

# **EFFECT OF SELECT MACRO ECONOMIC VARIABLES ON PERFORMANCE OF LISTED COMMERCIAL BANKS IN KENYA**

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## **ABSTRACT**

Profitability of financial institutions is a function of many variables including economic variables and institution based factors. Each institution may have control on the internal factors but not the economic factors. The general objective of this study was to determine the effect of selected economic variables on profitability of commercial banks in Kenya. The specific objectives of the study include: examining the effect of real interest rates on profitability of commercial banks in Kenya; determining the effect of Gross domestic product on profitability of commercial banks in Kenya; evaluating the effect of exchange rates on profitability of commercial banks in Kenya; and determining the effect of inflation on profitability of commercial banks in Kenya. The study used descriptive research design to obtain information that describes what exists with respect to the variables tested while the longitudinal design helped track changes over time. The study focussed on all the licensed 44 commercial banks in Kenya as at December 2016. All the 44 commercial banks were included in the study hence a census. The study used secondary data and utilized a data collection form to collect as used in various previous research projects. Descriptive statistics, inferential statistics were conducted using the SPSS version 23.0 and the findings were presented in the form of tables. The analyzed findings indicated that when ROA was used as a measure of profitability of commercial banks; real

interest rate ( $p=0.039$ ), GDP ( $p=0.003$ ), exchange rate ( $p=0.002$ ) and inflation ( $p=0.004$ ) all had p values less than 0.05. When ROE was used as a measure of performance, real interest rates ( $p=0.002<0.05$ ), GDP ( $p=0.000<0.05$ ) and Exchange rates ( $p=0.003<0.05$ ) were all significant factors affecting profitability of commercial banks as their p values were less than 0.05. The study concludes that real interest rate significantly affected Return on Assets and Return on Equity as measures of profitability of commercial banks. Compared to other variables, GDP had the largest effect on profitability of commercial banks. In comparison to other variables, exchange rates however had least effect on profitability of commercial banks. Inflation only had significant effect on ROA as a measure of profitability of commercial banks. The study recommends that regulatory bodies like Central Bank of Kenya should work closely with the National Treasury to implement sound policies and measures of maintain interest rates in the economy. The National Government should adequately support all the sectors of the economy in order to grow the GDP of each of these sectors. Adequate measures and policies, strategies and measures should be formulated to check the level of foreign exchange. Proper fiscal and monetary policies should be enforced to control the level of inflation in an economy.

**Key Words:** *macro economic variables, performance, listed commercial banks, Kenya*

## **INTRODUCTION**

Commercial banks play a vital role in the economic resource allocation of countries and contribute to economic growth of the country by making funds available for investors to borrow as well as financial deepening in the country (Oturi, 2013). Bank performance is vitally important for all stakeholders such as its owners, the investors, and the debtors, managers of banks, the regulators and the government. Kenyan commercial banks have played major roles in the economic development of their operations and are always affected by the economic conditions (Ouma & Muriu, 2014). The performance of commercial banks is affected by internal and external factors which can be classified into bank specific (internal) and macroeconomic variables (Ongere, 2013). The internal factors are individual bank characteristics which affect the bank performance mainly influenced by decisions of management and board. The external factors are sector wide which are beyond the control of the company and affect profitability of banks.

One driving force of any economy is the interaction of the individual; companies within it both with each other and financial institutions. An effective and efficient function of the financial sector requires a sound and favourable economic environment in the country (Osoro, Gor & Mbithi, 2016). In this era of globalization, it is imperative for financial institutions to be strongly integrated with the global economy. Increased integration and the growing economic fluctuations require more attention to be paid to determine the effect of macroeconomic variables and the company's development (Simiyu & Ngile, 2015). Economic variables are used as a basis for judging the economic performance of an economy. The variables include Gross Domestic Product (GDP), exchange rates, rate of inflation, consumer price index, stock market index and interest rates as well as government spending among other government activities such as political activities. These economic activities are important for the growth of the economy (Mankiw & Ball, 2010).

Maghyereh (2002) economic variables are made up of various aspects and workings of a nation which include; income, output, and the interrelationships among the varied economic sector. The macroeconomic variables are significant determinants of the stock market activities since a conducive economic operating environment propels individual businesses to a stage where they can access securities for sustained growth. Asaolu and Ogunmuyiwa (2010) established the following indicators determine the performance of the securities market in an economy: real GDP growth rate, the exchange rate, rate of inflation, the fiscal position and the debt position. Other variables include the inflation rate, lending rate, as well as the Treasury bill rate. These factors directly influence the state of corporate activity in the country.

### **Global Perspective Economic Variables on profitability of Banks**

Kanwal and Nadeem (2013) conducted a study to establish the effect of macroeconomic variables on the profitability of listed commercial banks in Pakistan and identified as inflation rate, GDP and interest rates as the major external factors affecting profitability of commercial

banks in Pakistan. In order to maximize risk adjusted returns commercial banks need to focus more on other external factors influencing commercial banks and formulate policies to improve the internal factors. Singh and Sharma (2016) analysed the factors influencing commercial banks profitability in India. The study showed that bank specific factors (bank size, profitability, capital adequacy and deposits) except cost funding and macroeconomic variables except unemployment significantly affect bank liquidity. Zhang and Dong (2011) analyzed the profitability of the US banking sector over the period from 2000 – 2008. Their profitability determinants included bank-specific characteristic as well as economic factors. They found that the macroeconomic factors of GDP and interest rate change were significant in explain bank profit.

The performance of banking industry in Europe was reviewed between the period 1994 to 1998 by Staikouras and Wood (2004). The ordinary least square technique and fixed effects model was used and the findings showed that while interest rate has a positive significant effect on ROA, GDP growth has a significant negative impact. Pan and Pan (2014) on level factors like economic growth, monetary policy, inflation and financial development. The ever-changing international situation brings about uncertain macro environment to commercial banks, domestic factors such as deepening reform, inflation and overheated real estate in China has cause substantial impact to profitability of commercial banks in China. San and Heng (2013) for banks in Malaysia GDP growth and inflation rates are not determinants of profitability in any model and hold almost 70% assets in the financial system. Thus, it is important for regulators to ensure that banks are in a sound position to make profit. Sufian (2011) analyzed 11-29 Korean commercial banks during year 1992-2003. Linear regression results revealed negative impact of Gross Domestic Product (GDP) on Return on Assets (ROA). The studies reviewed above identify Gross Domestic Products, economic growth, monetary policy, inflation and financial development as the common factors that affect profitability. The current study will focus on effect of select macro-economic variables on profitability of commercial banks in Kenya.

### **Regional Perspective Economic Variables on profitability of Banks**

The profitability of commercial banks can be affected by internal and external factors which can be classified into bank specific (internal) and macroeconomic variables (Flamini, Schumacer & McDonald, 2009). The internal factors are individual bank in characteristics which affect the bank's profitability; these factors are basically influenced by the internal decisions of management and board. The external factors are sector wide or country wide factors which are beyond the control of the company and affect the profitability of banks as seen in Rwandan Commercial banks. Konadu (2016) the survival of commercial banks in Ghana depends on the ability of the banks to maximize their returns on the resources they employ. Nonetheless the ability of these banks to make profit is dependent on macroeconomic variables which are crucial in determining profitability of banks. Osamwonyi and Michael (2014) as Nigeria is dominated by commercial banks it is important to understand the importance of macroeconomic variables in the growth of any country and the profitability of the banks. The higher the risk associated with

the macroeconomic variables such as gross domestic product, interest rates and inflation the lower the return on banks productivity.

Sheefeni (2015) looked at the macroeconomic determinants of profitability among commercial banks in Namibia. The study state that in a country where the financial sector is dominated by a few inle large commercial banks any failure of the sector has enormous potential impact on the economy. This due to the fact that any bankruptcy in the sector has a potential contagion effect that lead to bank runs, crises and the overall financial crisis. Marobhe and Pastory (2015) investigated the determinants of the commercial banks profitability in Tanzania. The results confirm that capital adequacy, liquidity, asset quality and macro-economic factors are critical components in influencing profitability of the commercial banks. Keywords: Profitability, Multiple Regression, Commercial Banks. Tanzanian commercial banks with higher level of liquidity have shown greater profitability potential. Asset quality in terms of nonperforming loans and overheads expenses tends to decrease profitability.

The above background indicates that macroeconomic variables such as the exchange rate, the rate of inflation and the interest rates would influence commercial banks profitability. This research seeks to find out the effect of selected macroeconomic variables on profitability of commercial banks in Kenya.

### **Economic Variables**

Romer (2004) defines economics as the study of the economy as a whole focusing on the behaviour of an entire economy. Brinson et al. (1991) defined economic variables as those that are important in the broad economy at either the regional or national level. These variables also affected the whole population and not only a few select people. The variables identified in the study as having a major influence included the following: gross domestic product (GDP), interest rates, inflation, currency exchange rate, legal and regulatory environment and risks. These variables matter to all stakeholders ranging from business owners, consumers, the government, commercial and service firms. These factors are important to commercial banks since they have a direct impact its performance.

Gross Domestic Product (GDP) as defined by Asaolu and Ogunmuyiwa (2010) is the overall income generated from various factors of production, over a period of time in a certain locality. Some of these factors that generate revenues inclec, charge rates from interests in loans and foreign exchange rates and levies charge by government institutions. Aguiar and Broner (2006) refer to inflation as a persistent or sustained increase in the prices of services and goods in the long term. This is caused by a rise in earning which is not proportional to the increase in production of products and services. This results in more money chasing few goods general prices of goods and services which leads to a significant reduction in disposable income. The purchasing power of low-income earners is also reduced. Since the low-income earners comprise

the majority of a country's population the reduction in purchasing power leads to lower levels of savings which ultimately affects the performance of Securities exchange (Willy, 2012).

Interest rate can be defined as the cost expressed as a percentage of the principal (the amount borrowed) charged by the lender to the borrower for lending the money. To the borrower, the interest is a cost while to the lender it is a source of revenue. Interest rates are usually charged per month or year (per annum) and its levels are determined by and are directly proportional to the risk levels of the borrower. Thus, the amount borrowed should be invested in activities or use that generates more return than the lending rate so as to make economic sense (Darfor & Agyapong, 2010). Schiller (2008) defines exchange rate as the amount of local or home currency required to purchase one unit of a foreign currency. The interest rate is determined by various things such as the demand and supply of the foreign currency, current account balance, trade balance and the capital account balance. Samuelson and Nordhaus (2010) further define the exchange rate as prices of one currency expressed in terms of another. The exchange rates can be expressed as either a direct or indirect quotation. They also state that an exchange rate plays a crucial role in the open economy framework, which is a crucial part of the monetary transmission mechanism.

They also stated that real exchange rates affect the aggregate demand channel of the monetary transmission of monetary policy. The exchange rate affects the relative prices between domestic and foreign goods and the foreign demand for local goods (Ncube & Ndou, 2011). Variations in foreign exchange rates can be measured in real and nominal terms but most studies have utilized nominal exchange rates. The current study will use the real exchange rate. The real rate tells us how many times more or less goods and services can be purchased abroad (after conversion into a foreign currency) than in the domestic market for a given amount. In practice, changes of the real exchange rate rather than its absolute level are important. Rather than focusing on the nominal exchange rate, it is more sensible to monitor the real exchange rate when assessing the effect of exchange rates on international trade or export competitiveness of a country.

### **Profitability of Commercial Banks in Kenya**

Profitability of the commercial banks is seen as the excess incomes and revenues earned from interests and levies charged to its customers. After covering all the banks' expenditure, according to Odhiambo (2008) the rest of the revenues are deemed profits. Kenya's banking sector involves 44 registered and licensed commercial banks providing banking and financial services to customers. Kenya's banking industry is one of the fastest growing in the region and Africa as a continent (Odhiambo, 2008) The banking industry is regulated by the Central bank of Kenya Act, the banking Act, the company Act among other guidelines as spelt out in the Constitution of Kenya.

Commercial banks' performance in Kenya over the last few years has not been impressive. Several reforms have been implemented since the 1990s aiming at increasing performance,

stability, productivity, financial access and efficiency. However bank productivity on average has been erratic. In the period 2008- 2013, increases in Profits before tax has been below 20% on average terms. In the year 2013 profit before tax of the Kenyan commercial banks increased by 16.6% as compared to the year 2012 when profit before tax increased by 20.6%. In the year 2009, profit before tax of the Kenyan banks increased by 12.9% as compared to the year 2008 when profit before tax increased by 13.4% (Morekwa & Temesgen, 2013).The year 2010 is the only year that profit before tax increased by around 52 percent. There has been a lot of changes in technology and several financial innovations have been developed in Kenya`s financial sector. All these changes have reorganized the banking sector in terms of management, interactions with clients and relationships with other institutions. All these developments are likely to affect banks` performance and their total cost of operations. It is therefore of great importance to identify macroeconomic variables influencing the profitability of commercial banks.

### **STATEMENT OF THE PROBLEM**

In August 2016, a law was enacted to amend the Banking Act by placing restrictions on the rate which banks offer on loans and deposits. This amendment put a cap on lending rates at 4.0% above the Central Bank Rate (CBR) and set a floor on the deposit rates at 70% of the CBR. In addition, the economic growth of the Country has been declining as the cost of business was reported to be increasing (Cytonn, 2017). There has been uncertainty in the foreign exchange market as the local currency depreciated against the world`s major currency including United States Dollar to trade at an all-time low of Ksh. 103 (CBK, 2017). The rate of inflation has also been on the rise which led to revision of the composition of goods used in its computation. All these factors coupled with political risks associated with elections every five years have affected the business environment and business performance. The banking industry has been reporting a decline in its profitability over the past few years. As a result, a number of commercial banks have restructured leading to loss of employment as their profits decline. Some have even closed down branches as credit to SMEs and other sectors declined (Cytonn, 2017). Unless the factors affecting the performance of commercial banks are checked, they will continue to restrict credit, report lower profits which will in turn stifle economic growth. Several studies have been conducted on economic variable. For instance, Kanwal and Nadeem (2013) established the existence of a strong positive relationship of real interest rate with ROA, ROE and EM. Osamwonyi and Michael (2014) established a positive relationship of gross domestic product (GDP) with return on equity (ROE). Interest rate and inflation rate had a negative relationship with return on equity (ROE). Sheefeni (2015) revealed that the variables gross domestic product, inflation rate and interest rate do not significantly influence commercial bank`s profitability in Namibia. Osor (2015) showed that health care is a necessity rather than a luxury in Kenya, with an elasticity of 0.78 percent. Njenga(2013) showed that high cost of living in Kenya would result in lower tax revenue from income, profits and capital gains hence the government should ensure cost of production reduce to make goods and services cheaper. None of these studies had examined the effect of economic variable on profitability of commercial banks. These studies

were done at past periods which make it difficult to apply their findings. A need therefore arose to establish the effect of selected economic variables on performance of commercial banks in Kenya.

## **GENERAL OBJECTIVE**

The main aim of this study was to determine the effect of selected economic variables on performance of commercial banks in Kenya.

## **SPECIFIC OBJECTIVES**

1. To examine the effect of real interest rates on profitability of commercial banks in Kenya.
2. To determine the effect of Gross domestic product on profitability of commercial banks in Kenya.
3. To evaluate the effect of exchange rates on profitability of commercial banks in Kenya.
4. To determine the effect of inflation on profitability of commercial banks in Kenya.

## **THEORETICAL FRAMEWORK**

### **Efficient Market Hypothesis**

This hypothesis was formulated by Fama (1970). According to Fama (1970), an efficient market hypothesis (EMH) dictates that earning due to investors competition following a profit-maximizing behavior high profits would be impossible to be experienced. Fama (1970) differentiated three systems of EMH: the weak one, the semi-strong one and the strong one. The most empirical research has been formed by the semi-strong form of EMH. The EMH presumed actors in economy have everything necessary in regards to facts relating to all fluctuations in macroeconomic variables giving reflection in stock prices. Source of stock price changes is determined by Macroeconomic variables such as supply of money in the country, inflation, and exchange rate been expounded by various researchers (Fama, 1981; Chen et al., 1986; Mayasami & Sims, 2002). Efficient market hypothesis is relevant to this study because it helps in making inferences that changes in these macroeconomic factors definitely affect performance of commercial banks. The study is therefore geared towards determining the expected connection of the numerous macroeconomic variables and performance of commercial banks in Kenya.

### **Modern Portfolio Theory**

This theory was advanced by Markowitz in 1952. According to Markowitz (1952), a portfolio is a collection of securities. As most securities are available, investments have uncertain returns and thus risky, one needs to establish which portfolio to own. Markowitz asserts investors should base their portfolio decisions solely on expected returns and standard deviations. Investors should estimate the expected return and standard deviation of each portfolio and then choose the best one on the basis of these two parameters. Markowitz (1952) developed a basic and most accepted model for portfolio selection, by introducing the usage of expected rate of return and



expected risk for a portfolio. He identified the risk-reduction benefits associated with holding a diversified portfolio of assets. The objective of a portfolio may be for capital gains or for income, or a mixture of both. A growth-oriented portfolio is a collection of investments selected for their price appreciation potential, while an income-oriented portfolio consists of investments selected for their current income of dividends or interest. At the end of the day, investors had to make decisions of how to trade their portfolios for maximum benefits.

Omisore, Yusuf and Christopher (2011) stated that in essence, portfolio is the total collection of all investments held by an individual or institution, including stocks, bonds, real estate, options, futures, and alternative investments. Portfolio risk is the chance that combination of assets or units within individual group of investment fail to meet financial objectives. In theory, portfolio risk can be eliminated by successful diversification as a basis of making sound decisions on how, where, and when to invest so as to realize minimal risks and maximum returns. An efficient portfolio is one that has maximum expected return for a given variance or minimum variance for a given expected return. By selecting assets with low correlation of returns, it is feasible to reduce overall risk of the portfolio. This occurs because as the returns of one asset go down, they will be offset by the returns of another asset going up. This is more likely to happen with securities from firms in different industries especially if those industries move differently against macroeconomic business cycles (Zopounidis, Doumpos & Fabozzi, 2014).

Individuals as well as institutional investors are confronted with basically the same problems when allocating their own financial funds or those of those of third parties. The asset allocation puzzle, in theory is a very big dimension (Levinson & Zhu, 2013). This is because there exist tens of thousands of listed companies in the world stock exchange markets, masses of government and commercial bonds with different risks and maturities, treasuries, currencies, commodities, arts and real estate. Moreover, there is an even much bigger number of financial derivatives on the mentioned asset classes and their representatives such as different kinds of options, swaps, Forwards and structural products (Michalski, 2013). The theory is relevant to the current study because it explains how investors can reduce their risk exposures (changes in macroeconomic economic variables like inflation, exchange rates and interest rates) which shall have an effect on performance of commercial banks in Kenya.

### **Liquidity Preference Theory**

The liquidity preference theory was formulated by Keynes (1964). According to the theory, investors prefer short-term securities in comparison to long-term securities. Encouragements to hold long term bonds are due to the notion that there will be higher interests compared to short-term bonds. The result is that the yield curve will always have an upward slope. Important to note is that long term bonds yield more compared to short term bonds. This is due to various reasons that are; investors prefer to clasp onto short term securities since they are more liquid and that they can be easily converted to cash with modest dangers of loss of engaged principals. Simultaneously, borrowers tend to react in the reverse direction in that they prefer long term

debts compared to short-term debts since the latter exposes them to the risk of having to repay the debt under adverse condition (Choudhry, 2011).

The two key roles as performed by commercial banks are liquidity and risk transformation. Analysis of banks role in creating liquidity and thereby spurring economic growth have a long tradition dating back to Adam Smith (1776), (Michalski, 2009). This theory argues that commercial banks create liquidity on the balance sheet by financing relatively illiquid assets with relatively liquid liabilities ones. Keynes (1936) presents liquidity preference theory as a liquidity preference theory of interest, a theory that is supposed to fill the vacuum left by what he regarded as a flawed classical savings theory of interest. Initially it was assumed that liquidity preference is translated to demand for money. Therefore, if one had a constant degree of money then liquidity preference became the factor that would be used to determine the rate of interest in the money market of Hicks' (1937) on seminal investment saving to liquidity preference money supply model, (Bibow, 2013).

The theory of liquidity preference has continued to be a dominant concept in economics and finance particularly in its application in the theory of demand for money (Munene, 2015). Based on the Keynes theory Central Banks set the rate of interest to control asset prices via the demand for money. The theory is relevant to the study because it explains how real interest rates affect the ability of investors to hold securities and therefore performance of commercial banks in Kenya.

### **Intermediation Theory**

The theory regarding financial intermediation was developed starting with the 60's, the starting point being the work of Gurley and Shaw (1960). The theory is based on the theory of informational asymmetry and the agency theory. In principle, the existence of financial intermediaries is explained by the existence of the following categories of factors: high cost of transaction, lack of complete information in useful time; and the method of regulation. Commercial banks engage in a critical role in the economy of financial intermediation. Commercial banks act as intermediaries between those who have surplus finances (depositors) and those with deficits (borrowers). Commercial banks and insurance companies have historically played a central role in intermediation virtually in all the economies. However, this is not the case in the emerging markets which are at very early stage.

Nevertheless, even in emerging economies intermediation tends to influence the development of financial markets (McKinnon, 1973). Banks that have existed from ancient times, they take deposits from the households with surplus and give loans to household with deficits. Commercial banks and insurance companies have played this role of transformation of savings of households into investments in various sectors of the economy (Aduda et al, 2013). The roles played by financial intermediaries in the economy are found in various models covered by the theory of intermediation. The theory of intermediation is based on the model of resource allocation which

is built on perfect and complete markets by suggesting that friction of transaction costs together with information asymmetry are crucial for one to understand intermediation.

The role of transaction cost has been emphasized by Shaw (1960) and other authors. Information asymmetry has been stressed by several authors as an alternative rationalization for the importance of intermediaries. An intermediary can signal status by deciding to invest in assets which it has knowledge about (Leland & Pyle, 1977). By acting as “delegated monitors”, intermediaries can overcome the problems associated with asymmetric information (Diamond, 1984). Bhattacharya and Thakor (1993) conducted an excellent study on the current status of the literature dealing with banking. This study was built on already existing reviews on banking. The theory of intermediation highlights the significance of the commercial banks in any economy. It is clear based on this theory that intermediation by extension commercial banks are key ingredients for investment to flourish in any economy. The theory explains financial intermediation of commercial banks in Kenya would ultimately result into their performance.

## **EMPIRICAL REVIEW**

### **Real Interest Rates and Profitability**

Ngure (2014) sought to determine the effect of interest rates on financial performance of commercial banks in Kenya. The study used descriptive research design using secondary data obtained from Central Bank of Kenya for the period of five years from 2009 to 2013. The study concluded that bank size and interest rate volatility had effect on profitability of commercial banks. The study also found that the model containing interest rates and size of commercial bank can explain 64% of the changes in commercial banks profitability. The study recommended that in times of poor performance of commercial banks and the need to boost their profitability may be necessary for their role in economy, Central Bank of Kenya should come up with monetary policy that will lead to rise in interest rates and hence improving banks profitability. But with the cap on interest rates extended by the CBK policies, it may be very difficult to change the poor performance of the commercial banks through upward adjustment of interest rates.

Irungu (2013) looked at the effect of interest rate spread on financial performance of commercial banks in Kenya. The target population in this study is all 43 commercial banks in Kenya. Data is collected from central banks supervision report. The data collected was analysed using SPSS (Statistical Package for Social Science). Regression analysis was used to analyse the data and find out whether exists a relationship between interest rate spread and the performance of commercial banks in Kenya. The study found that there is strong positive relationship between financial performances of commercial banks with interest rate spread. The study found that interest rate spread affect performance assets in banks as it increases the cost of loans charged on the borrowers, regulation on interest rates have far reaching effects on assets non-performance.

Ndichu (2014) established the effect of interest rate spread and on the financial performance of deposit taking micro-finance banks in Kenya. The research study utilized descriptive research

design and embraced systematic random sampling technique on selecting the four-deposit taking micro-finance banks in Kenya out of the nine existing in the country. Secondary data was analysed and presented in form of tables and figures to provide a clear picture of how interest rates spread contribute in the success or failure of the deposit taking micro-finance business and to show the various characteristics and relationships among the variables in consideration. Findings further showed that interest rate spread is statistically significant at 95% and 99% significant level with a negative correlation thus as interest rates spread increases the financial performance of deposit taking micro-finance banks decreases.

Ngumi (2014) conducted a study on the effect of lending interest rates on financial performance of deposit taking micro finance institutions in Kenya. The study involved collecting secondary data from Central Bank of Kenya, individual Deposit Taking Microfinance Institutions and the Association of Microfinance Institutions in Kenya. Consequently, data for nine deposit taking micro-finance banks was analysed for five years (2009-2013) using multivariate regression model. The study found out that a strong relationship exists between lending interest rates and financial performance of deposit taking micro-finance banks.

Obamuyi (2013) looked at the determinants of banks' profitability in a developing economy from Nigeria. The fixed effects regression model was employed on a panel data obtained from the financial statements of 20 banks for 2006 to 2012. The results indicated that improved banks capital and interest rates as well as efficient expenses management and favourable economic condition contribute to higher banks performance and growth in Nigeria.

Ayaydin and Karakaya (2014) assessed the effect of bank capital on profitability and risk in Turkish banking. The study utilized the two-step system generalized methods of moments developed by Arellano and Bover (1995) and Blundell and Bond (1998) for dynamic panels using bank-level data for 23 Turkish commercial banks over the period 2003 to 2011 to investigate the impacts of interest rates on commercial bank productivity. The net interest margin and the rate of interest expenses to assets as the other profitability indicators are parallel.

Khan and Sattar (2014) analysed the impact of Interest Rate Changes on the Profitability of four Major Commercial Banks in Pakistan. The impact of interest rates changes on the profitability of commercial banks being operated in Pakistan by examining the financial statements of four major banks during 2008 to 2012. Like the efficiency of banking sector is considered most important for economic growth, monetary policy implementation and macro-economic stability. The study concluded that there is strong and positive correlation between interest rate and commercial banks profitability. It means if the value of interest rate is increases/decreases then as result value of banks profitability will also increases/decreases.

### **Gross Domestic Product and Profitability**

Any growth in gross domestic product in an economy, results in more economic activities being performed by different players who make more products leading to higher profitability amongst

economic players. The GDP is positively associated with profitability of commercial banks. As noted by Barasa (2014) in the study on the relationship between inflation, money supply and GDP and performance, it was concluded that there was a weak positive relationship between the selected macro-economic variables (inflation, money supply, and GDP per capita) together and stock market performance. Hong and Razak (2015) conducted a study on the impact of nominal GDP and inflation on the financial performance of Islamic banks in Malaysia. In order to analyse the performance growth of the Islamic banks, the financial data was generated from Bank scope for the duration of year 2007 until 2011. The period chosen include the U.S. financial crisis as the results should portray the resilience of the Islamic Banks. The study concluded that the log-linear regression between nominal GDP and inflation rate as the dependent variables show that nominal GDP has significant and positive impact on ROAA (return on average asset) and liquidity ratio and EQL (equity to total liquidity).

Kiptoo (2012) sought to investigate the factors that influenced commercial bank rate adjustment disparity with what the Central Bank of Kenya would expect after variation of the Central Bank Rate and Cash Reserve Ratio. The study used secondary data which was collected from the Central Bank of Kenya and the Kenya National Bureau of Statistics, and on whose basis comparisons were made with reference to the Non-Performing Loans, Operating Costs, industry Return on investment, and Overall Gross Domestic Product. The study revealed that gross domestic product had little and negative influence on commercial bank profitability and that an increase in gross domestic product did not significantly trigger commercial banks' adjustment of interest rate, and if it did it was to the opposite direction. An adjustment in interest rates often renders the effect of GDP on productivity useless. It is of great importance to test the impact of GDP on profitability alone while interest rate is held at a constant.

Francis (2013) identified determinants of commercial bank profitability in Sub-Saharan Africa. Using the cost efficiency model, bank profitability was estimated using panel random effects method in static framework. The explanatory variables are growth in bank assets, growth in bank deposits, capital adequacy, operational efficiency (inefficiency), and liquidity ratio as well as the macroeconomic variables of growth in GDP and inflation. The findings clearly show that both bank-specific as well as macroeconomic factors explain the variation in commercial bank profitability.

Decline in GDP growth will negatively affect the demand for products at the market and credit services from financial institutions. And as interest earnings is one of the key sources of income to financial institutions then with such a case the profitability will be low. Ongore and Kusa (2013) conducted a study on determinants of financial performance of commercial banks in Kenya. The study adopted a liners multiple regression and generalized least square on panel data to estimate the parameters. The findings showed that bank specific factors significantly affect the performance of commercial banks in Kenya, except for liquidity variable. During the declining of GDP growth, the demand for credit falls which in turn negatively affect the profitability of

banks. On the contrary, in a growing economy as expressed by positive GDP growth, the demand for credit is high due to the nature of business cycle.

Yakubu and Affoi (2013) analysed the impact of the commercial banks credit on economic growth in Nigeria from 1992 to 2012. Using the ordinary least square it was found that the commercial bank credit has significant effect on the economic growth in Nigerian. The coefficient of determination showed that 92% variation in GDP is caused by commercial bank credit. Therefore, banks should continue to give credit to the private sector of the economic as it is contributing significantly for the growth of GDP in Nigeria.

Imoughele and Ismaila (2014) looked at the impact of commercial bank credit on the growth of small and medium scale enterprises econometric evidence from Nigeria (1986-2012) obtained mainly by secondary sources. Econometric model was specified and estimated via the Ordinary Least Square (OLS) techniques to ascertain the relationship between dependent SMEs output and the explanatory variables. The variables were tested for stationary, co-integration analysis was also carried out and also error correction test was performed. The findings revealed that commercial banks credit to SMEs and the saving and time deposit of commercial banks exert a positive and significant influence on SMEs development proxy by wholesale and retail trade output as a component of GDP, while exchange rate and interest rate exhibit adversative effect on SMEs development.

### **Exchange Rates and Profitability**

Kiganda (2014) conducted a study on the effect of macroeconomic factors on commercial banks profitability in Kenya as in the case of Equity bank limited. This study was modeled on the theory of production and based on correlation research design. Sample size consisted annual data spanning 5years from 2008- 2012. To accomplish this task the study used Cobb-Douglas production function transformed into natural logarithm. This study employed OLS to establish the relationship between macroeconomic factors and bank profitability. The results indicated that macroeconomic factors (real GDP, inflation and exchange rate) have insignificant effect on bank profitability in Kenya with Equity bank in focus at 5% level of significance.

Casey, He and Fayman (2014) conducted a study on Bank Profitability and the impact of foreign currency fluctuations. The study investigated whether the performance of 22 large US commercial banks affected by foreign exchange fluctuations over a 40 year period . The study found that these large U.S. 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. The value of the local currencies in respect to strong foreign currencies like the Euros, pounds and dollar affects profitability of commercial banks in respect to the rate of exchange for the currencies. This is especially true for commercial banks with international presence and with customers who transact in different currencies.

Otuori (2013) sought to investigate the influence of exchange rate determinants on the performance of commercial banks in Kenya. The study adopted a descriptive design and primary data was collected through self-administered questionnaires. Unexpected current account deficit is associated with exchange rate depreciation, and a rise in interest rates. Evidence is found that current account deficits diminishes domestic wealth, and may lead to overshooting of exchange rates. The study found that exports and imports had a positive effect on bank profitability in Kenya. The study therefore concludes that higher levels of exports and imports lead to higher profitability in commercial banks.

Ngerebo (2012) looked at the impact of foreign exchange fluctuation on the intermediation of banks in Nigeria (1970-2004). The study used data sourced mainly from Central Bank of Nigeria publications. In conducting this relationship study, sample sizes of 34 years (1970 – 2004) were collected and analysed. The result led to the conclusion that exchange rate fluctuation has significant impact on banks' intermediation. It was therefore recommended that government should ensure a stable naira exchange rate through a right mix of policies and de-emphasis on cash-economy.

Osoro and Ogeto (2014) investigated macroeconomic fluctuations effects on the financial performance of listed manufacturing firms in Kenya. The research adopted an explanatory survey research approach and the targeted population were the nine companies listed in the manufacturing and allied market segment. Secondary data was obtained from the Nairobi Stock Exchange and the Kenya National Bureau of Statistics. The data collected was analysed with the use Microsoft Excel and SPSS version 20. The study concluded that manufacturing firms are exposed to three types of exchange rates risks translation exposure, transaction exposure and economic exposure.

Majok (2015) conducted a study on the effects of exchange rate fluctuations on financial performance of commercial banks in Kenya. The study adopted a descriptive research design. The study used secondary data from the banks consolidated financial statements as well as the Central bank of Kenya data. The study established that there was a positive relationship between foreign exchange rate fluctuations and the financial performance of banks as measured by the returns on assets ratio. The research findings further revealed that the strength of association between the fluctuations and the returns was a weak one.

Maigua and Mouni (2016) sought to investigate the influence of interest rate determinants on the performance of commercial banks in Kenya. The target population of the study was all 43 commercial banks operating in Kenya. The sample size was 26 commercial banks obtained from the population. The data analysis technique applied in this study was the multiple regression analysis. The study found that to great extent exchange rates influences the performance of commercial banks. The exchange rates strongly affect the performance of the commercial banks in Kenya. There is a negative relationship between the exchange rates and the performance of

commercial banks in Kenya. Higher levels of exchange rates lead to lower performance in commercial banks.

Ahmed (2015) analysed the effect of foreign exchange exposure on the financial performance of commercial banks in Kenya. The research used both secondary and primary data. The study utilized descriptive design. The study found that exchange rate movement in Kenya has been variable with periods of rapid depreciation of the domestic currency Kenya Shilling, which adversely affect the Kenyan economy and that foreign exchange exposure has negative effect on the performance of listed commercial banks in Kenya. Changes in the economic situation where inflation and depression set in greatly affects the profitability index of commercial banks on the basis of the changes in exchange rates adopted.

### **Inflation and Profitability**

Hooshyari and Moghanloo (2015) evaluated the impact of inflation on profitability of banks. The population was the state and private banks in Iran that information and financial statements was available on their sites. In order to analyse the data resulted from collected questionnaires deductive and descriptive statistical methods were used. The overall reliability of the model is used j-statistic and to test whether all the non-zero coefficients Waled Test is used. The study concluded that there is a strong correlation between inflation and profitability of banks in Iran. In inflation there is more economic activities assumed by many different players meaning they earn more, and the funds are stored in banks which increases the profitability of commercial banks.

Chioma, Adanma and Clementina (2014) study was designed to empirically examine the relationship between inflation and banks' performance and how the outcome influences the lending decision of such banks. The research design adopted in this study is ex-post factor research design which relies mainly on the use of secondary data. The target population were all the commercial banks quoted in Nigerian Stock Exchange. The result revealed that there is positive but not significant relationship between inflation, banks' performance and the investment decision of commercial banks operating in Nigeria. This implies that the impact of inflation on bank's performance vis-à-vis investment decision of banks was positive but not statistically significant.

Khan, Shahid, Bari, Anam, Shehzad and Siddique (2014) analysed the impacts of inflationary trends on banks' performance (large banks segment) in Pakistan. This research was qualitative in nature where the data was taken from large banking segments being categorized by State bank of Pakistan. Through discussion and calculated results, a strong positive relation was found among the variables and the study concluded that inflation has a strong correlation on bank performance.

Omondi (2014) conducted a study on the relationship between annual inflation rate and Kenya Commercial Bank base lending rate, new lending volumes and loans defaulting. The study adopted descriptive research design with the target population comprising of 450 KCB



employees. Secondary data was obtained from banks administrative records and documentation while data on inflation rates was obtained from the Kenya National Bureau of Statistics, through email. Primary data was mainly obtained from KCB employees using self-administered questionnaires. Secondary data was obtained from banks administrative records and documentation while data on inflation rates was obtained from the Kenya National Bureau of Statistics, through email. Primary data was mainly obtained from KCB employees using self-administered questionnaires. The major finding was the positive relationship between inflation rate and the base lending rate charged by the bank, as inflation levels rises, so did the bank's base lending rate both from the key informant figures and the regression analysis of the secondary data, showing that inflation has a significant effect on KCB base lending rate.

All (2014) investigated the effects of bank specific and macroeconomic factors on banks' profitability in Tanzania. The fixed effects regression model was used on a panel data obtained from 23 banks from 2009 to 2013. The empirical results show that bank-specific factors that are affected by bank-level management significantly affect banks' profitability in Tanzania. However, the economic factors such as inflation do not seem to significantly affect banks' profitability. It can be argued that the profitability performance of banks in Tanzania is mainly influenced by management decisions, while economic factors have insignificant contribution. Thus, Bank management must efficiently manage factors related to their management decisions in order to protect the long run interest of profit-making.

## **RESEARCH METHODOLOGY**

### **Research Design**

Research design is the plan and structure of investigation so conceived as to obtain answers to research questions. The plan is the overall scheme or program of the research (Robson & McCartan, 2016). Descriptive and longitudinal design were adopted with a view to making statistical inferences about commercial banks. Descriptive research design was used to obtain information that describes what exists with respect to the variables tested while the longitudinal design helped track changes over time and relate them to the variables to explain why the changes occur which address the objectives of this study.

### **Population**

A population refers to an entire group of individuals, events or objects having a common observable characteristic (Kothari, 2005). A population describes the parameters whose characteristics the research will attempt to describe. Records from the CBK (2016) indicate that there are 44 banks in Kenya. The interest in this population is driven by the fact commercial banks are affected by different economic variables influencing their profitability.

### **Sampling Frame and Sample Size**

Sampling frame describes the list of all population units from which the sample will be selected (Cooper & Schindler, 2003). It is a physical representation of the target population and comprises all the units that are potential members of a sample (Kothari, 2008). The sample size depends on what one wants to know, the purpose of the inquiry, what is at stake, what will be useful, what will have credibility and what can be done with available time and resources (Paton, 2002). Since the population of the study is small and easily accessible as all the commercial banks in Kenya are headquartered in Nairobi, all the units were selected hence a census.

### **Data Collection Instruments**

Creswell (2002) defines data collection as means by which information is obtained from the selected subjects of an investigation. The study used secondary data which was collected from the Central Bank and financial statements of all the commercial banks in Kenya. Secondary data was appropriate for this study as it sought to evaluate the effect of selected economic variable on profitability of commercial banks in Kenya. All the statistics on the variables were gotten from the published reports at the Central Bank of Kenya. Data for five years was collected starting the year 2012 to 2016.

### **Data Collection Procedure**

This study utilized a data collection form to collect secondary data as used in various previous research projects (Lumpkin & Dess, 2001). The data collection form (Appendix I) was used when perusing through the Bank Supervision Report at the Central Bank of Kenya. This ensured that all the required data is captured in preparation for the data analysis.

### **Data Analysis and Presentation**

The data was analysed using descriptive statistics where means and standard deviation were computed and inferential statistics. The study adopted the following Panel data regression model:

$$Y_{i,t} = \alpha + \beta_1 X_{1i,t} + \beta_2 X_{2i,t} + \beta_3 X_{3i,t} + \beta_4 X_{4i,t} + \epsilon_{i,t}$$

Where: Y= Profitability of Commercial Banks (ROA and ROE);  $\alpha$  = Constant;  $X_1$  = Real interest rates;  $X_2$ = Gross Domestic Product;  $X_3$ = Exchange Rates;  $X_4$ = Inflation;  $\epsilon_{i,t}$ = Error Term;  $\beta_1, \beta_2, \beta_3$  and  $\beta_4$ = Coefficient

Panel data is a dataset in which the behaviour of units is observed over a long period of time (Kónya, 2006). This type of data allows one to observe a repeated measurement of the same variables on the same unit, investigating how an event changes the outcome over a period of time (Bokpin, 2013). Panel data is chosen for this research because of a number of reasons: first, its analysis utilizes both time series and cross sectional data and hence it is expected to give unbiased estimators; secondly this form of analysis is suitable for studying data which vary over time and cross sectional, such as the kind envisaged in this study; thirdly, panel data set includes

more data information, more degrees of freedom, reduced co linearity among variables, and therefore providing a more efficient estimation than pure cross sectional or time series estimations and finally, the panel data methodology gives researchers greater flexibility in controlling for the effects of individual-specific variables and time-specific variables (Yu & Lee, 2012).

The researcher used the following tests to determine the suitability of the regression model: multicollinearity, auto-correlation test and normality test. Multicollinearity in which tests the correlation among the independent variables in the regression model. The implicit assumption made is such that the OLS estimation method is that the independent variables are not correlated to one another and can be remedied by either leaving the model despite the multi-collinearity or to drop one of the variables. This test was conducted by Variance Inflated Factor (VIF) measuring the variance in the inflated regression coefficients as compared to the predictor variables which are not linearly related. Generally, a VIF of 1 indicates no correlation, 1-5 moderately correlated and 5-10 highly correlated. The second test is normality test which determines of the data set is well modelled by normal distribution. This data set can be examined graphically or numerically. This study used Skewness and Kurtosis to test for normality. The third test is the auto-correlation test which looks at errors associated within a given time period and carried over to future time periods when handling time-series data set. The test was conducted using the Durbin Watson test statistics (DW) - which is based on the assumption that the structure is of first order.

## **RESEARCH RESULTS**

The main objective of the study was to determine the effect of selected economic variables on profitability of commercial banks in Kenya. The specific objectives of the study were to: examine the effect of real interest rates on profitability of commercial banks in Kenya; determine the effect of Gross domestic product on profitability of commercial banks in Kenya; evaluate the effect of exchange rates on profitability of commercial banks in Kenya; and determine the effect of inflation on profitability of commercial banks in Kenya. The study collected secondary data using data collection sheet. Data was collected over a five-year period (2012-2016). Data was collected on 39 commercial banks in determination of their profitability. Profitability was measured by ROA and ROE. The collected data was analyzed using SPSS software. A summary of the analyzed findings is provided below.

### **Real Interest Rates and Profitability of Commercial Banks**

The descriptive statistics together with diagnostic tests indicated that interest rate was suitable for regressing with profitability of commercial banks. From the regressed results, real interest rate had significant effect on both ROA and ROE as measures of profitability of commercial banks. The beta coefficients in each case was positive showing that increase in real interest rate significantly improves both ROA and ROE as measures of profitability of commercial banks. Similar findings were sought by Irungu (2013) looked at the effect of interest rate spread on

financial performance of commercial banks in Kenya and revealed that a strong positive relationship between financial performances of commercial banks with interest rate spread.

### **Gross Domestic Product and Profitability of Commercial Banks**

From the diagnostic and descriptive findings, GDP was a suitable in regressing with profitability of commercial banks. From regression results, GDP had significant influence on ROA and ROE as measures of profitability of commercial banks. GDP had positive beta coefficients with each of ROA and ROE as measures of profitability of commercial banks. Therefore, an increase in GDP results into improvement in profitability of commercial banks. The findings are consistent with Hong and Razak (2015) who conducted a study on the impact of nominal GDP and inflation on the financial performance of Islamic banks in Malaysia and established that nominal GDP had significant and positive impact on ROAA (return on average asset) and liquidity ratio and EQL (equity to total liquidity) of commercial banks.

### **Exchange Rates and Profitability of Commercial Banks**

The descriptive and diagnostic results indicated that exchange rate was suitable for regressing with the dependent variable. When regressed, the findings indicated that exchange rates had significant influence on profitability of commercial banks. With a positive beta coefficient, an increase in exchange rate would therefore improve profitability of commercial banks. These findings contradict with Kiganda (2014) who conducted a study on the effect of macroeconomic factors on commercial banks profitability in Kenya as in the case of Equity bank limited. The study established that macroeconomic factors (real GDP, inflation and exchange rate) have insignificant effect on bank profitability in Kenya with Equity bank in focus at 5% level of significance.

### **Inflation and Profitability of Commercial Banks**

As one of the independent variables, inflation was identified as a suitable variable for regressing with profitability of commercial banks based on diagnostic results. From regression analysis, inflation only had a significant influence on ROA as a measure of profitability. When regressed with ROE, an insignificant effect was identified. Contrary to the general expectation, the beta coefficients were positive showing that an increase in inflation improves profitability of commercial banks. The findings are in line with Hooshyari and Moghanloo (2015) who evaluated the impact of inflation on profitability of banks and revealed that there is a strong correlation between inflation and profitability of banks in Iran. Similarly, Chioma, Adanma and Clementina (2014) examined the relationship between inflation and banks' performance and how the outcome influences the lending decision of such banks. It was established that there was positive but not significant relationship between inflation, banks' performance and the investment decision of commercial banks operating in Nigeria. In comparative terms, ROE was a proper measure of profitability of commercial banks as compared to ROA, since it had a larger coefficient of determination R squared. Moreover, GDP had the largest influence on profitability

of commercial banks in view of the beta coefficients. On the other hand, exchange rates had least influence on profitability of commercial banks.

## **REGRESSION ANALYSIS**

The researcher conducted regression analysis to establish the effect of selected economic variables on profitability of commercial banks in Kenya. Profitability was measured using ROA and Return on Equity ROE.

### **Return on Assets as a Measure of Profitability**

Regression analysis was conducted with ROA as a measure of profitability of commercial banks. The findings are indicated in subsequent Tables.

**Table 1: Model Summary for ROA**

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.717	.514	.497	.3036

- a. Predictors: (Constant), Inflation Rate, Real Interest Rate, Exchange Rate, Gross Domestic Product GDP
- b. Dependent Variable: Return on Assets

From the Model Summary above, the coefficient of correlation R is 0.717, an indication that selected economic variables had a strong bearing influence ROA as a measure of profitability of commercial banks in Kenya. The coefficient of determination R square was 0.514 showing that selected economic variables explain 51.4% change in ROA as a measure of profitability of commercial banks in Kenya. This indicates that there are other factors that explain the rest 48.6%.

**Table 2: Analysis of Variance ANOVA for ROA**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	.243	4	.061	61	.000 <sup>b</sup>
Residual	.230	190	.001		
Total	.473	194			

a. Dependent Variable: Return on Assets

b. Predictors: (Constant), Inflation Rate, Real Interest Rate, Exchange Rate, Gross Domestic Product GDP

The ANOVA findings were processed at 5% level of significance. From the findings, F calculated is 61, while F critical at degrees of freedom (df. 4, 190) is 2.419. This infers that that the overall regression model significantly predicted the effect of selected economic variables on profitability of commercial banks in Kenya.

**Table 3: Regression Coefficients for ROA**

	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	3.211	.961		3.341	.032
Real Interest Rate	.453	.173	.341	2.618	.039
Gross Domestic Product GDP	.567	.156	.868	3.634	.003
Exchange Rate	.325	.116	.523	2.802	.002
Inflation Rate	.262	.102	.650	2.568	.004

a. Dependent Variable: Return on Assets

The resultant equation becomes;

$$Y_{i,t} = 3.211 + 0.453X_{1i,t} + 0.567X_{2i,t} + 0.325X_{3i,t} + 0.262X_{4i,t}$$

Where: Y= Profitability of Commercial Banks (ROA);  $\alpha$  = Constant;  $X_1$  = Real interest rates;  $X_2$ = Gross Domestic Product;  $X_3$ = Exchange Rates;  $X_4$ = Inflation

Therefore, holding all variables constant, profitability of commercial banks would be at 3.211. A unit increase in real interest rate would increase profitability of commercial banks by 45.3%. A unit increase in GDP would result into 56.7% increase in profitability of commercial banks. A unit increase in exchange rates would result into 32.5% increase in profitability of commercial banks. A unit increase in inflation would lead to 26.2% increase in profitability of commercial banks.

With regard to significance at 5%, real interest rate (p=0.039), GDP (p=0.003), exchange rate (p=0.002) and inflation (p=0.004) all had p values less than 0.05. Therefore, they were significant variables affecting profitability of commercial banks. The findings contradict with Sheefeni (2015) who revealed that the variables gross domestic product, inflation rate and interest rate do not significantly influence commercial bank’s profitability in Namibia.

### **Return on Equity ROE as a Measure of Profitability**

The researcher further assessed how selected economic variables affected ROE as a measure of profitability of commercial banks in Kenya. The findings are indicated in subsequent Tables.

**Table 4: Model Summary for ROE**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.787a	.619	.593	.199

a. Predictors: (Constant), Inflation Rate, Real Interest Rate, Exchange Rate, Gross Domestic Product GDP

b. Dependent Variable: Return on Equity

From Model Summary Table above, R is 0.787, showing strong positive correlation between selected economic variables and ROE as a measure of profitability of commercial banks in Kenya. The value of R square is 0.619, showing that 61.9% change in ROE as a measure of profitability of commercial banks in Kenya is explained by selected economic variables.

**Table 5: ANOVA for ROE**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	.145	4	.036	76.60	.000 <sup>b</sup>
Residual	.089	190	.00047		
Total	.234	194			

a. Dependent Variable: Return on Equity

b. Predictors: (Constant), Inflation Rate, Real Interest Rate, Exchange Rate, Gross Domestic Product GDP

The ANOVA findings of the processed data at 5% level of significance shows an F calculated value of 76.60 while F critical is 2.419. Since F calculated is greater than F critical, this shows that the overall regression model significantly predicted the relationship between the study variables.

**Table 6: Regression Coefficients for ROE**

	<b>Unstandardized Coefficients</b>		<b>Standardized Coefficients</b>		<b>Sig.</b>
	<b>B</b>	<b>Std. Error</b>	<b>Beta</b>	<b>t</b>	
(Constant)	4.783	1.969		2.429	.000
Real Interest Rate	.413	.112	.389	3.688	.002
Gross Domestic Product	.424	.156	1.006	2.718	.000
Exchange Rate	.159	.054	.601	2.944	.003
Inflation Rate	.467	.281	.744	1.662	.508

a. Dependent Variable: Return on Equity

The established regression equation becomes;

$$Y_{i,t} = 4.783 + 0.413X_{1i,t} + 0.424X_{2i,t} + 0.159X_{3i,t}$$

Where: Y= Profitability of Commercial Banks (ROE);  $\alpha$  = Constant;  $X_1$  = Real interest rates;  $X_2$ = Gross Domestic Product;  $X_3$ = Exchange Rates;  $X_4$ = Inflation rate

Therefore, relaxing all the factors, profitability of commercial banks would be at 4.783. A unit increase in real interest rate would result into 41.3% increase in profitability of commercial banks. A unit increase in GDP would improve profitability of commercial banks by 42.4% and a unit increase in exchange rates would result into 15.9% improvement in profitability of commercial banks.

In view of significance at 5%, real interest rates ( $p=0.002<0.05$ ), GDP ( $p=0.000<0.05$ ) and Exchange rates ( $p=0.003<0.05$ ) were all significant factors affecting profitability of commercial banks as their  $p$  values were less than 0.05. These findings are consistent with Osamwonyi and Michael (2014) who established a positive relationship of gross domestic product (GDP) with return on equity (ROE). However, inflation insignificantly affected ROE of commercial banks in Kenya.

## **CONCLUSIONS**

Real interest rate significantly affected Return on Assets and Return on Equity as measures of profitability of commercial banks. An increase in real interest rate would strengthen profitability of commercial banks. These findings are summarized by the International Fisher Effect Theory. According to the theory, foreign currencies with relatively high interest rates tend to depreciate because the high nominal interest rates reflect expected rate of inflation (Madura, 2010).

Gross Domestic Product GDP had significant influence on profitability of commercial banks as measured by ROA and ROE. Compared to other variables, GDP had the largest effect on profitability of commercial banks. The findings are consistent with Barasa (2014) who noted that GDP is positively associated with profitability of commercial banks.

Exchange rate significantly affected both ROA and ROE as measures of profitability of commercial banks. An increase in exchange rates would lead to improvement in profitability of commercial banks. In comparison to other variables, exchange rates however had least effect on profitability of commercial banks. The findings are consistent with the Foreign Exchange Exposure Theory whose view is that exchange rate fluctuations should affect the value of a multinational company mainly via foreign sales and foreign (net) assets, which have to be denominated in the domestic currency of the parent company (Buckley, 2000; Levi, 1996; Shapiro, 2003).

Inflation only had significant effect on ROA as a measure of profitability of commercial banks. The effect of inflation on ROE was insignificant. An increase in inflation would growth profitability of commercial banks especially their ROAs. The findings can be well explained by the Interest Rate Parity Theory by Keynes (1923) to link the exchange rate, interest rate and inflation.

## **RECOMMENDATIONS**

Regulatory bodies like Central Bank of Kenya should work closely with the National Treasury to implement sound policies and measures of maintain interest rates in the economy. The Central Bank of Kenya should strengthen on its monetary policies to regulate the level of interest rates in an economy.

The National Government should adequately support all the sectors of the economy in order to grow the GDP of each of these sectors. Some of the most important sectors with large influence



on GDP include the Agriculture sector. GDP can also be improved by creating a conducive environment in the country for both private and foreign investors.

Adequate measures and policies, strategies and measures should be formulated to check the level of foreign exchange. This could be through deflation of local currency relative to foreign currencies or adoption of fixed exchange rate regimes. On the other hand, should adopt appropriate risk management strategies like hedging and forwards as it regards fluctuation in exchange rates.

Proper fiscal and monetary policies should be enforced to control the level of inflation in an economy. On the other hand, the management of commercial banks should determine their profitability using ROE as compared to ROA.

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