MACROECONOMIC FACTORS AND FINANCIAL PERFORMANCE OF COMMERCIAL BANKS LISTED ON THE NAIROBI SECURITIES EXCHANGE, KENYA.

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A RESEARCH PROPOSAL SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION (FINANCE OPTION) OF KENYATTA UNIVERSITY

MAY, 2019
DECLARATION

Declaration by the Student

I declare that this project is my original work and has not been submitted for an award of a degree in any other University for examination purposes.

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Declaration by the Supervisor

I/we confirm that the work in this project was done by the candidate under my/our supervision.

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DEDICATION

This work is dedicated to the Almighty God for His mercy and grace. To my husband, Fredrick and my son, Leo who has been affected in very many ways by this quest.
ACKNOWLEDGEMENT

My deepest gratitude goes to the Almighty God for enabling me to complete this proposal. I would like to express profound gratitude to my supervisor Dr. Vincent Shiundu for his encouragement; constructive comments and positive criticism to enable me achieve my academic objective.
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ABBREVIATIONS AND ACRONYMS

CBK Central Bank of Kenya
CFC Credit Finance Corporation
CPI Consumer Price Index
CRB Credit Reference Bureau
GDP Gross Domestic Product
HF Housing Finance
I&M Investments & Mortgages
KCB Kenya Commercial Bank
KNBS Kenya National Bureau of Statistics
KSH Kenyan Shillings
MRP Money Remittance Provider
NACOSTI National Commission for Science, Technology & Innovation
NBK National Bank of Kenya
NIC National Industrial Credit
NSE Nairobi Securities Exchange
NPL Non-Performing Loan
ROA Return on Assets
ROE Return on Equity
USD United States Dollar
OPERATIONAL DEFINITION OF TERMS

**Bank size**
This is the volume of assets in total of a commercial bank. Log of volume of assets was adopted as a measurement of bank size.

**Commercial banks**
These are financial institutions that provide borrowing and lending services.

**Exchange Rate**
This refers to the amount of local currency needed to acquire a foreign currency. This study made use of Kenya Shillings to United States Dollar.

**Financial Performance**
This refers to the ability of commercial banks to operate profitably, earning profit on their investments and assets. For this study Return on Equity was adopted as an indicator of financial performance.

**Inflation**
This refers to the general rise in the price level of goods and services in an economy within a given period of time.

**Macroeconomic factors**
This are trends that apply to a broad aspect of the economy as opposed to a certain population.

**Nairobi Securities Exchange**
It is an organized market where stocks and shares are issued, bought and sold through the services of stockbrokers/dealers.

**Real Interest Rate**
The amount an investor receives or expects to be given after incorporating inflation.

**Return on Equity**
This refers to the rate of return earned on commercial bank’s shareholders funds.
ABSTRACT

Financial performance is paramount in any given economy. The performance of banks in Kenya is very crucial given the importance of banks in an economy. The financial performance of commercial banks is affected by various macroeconomic factors which this study delved into. This study aimed at contributing to research in determining to what extent macroeconomic factors influence financial performance banks in Kenya. The specific objectives of this study were: to ascertain the effect inflation, exchange rate and interest rate on financial performance of commercial banks listed on the Nairobi Securities Exchange, Kenya. Also, to ascertain the moderating role of bank size on the relationship between macroeconomic factors and financial performance of commercial banks listed on the Nairobi Securities Exchange, Kenya. The financial performance measure of commercial banks used was the Return on Equity (ROE) which was regressed against the macroeconomic factors including interest rate, exchange rate and inflation. The study is anchored on three theories namely: deflation theory, interest rate parity theory and agency theory. The study adopted a descriptive research design. A census of eleven listed commercial banks in Kenya that were in operation from 2012 to 2017, was carried out to gather information on the financial performance in the sector pertaining to the ROE. Secondary data was used and sourced from the audited financial statements of the listed commercial banks, KNBS and CBK. Data for the study was analyzed by use of panel regression model and presented using tables. Prior to carrying out the regression diagnostic tests were carried out for stationarity, correlation, normality and the Hausman test. The study concluded that the effect of inflation on financial performance is statistically insignificant. However, with regards to the effect of interest rate on financial performance of commercial banks, the study concluded that interest rate positively and significantly affects the financial performance of commercial banks listed on the NSE, Kenya. The study also concluded that there exist an inverse and significant effect of exchange rate on financial performance of commercial banks listed on the NSE, Kenya. Lastly, on the moderating effect the bank size on the relationship between macroeconomic factors and financial performance of commercial Banks listed at the NSE, Kenya. The study concluded that bank size has an insignificant moderating effect on the relationship between inflation and financial performance of commercial banks listed on the NSE, Kenya. Conversely, the study concluded that bank size has a positive and significant moderating effect on the relationship between interest rate and financial performance of commercial banks listed on the NSE, Kenya. Also, the study concluded that bank size has a negative and significant moderating effect on the relationship between exchange rate and financial performance of commercial banks listed on the NSE, Kenya. The study recommends that CBK should manage interest rates adequately in order to avoid its fluctuations as this will hamper performance of banks. Since the study concluded that the effect of exchange rate on financial performance is negative but statistically significant, the study recommends that bank management consider the prevailing and anticipated exchange rates in the economy when making decisions. The study suggests that further studies focus on all commercial banks in Kenya. Similarly, further research can be done on the moderating effect of capital adequacy requirements on the relationship between macroeconomic factors and financial performance of commercial banks in Kenya.
CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Globally, financial Institutions contribute crucially to the role of economic development and growth. Financial institutions provide financial intermediation services where they engage in collecting and mobilizing resources for investors and businesses which enhance economic development (Were & Wambua, 2014). An efficient banking system is of utmost importance for adequate financial intermediation which brings about sustainable investments in the private sector investment. Importantly, these roles played by the banking sector is hinged on bank performance and as such, knowing the factors affecting bank performance is of high crucial to banks and of high importance in stabilizing the economy (Alper & Anbar, 2011).

The banking system stands as the most significant part of the financial system of countries. The role of capital provision, where banks channel funds to deficit economic units from surplus units cannot be over emphasized (Rasiah, 2010). Despite the past and ongoing reforms witnessed in Africa, the performance of banks has remained poor as they are not effective their financial intermediation roles. These poor performances experienced by banks have continued have resulted in high liquidity risk levels and loss of confidence by investors and customers in some cases. These are also seen in the high cost of financial intermediation charged by banks (Agade, 2014).

In Kenya, a number of banks in Kenya have collapsed which include: the Continental Bank of Kenya Ltd, Trust Bank of Kenya and also Chase Bank and many more. Further, based on an annual CBK investigation report, there has been decreasing trend of revenue generated by Kenyan banks (Sawe, 2011). An example of such is Barclays Bank of Kenya and Equity Bank of Kenya which
experienced a 10% and 4% decline in profits respectively. Notwithstanding of strict regulations and legislative framework implemented by the CBK, the banking system in Kenya has encountered banking difficulties since 1986, and this brought about the closure of many banks (Gitonga, 2014) with the latest dated 2015 and 2016 being Imperial and Chase banks respectively. This trend creates a continuous threat to the financial viability and sustainability of the commercial banks in Kenya.

1.1.1 Macroeconomic Factors

External factors are within bank operating environment which individually and sometimes collectively determine performance of the banks as they are mostly above their control (Ongore & Kusa, 2013). In a similar narration, Karkrah and Ameyaw (2010) opine that macroeconomic factors structure a greater part of the external factors that affect a business. The most frequent external factors that have been recognized includes exchange rates, GDP, unemployment, inflation among others. According to Njuguna (2013), macroeconomic (external) factors are grouped into three classes: those related to general external environment such as inflation and unemployment rate, those associated to the direction the economy is moving such as GDP and the factors in the financial market conditions such as interest rates, exchange rate, stock market returns.

According to Agade (2014) inflation refers to the general increase in prices of commodities over a given period. According to Rovell (1979) inflation is an external variable that affects bank’s performance. Inflation also affects the solvency of debt which may result in NPL’s.

Exchange rate refers to the amount at which a currency will be exchanged for another (Ajayi & Atanda, 2012). A rise in the exchange rate of a local currency against a foreign currency indicates a depreciation in that local currency. In this study, the exchange rate of Kenyan Shillings to US dollars was applied.
According to Mwangi (2013) interest rate is the amount that is paid by a borrower to a lender for money or assets used. Interest rate refers to the maximum rate of lending rate by banks. The current study adopted real interest rate as a proxy for interest rate. It is the nominal interest rate less inflation. Furthermore, this study used interest rate, inflation and exchange rate to provide a useful framework to monitor the banking sector performance in Kenya. Agade (2014); Ajayi and Atanda (2012); Buyinza (2010); Fredric (2014) put forward that inflation, interest and exchange rates are the most important factors in the external environment that affect the performances of banks.

1.1.2 Bank Size

Bank size refers to the total assets of a bank at a given time. Banks size is indicated to have an underlying relationship with the profitability of banks and in turn its financial performance. Increasing size of banks can bring about better financial performance by allowing banks to enjoy economies of scale (Kwakwa, 2014). For instance, increasing bank size provides banks with the advantage of allowing them to spread their fixed costs which can be over a greater asset base, which ultimately reduces their average costs. In addition, with increases in the scale of operation, these banks can utilize specialized inputs which include loan officers who are experts in a certain line of business, thus, bringing about greater efficiency (Buyinza, 2010).

The relationship between bank size and financial performance of banks lies beyond economies of scale. Small banks can develop stronger relationships with the local businesses environment and smaller customers than the large banks do, this therefore gives them full access to vital information which is used setting policies regarding credit decisions (Medley, 2016). The pricing and information advantages enjoyed by small banks ultimately offset any loss emanating from scale
economies. In measuring bank size, the current study adopted total assets which was measured using the natural logarithm.

1.1.3 Financial Performance

This refers to the extent of business progress over a certain period of time shown using profits and losses (Soyemi et al., 2013). Evaluating an entity’s financial performance allows owners and decision-makers to ascertain and judge performance output of business in objective monetary terms. It is mostly utilized to describe how well resources of an entity are being used to generate income for owners or investors. It is usually ascertained via a firm's Return on Assets (ROA) or the Return on Equity (Mwangi, 2013).

ROA is a ratio that points out how profitable a bank is. It is the income to total assets ratio (Khrawish, 2011). It assesses management capabilities to manage company assets available to them and realize profit. That is, it reflects how company assets are effectively used to generate income. It shows the management efficiency of an organization in realizing income from the available resources of the organization (Khrawish, 2011). In this vein, increase in ROA implies that the organization is very effective in managing its assets. ROA is expressed as:

\[ \text{Return on Assets} = \frac{\text{Net Income of banks}}{\text{Banks Average Total Assets}} \] which is in percentage.

ROE is a profitability indicator of how much profit a firm is realizing form funds of shareholders. Return on Equity of Banks = Net income of Banks/ Shareholders equity of Banks. It signifies how good the company is bringing returns on the funds it received as form of investment from the shareholders (Khrawish, 2011). A higher ROE is preferable to investors. ROE is also a useful criterion to pick stocks within the same sector. In all the sectors and even within the same sector,
level of profit and income significantly vary, if a company chooses to issue dividends as opposed to retaining the profit generated as idle cash the ROE levels may vary.

In the year 2016, the commercial banks in Kenya registered a decrease in profits. Apparently, some large banks such as Barclays Bank of Kenya and Equity Bank of Kenya had a decrease of four and ten % respectively in profits. The net interest income for National Bank of Kenya (NBK) declined by Kshs 400Million to Kshs 5.4Billion in the year ended 31 December 2015 which was attributed to increased interest expenses (NBK, 2015). Interest is one of the macroeconomic factors which was evaluated in our study to establish its effect on bank performance in Kenya.

Irrespective of serious regulations and legislative framework enacted by the CBK, Kenya’s banking sector has gone through banking problems dated back to 1986, which has caused the collapse of notable banks where the most recent ones being Chase banks and Imperial in 2016 and 2015 respectively. According to the yearly CBK investigation Reports, the rate of revenue generation has been on a decrease for Kenyan banks thereby causing the growth and profitability to decrease (Sawe, 2011). Some of the factors resulting in the declining performance include the unpredictability of interest rates, fluctuating exchange rates and increasing levels of prices which was discussed in detail in the course of this study.

In Kenya, the Bank Financial Institutions represent a large fraction in the country’s financial sector. Therefore, in such a scenario where a nation’s financial sector is majorly characterized by banks, any lapses or failure in such a sector carries along significant adverse implication for the country’s economic growth at large. Evidently, this is link to the fact that the occurrence of such contagious as it leads to bank runs, among other which may ultimately result in some financial crises and much more tribulations.
1.1.4 Macroeconomic Factors and Financial Performance

Dynamics in the global macroeconomic environment impact on performance of financial sectors and economies. Stable financial systems require macroeconomic stability therefore positive interactions between the macroeconomic conditions and financial sectors are critical in achieving and maintaining financial system stability.

Inflation is a macroeconomic factor that affects bank’s profitability (Rovell, 1979). His argument takes a view that the effect of inflation on bank profitability depends on the rate at which the bank’s wages and other operating expenses increase compared to inflation. Furthermore, inflation has an adverse effect on commercial bank’s profitability as it erodes the real value of bank’s assets relative to their liabilities; hence it affects profits (Shingjergji, 2013).

According to Fredric (2014) high interest rates will broaden the debt burden of borrower eventually causing loan defaults. Additional explanation by Fredric (2014) on interest rate policy, frequent changes in interest rate policy may increase bad loans. As a result, increase in loan defaults may lead to asset corrosion of banks and capital erosion. (Asari, Muhammad, Ahmad, Latif, Abdullah and Jusoff, 2011).

There is a relationship between the interest rate and financial performance of banks, this is on the basis that net interest income which is a difference between interest income and interest expenses largely affects the commercial banks’ profits (Shingjergji, 2013).
Kwakwa (2014) stated that exchange rate depreciation is correlated with lower quality of bank assets, especially in countries with widespread currency mismatches. It is further supported by Al-Tamimi (2010) as they found that exchange rate brings negative impact to banks’ asset quality.

1.1.5 Commercial banks in Kenya

The Banking Industry of Kenya is made up of the CBK which is the apex regulator; 43 commercial banks, 13 microfinance institutions, 3 CRBs, 17 MRPs and 77 forex bureaus as at 31 December 2016. 40 out of the 43 banking institutions are privately owned while majority ownership is held by the Government of Kenya in 3 institutions. Furthermore, 15 banking institutions out of the 43 are foreign controlled where the locally controlled one are 28 (Banking Sector Annual Reports, 2016).


1.1.6 Nairobi Securities Exchange

A stock exchange is an organized market for the trading of bonds, stocks and other securities. A stock exchange or stock market provides a medium where various firms can join by becoming members and raise additional capital business expansion through issuing and selling of securities.

The NSE was established in the year 1954 which was previously called Nairobi Stock Exchange under the Societies Act (1954) which was a voluntary stockbrokers association. NSE had the
responsibility of establishing the securities market and coordinating the activities thereafter. In July 2011, Nairobi stock Exchange was renamed to become the Nairobi Securities Exchange. This was in line with the 2010-2014 strategic plan to evolve the NSE which transformed to a full service securities exchange which provides platform for trading of securities, clearing of securities and debt settlement, derivatives, equities, and other traded instruments (“NSE”, 2015).

The role and responsibility of the NSE is to: first, enable the savings mobilization for purposes of investments; secondly, it provides enablement for growth and expansion of the financial services sector for example insurance pension schemes, which advocates for savings by employees; thirdly, it encourages high accounting standards and resources management; fourthly, it encourages floatation of private companies which allows for greater growth and lastly, NSE facilitates equity financing and enhances access to finance for both new and old companies (“NSE”, 2015). In light of the new roles and responsibilities of the NSE, the Kenyan government envisions a highly industrialized country in its vision 2030, thereby having a smooth platform for big names of businesses and investments in the regional and global financial market

1.2 Statement of the Problem

The wellbeing of a country’s economy has a direct association with the soundness of the country’s banking system. Various researches across the globe have demonstrated that a highly developed banking is responsible for high economic development and growth in a country (Al-Tamimi, 2010). A bank is in simple terms just like the heart in the economic structure of a nation and the capital provided by it the nation’s blood. As long as the blood keeps circulating within the organs, then the system will remain sound and adequately healthy. It there blood supply shortage or failure
to any organ the part is rendered useless. Therefore a lack of financing to the various economic sectors, leads to economic stagnation (Agade, 2014).

As a result of the complex operating environment of banks, profitability which is widely used to assess bank performance has been at the centre of attention for both researchers and also policy makers (Al-Qudah, & Jaradat, 2013). Profitability is highly crucial for the continuous existence of banks and also their wellbeing. Importantly, cash dividends and retained earnings are solely sourced from a bank’s profitability.

As widely reported by World Bank (2017), the trend in banking performance as measured by the profitability ratio ROE is declining trend. The ROE of commercial banks was reported to be 21.99% as at 2012 indicating a decline as compared to the 23.10% of 2011. Also, the decreasing trend of the ROE of banks in Kenya extended to 2013 all through to 2015 where the ROE was respectively at 20.94%, 20.88% to 17.39%. This has however brought about concern in every corner of the financial sector. This can be attributed to the fact that Kenya is a bank driven economy.

In Kenya, a number of banks have collapsed and this is largely attributed to external factors and this trend stands as a challenge to the financial viability and sustainability of the commercial banks in Kenya. All market players (banks) are striving to maximize profitability and by extension market share in the banking sector. With the CBK performing its oversight role of regulating interest rates, there still exists instability in the macroeconomic environment of Kenya.

There are quite a few studies on macroeconomic factors and their effect on banking performance. In addition, available studies lack consensus on the subject matter as they are characterized by mixed findings. For instance, Macharia (2013); Ongore and Kusa (2013); Frederic (2014)
indicated that inflation significantly and negatively affects the financial performance of commercial banks. On the contrary, Ajayi and Atanda (2012); Kiganda (2014), Kwakwa (2014) indicated that inflation has an insignificant positive effect on the financial performance of banks. Lastly, Buyinza (2010) indicated inflation having a significant positive effect on financial performance of commercial banks. Furthermore, studies conducted on macroeconomic factors and bank performance of commercial banks did not consider bank size and its moderation role on the relationship between macroeconomic factors and financial performance of commercial banks. Bank size is an important internal factor for banks that captures economies and diseconomies of scale.

In addressing the research gaps (contextual gap, conceptual gaps and knowledge gaps) the current investigation assessed the impact of macroeconomic factors on financial performance of commercial banks listed on the NSE, Kenya.

1.3 Objectives of the Study

This study will be informed by general and specific objectives as captured hereunder:

1.3.1 General Objective

To determine the effect of macroeconomic factors on financial performance of commercial banks listed at the NSE, Kenya.

1.3.2 Specific Objectives

The following are the specific objectives of the research.
To determine the effect of inflation on financial performance of commercial banks listed on the Nairobi Securities Exchange, Kenya.

To investigate the effect of real interest rate on financial performance of commercial banks listed on the Nairobi Securities Exchange, Kenya.

To establish the effect of exchange rate on financial performance of commercial banks listed on the Nairobi Securities Exchange, Kenya.

To investigate the moderating effect of bank size on the relationship between macroeconomic factors and financial performance of commercial banks listed on the Nairobi Securities Exchange, Kenya.

**1.4 Research Hypotheses**

The research hypotheses for the study are:

H$_{01}$: Inflation has no significant effect on financial performance of commercial banks listed on the NSE, Kenya.

H$_{02}$: Interest rate has no significant effect on financial performance of commercial banks listed on the NSE, Kenya.

H$_{03}$: Exchange rate has no significant effect on financial performance of commercial banks listed on the NSE, Kenya.

H$_{04}$: Bank size has no significant moderating effect on the relationship between macroeconomic factors and financial performance of commercial banks listed on the NSE, Kenya.

**1.5 Significance of the Study**

This research is of relevance to the Kenyan Government as it will guide law and policy making bodies in formulation of laws and policies as regarding the banking sector. Secondly, results from
this research will be very relevant to the top management of banks. It will broaden their knowledge on how macroeconomic factors affect financial performance of banks. Thirdly, the study will be of significance to the society as it will educate the society on the impact of macroeconomic factors on banking performance. Lastly, the research will serve as reference for academicians carrying out a study in a related field.

1.6 Scope of the Study

This research was based on all listed commercial banks that have been functioning within the time frame which is 2012 to 2017. The research therefore employed panel data on all 11 listed commercial banks at the NSE in Kenya within the period of six years while using a panel regression model for the data analysis. The study was limited to inflation, exchange rate, interest rate and bank size and the relationship to financial performance of listed commercial banks in Kenya.

1.7 Limitations of the study

The limitation of the study may be attributed to that fact that the study used secondary data, as such there was the challenge of originality of data. The researcher ensured original data is used in the study by ensuring that data from the audited financial statement of the banks were sourced and utilized.

1.8 Organization of the study

The research project is structured as follows: the foregoing chapter one constitute the research background, research objectives, significance of the study, scope and limitations of the study.
Chapter two is the literature review. It also looks at theoretical review and empirical review to provide more insights into the study. Chapter three presents the methodology of the study. It constitutes the research design, target population, data collection instruments and data analysis for the study. Chapter four comprises of data analysis and interpretation while chapter five presents the summary, conclusion and recommendation of the study.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction
This segment of the study has the review of theories and past studies on the subject matter of the study.

2.2 Theoretical Review
The research is based on Deflation Theory, Interest Rate Parity Theory and Agency Theory which will underpin the study.

2.2.1 Deflation Theory
The theory was brought forth by Fisher (1933), the theory view the decrease in general price levels to bring about depreciation in the net value of businesses and investments, which further lowers profitability, thereby triggering bankruptcies and other forms of business collapses. Therefore, interest rates which move hand in hand with price levels are characterized by various fluctuations which bring about loss of value of money. These fluctuations and volatility of profitability determinants as regarded as forces within the external (operating) environment and internal environment which exert influence on the degree of over indebtedness between creditors and debtors which ultimately result in default in loan repayment. This default in turn hampers on bank profitability and its financial performance at large. Higher inflation leads to higher profitability when it is well anticipated as interest rate is quickly adjusted and vice versa.
In view of this study, the theory postulates that decreased inflation brings about reduced revenue of banks and ultimately reduced bank profitability which eventually lead to banks running into bankruptcy. This varies with the expectation that higher inflation (that is price levels) leads to losses in the purchasing power of money and increase in operating costs and further the interest rates in the banking industry and economy at large. As a result of this loss of purchasing power of money and reduced value of money, the growth of the country’s economy is hampered and thus, hence negatively impacting on GDP growth of the country (Pandey, 2009).

2.2.2 Interest rate Parity Theory

The theory was brought about by Keynes (1936). The theory is of the notion that the variations in the rate of interests between one nation’s currency and that of its counterparts in other countries who trade across borders account for the fluctuations in the nominal rate of interest. The theory rests on the notion of the differences in interest rates of other economies and the local economy. Parity condition rests on the idea that the differences in interest rate for 2 different currencies is accounted by a discount or premium for the forward rate of exchanges on the foreign currency whereby there is no trading activity as regarding selling and buying of currency in the market (Bhole & Dash, 2002).

This theory relates the existence of parity which performs a vital function in banking transactions. Banks charge interest on loans in order to make profits so as to sustain market share and perform their role of intermediation efficiently. Thus, the financial performance banks is often affected by the rate of interest charge on loans. Increased interest rates lead to higher profitability while decreased interest rates leads to lower profitability and hence poor financial performance of banks.
2.2.3 Agency Theory

Agency Theory was brought about by Jensen and Meckling (1976). The theory provides insight on the linkage existing within management/CEOs of institutions and firm owners in this case shareholders of that institution (Mulwa, 2015). This theory opines that agency conflict exists. The managing team of an institution is often categorized as an agent contracted by the shareholders who are also referred to as the owners of the organization (Waweru, 2013). The managerial activities are based on the interests of the shareholders and the financial growth of the institution.

Agency theory is relevant to this research because provides an insights on how the commercial banks’ performance is determined by how managers of banks carry out their responsibilities of maximizing profits and minimizing costs. The theory suggests that the managers may put personal interest first before that of shareholders. They may engage in activities that benefits them at the loss of the owners of the banks (Acaravci & Calim, 2013). This consequently impacts negatively on the profitability and overall financial performance of banks.

2.3 Empirical Review

This section constitutes the review of empirical studies on macroeconomic factors and financial performance.

2.3.1 Inflation and Financial Performance

An empirical analysis was undertaken by Buyinza (2010) which sought to assess the profit rate of banks of Sub Sahara Africa countries. The study looked at profitability of 23 through the 1999 to 2006 period in Sub Sahara Africa countries. The study adopted panel data regression analysis and the results showed inflation to positively and significantly affect profitability of banks. However,
Beyinza (2010) concentrated on Sub Sahara Africa banks which were more of a comparative study. Listed banks in Kenya will be the focus of this study as it will provide country specific result.

Also, Ajayi and Atanda (2012) did a research on monetary policy effects on banking performance for Nigeria. While focusing on the period 1980 to 2008 and with the use of Engle-granger two-step co-integration approach, the study provided evidence of inflation having a positive but insignificant influence on the performance of banks in Nigeria. Nigerian commercial banks was the focus of the study, however, such findings cannot be extended to Kenya. In line with this, Kenyan listed commercial banks will be the focus of this study.

Macharia (2013) carried out an empirical research on the global financial crisis and its impact on bank financial performance in Kenya. While focusing on banks that offer mortgage finance, findings showed that there exists a negative inflation effect on performance of Kenyan banks. Macharia (2013) sole focused on those banks that are engaged in mortgage services whereas this study will be on commercial banks listed on the NSE in Kenya for the period 2012 to 2017.

Kiganda (2014) also did a study focusing on macroeconomic factors and profitability of commercial banks in Kenya while Equity bank limited was the research focus. Yearly data was used in the study which covered the period 2008 to 2012. Multiple regression model was adopted for the study where the results indicate that inflation has an insignificant positive influence on the profitability of banks with emphasize on one bank that is Equity Bank Limited. This study was however focused on Equity Bank Limited and hence this cannot be extended to commercial banks in Kenya.

Kwakwa (2014) also carried out an enquiry on the significant determinants of Ghanaian banks performance. Looking at variables such as money supply, bank size and inflation, bank size as
predicting variables and bank performance as criterion variable, findings showed inflation having an insignificant but positive impact on performance. However, considering the study by Kwakwa was on Ghana, the findings may not realistically be applied to the Kenyan context. Therefore, this study seeks to address this gap.

2.3.2 Interest Rate and Financial Performance

An investigation was done by Alper and Anbar (2011) on external determinants of profitability in Turkey covering the period 2002 to 2010. The bank profitability was looked at using ROA and ROE which are regressed on macroeconomic determinants. The findings of the study show that interest rates affects bank positively, thus implying that higher bank profitability is associated with high interest rates. However, Alper and Anbar (2011) focused on banks in Turkey. This study will centre on listed commercial banks in Kenya.

Macharia (2013) carried out an empirical research on the global financial crisis and its impact on bank financial performance in Kenya. While focusing on banks that offer mortgage finance, findings showed that there exists a negative relation of interest rates and performance of banks situated in Kenya. Macharia solely concentrated on banks offering mortgage services whereas this study will be concentrating on listed banks on the NSE in Kenya for the period 2012 to 2017.

2.3.3 Exchange Rate and Financial Performance

Desaro (2012) did a research on influence of macroeconomic variables on banks performance in Kenya. GDP growth rates, the money supply, inflation, exchange rates and the lending rate of the sampled commercial banks were considered. The study made use of quarterly data which was analyzed using Pooled Least Square Method. The study findings show that ROA was negatively
correlated with exchange rate. However, the study was based on a census. This research will be on the listed commercial banks at the NSE, Kenya.

Macharia (2013) did an empirical research on the global financial crisis and its effect on bank financial performance in Kenya. While focusing on banks that offer mortgage finance, findings showed that there exists a negative effect of exchange rate on performance of banks in Kenya. Macharia (2013) sole focused on only banks offering mortgage services whereas the this research will be on banks listed on the NSE in Kenya for the period 2012 to 2017. Listed banks will be the focus of the current study.

Similarly, Kiganda (2014) did a research on the external factors effect on commercial banks profitability in Kenya as it focused on Equity Bank Limited. The study used multiple regression analysis and the output showed that exchange rate negatively and insignificantly affects profitability. However, the study was a case study of Equity Bank Limited only. Notably, Equity Bank is listed on the NSE, Kenya. However, the findings of the study cannot be extended to all commercial banks listed on the NSE, Kenya.

2.3.4 Bank size and financial performance

A researched out by Buyinza (2010) on profitability of commercial banks in Sub Sahara Africa countries. 23 banks made up the sample of the study where their profits for 1999 to 2006 were reviewed. Panel data regression analysis was used where results showed size of bank to positively and significantly effect of bank profits. Although, Buyinza did a cross country study. This study is on Kenyan banks, thereby giving a country based recommendations. And also country level implications
Similarly, Pinter, Ali, Akhtar and Ahmed (2011) carried out an enquiry into the influence of bank specific factors on commercial banks’ performance in the context of Pakistan. 22 private and public commercial banks for the time frame for the period 2006 through 2009 was considered. The research adopted multiple regression model and panel data estimation. The results of the study indicate a strong and positive impact of bank size on financial performance of banks in Pakistan.

A study was undertaken by Nasserinia et al. (2014) on the main performance determinants of banks in Japan. Internal, market and eternal variables were considered during the period of the global financial crisis. NIM was adopted as a proxy of performance in the study. The research findings indicate a positive and significant impact of bank size on the performance of banks in Japan. However, the research was based on banks in the context of Japan, thus the results from the research cannot apply in the case of Kenya. As such, the ongoing investigation will focus on listed Kenyan commercial banks.

Similarly, Kwakwa (2014) did a research on performance determinants of Ghanaian banks. The variables included in the research were bank size, inflation and money supply. ROA and ROE were used to capture performance. Bank size was shown to have a significant positive relationship with ROA. On the other hand, bank size had an insignificant and positive relationship with ROE. However, the research was focused on banks in Ghana. The focus of the current study is on commercial banks listed on the NSE.

2.4 Summary of Literature review and Research gaps

This section shows evidence of research gaps, these gaps range from contextual, conceptual and knowledge gaps. A number of studies on macroeconomic factors and financial performance were conducted for commercial banks in developed and other countries other than Kenya. Similarly,
these studies are inconclusive as they are characterized by mixed results. Thus, the contextual and knowledge gaps respectively.

In addition, previous studies on macroeconomic factors and performance of commercial banks did not consider bank size and its moderating effect on the relationship macroeconomic factors and financial performance of commercial banks, thus, the conceptual gap. The proposed study seeks to address these gaps in literature by evaluating the influence of macroeconomic factors on financial performance and the moderating effect of bank size on the relationship between macroeconomic factors and performance of commercial banks listed on the NSE, Kenya. Bank size is a vital bank specific factor that captures potential economies of scale.
<table>
<thead>
<tr>
<th>Researcher</th>
<th>Research Objectives</th>
<th>Key Finding</th>
<th>Research Gaps</th>
<th>Focus of the Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiganda, 2014</td>
<td>Effects of inflation on profitability of Equity Bank Ltd</td>
<td>- Inflation has a positive and insignificant impact on commercial banks in Kenya.</td>
<td>The study only focused on Equity Bank Limited and the findings could therefore not be generalized for all commercial banks listed on the NSE, Kenya.</td>
<td>Focus is on listed banks</td>
</tr>
<tr>
<td>KENYA</td>
<td></td>
<td>- Exchange rate has an insignificant negative effect on bank profitability at 5% level of significance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasserinia, 2014</td>
<td>The key determinants of performance of commercial banks in Japan.</td>
<td>Bank size is directly and significantly related to performance</td>
<td>The study was on commercial banks in Japan.</td>
<td>Focus is on all commercial banks listed at the NSE and therefore address the contextual gap.</td>
</tr>
<tr>
<td>JAPAN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kwakwa, 2014</td>
<td>Performance determinants of Ghanaian banks.</td>
<td>Bank size was shown to have a significant positive relationship with ROA &amp; had an insignificant positive relationship with ROE.</td>
<td>The study was done in Ghana and focused on one bank.</td>
<td>Focus is on listed commercial banks</td>
</tr>
<tr>
<td>GHANA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macharia, 2013</td>
<td>Interest rate effects on performance of banks</td>
<td>Interest rate is inversely and significantly related to performance</td>
<td>The study focused banks offering mortgage finance. Bank size was not considered as a moderator.</td>
<td>Focus is on listed commercial banks</td>
</tr>
<tr>
<td>KENYA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desaro, 2012</td>
<td>Effect of exchange rate on performance banks</td>
<td>ROA was negatively correlated with the variable exchange rate.</td>
<td>Looked at all commercial banks in Kenya, isolated bank size as a moderator.</td>
<td>Focus is banks listed at the NSE, Kenya and the moderating effect of bank size will be looked at.</td>
</tr>
<tr>
<td>Researcher</td>
<td>Research Objectives</td>
<td>Key Finding</td>
<td>Research Gaps</td>
<td>Focus of the Study</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Pinter, Ali, Akhtar and Ahmed, 2011 PAKISTAN</td>
<td>Influence of bank specific factors on commercial banks’ performance in the context of Pakistan.</td>
<td>Bank size has a strong and positive impact of bank size on financial performance of banks in Pakistan.</td>
<td>The study was done on 22 commercial banks in Pakistan</td>
<td>Focus is on the listed commercial banks in Kenya.</td>
</tr>
<tr>
<td>Alper and Anbar, 2011 TURKEY</td>
<td>External determinants of commercial banks profitability in Turkey</td>
<td>The findings of the study show that interest rates affects bank positively, thus implying that higher bank profitability is associated with high interest rates.</td>
<td>The study on commercial banks in Turkey</td>
<td>This study centred on listed commercial banks in Kenya.</td>
</tr>
<tr>
<td>Buyinza, 2010 SUB SAHARA</td>
<td>Profit rate of banks of Sub Sahara Africa countries</td>
<td>Inflation positively and significantly affects profitability of banks.</td>
<td>The study period was 1999 to 2006 and it was a cross country study.</td>
<td>The study focused on the period 2012 to 2017 and will be on all listed commercial banks in Kenya.</td>
</tr>
</tbody>
</table>
2.5 Conceptual Framework

The conceptual framework shows the proposed link of the study variables. Financial performance is dependent on macro-economic factors, therefore it is the dependent variable. Similarly, the independent variables are the macroeconomic factors which are inflation, interest rate and exchange rate. The macroeconomic factors are believed to predict the performance of banks.

**Independent Variables**

- **Macroeconomic Factors**
  - **Inflation**
    - Inflation Rate
  - **Interest Rate**
    - Real interest rate
  - **Exchange Rate**
    - USD/Ksh

**Dependent Variable**

- **Financial Performance**
  - ROE

**Moderator**

- **Bank size**
  - Natural Log
  - Volume of Assets

*Figure 2.1 Conceptual Framework*
Source: Researcher (2018)
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter comprises of the methodology of the research. It constitutes the, target population, research design, data analysis and data collection instruments and procedure, data analysis and presentation.

3.2 Research Design

A research design is a scheme, outline or plan that is used to generate answers to research problems (Orodho, 2003). The research will use causal research design. This is adopted in a study to determine the cause and effect relationships among variables, that is the independent and dependent variables. Thus, the appropriate research design in this case is causal design as it seeks to establish the influence of macroeconomic factors on performance of listed commercial banks in Kenya.

3.3 Target Population

Cooper and Schindler (2009) stated that a population refers to the total collection of elements about which a researcher wants to make some inferences. The study’s target population consists of all listed commercial banks in Kenya from 2012 to 2017 period which are 11 in number. Therefore, the 11 commercial banks listed on the NSE and their published financial statements constitute the unit of analysis and unit of observation of the study respectively.
3.4 Empirical model

The study adopted a panel regression model.

\[ Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \epsilon_{it} \]  

.. Model 1

Where:

\( Y \) – ROE

\( \beta_0 \) - Constant

\( X_1 \) – Inflation

\( X_2 \) – Interest rate

\( X_3 \) – Exchange rate

\( \beta_1 \) – \( \beta_3 \) = Regression coefficients

\( \epsilon \) = Error term which captures the omitted variables in the model

\( it \) - Number of listed commercial banks for each period

The moderating effect of the bank size on the zero-order correlation between macroeconomic factors and financial performance was tested using the two models presented below:

.. Model 2

.. Model 3

Where:

\( Y_{it} \) = Dependent Variable (Financial performance) for each firm at period \( t \)

\( X_{it} \) = Macroeconomic Factors

\( MV_{it} \) = Bank size (Moderator)
$X_{it}^{*}MV_{it}=$Interaction term

If the value of the interaction terms is zero or statistically insignificant then there is no moderating effect otherwise where the value is statistically significant there is a moderating effect of the moderating variable (Whisman & McClelland, 2005).

### 3.5 Operationalization and Measurement of Study Variables

The independent variables of the study are factors, which are inflation, interest rate and exchange rate in Kenya. The moderator is the bank size which will be measured as log of total assets. Additionally, the dependent variable of the study is financial performance as denoted Return on Equity (ROE).

**Table 3.1: Operationalization and Measurement of Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Operationalization</th>
<th>Measurement</th>
<th>Directional hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Performance</td>
<td>Dependent Variable</td>
<td>Return on shareholders’ wealth = EAT/EQUITY</td>
<td>Ratio</td>
<td>+/-</td>
</tr>
<tr>
<td>Inflation</td>
<td>Independent Variable</td>
<td>Inflation Rate</td>
<td>Ratio</td>
<td>+/-</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>Independent Variable</td>
<td>Real Interest Rate</td>
<td>Ratio</td>
<td>+/-</td>
</tr>
<tr>
<td>Exchange Rate</td>
<td>Independent Variable</td>
<td>Nominal Exchange Rate = USD/Ksh</td>
<td>Ratio</td>
<td>+/-</td>
</tr>
<tr>
<td>Bank Size</td>
<td>Moderator</td>
<td>Volume of Assets = As Log of Total assets</td>
<td>Ratio</td>
<td>+/-</td>
</tr>
</tbody>
</table>

Source (Researcher, 2018)
3.6 Sampling Design

Sampling is the act of finding a representative of a population in a study (Cooper & Shindler, 2009). The study however adopted a census as it focused on all the eleven listed commercial banks on Nairobi Securities Exchange, Kenya that have been in existence between 2012 to 2017. In addition, Kothari (2011) asserts that it enhances the validity of data collected.

3.7 Data Collection Instruments

The study will make use of secondary to be sourced from the audited financial statements of listed commercial banks; KNBS and CBK for the time frame 2012 to 2017.

3.8 Diagnostic test

Before the actual analysis the study will be tested against any violation of regression analysis. These tests include:

3.8.1 Multicollinearity Test

Multicollinearity is a condition where the independent variables are highly correlated in a study (Chris, 2008). Multicollinearity leads to inefficient estimates and inferences as it increases the p-values of variables. The correlation matrix was used to assess multicollinearity. According to Greene (2008), a coefficient (r) higher than 0.8 or r² higher than 64 indicates the presence of high level of multicollinearity. In the case of high multicollinearity, the affected variables will transformed into ratios or ultimately removed from the study.

3.8.2 Heteroscedasticity Test

The Heteroscedasticity test is carried out to check if the variance of the errors is constant over time (Chris, 2008). The test will be based on Breusch Pagan Godfrey test. In the absence of
heteroscedasticity, the method of generalized least squares (GLS) will be used. Alternatively, the variables can be transformed into logs where a log-log model can be adopted.

3.8.3 Autocorrelation Test

Autocorrelation refers to a scenario where the error term in a period is related to that of another period. The presence of autocorrelation brings about wrong inferences in a research study. The Durbin Watson statistic was used to assess autocorrelation. Durbin Watson statistics less than 2 implies the presence of autocorrelation, in such a case, the research data will be transformed, thus addressing the problem.

3.8.4 Stationarity test

This is a diagnostic test carried out when using panel data because of the time series aspect of the panel data. A time series analysis is said to be stationary if its variance or mean is not characterized by high volatility. The augmented Dickey Fuller test was adopted for panel unit root test. The non-stationary variables will be differenced and in such a case, the differenced variables will be used for the analysis of the study.

3.9 Data Analysis and Presentation

Once the research data was collected, it was then analyzed. The data for this study is panel data where the STATA software was used for the analysis under panel regression model. There was descriptive analysis to explain the general or basic feature of the data. It measured the dispersion of the dataset relative to its mean. Afterwards, inferential analysis was done based on panel regression which was then used to test the study hypotheses as per the specific objectives of the study. The testing was under the general 5% significance level.
3.10 Ethical Considerations

Research ethics refers to norms and standards which are expected to be adhered before, during and after a research (Mugenda & Mugenda, 2013). All researches are governed by stipulated professional standards and ethical considerations. In carrying out the research, the researcher obtained an approval letter from the Graduate School of Kenyatta University which was used to approach NACOSTI where the research permit was obtained. Furthermore, the research permit once obtained was used to approach the relevant institutions for data collection.
CHAPTER FOUR
DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter comprises of the descriptive statistics, diagnostic test results, panel regression analysis and hypothesis testing. It provides details as to the interaction between the variables.

4.2 Descriptive statistics

The descriptive statistics help in exhibiting the basic features of the data used in the study. This was carried out and the results shown in the table below.

Table 4.1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>66</td>
<td>0.173</td>
<td>0.070</td>
<td>-0.104</td>
<td>0.295</td>
</tr>
<tr>
<td>Inflation</td>
<td>66</td>
<td>7.233</td>
<td>2.513</td>
<td>2.700</td>
<td>10.000</td>
</tr>
<tr>
<td>Interest Rates</td>
<td>66</td>
<td>8.820</td>
<td>1.993</td>
<td>5.510</td>
<td>11.380</td>
</tr>
<tr>
<td>Exchange Rates</td>
<td>66</td>
<td>93.600</td>
<td>7.709</td>
<td>84.500</td>
<td>103.400</td>
</tr>
<tr>
<td>BankSize</td>
<td>66</td>
<td>8.297</td>
<td>0.265</td>
<td>7.612</td>
<td>8.811</td>
</tr>
</tbody>
</table>

Source (15 December, 2018)

From the results, ROE had a mean of 0.173 and standard deviation of 0.070. This implies that ROE is was relatively stable over the study period. Similarly, inflation was relatively stable with a mean of 7.233, standard deviation of 2.513. Interest rates had a mean of 8.820, standard deviation of 1.993. Interest rate over the study period was volatile as indicated by the mean and standard deviation. Exchange rate was highly volatile as it highly disperses as indicated by a mean of 93.60, standard deviation of 7.709. Bank size had a mean of 8.297, standard deviation of 0.265, thus indicating that bank size was relatively volatile over the study period.
4.3 Diagnostic test results

Prior to carrying out the regression, diagnostic tests were carried out. The tests carried out were the test for stationarity, correlation test, multicollinearity test, autocorrelation test, normality test and the Hausman specification test.

4.3.1 Stationarity test

This test was carried out using the Augmented Dickey-Fuller test and the results presented in table 4.3 below;

Table 4.2: Summary of the test for stationarity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>-7.984</td>
<td>0.0000</td>
</tr>
<tr>
<td>Inflation</td>
<td>-16.321</td>
<td>0.0000</td>
</tr>
<tr>
<td>Interest rates</td>
<td>-11.961</td>
<td>0.0000</td>
</tr>
<tr>
<td>Exchange rates</td>
<td>-28.108</td>
<td>0.0000</td>
</tr>
<tr>
<td>Bank Size</td>
<td>-6.715</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Source (Study Data, 2019)

A time series is said to be stationary if the mean, variance or pattern doesn’t exhibit an upward and downward trend. Under the Augmented Dickey Fuller test, the null hypothesis is that the series is non stationary while the alternative hypothesis is that the series is stationary. A non-stationary data set results in false results. If a statistical p value of less than 0.05 is obtained then the null hypothesis is rejected meaning that the data set is stationary. From the results in the table above, the ROE, inflation, Interest rates, exchange rates, and Bank size have p values of 0.000, 0.000, 0.000, and 0.000, respectively. This means that the data set was stationary.
4.3.2. Test for correlation

Correlation test is a test that indicates how strongly a pair of variable is correlated. This test was carried out using the Pearson’s correlation and results presented in the table below. The test was used to test for multicollinearity.

<table>
<thead>
<tr>
<th>Table 4.3: Correlation test</th>
<th>Inflation</th>
<th>Interest rates</th>
<th>Exchange rates</th>
<th>Bank size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflation</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest rates</td>
<td>-0.7640</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exchange rates</td>
<td>-0.2899</td>
<td>-0.2769</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0183</td>
<td>0.0244</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bank size</td>
<td>-0.1109</td>
<td>-0.1088</td>
<td>0.3158</td>
<td>1.0000</td>
</tr>
<tr>
<td></td>
<td>0.3752</td>
<td>0.3846</td>
<td>0.0098</td>
<td></td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed).

*Significant at 0.05

Source (Study Data, 2019)

According to Green, (2008), if a pair of variable has a correlation of 0.8 or -0.8 (i.e. r2 of 64% or more), then the pair is strongly correlated and this means that multicollinearity exists. From the table, none of the pair of association has r of more than 0.8 (64%) hence the data has no multicollinearity problem.

4.3.3. Normality test

According to Green, (2008), the null hypothesis is that the data is not normally distributed while the alternative hypothesis is that the data is normally distributed. A p value of less than 0.05 shows
non normality of the data whereas a p value of more than 0.05 shows that there is normality. This test was carried out using Doonik Hanson test.

**Table 4.4 Normality Test**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Pr(Skewness)</th>
<th>Pr(Kurtosis) adj</th>
<th>chi2(2)</th>
<th>Prob&gt;chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>66</td>
<td>0.0002</td>
<td>0.0038</td>
<td>2.87</td>
<td>0.2942</td>
</tr>
<tr>
<td>Inflation</td>
<td>66</td>
<td>0.0121</td>
<td>0.0698</td>
<td>3.37</td>
<td>0.2263</td>
</tr>
<tr>
<td>InterestRate</td>
<td>66</td>
<td>0.2728</td>
<td>0.0011</td>
<td>2.05</td>
<td>0.3569</td>
</tr>
<tr>
<td>ExchangeRates</td>
<td>66</td>
<td>0.8179</td>
<td>0.0213</td>
<td>1.24</td>
<td>0.4356</td>
</tr>
<tr>
<td>BankSize</td>
<td>66</td>
<td>0.1591</td>
<td>0.7347</td>
<td>2.18</td>
<td>0.3357</td>
</tr>
</tbody>
</table>

*Source (Study Data, 2019)*

From the table above the p values are >0.05 hence the conclusion that the data set was normally distributed.

**4.3.4 Test for Heteroscedasticity**

The test for heteroscedasticity was aimed at establishing if the variability of the variables was not equal across a range of the predictor variables. The test was carried out using the Breusch-Pagan test and the results presented in table 4.5 below.

**Table 4.5 Test for Heteroscedasticity.**

```
. estat hettest Inflation IntRates Exchange Rates BankSize, fstat

Breusch-Pagan test for heteroskedasticity
  Ho: Constant variance
  Variables: Inflation IntRates Exchange Rates BankSize

          F(4, 61) = 2.02
Prob > F = 0.1025
```

*Source (Study Data, 2019)*
The null hypothesis is that there is constant variance across a range of the predictor variables while the alternative hypothesis is that the variance was not constant. A p value of 0.05 or less implies the existence of heteroscedasticity while a p value of greater than 0.05 implies the existence of homoscedasticity. The overall p value obtained above implies that there is constant variance hence we fail to reject the null hypothesis and conclude that there is homoscedasticity.

4.3.5 Autocorrelation Test

The test for autocorrelation was aimed at establishing whether the error terms in a regression model correlate over time. The test was carried out based on the Durbin Watson test and the results presented in table 4.6 below:
Table 4.6: Test for autocorrelation

. prais ROE Inflation Excrates IntRates Bsize

Iteration 0: rho = 0.0000
Iteration 1: rho = 0.5494
Iteration 2: rho = 0.5550
Iteration 3: rho = 0.5551
Iteration 4: rho = 0.5551
Iteration 5: rho = 0.5551

Prais-Winsten AR(1) regression -- iterated estimates

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of obs = 66</th>
<th>F(4, 61) = 17.41</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>.119927173</td>
<td>4</td>
<td>.029981793</td>
<td>Prob &gt; F = 0.0000</td>
<td>R-squared = 0.5330</td>
</tr>
<tr>
<td>Residual</td>
<td>.105059438</td>
<td>61</td>
<td>.001722286</td>
<td>Adj R-squared = 0.5024</td>
<td>Root MSE = 0.0415</td>
</tr>
<tr>
<td>Total</td>
<td>.224986611</td>
<td>65</td>
<td>.003461332</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| ROE     | Coef.       | Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|---------|-------------|-----------|-------|------|---------------------|
| Inflation       | .0655938   | .0453653  | 1.45  | 0.153 | -.0251197 to .1563073 |
| Excrates        | -.8795209  | .2560636  | -3.43 | 0.001 | -1.391552 to -.3674902 |
| IntRates        | .0865954   | .0903037  | 0.96  | 0.341 | -.0939781 to .2671688 |
| Bsize _cons     | 3.064195   | .5412857  | 5.66  | 0.000 | 1.981827 to 4.146563  |
|                 | -1.042999  | .7159366  | -1.46 | 0.150 | -2.474603 to .3886044 |

rho .5551092

Durbin-Watson statistic (original) 0.868082
Durbin-Watson statistic (transformed) 1.973383

. Source (Study Data, 2019)

The original Durbin Watson statistic of 0.868082 indicated the existence of a positive serial correlation. The dataset was transformed and the new Durbin Watson Statistic obtained was 1.97 which is approximately equal to the established threshold of 2 hence based under the transformed results depicts that there is no autocorrelation.
4.3.6 Hausman test

A Hausman test was also done to find out on which model to use in carrying out a panel regression. The null hypothesis is that the preferred model is random effect while the alternative hypothesis is that the preferred model is the fixed effect model. A p value of less than 0.05 rejects the null hypothesis therefore the fixed effect model is used, while a p value of 0.05 fails to reject the null hypothesis therefore a random effect model is used.

Table 4.7: Hausman test.

<table>
<thead>
<tr>
<th></th>
<th>Coefficients</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>(b)</td>
<td>(B)</td>
<td>(b-B)</td>
<td>sqrt(diag(V_b-V_B))</td>
<td>S.E.</td>
</tr>
<tr>
<td>Fixed</td>
<td>.0033899</td>
<td>.0075989</td>
<td>-.004209</td>
<td>.0027803</td>
<td></td>
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<tr>
<td>Random</td>
<td>.0029179</td>
<td>.0082245</td>
<td>-.0053066</td>
<td>.0035061</td>
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<tr>
<td>Difference</td>
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<td>.0008264</td>
<td>.0005426</td>
<td></td>
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<tr>
<td></td>
<td>-.0017857</td>
<td>.1461696</td>
<td>-.1479553</td>
<td>.1001603</td>
<td></td>
</tr>
</tbody>
</table>

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

\[ \chi^2(4) = (b-B)'[\{V_{b-V_B}\}^{-1}](b-B) \]
\[ = 2.18 \]
\[ \text{Prob}>\chi^2 = 0.7023 \]

Source (Study Data, 2019)

From the findings a p value of 0.7023 was obtained, which is more than 0.05. From this finding the null hypothesis was not rejected hence the study relied on the random effect model to carry out a panel regression.
4.4 Panel regression analysis

The panel regression was carried out based on three empirical models and the results presented below;

4.4.1 Panel regression model without the moderating variable

The first model was the panel regression without the moderating variable and results presented in the table below;

Table 4.8: Panel regression model without the moderating variable

<table>
<thead>
<tr>
<th>Source (Study Data, 2019)</th>
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</thead>
</table>

| ROE                     | Coef.      | Std. Err. | Z     | P>|z|  | [95% Conf. Interval] |
|-------------------------|------------|-----------|-------|------|---------------------|
| Inflation               | .0034407   | .0044504  | 0.77  | 0.107| -.0016540 .0168518  |
| Interest rate           | .0029819   | .0015137  | 1.97  | 0.049*| -.0033986 .0198476  |
| Exchange rates          | -.0030220  | .0009741  | -3.74 | 0.000*| -.0058485 -.0018284 |
| _cons                   | -.4046265  | .1643669  | -1.94 | 0.052| -1.6221010 .0068506 |

| Sigma_u                 | .03795630  |           |       |      |                     |
| Sigma_e                 | .03454017  |           |       |      |                     |
| rho                     | .54701695  |           |       |      | (fraction of variance due to u_i) |

Source (Study Data, 2019)

Without the inclusion of the predictor variables, the ROE of the banks increase by 0.4046. This increase is significant as seen by the p value of 0.014. A unit increase in the country’s inflation results to an increase in the ROE of banks by 0.0034 times. This increase is nonetheless
insignificant as demonstrated by the p value obtained of 0.439. Secondly, a unit increase in the interest rates leads to a rise in the banks’ ROE by 0.0029. The increase is significant since the p value obtained was 0.049. Lastly, there is a significant inverse relationship between the exchange rates and the ROE. From the findings, a unit increase in exchange rates results in a decrease in the ROE by 0.0030 times. The p vale is 0.002 which is significant. An overall $R^2$ of 0.3214 was obtained which implies in the absence of the moderating variable, the predictor variables explain 32.14% of the change in the ROE of the banks that are listed in the NSE.

The equation thus become

$$\text{ROE}_{it} = 0.4046 + 0.0034\text{Inflation}_{it} + 0.0029\text{InterestRate}_{it} - 0.0030\text{ExchangeRate}_{it} + 0.8452\varepsilon_{it}$$

### 4.4.2 Panel regression in presence of moderating variable.

The second model represents the panel regression with the inclusion of the moderating variable. The inclusion of the variable was done using the composite to moderate the changes of the effect of the predictor variables on the dependent variables. The results are presented in the table below.
Table 4.9: Panel regression model with moderating variable

| ROE                        | Coef. | Std. Err. | Z     | P>|z| | [95% Conf. Interval] |
|----------------------------|-------|-----------|-------|-----|----------------------|
| Inflation                  | .0075989 | .0047210  | 1.61  | 0.107 | -.0016540  | .0168518 |
| Interest rate              | .0082245 | .0040120  | 2.05  | 0.040*| -.0033986  | .0198476 |
| Exchange rates             | -.0038384 | .0010256  | -3.74 | 0.000*| -.0058485  | -.0018284 |
| Bank Size                  | .1461696 | .0458917  | 3.19  | 0.001*| .0562235   | .2361158 |
| _cons                      | -.8079749 | .4157349  | -1.94 | 0.052 | -1.6221010 | .0068506 |
| Sigma_u                    | .03795630 |          |       |      |                      |
| Sigma_e                    | .03454017 |          |       |      |                      |
| rho                        | .54701695 | (fraction of variance due to u_i) | | | |

Source (Study Data, 2019)

With the introduction of bank size which is a moderating variable, a unit increase in the rate of inflation leads to a non-significant increase in ROE by 0.0076. The p value is 0.107 which is less than 0.05. A one unit increase in the rate of interests leads to a significant increase in the ROE by 0.0082. The p value of 0.040 indicates significance. There is a significant inverse relationship between the exchange rate and the ROE. A unit increase in the exchange rates leads to a decrease in the Banks’ ROE by 0.0038 times. The p value obtained is 0.000 which indicates that the effect of exchange rate on ROE is significant. The moderating variable (Bank size) is statistically significant as shown by the p value of 0.001. As the bank size increase by a unit, there is an increase in the ROE by 0.1462 times. In the absence of the explanatory variables, there is a non-significant
decline in ROE by 0.8079. From the model, an R2 of 0.5241 was obtained which implies that the predictor variables and the moderating variable explain 52.41% of the changes in the ROE. Further, there was an increase in R2 from 0.1548 in the absence of the moderating variable to 0.5241 in the presence of a moderating variable. This clearly indicates the significance of the bank size.

The panel regression model thus becomes;

$$\text{ROE}_{it} = -0.8079 + 0.0076\text{Inflation}_{it} + 0.0082\text{Interestrate}_{it} - 0.0038\text{ExchangeRate}_{it} + 0.1462\text{Banksize}_{it} + 0.4759\varepsilon_t$$

4.4.3 Panel regression under the interactions between the independent and moderating variable.

The third model represents the panel regression from the interactions between the predictor variables and the moderating variable (Bank size). If the value of the interaction terms is zero or statistically insignificant then there is no moderating effect otherwise where the value is statistically significant there is a moderating effect of the moderating variable (Whisman & McClelland, 2005).
The results are presented in the table below.

**Table 4.10: Interaction effects of moderating variable**

<table>
<thead>
<tr>
<th>Source (Study Data, 2019)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The results presents the panel regression output from the interactions between the bank size and the independent variables. For every unit increase in the rate of inflation, there is an increase in the ROE of banks by 0.008 times other factors held constant. The increase is not statistically significant. For every one unit rise in the interest rate there is a 0.0092 rise in the ROE of the banks. The rise is significant as shown by the p value of 0.025. With a unit increase in the exchange rates, there is a 0.0039 times decrease in the banks’ ROE other factors constant. The decrease is statistically significant based on the p value of 0.007. With the interactions between the bank size</td>
</tr>
</tbody>
</table>
and inflation, there is an increase in the ROE by 0.0140 and this increase is not significant. The interaction between the bank size and interest rates results in a 0.0045 significant increase in the ROE for every unit. The p value is 0.015 which is less than 0.05. Lastly, the interaction between the bank size and Exchange rates results in a significant increase in the ROE. With the introduction of bank size which is a moderating variable, a unit decrease in the ROE by 0.0384 times other things held constant. The p value is 0.000 which implies statistical significance. In the absence of the interactions and the predictor variables, there is a 3.497 increase in the ROE. The increase is not significant at 0.05 level of significance. Further there is an increase in R2 with the interactions from 0.5241 in the absence of the interactions to 0.5388 in the presence of the interactions. This means that the interactions alongside the predictor variables explains 53.88% of the changes on the ROE of the banks that are listed in the NSE.

The panel regression becomes:

\[
\text{ROE}_{it} = 3.497 + 0.0083\text{Inflation}_{it} + 0.0092\text{InterestRate}_{it} - 0.0039\text{ExchangeRate}_{it} + 0.1722\text{Banksize}_{it} \\
+ 0.0140\text{Banksize*Inflation}_{it} + 0.0045\text{Banksize*InterestRate}_{it} - 0.0384\text{Banksize*ExchangeRate}_{it} \\
+ 0.4612\epsilon_{it}
\]

### 4.5 Hypotheses Testing

#### 4.5.1 Hypothesis One: Inflation and financial performance

The first objective was to determine the effect of inflation on financial performance of commercial banks listed in the NSE. The null hypothesis states that inflation has no significant effect on financial performance of commercial banks listed in the NSE. The findings indicate that the effect was not statistically significant under the three models carried out. Therefore, the null hypothesis was not rejected at 5% significance level. Nonetheless, there was a positive association between
the inflation and the ROE. These findings are in agreement with the study by Kwakwa (2014) who found a positive but insignificant association between the inflation and performance of the banks in Ghana. The findings however differ from those of Macharia (2013) who found a negative inflation effect on performance of Kenyan banks, with a focus on banks engaged in mortgage services.

**4.5.2 Hypothesis Two: Interest and financial performance**

The second objective was to determine the effect of interest rates on the performance of commercial banks listed in the NSE. The null hypothesis states that interest rate has no significant effect on financial performance of commercial banks listed in the NSE. The results indicate a positive significant correlation between the interest rates and the ROE. Therefore, the null hypothesis was rejected at 5% significance level. An increase in the interest rates finally contributes to the rise in ROE of banks. An investigation was done by Alper and Anbar (2011) on external determinants of profitability in Turkey covering the period 2002 to 2010. The bank profitability was looked at using ROA and ROE which are regressed on macroeconomic determinants. The findings of the study show that interest rates affects bank positively, thus implying that higher bank profitability is associated with high interest rates. The findings are in agreement with that from this study. A study by Macharia, (2013) however found a negative association between the interest rates and the ROE. The findings from this study disagrees with that of Macharia, (2013).

**4.5.3 Hypothesis Three: Exchange rate and financial performance**

The third objective was to determine the effect of exchange rates on financial performance of commercial banks listed in the NSE. The null hypothesis states that exchange rate has no
significant effect on financial performance of commercial banks listed in the NSE. The results from this study established a significant inverse relationship between the exchange rates and the ROE. Therefore, the null hypothesis was rejected at 5% significance level. This implies that with a unit increase in the exchange rates, there is a decline in the ROE of commercial banks listed at the NSE. These findings are consistent with that of Desaro (2012) who did a research on influence of macroeconomic variables on banks performance in Kenya. The study findings from her study showed that ROA was negatively correlated with exchange rate. However, the study was based on a census. This research was based on the listed commercial banks at the NSE, Kenya. The study findings of Kiganda (2014) show an inverse but insignificant relationship between exchange rate and bank profitability, a case study of Equity Bank Limited. This research was extended to all the listed commercial banks at the NSE, Kenya.

4.5.4 Hypothesis Four: Bank size and financial performance

The fourth objective was to examine the moderating effect the bank size on the relationship between macroeconomic factors and financial performance of commercial Banks listed at the NSE, Kenya. The first model was carried out by treating bank size as an independent variable. From the regression results the effect of bank size was significant at 0.05 level of significance. In this model, for every unit increase in the rate of inflation, there is an increase in the ROE of banks by 0.008 times other factors held constant. The increase is not statistically significant. Similarly, for every one unit rise in the interest rate there is a 0.0092 rise in the ROE of the banks. The rise is significant as shown by the p value of 0.025. With a unit increase in the exchange rates, there is a 0.0039 times decrease in the banks’ ROE other factors constant. The decrease is statistically significant based on the p value of 0.007.
The second step was based on the interactions between bank size and each of the independent variables (macroeconomic factors). Therefore, the fourth hypothesis was broken down into three sub-hypothesis. The first sub hypothesis states that bank size has no significant moderating effect on the relationship between inflation and financial performance of commercial banks listed on the NSE, Kenya. With the interactions between the bank size and inflation, there is an increase in the ROE by 0.0140 and this increase is not significant. Therefore, the null hypothesis was not rejected at 5% significance level.

The second sub hypothesis states that bank size has no significant moderating effect on the relationship between interest rate and financial performance of commercial banks listed on the NSE, Kenya. The interaction between the bank size and interest rates results in a 0.0045 significant increase in the ROE for every unit. The p value is 0.015 which is less than 0.05. Therefore, the null hypothesis was rejected at 5% significance level. The positive effect of the interaction terms of bank size and interest rate is attributed to the notion that bigger banks are able to quickly and adequately respond to changes in the macroeconomic environment.

Lastly, the third sub-hypothesis states that bank size has no significant moderating effect on the relationship between exchange rate and financial performance of commercial banks listed on the NSE, Kenya. An increase in the interaction terms between the bank size and Exchange rates results in a significant decrease in the ROE by 0.0384 times other things held constant. The p value is 0.000 which implies statistical significance. In line with this, the null hypothesis was rejected at 5% significance level. The negative effect of the interaction terms of bank size and exchange rate is attributed to the notion that higher exchange rate implies depreciation of the home currency. Therefore, this in turn depletes the net worth of businesses.
CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter comprises of the summary, conclusions and recommendations of the study. It provides details on the conclusion of the study based on the research findings where policy recommendations were also deducted from.

5.2 Summary of the Study

The financial performance of commercial banks is affected by macroeconomic environment. This study aimed at contributing to research in determining to what extent macroeconomic factors influence financial performance banks in Kenya. The specific objectives of this study were: to ascertain the effect inflation, exchange rate and interest rate on financial performance of commercial banks listed on the Nairobi Securities Exchange, Kenya. Also, to ascertain the moderating role of bank size on the relationship between macroeconomic factors and financial performance of commercial banks listed on the Nairobi Securities Exchange, Kenya. The study was based on three theories namely: deflation theory, interest rate parity theory and agency theory. The study adopted a descriptive research design. The study was based on a census of 11 listed commercial banks in Kenya that were in operation from 2012 to 2017. The analysis of data was based on panel regression analysis where diagnostic tests were carried out before the regression.

The findings indicate that the effect of inflation was not statistically significant under the three models carried out. Therefore, the null hypothesis was not rejected at 5% significance level. Also,
the results indicate a positive significant relationship between the interest rates and the ROE. Therefore, the null hypothesis was rejected at 5% significance level. Furthermore, the results from this study established a significant inverse relationship between the exchange rates and the ROE. Therefore, the null hypothesis was rejected at 5% significance level.

In addition, with the interactions between the bank size and inflation, there is an increase in the ROE by 0.0140 and this increase is not significant. Therefore, the null hypothesis was not rejected at 5% significance level. Also, the interaction between the bank size and interest rates results in a 0.0045 positive and significant increase in the ROE for every unit. The interaction between was established to have a negative and significant effect on financial performance of commercial banks in Kenya. An increase in the interaction terms between the bank size and Exchange rates results in a significant decrease in the ROE by 0.0384 times other things held constant.

5.3 Conclusion

The conclusion of the study is based on the empirical findings of the study. The first objective was to determine the effect of inflation on financial performance of commercial banks listed in the NSE. In respect to this, the study concluded that the effect of inflation on financial performance is statistically insignificant. However, with regards to the effect of interest rate on financial performance of commercial banks, the study concluded that interest rate positively and significantly affects the financial performance of commercial banks listed on the NSE, Kenya. This is attributed to the notion that when bank increase the rates on loans, it leads to higher profits of these banks.
Regarding the effect of exchange rates on financial performance of commercial banks listed in the NSE. The study concluded that there exist an inverse and significant effect of exchange rate on financial performance of commercial banks listed on the NSE, Kenya.

Lastly, on the moderating effect the bank size on the relationship between macroeconomic factors and financial performance of commercial Banks listed at the NSE, Kenya. The study concluded that bank size has an insignificant moderating effect on the relationship between inflation and financial performance of commercial banks listed on the NSE, Kenya. Conversely, based on the research findings, the study concluded that bank size has a positive and significant moderating effect on the relationship between interest rate and financial performance of commercial banks listed on the NSE, Kenya. Also, the study concluded that bank size has a negative and significant moderating effect on the relationship between exchange rate and financial performance of commercial banks listed on the NSE, Kenya.

5.4 Policy Recommendations

The policy recommendations of the study are in line with the variables with significant effect on financial performance of commercial banks listed on the NSE, Kenya. The study concluded that interest rate has a positive and significant effect on financial performance of commercial banks listed on the NSE, Kenya. Therefore, in pursuit for high profitability and hence better performance of banks, management can utilize interest rates by raising it moderately. Similarly, the Central Bank should manage interest rates adequately in order to avoid its fluctuations as this will hamper performance of banks. The study concluded that the effect of exchange rate on financial performance is negative but statistically significant. Therefore, the study recommends that bank
management consider the prevailing and anticipated exchange rates in the economy when making decisions regarding the international operations and investments of banks.

Lastly, the study concluded that bank size has a significant moderating effect on the relationship between macroeconomic factors (interest rate and exchange rate) and financial performance of commercial banks listed on the NSE, Kenya. This is hinge on market power of banks, as larger banks have larger market share and thus, market power. Therefore, the management of banks should strive towards achieving higher market share as this also implies larger bank size which will allow banks to enhance performance.

5.5 Suggestions for Further Research

The study sought to establish the effect of macroeconomic factor on financial performance of commercial banks and the moderating effect of bank size on the relationship between macroeconomic factors and financial performance of commercial banks listed on the NSE, Kenya. Further studies can focus on all commercial banks in Kenya. Similarly, further research can be done on the moderating effect of capital adequacy requirements on the relationship between macroeconomic factors and financial performance of commercial banks in Kenya.
REFERENCES


Al-Qudah, A. M & Jaradat, M. A (2013). The Impact of Macroeconomic Variables and Banks Characteristics on Jordanian Islamic Banks Profitability: Empirical Evidence. International Business Research; Vol. 6, No. 10; 2013 ISSN 1913-9004 E-ISSN 1913-9012 Published by Canadian Center of Science and Education


Appendix I: Work Plan of Research Study

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<thead>
<tr>
<th>Month</th>
<th>Activity</th>
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<td>September, 2017</td>
<td>Proposal Writing.</td>
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<tr>
<td>January, 2018</td>
<td>Proposal defense.</td>
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<tr>
<td>February, 2018</td>
<td>Research amendments, Data Collection and Processing of data.</td>
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<tr>
<td>March, 2018</td>
<td>Data Analysis and Interpretation.</td>
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<tr>
<td>April, 2018</td>
<td>Report Writing and submission of report.</td>
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## Appendix II: Secondary data collection tool

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<tr>
<th>Year</th>
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<th>Total Assets</th>
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<th>Real Interest rate</th>
<th>Equity</th>
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