	0.0211	0.0600	0.0873	0.1402	0.0070
HFCK	2012	0.0169	0.0400	0.1276	0.0938	-0.0002
HFCK	2013	0.0173	0.0500	0.0893	0.0572	-0.0005
HFCK	2014	0.0118	0.0500	0.0893	0.0688	0.0044
HFCK	2015	0.0073	0.0500	0.1093	0.0658	0.0105
HFCK	2016	0.0147	0.0600	0.0851	0.0632	-0.0001
I&M	2009	0.0275	0.0300	0.0738	0.0924	-0.0047
I&M	2010	0.0262	0.0800	0.0360	0.0396	0.0057
I&M	2011	0.0402	0.0600	0.0873	0.1402	0.0070
I&M	2012	0.0367	0.0400	0.1276	0.0938	-0.0002
I&M	2013	0.0380	0.0500	0.0893	0.0572	-0.0005
I&M	2014	0.0283	0.0500	0.0893	0.0688	0.0044
I&M	2015	0.0192	0.0500	0.1093	0.0658	0.0105
I&M	2016	0.0386	0.0600	0.0851	0.0632	-0.0001
KCB	2009	0.0264	0.0300	0.0738	0.0924	-0.0047
KCB	2010	0.0205	0.0800	0.0360	0.0396	0.0057
KCB	2011	0.0348	0.0600	0.0873	0.1402	0.0070
KCB	2012	0.0365	0.0400	0.1276	0.0938	-0.0002
KCB	2013	0.0384	0.0500	0.0893	0.0572	-0.0005
KCB	2014	0.0320	0.0500	0.0893	0.0688	0.0044

KCB	2015	0.0193	0.0500	0.1093	0.0658	0.0105
KCB	2016	0.0392	0.0600	0.0851	0.0632	-0.0001
NATIONAL	2009	0.0285	0.0300	0.0738	0.0924	-0.0047
NATIONAL	2010	0.0200	0.0800	0.0360	0.0396	0.0057
NATIONAL	2011	0.0225	0.0600	0.0873	0.1402	0.0070
NATIONAL	2012	0.0109	0.0400	0.1276	0.0938	-0.0002
NATIONAL	2013	0.0118	0.0500	0.0893	0.0572	-0.0005
NATIONAL	2014	0.0082	0.0500	0.0893	0.0688	0.0044
NATIONAL	2015	0.0137	0.0500	0.1093	0.0658	0.0105
NATIONAL	2016	0.0013	0.0600	0.0851	0.0632	-0.0001
NIC	2009	0.0238	0.0300	0.0738	0.0924	-0.0047
NIC	2010	0.0228	0.0800	0.0360	0.0396	0.0057
NIC	2011	0.0344	0.0600	0.0873	0.1402	0.0070
NIC	2012	0.0286	0.0400	0.1276	0.0938	-0.0002
NIC	2013	0.0300	0.0500	0.0893	0.0572	-0.0005
NIC	2014	0.0248	0.0500	0.0893	0.0688	0.0044
NIC	2015	0.0152	0.0500	0.1093	0.0658	0.0105
NIC	2016	0.0256	0.0600	0.0851	0.0632	-0.0001
STANCHART	2009	0.0382	0.0300	0.0738	0.0924	-0.0047
STANCHART	2010	0.0318	0.0800	0.0360	0.0396	0.0057
STANCHART	2011	0.0355	0.0600	0.0873	0.1402	0.0070
STANCHART	2012	0.0411	0.0400	0.1276	0.0938	-0.0002
STANCHART	2013	0.0419	0.0500	0.0893	0.0572	-0.0005
STANCHART	2014	- 0.0047	0.0500	0.0893	0.0688	0.0044
STANCHART	2015	0.0166	0.0500	0.1093	0.0658	0.0105
STANCHART	2016	0.0347	0.0600	0.0851	0.0632	-0.0001