MACROECONOMIC VARIABLES AND MORTGAGE UPTAKE IN COMMERCIAL BANKS AND MORTGAGE FINANCE COMPANIES IN KENYA

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MARCH 2017
DECLARATION

Declaration by the student:

This proposal is my original work and has not been presented for a degree in any other University

Signature: ……………………… Date ……………………………

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D53/CTY/PT/31290/2015

Declaration by supervisor:

This is to confirm that the work in this proposal was done by the candidate under my supervision

Signature: ……………………… Date: ……………………………

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DEDICATION

This proposal is dedicated to my family for their prayers, support and encouragement has given me the drive and discipline to tackle this task with determination.
ACKNOWLEDGEMENT

First and foremost, I express my appreciation to the Almighty God my saviour, giving me the gift of life to reach this far, the strength and wisdom to prepare this proposal to the best of my ability. Special appreciation goes to my supervisor Dr. Lucy Wamugo for providing me with guidance and support through the preparation of this research proposal. Her great advice and time is immeasurable and is highly appreciated. My appreciation goes to my fellow students, whom we teamed up to help one another, I salute you and may the living God bless you all abundantly. Finally, I wish to appreciate my immediate family who have encouraged me and have never given up on me.
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<tr>
<td>CAHF</td>
<td>Centre for Affordable Housing Finance</td>
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<td>CBK</td>
<td>Central Bank of Kenya</td>
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<tr>
<td>CBR</td>
<td>Central Bank Rate</td>
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<td>CPI</td>
<td>Consumer Price Index</td>
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<td>EAC</td>
<td>East Africa Community</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>MFB</td>
<td>Microfinance Bank</td>
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<tr>
<td>OPIC</td>
<td>Overseas Private Investment Corporation</td>
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<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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ABSTRACT

The Kenyan mortgage market has experienced slow growth over the last few years despite the upsurge of mortgage payments. The uptake of mortgage loans in the country is still considered low. Although the mortgage market is considered underdeveloped, it has the potential to grow and is important for housing and economic growth in Kenya. The purpose of this study is to evaluate the effect of macroeconomic variables on mortgage uptake for commercial banks and mortgage finance companies in Kenya. The macroeconomic variables in this study include interest, inflation rate and money supply. This study will be guided by the following specific objectives; to determine the effect of inflation on mortgage uptake in commercial banks and mortgage finance companies in Kenya, to establish how money supply influences mortgage uptake in commercial banks and mortgage finance companies in Kenya and to investigate the effect of interest rate on mortgage uptake in commercial banks and mortgage finance companies in Kenya. The study will adopt descriptive research design. The target population of this study will be 34 commercial banks and mortgage finance companies offering mortgage services in Kenya. The study will use secondary data obtained from Central Bank of Kenya annual reports, Kenya Bankers Association annual reports, Kenya National Bureau of Statistics annual reports, the financial institutions reports and published financial reports. Panel data will be collected for a 6 year period, from 2010 to 2015. Data will be analysed using correlation and panel regression analysis.
CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Mortgage financing is an important means of financing investment in real estate (Brueggeman & Fisher, 2008). Investing in real estate requires large amount of capital to be mobilized which the investors may not raise on their own (Central Bank of Kenya, 2012). This would result to investors borrowing funds from lenders secured in real estate with a mortgage. A mortgage is a loan secured by collateral of some specified real estate property that the borrower is obliged to pay back with predetermined set of instalments (Biernert & Brauner, 2007). According to Giddings (2007) it is a source of long term finance for the development of more new housing, urban infrastructure and a major driver for the deepening of capital markets.

Muguchia (2012) identified mortgages as long term loans and thus are more affected by factors such as prices in bond market and generally competition for funds in the financial markets. Furthermore, interest charged on mortgage loans can either be floating or adjustable or fixed. The flexible interest rate framework is usually based on an index or other base rate for establishing the interest rate for each relevant period (Milani, 2012).

Interest rate is the amount a borrower pays for the use of money they borrow from a financial institution (Crowley, 2007). Interest rates are usually expressed as percentage over a period of one year. The most common types of mortgages are Fixed-rate mortgages and Adjustable-rate mortgage (Njongoro, 2013). He further stated that fixed-rate mortgages are the most common type of mortgages due to the act that monthly payments is constant for the term of the mortgage and regardless of the behaviour of market interest rates, the interest rate paid by the borrower is the same for the life of the loan. Adjustable-rate mortgages (ARM) have interest rates that vary over the term of the loan. The rates on ARMs are lower than on fixed-rate mortgages for the reason that the
borrower is bearing some of the market risk. Market risk arises because of the negative relationship between interest rates and bond prices.

International experience recommends that the widespread availability of residential mortgages has favourable impact on poverty alleviation, quality of housing, infrastructure and urbanization (Erbas, 2005). In a Central Bank of Kenya (CBK) survey done in 2013 and 2014, the slow growth in residential mortgage market in the country could be related to the trend of financial institutions granting variable interest rate to mortgage loans (Central Bank of Kenya, 2014).

1.1.1 The Global Mortgage Market

In comparison to international mortgage markets, Africa’s mortgage market is still at infancy. Countries in North America and Europe have mortgage values of 40% of GDP with Ireland, the Netherlands and Switzerland having a ratio of 80% of GDP (Hofinet, 2011). In the same report, most financial institutions in Africa are limited by high interest rates and mismatch between the short term nature of deposits and the long term nature of the mortgage lending.

According to Vuyisani (2003), the mortgage finance system in Africa is faced with major challenges such as default rates, lack of long term funds required to match high interest rates and the duration of the mortgage. South Africa and Namibia have the highest ratio of mortgage debt to GDP at 30% and 20% respectively. After South Africa and Namibia, North Africa has developed mortgage markets in Africa at 7% in Morocco, 5.9% in Tunisia, and 3% in Egypt (OPIC, 2006). Kenya has a ratio of 2.5% (Walley, 2011). The Kenyan mortgage market is underdeveloped as mortgage financing is unaffordable, inaccessible and unpopular (World Bank, 2011).
According Rust (2012), the narrow focus on the mortgage instrument and a failure of housing policy and delivery systems to acknowledge and support the potential of incrementing housing has crippled the development of appropriate housing finance systems across Africa.

1.1.2 The Kenyan Mortgage Market

In Kenya, there are two types of lenders who are authorised by the CBK. These are ordinary banks and mortgage companies. According to CBK (2015), the banking sector comprised of the Central Bank of Kenya, as the regulatory authority, and 43 banking institutions (42 commercial banks and 1 mortgage finance company). According to the same report, the number of commercial banks offering mortgages is 34 as compared to 37 in 2014. The decline in the number of commercial banks offering mortgage loans is attributable to the liquidation of Dubai Bank and placement of Imperial Bank Limited and Chase Bank Limited in receivership. The three banks were all offering mortgage loans.

Kenya’s mortgage market has not grown at par with the boom in construction and thus recording low mortgage uptake in financial institutions (Cytonn, 2016). The country has only 24,458 mortgages worth KES 203.3 billion for a country of 44 million people (CBK, 2015). This can be translated to about 3 per cent of GDP which falls behind South Africa and Namibia in Sub-Saharan Africa (Cytonn, 2016).

According to the Centre for Affordable Housing Finance in Africa, Kenya is Africa’s ninth largest economy with its capital city, Nairobi regarded as the business hub and entry point into East and Central Africa (CAHF, 2015). Furthermore, Kenya has the most advanced and dynamic mortgage industry in the EAC region followed by Tanzania and Uganda. The Centre for Affordable Housing Finance in Africa also mentions that
affordability is the major constraint in Kenya as compared to other countries in the EAC region.

The mortgage industry in Kenya remains relatively low; with 90% of Kenyans who cannot afford to take up mortgages (CBK, 2015). According to Makena (2016), low income levels and high property prices have made access to better mortgage loans become an indefinable dream to bulge ranks of citizens living below absolute paucity line.

Kenya Commercial Bank (KCB) has remained the leading mortgagee followed by Housing Finance Kenya. These two institutions have provided 52.8% of outstanding mortgage loans by value and 53.3% of existing mortgage accounts in 2014 (CAHF, 2015). Furthermore, Standard Chartered, CFC Stanbic, Equity, Co-operative, Barclays, Commercial Bank of Africa, Development Bank and I & M bank are other mortgage lenders in the country (CBK, 2015).

According to Hass Consult, a real estate agency, potential home owners prefer to rent houses (Hass Consult, 2013). There is therefore a potential of mortgages in the country to fill the gap and attain average mortgage debt to GDP level above 50%. In a World Bank report dated 2011, the mortgage market is estimated to be around Ksh. 800 billion which is around 13 times the current level (World Bank, 2011).

According to Naliaka (2016), access to mortgage financing has remained a major handicap for the middle income and lower income segments meaning affordability is a mirage. Furthermore, the unaffordability of mortgages makes Nairobi flourish as a major rental market as opposed to mortgage markets. Every Kenyan would wish to own a home in order to avoid the burden of paying rent every month (Cytonn, 2016). Furthermore, the real estate sector in Kenya would be close to a crisis due to the many developers who are
unable to sell off their units. This is due to the high prices and unaffordable payment plans set making it unaffordable to prospective buyers.

1.1.2.1 Interest Rate

Crowley (2007) defined interest rate as money borrower pays for the use of money they borrow from a lender/financial institutions or fee paid on borrowed assets. Fisher (1930) considered interest rate as the price of money and the link between income and capital. He defined interest rate as the price of money or the “per cent of premium paid on money at one date in terms of money to be in hand one year later”. Therefore, interest on loans is the price the lender charges the borrower for using the borrowed funds.

According to Lloyd (2006) and McConnell (2009), interest rates are a price paid for borrowing funds expressed as a percentage per year. It can also be defined as the price a borrower needs to pay to the lender for transferring purchasing power to the future. Lloyd (2006) continues to argue that interest rates rank among the most crucial variables with macroeconomic word in the world of Finance.

![Figure 1.1: Interest Trend in Kenya](image)

Figure 1.1 is a graphical representation of the inflation trends in Kenya from 2010 to 2015. The interest rates rose suddenly to its peak before stating to fall and then maintaining a same level.

The average interest rate between 2010 and 2012 was steady and then suddenly rose towards the start of 2012. The upward adjustment of the CBR prompted commercial banks to raise interest rates thereby reducing liquidity in the market, further curtailing economic growth (Kenya National Bureau of Statistics, 2012). Furthermore, the major challenge faced in the mortgage industry was high interest rates for long term mortgage borrowing. Commercial banks average lending rates in December 2012 were at 18.15 per cent.

The interest rate between 2012 and 2015 showed a collapse in interest rates and then maintaining the same level. The Central Bank of Kenya (CBK) adopted monetary policy measures in 2014 that contributed to the easing of inflationary pressure (Kenya National Bureau of Statistics, 2015). Further, the introduction of the Kenya Banks’ Reference Rate (KBRR) and Annual Percentage Rate (APR) frameworks in July 2014 facilitated a transparent credit pricing framework with the expectation that it will enhance the transmission of monetary policy signals through commercial banks’ lending rates. The KBRR was initially set at 9.13 per cent and replaced the base lending rate, which commercial banks previously used to guide their pricing of loans and advances (Kenya National Bureau of Statistics, 2015).

Banks charge borrowers a little higher interest rate than they pay depositors for that same money so they can profit for providing these services (Avery & Canner, 2006). The main types of mortgage interest rates are fixed and variable interest rates. High interest rates have the negative effect of increasing the cost of borrowing and consequently limiting the
level of aggregate investment and consumption and the overall economic growth in the
country (Muguchia, 2012). Furthermore, rising interest rates hike interest payments on
mortgage which increases likelihood of loan defaults and bank vulnerability, and cost-
push inflation that makes mortgage payments more expensive. According to CBK (2014),
the high variability among the mortgage lenders is a clear indication that some
commercial banks are gaining very high profits from this industry.

According to Siddiqui (2012), interest rates on a particular financial instrument for
example, a mortgage reflects the time for which the money is on loan, the risk that the
money may not be repaid and the current supply and demand in the market place for
funds available for lending. Interest rate always changes as a result of inflation and
Central Banks rate and slightly varies from bank to bank depending on asset, staff cost,
market power among other factors (Aboagye et al., 2008).

Interest rate is a critical factor since it drives the mortgage market and access to more
middle income housing. High interest rates make renting relatively more attractive to
buying. Excessive high interest rates in Kenya Finance sector have strongly discouraged
long term investment and constrained Kenyan investors’ ability to take up mortgage
finance.

1.1.2.2 Inflation

Inflation is the rise in the general level of prices of goods and services in an economy
over a period of time (Dobson, 2002). Each unit of currency buys fewer goods and
services when the price level rises. Inflation reduces the purchasing power per unit of
money. The negative effects of inflation are increase in the opportunity cost of holding
money, uncertainty over future inflation which may discourage investment and savings,
and shortages of goods since consumers stock due to perceived increase in prices in future.

In October 2009, the measurement of inflation in Kenya changed from the arithmetic mean to a weighted geometric mean. Weighted geometric methodology was said to be less sensitive to volatile food prices and provides a more accurate assessment of price changes, adding more credibility to monetary policy.

![Inflation Trend in Kenya](image.png)

**Figure 1.2: Inflation Trend in Kenya**


Figure 1.2 is a graphical representation of the inflation trend from 2010 to 2015. The inflation rate reached a peak before failing and then afterwards maintaining steady increase and decline.

In 2010, annual inflation rate was recorded at 4.1 per cent. The annual average inflation declined throughout the year moving from 9.2 per cent in December 2009 to 8.6 per cent in January 2010 and 4.0 per cent in December 2010 (CBK, 2010). In 2011, the annual inflation rate was 14.0 per cent. This increase as compared to 2010 was majorly attributed
to low food production due to unavailability of rains and unstable international crude oil prices (CBK, 2011).

The inflation rate in 2012 was down to 9.4 per cent. This was due to the tightening of monetary policy stance by the CBK to reduce inflation. The high inflation rate by December 2012 was also mild inflationary pressures attributed to seasonality including the onset of the dry season expected over the first quarter of 2013 (CBK, 2012). Furthermore, the annual inflation rate in 2013 was 5.7 per cent. This remained within the allowable corridor set by the National Treasury.

The inflation rate rose slightly in 2014 as compared to 2013. The annual inflation rate in 2014 was 6.9 per cent. This was due to unstable international crude oil prices (CBK, 2014). According to the same report, the National Treasury expected inflation to stabilize on account of lower fuel and energy inflation. Inflation in 2015, the annual inflation rate was 6.6 reflecting the impact of the monetary policy measures (Kenya National Bureau of Statistics, 2016). In the same report, the country had seen relatively higher food supplies given the favourable harvests. The decline in international oil prices coupled with the stability of the Kenya shilling mitigated any risks of imported inflation.

According to Ariso (2015), the general lending rate of financial institutions can be portrayed by the mortgage interest rates. He further mentions that through ‘Taylor rule’, inflation can be stabilized through adjustment of interest rates in response to output and inflation. Interest rates can therefore be increased when inflation is above the target rate and reduced when inflation is below the target area. The CBK is responsible for the regulation of interest rates in Kenya.

Economic recession is a financial meltdown that results in financial crisis, economic recession and unemployment (Bett, 2013). Furthermore, it can exist for a period of a few
months to years affecting regional or world economies. Inflation leads to an economic recession. According to Bett (2013), a long lasting impact of economic recession can lead to economic depression. He further says that the central reason for recession is the dependence of consumer demand and business investments in high levels of debt.

Inflation rates affect the purchasing power of money and an increase in inflation has a great effect in the demand patterns on consumers. The demand for acquiring houses through mortgage reduces and the people revert to purchasing crucial needs with the available finances they had. According to Crowley (2007), high inflation rates lowered the disposal income and lowered purchasing power of the customers.

According to Njongoro (2013), the interest rates in Kenya are mainly driven by inflation, which affects the value of money; demand and supply of money through sale and purchase of government security in the open market; monetary policy and intervention by the government through setting the central bank lending rate; general economic conditions such as economic booms and slumps.

Inflation increase has a great effect to changes in the demand patterns of majority of people (Bett, 2013). The demand for acquiring housing though mortgages reduces and people revert to purchasing crucial needs with the available finances they have. Customers’ purchasing power and disposal income is lowered by high inflation rate.

1.1.2.3 Money Supply

Money Supply is a broad measure of money in an economy. An increase in money supply gives rise to an adverse impact on the real estate market. Excessive growth in money supply may lead to an inflationary environment and might affect the investments because of higher discount rate and this therefore affects the mortgage uptake (Liow, Ibrahim and Huang, 2005).
Theoretically, the change in money supply leads to change in interest rate and thus affect economic activities. According to Ariso (2015), money influences price level according to the quantity theory of money. He further mentioned that money supply could thus affect real estate prices through interest rate.

![Money supply trend in Kenya](image)

**Figure 1.3: Money supply Trend in Kenya**


Figure 1.3 shows that money supply trend in Kenya for the years 2010 to 2015. There is a steady increase of money supply. The money supply accelerated and decelerated percentage changes are based on the projected growth rates computed by the Central Bank of Kenya.

In 2010 money supply was recorded at KES 1,272,600 thus showing an increase of 21.7 per cent in the year December 2010 compared with 16.0 percent in a corresponding period in 2009 (CBK, 2010). Furthermore, the expansion in money supply by December 2010 was supported by accumulation of foreign assets and expansion of credit to the private and Government sectors. In December 2011, money supply decelerated to 19.1
per cent recording KES 1,514,200 as compared to 21.7 per cent in the year to December 2010 (CBK, 2011). This reflected deceleration in the growth of both net domestic assets (NDA) and net foreign assets (NFA) of the banking sector on account of substantial tightening of monetary policy since October 2011.

In the year to December 2012, money supply decelerated to 14.9 per cent from 19.1 percent in the year to December 2011. In 2013, money supply decelerated to 13.3 per cent in the year from 14.9 per cent in the year to December 2012. The slowdown in the growth of broad money supply was reflected in the reduction in net domestic assets of the banking systems following a decline in net credit to Government on account of accumulation of Government deposits at the CBK (CBK, 2012).

Growth in money supply accelerated to 16.7 percent in 2014 from 13.3 percent in 2013. The increase in money supply was attributed to increases in both Net Foreign Assets (NFA) and Net Domestic Assets (NDA) of the banking system as this was reflected wholly in holdings of the Central Bank, largely from proceeds of the sovereign bond issued in June 2014 and December 2014 (CBK, 2014). Money supply declined to 14.1 per cent in the year to December 2015. This was as a result of the subdued uptake of credit by government from the domestic market following receipt of syndicated loan.

A rise in the supply of money makes interest rates to decline so as to sustain the money market in balance (Croushore, 2007). He further held that if money supply is increasing without a corresponding shift in money demand curve the equilibrium interest rates declines. Similarly, if a shift in money supply is followed by a shift in money supply in the short run, the interest will not change. This implies that a monetary policy is ineffective in lowering the mortgage interest rates.
1.1.3 Financial Institutions in Kenya

Mortgage lending is mainly done by commercial banks in Kenya. Commercial banks and mortgage finance institutions are licensed and regulated in accordance with the provisions of the Banking Act and the Regulations and Prudential Guidelines issued there under.

According to the Central Bank of Kenya (CBK) Bank Supervision Annual Report 2015, the banking sector comprised of the Central Bank of Kenya, as the regulatory authority and 43 banking institutions (42 commercial banks and 1 mortgage finance company). According to the report, only 34 banks in Kenya including Housing Finance Corporation Limited offer mortgage services as per December 2015.

Mortgage financing over the years has been a preserve for housing financing companies and commercial banks but with time, microfinance institutions have started to venture into the mortgage line of business (Ngumo, 2012). Microfinance institutions in Kenya have ventured into mortgage financing with Kenya Women Finance Trust MFB, Faulu Kenya MFB and Rafiki MFB considered the largest MFB in the country (CBK, 2015). According to the same report, they have a combined market share of 92.26%. Mortgage financing is an emerging sector in microfinance sector with mortgage products being provided in same terms and flexibility like those of commercial banks.

In an economy, the role of banks is vital because they execute monetary policy and provide means for facilitating payment for goods and services in the domestic and international trade. Commercial banks are custodians of depositor’s funds and operate by receiving cash deposits from the general public and loaning them out to the needy at statutorily allowed interest rates. Loans are based on the credit policy of the bank that is tightly coupled with the central bank interest rate policy. These in effect determine the level of financial risk in a particular bank (CBK, 2010).
1.2 Statement of the problem

The uptake of mortgage loans offered by commercial banks is low with a small percentage of Kenyans who can afford to take up mortgages (CBK, 2015). The mortgage market plays an important role in any economy and is known to have a dramatic multiplier effect and is a key economic indicator. An efficient and sustainable mortgage market regime is a pre-requisite for sustainable housing delivery for the citizens of a nation. A mortgage market is an important medium for financing housing around the globe (Boamah, 2010).

Vast studies have also been carried out locally and internationally on mortgage and mortgage financing. Rodenholm and Dominique (2013) studied on macroeconomic effects on securitized real estate markets which was comparative study of Sweden and Switzerland. Apergis (2011) analyzed the dynamic effects of specific macroeconomic variables (i.e. housing loan rates, inflation and employment) on the price of new houses sold in Greece. Among numerous studies not mentioned, these two studies are in the context of a foreign nation and the results cannot be generalised to the Kenyan environment.

Local studies include Njongoro (2013) who studied the effect of mortgage interest rates on the growth of mortgage financing in Kenya; Ngumo (2012) studied the effect of interest rates on the financial performance of firms offering mortgages and Muguchia (2012) investigated the effect of flexible interest rates on the growth of mortgage finance in Kenya during the financial period 2007 to 2011. Much of these empirical evidence relied on mortgage interest rate as an indicator of mortgage financing in Kenya. Agao (2012) conducted a study on the effect of macroeconomic variables on mortgage uptake in Kenya. Her study was however limited to residential house prices, GDP and Central
Bank Rate as the macroeconomic variables under study. The present study will study other macroeconomic variables and fill this research gap.

None of the above studies examined the effect of a combination of interest, inflation rate and money supply as macroeconomic variables on mortgage uptake in commercial banks and mortgage finance companies in Kenya. It is from this background that the researcher seeks to fill the gap by conducting a study to identify the effect of macroeconomic variables on mortgage uptake for commercial banks and mortgage finance companies in Kenya.

1.3 **Objective of the Study**

The main objective of the study is to establish the effect of macroeconomic variables on mortgage uptake in commercial banks and mortgage finance companies in Kenya.

1.3.1 **Specific Objectives**

i. To determine the effect of inflation on mortgage uptake in commercial banks and mortgage finance companies in Kenya.

ii. To establish how money supply influences mortgage uptake in commercial banks and mortgage finance companies in Kenya.

iii. To investigate the effect of interest rate on mortgage uptake in commercial banks and mortgage finance companies in Kenya.

1.4 **Research Hypothesis**

The study seeks to test the following null hypothesis:

$H_{01}$: There is no statistically significant relationship between inflation and mortgage uptake in commercial banks and mortgage finance companies in Kenya.
H_{02}: There is no statistically significant relationship between Money supply and mortgage uptake in commercial banks and mortgage finance companies in Kenya.

H_{03}: There is no statistically significant relationship between Interest rate and mortgage uptake in commercial banks and mortgage finance companies in Kenya.

1.5 **Significance of the study**

The significance of the study was based on the following perspectives: the policy perspective, industrial perspective (investors) and theoretical perspective (scholars).

The study adds knowledge to policy decision makers in mortgage industry. The policy makers include the government who will be able to develop policy and regulation framework that will ensure increase in mortgage uptake. The government will be able to protect consumers from commercial banks and mortgage finance companies that exploit them. The research will also guide fiscal and monetary policy makers in the government and the market towards implementing expansionary monetary policy that will enhance citizen’s ability to take mortgage loans hence stimulating economic development.

This study will influence strategic decision making of commercial banks and mortgage finance companies that are offering mortgage services in the country. These investors will be enlightened to encourage an increase in mortgage loans from the public so as to increase their financial position and performance as well as the country economic growth.

Finally, the study will be of significance to other researchers, policy makers and individuals who may want to carry out research or acquire more knowledge on mortgage financing. The study will facilitate individual researchers to identify gaps in the current research and carry out research in those areas.
1.6 Scope of the study

The study focuses on macroeconomic variables and mortgage uptake in commercial banks and mortgage finance companies in Kenya from 2010 to 2015. This study period was selected since the Kenyan economy performed strongly during this period with a positive result in terms of increased money supply in the economy, low interest rates and declining inflation. These macroeconomic indicators remained stable and supported growth through the years. Prior to 2010, the country was recovering from the post-election violence 2007/08. The research study will be focussing on macroeconomic variables which are interest rate, inflation and money supply as the independent variables. They have been selected since they have a bigger influence in the level of liquidity in the economy. Liquidity enables transactions to take place and increased disposable income thus influencing the mortgage uptake level in Kenya.

1.7 Limitations of the study

This study will be limited in the aspect that most respondents will be reluctant to give information important to the study since it may be highly confidential. However, this will be overcome by assuring the respondents that the information gathered would be handled confidentially and used solely for the purpose of the study.

1.8 Organization of the study

This research proposal is structured as follows: the foregoing Chapter One provides the research background, statement of the problem, research objectives, significance of the study, scope, and the limitations to be encountered in the course of the study. Chapter two presents literature review on theories and the conceptual framework. Chapter three presents the research methodology employed in the study.
CHAPTER TWO: LITERATURE REVIEW

1.9 Introduction

This chapter presents the literature review. The first section, the theoretical literature will focus on the theories related to the independent variables in this study. The second section will be the empirical literature which comprise of past studies. The third section will be the conceptual framework on which this study is based. There will be a summary of the literature review to generate the study gap in the fourth section.

1.10 Theoretical Literature

This section presents the theories related to the study. The study will be guided by the following theories; Classical Theory of Interest Rates, The Theory of Consumer Choice and the Title and Lien Theories of Mortgage.

1.10.1 Classical Theory of Interest Rates

This theory was propounded by classical economists like A. Marshall, N.W. Senior and I. Fisher who viewed the interest from the supply side while J.B. Clark explained the interest from the viewpoints of demand.

This theory is based on the fact the demand for capital and supply of capital determines the rate of interest. At the point where the demand for capital is equal to supply of capital, the rate of interest is established. The demand for capital arises from investment and savings from the supply of capital. The lower the rate of interest, the greater shall be the demand for capital (Drumond & Jorge, 2013). The classical theory is also called ‘Real theory’ of interest because it is based on the real forces of demand and supply.

In Kenya, interest rates are determined by the Central bank through the Monetary Policy Committee. This is usually through the Central Bank Rate (CBR) which is the price at
which the CBK lends money overnight to commercial banks (Wanja, 2015). It also serves as a signalling instrument for monetary policy. This rate determines the rates at which commercial banks lend to their customers since their interest rates are based on this CBR.

Further, the mortgage industry is also affected by The Kenya Banks’ Reference Rate (KBRR) which is the base rate for lending by commercial banks and microfinance banks as well as for pricing mortgage products (CBK, 2015).

This theory can be related to the Kenyan mortgage market and more specifically to the rate of interest presented to the market by commercial banks and mortgage finance institutions. It can be argued that in order to enable growth of the mortgage industry in Kenya, the Central Bank should compel commercial banks and mortgage institutions to lower the interest rates on the mortgage products and services (Njongoro, 2013). High interest rates would raise repayments on mortgage loans and thus increase the number of households struggling to repay their mortgage loans whereas low interest rates encourage mortgage uptake (Hass Consult, 2013).

1.10.2 Loanable Funds Theory

This classical theory was developed by Wicksell Robertson in 1934. This theory states that the quantity of a financial security supplied changes at every given interest rate in response to a change in another factor besides the interest rate. According to this theory, interest rate is the price paid for the right to borrow and utilize loanable funds (Harvey, 1993). The supply of loanable funds comes from people and organizations, such as the government and businesses, which have opted to save part of their money for investment purposes. Lending money to borrowers at a rate of interest is one way to invest.

In economics, the loanable funds market is a hypothetical market that brings savers and borrowers together. Savers supply the loanable funds; for instance, buying bonds transfers
their money to the institution issuing the bond, which can be a firm or government. In return, borrowers demand loanable funds; when an institution sells a bond, it is demanding loanable funds. According to McConnell and Blue (2005), another term for financial assets is "loan able funds", funds that are available for borrowing, which consist of household savings and sometimes bank loans. He further said that loanable funds are often used to invest in new capital goods, therefore, the demand and supply of capital is usually discussed in terms of the demand and supply of loanable funds.

Individuals and organizations seek loans for investment purposes and the desire to finance investments through borrowing makes up the demand for loanable funds (Mayer, 2010). According to this theory, as the risk of financial security decreases it becomes more attractive to suppliers of fund, hence the supply of funds increases. Conversely, as the risk of financial security increases it becomes less attractive to suppliers of funds hence the supply of funds decreases (Saunders & Marcia, 2001). This theory links to this study as it suggests that supply of loans will decrease if the mortgage loan is considered to be risky since the lenders supplying the funds consider the returns and the associated risks in lending.

1.10.3 Title theory and Lien theory of mortgages

Werner and Kratovil (1981) identified two methods used in purchasing real property known as the Title and Lien Theory.

In lien theory the mortgagee holds the deed to the property during the mortgage term. The mortgagee has an obligation to make all payments to the mortgagor and the mortgage becomes a lien on the property, but the title remains with the buyer. This is equivalent to future interest in the property which allows the mortgagee to use the process of foreclosure. The lenders lien is removed once the payments have been completed. In case
of default by the mortgagee the mortgage will go through formal foreclosure proceedings in order to gain legal title to secure repayment of the loan.

In title theory the mortgage transfers legal title of the property to the mortgagor who retains it until the mortgage has been foreclosed. The mortgagor is said to hold the title for security reasons only. The mortgagee is entitled to legal title when the debt is fully repaid; the mortgagor retains ownership of the mortgaged property while borrower retains possession. The mortgagor has legal title to the mortgaged property. This is in case the mortgagee defaults they have the right to immediate possession of the property.

When the rate on a mortgage contract increases significantly, this is normally favourable to the lender in the absence of correlated increases in rates on liabilities. Conversely the lender faces the risk that interest rate increase could be unaffordable to the borrower, forcing the borrower to default, in which case it could be necessary to foreclose on the property (with substantial costs of foreclosure). The lender faces the risk that the value of the property underlying the mortgage could drop in value to below the outstanding balance on the mortgage; if this event induces the borrower to default due to moral hazard, the lender must not only incur the costs of implementing a foreclosure but also must sell the property at a price that fails to recoup the lender's investment.

This theory relates to Kenya and specifically this study since commercial banks and mortgage finance companies issuing mortgage products use the Lien theory and this allows the customers to assume ownership of the property as soon as they acquire the mortgage. Assuming that most financial institutions use this theory, it will be more attractive to customers and will enable the mortgage industry to grow and enable the mortgage industry realize its full potential.
1.11 Empirical Literature Review

Various studies and researchers have been done in the field of mortgage uptake. Real estate development is critical and is used to access the level of economic development of a country. From this stand, mortgage institutions and banks provide financing to ensure that this objective is met.

Nyanyuki (2016) sought out to determine the factors influencing performance of mortgage lending by commercial banks in Mombasa County. A descriptive research design was used and data analysis was done using a regression model to test the influence of various variables on the performance of mortgage lending by commercial banks in Mombasa County. The study revealed that majority of the respondents strongly agreed that mortgage lending has improved profitability margins of most commercial banks in Mombasa County. 90% of the respondents strongly agreed that lack of credit history influences the capability to get mortgage loans. Finally, the results revealed that mortgage costs and loan structure had a significant correlation on the performance of mortgage lending by commercial banks in Mombasa County. This research was not exhaustive enough as there other areas like interest rates and how they affect performance of mortgage lending by commercial banks. The current study will investigate other variables which are inflation and money supply and also focus make conclusions that represents the whole country. This past study only focused in Mombasa County.

Njiru and Moronge (2013) carried out a study to establish the factors affecting growth of mortgage industry in Kenya. The results of the study indicated that interest rate volatility and mortgage loans accessibility affected the growth of the mortgage industry. Other findings identified in the research shows that the Kenya government had not put up sufficient measures that could encourage mortgage uptake in the country. The study
recommended that the government should put up rules and regulations to prevent the customers from being exploited through high interest rates and also mortgage firms to work towards product diversity. The study used descriptive analysis and therefore did not identify the strength of the influence of each of the factors. The current study will employ the use of regression analysis in order to identify the nature of the relationship between the independent and the dependent variable.

Njongoro (2013) studied the effect of mortgage interest rates on the growth of mortgage financing in Kenya. The study sought out to find out and collect facts in the market and describe the casual linkages between mortgage interest rates and growth of mortgage financing in Kenya for a period between 2009 and 2012. The research findings shows that total mortgage outstanding have been increasing while average interest rate generally increased in the period of study. A strong negative relationship was realized between mortgage interest rate and growth of mortgage financing. However, the results indicate that mortgage interest rate and non-performing loans are not adequate predictors of growth of mortgage market as indicated by the coefficients. This study only focused on one factor, interest rates, and is therefore not comprehensive enough. The current study will have a wider time scope and thus better analysis and will focus on a number of macroeconomic variables to determine which among them influences the industry more.

Hullgren and Soderberg (2013) investigated consumer characteristics that influence Swedish consumers’ mortgage rate decisions, such as the choice between an adjustable rate mortgage and a fixed rate mortgage. Data for the study was collected in a randomized survey of the Swedish population in 2010 and binary logistic regression used to analyze data. The results established that a lower level of education, lower income, lower financial literacy, and trouble handling interest rate increases influence Swedish consumers to choose ARMs while gender does not significantly affect the overall results.
The results in the study investigated consumer characteristics in the Sweden market. This current study will focus on macroeconomic variables and mortgage uptake in commercial banks and mortgage finance companies in the Kenyan market.

Kangongo (2013) sought to establish the relationship between inflation rates and real estate prices in Nairobi, Kenya. Simple linear regression model was used to determine the nature of the relationship. The findings of this study show that there is no clear relationship between the property price and the inflation rate. The current study will seek to investigate the relationship of inflation and mortgage uptake in the country. Further other macroeconomic variables under study include interest rates and money supply.

Rodenholm & Dominique (2013) studied on macroeconomic effects on securitized real estate markets which was comparative study of Sweden and Switzerland. The study investigated to what extent macroeconomic factors influence real estate stock prices before and after the outbreak of the financial crisis in 2007. The results show that the macroeconomic effects on real estate stock prices differ among small economies and are inconsistent in a pre-crisis and crisis period. The present study will be done in macroeconomic variables namely inflation, interest rates and money supply. It will be solely based on the Kenyan market and conclusion will be drawn on the effect of macroeconomic variables on mortgage uptake.

Adongo (2012) conducted a study dealing with the relationship between mortgage financing and financial performance of commercial banks in Kenya. The study adopted correlation research. The analysis showed that there is a strong and positive relationship between mortgage financing and financial performance of the commercial banks. It was concluded that commercial banks offer mortgage financing so as to gain market penetration and competitive advantage. Despite this, the study identified high interest
rates as a leading contributor to profitability in commercial banks. This could have a negative or positive effect on mortgage uptake. The current study will therefore investigate how interest rates and other macroeconomic variables; inflation and money supply affect the uptake of mortgages in Kenya.

Aguko (2012) sought to investigate the factors influencing mortgage uptake in Kenya. To capture the various levels of staffs and management at Housing Finance Corporation (FC), stratified random sampling method was conducted and data analysis method used was based on quantitative approach using descriptive statistics. The study concluded that interest rate setting on mortgage debt; government instruments and fiscal measures are the major policies that govern mortgage financing. This study however focused on HFC unlike this present study that will have a wider scope and consider all commercial banks and mortgage finance companies in Kenya.

Carranza and Estrada (2012) conducted a research to identify the determinants of mortgage default in Colombia. The focus of the study was the Colombian mortgage market between 1997 and 2004 using two separate data sets that were matched using simulation techniques. They found out that home prices and debt balances are the main determinants of mortgage default. Income variations had a very small effect on default probabilities. This could however be different in the Kenyan context where income plays a major role in mortgage defaults in Kenya. This study was conducted and conclusions were drawn from the Colombian market. The present study will be done specific to Kenya and will aim at addressing the effect of macroeconomic variables on Kenyan mortgage uptake in commercial banks and mortgage finance companies in Kenya.

In her study on the effect of flexible interest rates on the growth of mortgage finance in Kenya during the financial period 2007 to 2011, Muguchia (2012), concludes that the
flexible interest rates have a strong negative and significant effect on mortgage financing among the financial institutions in Kenya. The study relied on secondary data from annual reports of the banks and regression analysis was mainly used to analyze the data. From the study, it was also revealed that independent variables like liquidity ratio and inflation had a negative impact on mortgage financing. The document argues that if banks charge a fixed rate of interest, it would be possible for investors to plan for a predictable amount of money to be repaid hence stability and increased level of borrowing. The study however relied heavily on the effect of flexible interest rates on the growth of mortgage financing unlike this study which will study macroeconomic variables and mortgage uptake. It will be more comprehensive.

Ngumo (2012) studied the effect of interest rates on the financial performance of firms offering mortgages. The study adopted a survey research design on a target population of all organisations registered as mortgage lending institutions. The study was able to establish a positive relationship between financial performance and the amount of mortgage loans advanced. The study concludes that the amount of mortgage advanced by mortgage firms would lead to a high financial performance as it raises the revenue thereof. On the other hand, interest rate would positively relate with financial performance till it starts discouraging borrowings owing to increase in the cost of mortgage. The study was focused on the effect of interest rates and did not consider other macroeconomic variables. The present study will build on the past research and study the effect of macroeconomic variables namely interest rates, inflation and money supply on the uptake of mortgages in commercial banks and mortgage finance companies in Kenya. This will in the long term be beneficial to these institutions since they will have improved financial performance due to increase in the number of mortgage accounts.
Apergis (2011) analyzed the dynamic effects of specific macroeconomic variables (i.e. housing loan rates, inflation and employment) on the price of new houses sold in Greece. An error correction vector autoregressive (ECVAR) model is used to model the impact of the macroeconomic variables on real housing prices. Variance decompositions showed that the housing loan rate is the variable with the highest explanatory power over the variation of real housing prices, followed by inflation and employment. The context of the study was of a foreign nation and the results cannot be generalized in the Kenyan environment. The current study will focus on the Kenyan market.

Moench, Vickery and Aragon (2010) conducted their study in the USA and focused mainly on the choice between fixed rate mortgages and adjustable-rate mortgages. They document that the market share of ARMs has declined significantly across all segments of the mortgage market in recent years. They present evidence that this decline in the ARM share can largely be accounted for by factors that explain mortgage choice in earlier periods in particular, measures of the relative borrowing costs for fixed-rate and adjustable-rate mortgages. Supply-side factors, especially the increasing share of the conforming mortgage market, are also important in accounting for the fall in the ARM share over this period. This study exclusively investigated fixed and adjustable rate mortgages in the USA market. This current study will focus on macroeconomic variables and mortgage uptake in commercial banks and mortgage finance companies in the Kenyan market.

Wahome (2010) in her study examined the relationship between factors influencing mortgage financing and performance of mortgage institutions in Kenya. The study used regression analysis to analyze the data. From his research, he concluded that factors influencing mortgage financing in Kenya have a positive effect on firm performance and identified the market and financial factors influencing mortgage financing. They included
improvement of risk management, market penetration, financial laws of the country, creation of wealth among others. Despite this, the study did not address the variables affecting the uptake of mortgages in commercial banks and mortgage finance companies in Kenya. It focused on the financial performance of mortgage firms. This current study will focus on secondary data unlike primary data that was employed in this previous study.

Lwali (2008) conducted a study to find out the specific challenges faced by international housing finance institutions in Africa today. Her research objectives were geared towards establishing challenges faced by international housing finance institutions in Kenya with a case study design the target organization being Shelter Afrique. In her findings, it was identified that the major challenges experienced by Shelter Afrique were as a result of unpredictable changes in the macroeconomic environment. The performance of housing projects funded Shelter Afrique was also affected due to these changes resulting into enhancement of credit risk. Despite this, the study did not forecast the macroeconomic variables and thus did not put in place measures to manage them. This current study will focus on macroeconomic variables as the independent variables and have necessary measures to determine how they influence mortgage uptake in commercial banks and mortgage finance companies in Kenya.

Sørensen and Lichtenberger (2007) analyzed the process of convergence of mortgage interest rates for the house purchase in the euro area and found that supply and demand factors only partially explain interest rates, while a fundamental role is played by institutional factors specific to each country. As a result to this, country specific factors ought to be considered to have an effect on mortgage interest rates of that particular country for example political instability, efficiency of the justice system and intensity of the bank-customer relationship among others. This study focused on the euro area and
solely on interest rates. This current study will investigate the country specific factors that influence the uptake of mortgage in Kenya.

Shin (2006) conducted a study on the choice of residential mortgage lending by Korean household to determine house hold of mortgage lender in the Korean market using data from 2004-2006 surveys on the same. It was evident that more Koreans intending to buy low and middle priced houses were more inclined to the banks due to flexibility in rates and a wider array of mortgage product. However the study failed to show significance of agents’ mobility variable, risk averseness variable and expectation on future interest rate movement. The inclination managed may be the case in our country Kenya as at now, but the findings from the study indicates a negative relationship between the interest rates and level of mortgage uptake. Further the study discovered that, not everyone understood the rules or regulations governing the Korean housing affairs hence desirable data could not be obtained. Thus at the end of the study, it was noted that, it was necessary to educate the masses about mortgage product through government funding. The present study will look at how macroeconomic variables are affecting the mortgage uptake in the Kenyan market.

Gerlach and Peng (2005) carried out an assessment to determine the long and short term relationship between interest rates and mortgage credit of the Hong Kong housing market. The property prices in Hong Kong underwent extraordinarily large swings, with at least three episodes of price increases of over 20% and two episodes of sharp declines by as much as 50% in the 1990’s. According to their findings growth in the long term mortgage loans is significantly and positively related to the decrease in interest rates. This study addressed factors affecting the Hong Kong market. This current study will focus on the Kenya market and investigate how macroeconomic variables influence mortgage uptake in Kenya.
Fang (2004) conducted a study on the relationship between home mortgage loan and real estate market in China and their effect on banks financial performance. The study sought to analyze the correlation between the development of real-estate market and home finance and their effect on banks financial performance. The study revealed that although residents’ sustainable income, macroeconomic factors are all the reasons for the development of the China’s real estate market, but the mortgage cannot be ignored which is also an important factor for rising home prices, and at different times, different regions show different characteristics. In the short term, the function of mortgage is more apparent in promoting house prices. While the real estate market in a region or city getting gradually mature, the effect of mortgage on the house prices tends to be less evident, but it remains an important factor that cannot be ignored. The study further revealed that both real estate financing and mortgage had positive effects on the banks profitability. This study focused on the China market and therefore cannot be related to the Kenyan market given the diversity of the two mortgage markets. This study seeks to identify the specific variables affecting the mortgage uptake in Kenya.

Vuyisani (2003) conducted a study on Housing Finance Systems in Four Different African Countries: South Africa, Nigeria, Ghana and Tanzania. The researcher says that the generic problem that eliminates low-income earners from the housing market is affordability. From the findings, it is further noted that incremental housing is implemented in South Africa and Ghana through micro-finance for housing. In Tanzania and Nigeria, it is almost non-existent because micro-finance is a fairly new concept. The research argued that interest rates do not affect the affordability to construct new houses. This research was conducted in markets that are different from the Kenyan market, therefore he current study will address the happenings in the Kenyan context and further look at the effects of the macroeconomic variables affecting mortgage uptake.
1.12 Summary of Literature and Research Gap

Mortgages are rapidly becoming important financial instruments in emerging markets. In theory, the effect of macroeconomic variables on mortgage uptake remains very controversial. Some empirical findings show a positive relationship, others show a negative relationship and in some instances, even no relationship between the two variables.

Kenya’s mortgage situation has been skewed in favour of high income earners as most developers and housing financiers always target high income population because of the perception that they surplus income to take up mortgages and repay comfortably. The result is the isolation of low income population who form the majority of the population. For the growth of mortgage market to grow, it should encompass the whole population.

My research focuses on macroeconomic variables namely include interest rates, inflation and money supply, that affect mortgage uptake in Kenya. There is evidence that the mortgage finance market is enlarging in the country. Hence there is need to extend the research.

The mortgage market is dynamic market and untapped studies on macroeconomic variables; inflation rate, interest and money supply in relation to mortgage uptake, exists and therefore a gap to be filled in relation to knowledge and empirical studies.
1.13 Conceptual Framework

Independent Variable

- Inflation
  - Consumer Price Index (CPI)

- Money Supply
  - Aggregate amount of monetary assets

- Interest Rate
  - Average mortgage interest rate

Dependent Variable

- Mortgage Uptake
  - Number of mortgage accounts

Figure 2.1 Conceptual Framework

Source: Author (2016)
CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction
This chapter involves the systematic study of methods which are to analyze a research study. It therefore gives details of the research philosophy, research design, target population, data collection procedure and data analysis and presentation to be used in the study.

3.2 Research Philosophy
This study will be based on Positivism research philosophy. Positivism is based on believe of stable reality which can be described from an objective perspective (Saunders & Lewis, 2000). In this case, the phenomena being studied is not interfered with. Positivism involves manipulation of reality with variations on single independent variable in order to identify regularities and establish the relationship that exists between the elements in social world. Positivism supports this study since it aims at working with observable reality (testing the effect of macroeconomic variables and mortgage uptake in commercial banks and mortgage finance companies in Kenya). In this case the researcher will collect data independently and analyze it with statistical tools. Neither the subject will influence the researcher nor does the researcher influence the subject.

3.3 Research Design
A research design is the blue print of every research and outlines the procedure for collecting and analyzing data. It includes an expression of both the structure of the research problem and the plan of investigation used to obtain empirical evidence on the relationships between the variables of a study (Cooper & Schindler, 2006). This study will use quantitative research design. The study aims to determine the effect of
macroeconomic variables on mortgage uptake in commercial banks and mortgage finance companies in Kenya.

3.4 Target population

According to Kothari (2004), population is the entire group of individuals or items under consideration in any field of inquiry and have a common attribute. The population of interest comprises of commercial banks and mortgage finance companies among the financial institutions in Kenya. According to CBK (2015), 34 commercial banks and mortgage finance companies are offering mortgage loans and are licensed and regulated in accordance with the provisions of the Banking Act and the Regulations and Prudential Guidelines issued there-under.

The study is about the mortgage industry and the researcher will carry out a census study consisting of all the commercial banks and mortgage finance companies offering mortgage finance hence no need for sampling.

3.5 Data Collection Procedure

Data will be collected through secondary information. According to Mugenda and Mugenda (2003), secondary data is information that has previously been collected, utilized by a person other than the one who collected the data. It can be obtained from books, journals and electronic materials.

Panel data will be collected for a 6 year period, from 2010 to 2015 on the number of mortgage accounts as the independent variable and macroeconomic-economic variables of Consumer Price Index, Aggregate amount of monetary assets (M3) and average mortgage interest rate as the predictor variables.
Data will be obtained for a period of six years from 2010 to 2015. This study period was selected since the Kenyan economy performed strongly during this period with a positive result in terms of increased money supply in the economy, low interest rates and declining inflation. These macroeconomic indicators remained stable and supported growth through the years. Prior to 2010, the country was recovering from the post-election violence 2007/08. This time period was also chosen since it will be adequate to observe a trend and is also reasonable in consideration of the limited research time available needed to carry out the research.

Data will be collected from secondary sources. The secondary data will be obtained from CBK annual reports, Kenya Bankers Association annual reports, Kenya National Bureau of Statistics annual reports, the commercial banks and mortgage finance companies reports and published financial reports for the year 2010 to 2015.

3.6 Data Analysis and Presentation

Data analysis will be carried out by use of simple mean, standard deviation, panel regression and correlation analysis by use of SPSS. A panel regression analysis will be used to come up with the model expressing the relationship between the dependent variable (Mortgage uptake) and the macroeconomic variables namely interest rates, inflation and money supply. The findings will be presented in tables to facilitate comparison and for easy inference.

3.6.1 Diagnostic tests

The study carried out the following diagnostic tests on the data.

3.6.1.1 Multicollinearity

Multicollinearity refers to a situation in which two or more explanatory variables in a multiple regression model are highly linearly related. In order to check multicollinearity
in the three variables, the study checked on the interconnection among these factors. This test will be carried under Pearson correlation and the output explained.

### 3.6.1.2 Heteroscedasticity

Heteroscedasticity is a term used to describe the situation when the variance of the residuals from a model is not constant. Breusch-Pegan-Godfrey test (B-P-G Test) will be used to test for the presence of heteroscedasticity.

### 3.6.2 Empirical Model

The variables involved include interest rate, inflation and money supply.

The study will be depicted by the following panel regression model:

\[
Y_t = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + e_t
\]

Where:

- \( t \) refers to the time; \( Y_t \) is the uptake of Mortgage loans in the mortgage industry shown by the number of mortgage loans advanced at time, \( t \).
- \( \alpha \) = Regression constant
- \( \beta_1, \beta_2, \beta_3 \) are the coefficients of the independent variables in the regression model
- \( X_{1t} \) = Average mortgage interest rate at time, \( t \).
- \( X_{2t} \) = Inflation. This was measured by the annual change in the Consumer Price Index (CPI) in the year \( t \).
- \( X_{3t} \) = Money Supply. This is the aggregate amount of monetary assets at time, \( t \).
- \( e_t \) = Error term.

\( t \) = Time.
3.7 Operationalisation and measurement of variables

The table below shows how the independent variables and the dependent variables have been operationized.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Operationalisation</th>
<th>Measurement</th>
<th>Hypothesized Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortgage Uptake</td>
<td>Dependent</td>
<td>Number of mortgage accounts in the industry</td>
<td>Number of mortgage accounts in the industry</td>
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<tr>
<td>Inflation</td>
<td>Independent</td>
<td>Percentage change in Consumer Price Index (CPI) on a year to year basis</td>
<td>Consumer Price Index (CPI)</td>
<td>None</td>
</tr>
<tr>
<td>Money Supply</td>
<td>Independent</td>
<td>Aggregate amount of monetary assets</td>
<td>M3</td>
<td>None</td>
</tr>
<tr>
<td>Interest rate</td>
<td>Independent</td>
<td>The rate of interest charged on a mortgage loan</td>
<td>Average mortgage interest rate</td>
<td>None</td>
</tr>
</tbody>
</table>

3.8 Ethical Considerations

This is in line with the moral principles guiding the research work all the way from inception, completion to publication of the research work. The researcher will ensure that the study obtained a valid consent on every person from whom the data was gathered from. In addition, the researcher will ensure confidentiality of the information.
REFERENCES


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APPENDICES

Appendix I: Research Budget

<table>
<thead>
<tr>
<th>BUDGET ITEMS</th>
<th>NUMBER</th>
<th>COST PER UNIT</th>
<th>TOTAL COST</th>
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</thead>
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<td>Facilities - Internet &amp; Transport</td>
<td>7,000</td>
<td>7,000.00</td>
<td></td>
</tr>
<tr>
<td>Software Licensing</td>
<td>5,000</td>
<td>5,000.00</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5,000</td>
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<tr>
<td>Total Cost</td>
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<td>17,000.00</td>
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Appendix II: Research Work Plan

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<th>Dec</th>
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<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
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<td>Identify the research area</td>
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<tr>
<td>Write chapter one of the research proposal</td>
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<tr>
<td>Literature review</td>
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<tr>
<td>Formulate the research methodology</td>
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<tr>
<td>Prepare for proposal defence</td>
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<td>22nd</td>
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<tr>
<td>Data collection and analysis</td>
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<tr>
<td>Write final draft</td>
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<tr>
<td>Project due</td>
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## Appendix III: Data Abstraction Tool

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<th>Year</th>
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<th>2012</th>
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<tbody>
<tr>
<td>Number of mortgage accounts</td>
<td></td>
<td></td>
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<tr>
<td>Consumer Price Index (CPI)</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>M3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Average mortgage interest rate</td>
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</tbody>
</table>