MACROECONOMIC FACTORS AND MORTGAGE GROWTH FINANCING BY COMMERCIAL BANKS IN KENYA

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Macroeconomic Factors and Mortgage Growth Financing by Commercial Banks in Kenya

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DECLARATION

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

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DEDICATION

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ACRONYMS AND ABBREVIATIONS

Acorn D-REIT	Acorn Student Accommodation Development Real Estate Investment Trust
ANOVA	Analysis of Variance
ARM	Adjustable Rate of Mortgage
CBK	Central Bank of Kenya
CBR	Central Bank Rate
CMA	Capital Markets Authority
CPI	Consumer Price Index
EADB	East African Development Bank
FMBN	Federal Mortgage Bank of Nigeria
FOREX	Foreign Exchange Rate
GDP	Gross Domestic Product
GNP	Gross National Product
HFCK	Housing Finance Company of Kenya
IHFI	International Housing Finance Institutions
IR	Interest Rate
KCB	Kenya Commercial Bank
KMRC	Kenya Mortgage Refinance Company
MI	Aggregation of Money Circulation in a Nation's Economy
M2	+Savings Deposits Of Post Office Savings Banks

M3	Broad Money
MBS	Mortgage-Backed Securities
NIC	National Industrial Credit
PMBs	Primary Mortgage Banks
PMIs	Primary Mortgage Institutions
PPP	Purchasing Power Parity
ROA	Return on Assets
ROE	Return on Equity
RoK	Republic of Kenya
SSA	Saharan Africa
STATA	Statistical Software for Data Science
US	United States
USD	United States Dollar
VIF	Variance Inflation Factor

DEFINITION OF OPERATIONAL TERMS

Commercial Banks	Financial resource mobilization institution which provides intermediary services such as taking deposit and giving of loans (CBK, 2017)
Exchange Rate	The price of one country's currency expressed in another country's currency. In other words, the rate at which one currency can be exchanged for another (Mishkin & Eakins, 2009).
Financing	Refers to the ways of obtaining capital to expand operations and purchase assets (Garcia, 2017).
Gross Domestic Product	Total value of goods and services in the market of a country, produced in a given year (CBK, 2013).
Growth of Mortgage Financing	Refers to the change in the amount of funds offered to borrowers as loan to purchase or maintain a home, land, or other types of real estate (Owuor et al., 2018).
Inflation Rate	Refers after to an upward thrust among the normal degree about prices of accessories or functions inside an economy upon duration on time (CBK, 2018).
Money Supply	Is all the currency and other liquid instruments in a country's economy on the date measured (Omodero, 2019).
Mortgage	Loan secured by the collateral of some specific real estate property that allow home buyers to spread out the cost of the

	home over several decades by making reasonable monthly payments. This arrangement gives lenders the legal power to repossess a property if the borrower fails to satisfy the conditions of the mortgage, most typically by failing to repay the loan plus interest (Yinger, 2018).
Mortgage Finance	Is a loan given by commercial bank or mortgage bank to finance the purchase of real estate with specific payment schedule and interest rate (Colaniran, 2017).
Rate of Interest	The expense on hiring money. In other words the amount of interest per unit time, usually a year (Grant, 2018).
Economic Growth	The term economic growth is defined as the process whereby the country's real national and per capita income increases over a long period of time.（Haller, 2012）
Monentary policy	Monetary policy consists of decisions and actions taken by the Central Bank to ensure that the supply of money in the economy is consistent with growth and price objectives set by the government. (CBK,2020)

ABSTRACT

Various macroeconomic variables including gross domestic product (GDP), interest rate, inflation, money supply, and exchange rate, among others, have implication on financing of mortgage by financial institutions including commercial Banks in Kenya. In this paper, these variables are incorporated so as to analyze the influence of macroeconomic variables on the growth of mortgage financing and facilitate mortgage financing by commercial banks in Kenya. This study's general objective, sought to find out the effect of macroeconomic factors on the growth of mortgage financing among commercial banks in Kenya. Specifically, the study assessed the effect of interest rate; Money supply, inflation rate, exchange rate and monetary policy have on the growth of mortgage financing within commercial banks in Kenya. The study adopted positivism paradigm and correlational research design, where the target population consisted of 43 commercial banks in Kenya. The study adopted census and collected data from the 43 commercial banks. Secondary data was used from Central bank of Kenya reports and financial statements of the commercial banks. Time series data analysis model was used using STATA software. The hypothesis was tested using the simple and multiple regression approaches. Tables and figures were used to present the findings of the study. The study found that interest rate, inflation rate and exchange rate have a significant negative effect on the growth of the mortgage financing among commercial banks in Kenya commercial banks. Economic growth and money supply have a significant positive effect on the growth of the mortgage financing among commercial banks in Kenya commercial banks. There was a significant moderating effect of monetary policy on the effect of macroeconomic factors on the growth of the mortgage financing among Kenyan commercial banks. In conclusion, findings on the effect of macroeconomic variables on the growth of mortgage financing showed that there is a statistically significant correlation between financing of mortgage products and macroeconomic variables. In addition, results showed that macroeconomic variables explain the variations of the mortgage financing. Based on the results, this paper concludes that macro-economic variables have a statistically significant influence on financing of mortgages, the five independent variables; interest rate, economic growth, money supply, inflation and exchange rate influenced the growth of mortgage financing. The government should implement policies aimed at increasing investment in infrastructure projects to stimulate economic activity, create jobs, and attract investments, ultimately leading to uptake of mortgages which will require financing from the commercial banks and thus growth in mortgage financing. The Central Bank of Kenya (CBK) should implement a transparent and predictable monetary policy framework aimed at maintaining stable interest rates and inflation within a targeted range. The CBK should use a combination of monetary policy tools, including open market operations such as buying or selling treasury bills, to manage money supply and control inflationary pressures. Collaboration with other regulatory agencies, such as the Capital Markets Authority and the Insurance Regulatory Authority, and the National Construction Authority can provide a comprehensive view of the financial system and non-financial systems which can help identify potential systemic risks that may affect mortgage financing.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Recent years have seen a significant increase in the number of individuals choosing to construct or own their own homes and houses as opposed to renting (LaCour-Little, 2020). As a consequence, the number of mortgage firms that provide financial solutions has increased. The increase in the demand for housing has seen many commercial banks now provide mortgage lending as one of their products. A house buyer or builder may get finance (a loan) from a financial institution like a bank either directly or indirectly via intermediaries to pay for or secure against the property (Rodríguez-Planas, 2018).

Mortgage financing is the process of approving and extending a house loan or commercial property mortgage to a qualified applicant. The objective or emphasis of mortgage finance is often centred on two main aims. First, the financing tries to generate income for the lender; second, the extension of mortgage enables eligible individuals and corporate organisations to secure properties (Scanlon, 2017). In mortgage finance, a legal or equitable interest in a particular immovable property is transferred in exchange for the repayment of a loan. Possession of the property may be retained by the borrower, but the lender acquires complete legal ownership. A bank or other financial institution may lend house buyer or builder money to buy or secure the property. Mortgage loans differ in size, term, interest rate, mode of repayment, and other aspects (Brissimis & Vlassopoulos, 2019).

In most developing economies where short-term financial contracts dominate financial systems, mortgage finance becomes a critical segment in the policy agenda to lengthen financial contracts. Mortgage finance also attempts to create non-bank sections in financial systems (Beck et al., 2016). Unlike other human basic needs such as clothing

and food, housing requires a regular flow of income and heavy capital outlay to meet this long-term objective (Doling, Vandenberg & Tolentino, 2013).

According to Brueggeman and Fisher (2018), real estate investments are mainly financed through mortgages. Mortgage financing is considered an appropriate funds option for aspiring homeowners in developing economies. Mortgage finance plays a key role in housing market development thus making it real for someone to live in his dream houses while they are still building their financial stability. This cautions individuals from the possible future rise in house prices (Keys, 2015).

1.1.1 Global Perspective of Macroeconomic Factors and Mortgage Financing

The availability and utilization of mortgages for house financing are closely linked to the macroeconomic conditions of a country. Developed economies typically have more robust mortgage markets compared to developing and undeveloped economies (Ryan-Collins, 2021). This discrepancy can be attributed to various macroeconomic factors that influence the accessibility and usage of mortgage financing. One key macroeconomic variable that affects mortgage financing is the level of economic development, as measured by Gross Domestic Product (GDP). Developed economies tend to have higher GDP per capita, indicating greater overall wealth and economic stability (Uppal, 2021).

In such economies, there is typically a larger pool of potential borrowers with sufficient income and creditworthiness to qualify for mortgages. As a result, the mortgage market tends to be more developed, with a higher proportion of GDP represented by outstanding mortgage debt. In developed economies like the Netherlands, for example, where the mortgage market is well-established, mortgage debt can represent a substantial portion of the GDP, reaching as high as 83% (Sitek, 2021). This indicates a high level of utilization and availability of mortgage financing for house purchases. In contrast, developing economies, particularly those in lower middle-income countries across Asia, typically have much lower levels of mortgage debt relative to their GDP, often accounting for only 1% or less.

Mortgage financing has gained recognition and is readily available in developed economies compared to developing economies (Hahm, 2014). This arises from challenges such as a mismatch between the long-term nature of mortgages and the short-term nature of customer deposits in addition to high-interest rates charged on loans (Hassler, 2016).

The United States (U.S) experienced housing sector recovery after the 2007 financial recess due to supportive government programs, increased refinancing activities, and a regime that favored low-interest rates on loans (Sharma, 2017). Sharma gave the additional example of England where the Bank of England announced a further increase in secured loans to households by building societies and banks. This led to a further increase in demand for rental properties and mortgages.

The United States leads the world in mortgage options for its citizens. Borrowers can decide to pay a floating rate or a fixed interest rate; they can choose mortgage rate reset time; they can choose amortization period and the term; they can freely prepay, they can borrow against home equity; the interest rate can be locked by borrowers between mortgage application time and house purchase time. The U.S mortgage borrowers can obtain mortgages at attractive terms thus stabilizing the economy (Green & Wachter, 2017). The standard mortgage in the United States is a 30-year fixed-rate loan with no prepayment penalties. The prepayment risk is mitigated by the usage of mortgage-backed securities (MBS). Lenders package and sell mortgages to investors, who get the mortgage income and consequently carry the prepayment risk. As with callable bonds, investors in mortgage-backed securities want a higher return to compensate for this risk. Consequently, mortgages with fixed rates and no prepayment penalties will often have higher interest rates than those with prepayment penalties (Vinokurova, 2018).

In Japan, mortgage loan financing is heavily reliant on government treasury investment, which is based on subsidies. Around 60–70% of Japan's total home financing is through debt (Mitchell & Piggott, 2016). It is difficult for housing finance systems to develop tools that will effectively fund the acquisition of owner-occupied property. Mortgage design is

influenced by a nation's economic and institutional structure, housing system characteristics, risk distribution, and risk allocation. Due to non-performing loans, financial institutions' capital bases have been substantially decimated over the previous decade, forcing them to change their business models from lending to industrial firms to financing house purchases. After the price drop in property markets, a debate over the existing home financing structure has evolved. Japan is now revamping its housing financing institutions by redefining the public sector's role (Naoi et al., 2018).

In China, especially in Hong Kongs' housing market, mortgages that are produced as a result of pastime costs relate positively yet drastically in conformity with growth between mortgage loans. This is among the lengthy move that influences quick-term and lengthy-time period among loans pastime degree yet the savings in imitation of lie superior (Gerlach & Peng, 2015). Cost, presence then securitization regarding mortgage practice namely discriminating elements about potent personal loan borrowers (Loutskina & Strahan. 2017).

For monetary policy to be transmitted efficiently, mortgage finance structure and importance are critical. Recent researches indicate that banking crises arising from bust cycles and housing boom in some countries such as Ireland, Spain and the U.S. are deeper than other banking crises making housing finance to be at the center of these multiple crises (Claessens et al., 2017). In some countries, the government is forced to encourage private sector involvement in the housing sector by developing market-oriented policies since the private sector cannot deliver these goals on its own. These policies include strengthening the mortgage finance market, licensing primary mortgage institutions, taking measures to boost the provision of house financing and strengthening the current mortgage support systems (Zandi & Deritis, 2016). They further suggest that mortgage loans from the private sector and government should be brought together through the establishment of mortgage finance systems with the government acting as a regulator.

The mortgage loan portfolio for individuals comprised almost 23% of the banking system's loan portfolio in 2017, but it decreased to 19% by 2019 in Albania. Housing

financing products may offer either fixed or floating interest rates, with interest rates varying based on the currency of the product. Typically, most loans financing housing are denominated in euros with floating interest rates. However, some hybrid products have emerged as successful in the market, offering a fixed interest rate for the initial 2-5 years followed by a floating rate for the remaining period. Banks in Albania typically finance up to 80% of the collateral market value, and the loan tenor can range from 5 to 30 years. Demand for housing loans in 2017 and the beginning of 2018 surpassed the demand for consumer loans among individuals (Shahini, 2019).

1.1.2 Regional Perspective of Macroeconomic Factors and Mortgage Financing

In Africa, the mortgage sector is a reflection of the various nations' economic performance. This is because challenges facing the mortgage industry mostly emanate from the economic downturns in a given country. The current form of the mortgage sector in the various African countries such as Ghana, Namibia and Botswana requires an intervention to enhance its growth. Nubi (2016) suggests that the interventions should also include policy enforcement to ensure that even the low-income earners become participants in the industry. Moss (2016) noted that the mortgage industry faces a myriad of challenges including insufficient funds, high rates of defaults, and economic turbulence.

In Ghana, the nation experienced political instability and economic decline which negatively affected the banking sector. The mortgage sector was also affected and there was reduced uptake of mortgage loans (Moss, 2016). Mohammed (2014) noted that the housing finance corporation in Ghana was not successful in addressing the issue of the housing shortage. On the other hand, Nigerian housing became more modernized but its progress was impeded by the high cost of land in the urban regions and inadequate real estate developers.

The Nigerian mortgage-banking sector began in 1956 with the formation of the Nigerian Building Society, which is currently known as the Federal Mortgage Bank of Nigeria (FMBN). Until the Mortgage Institutions Act No. 53 of 1989, which established the

regulatory framework for the establishment of Primary Mortgage Institutions (PMIs) by private entrepreneurs, FMBN was Nigeria's only primary institution specialising in retail mortgage banking, according to Agusto & Co Research (2011). The key mortgage institutions (building societies), commercial banks, the Federal Mortgage Bank of Nigeria, private developers, and corporate-sponsored cooperatives were the industry's major market participants. There is currently no secondary mortgage market in Nigeria. The mortgage financing industry in Nigeria is mostly two-tiered, with the FMBN and Primary Mortgage Banaks (PMBs) serving as middlemen between money savers and consumers.

In South Africa, the government is always ensuring that there is no discrimination by ensuring that there are various mortgage products, suitable for every citizen depending on their preferences. The nation also has policies that provide incentives for the poor, for instance, the capital subsidy scheme (Renke & Steennot, 2020). Nubi (2016), notes that in Tanzania, the mortgage industry is hampered by the absence of policies to govern housing issues. This was contributed largely due to the inaccessibility of credit facilities to low-income earners and their presumptions towards housing. Also, the mortgage facilities are only affordable to high-income earners.

1.1.3 Local Perspective of Perspective of Macroeconomic Factors and Mortgage Financing

The mortgage sector in Kenya began on November 18, 1965, with the foundation of Housing Finance. Over the years, Housing Finance has dominated the mortgage market, continuing to control over 20% of the mortgage industry in Kenya. In 2002, amendments to the Banking Act authorised commercial banks to issue loans with terms longer than five years, allowing them to enter the mortgage industry. The mortgage industry as at December 2012, the total mortgage book was Ksh. 91.2 billion and comprised 16,135 mortgage loans. During the period the average loan size rose from Ksh. 4.1 million to Ksh. 6.6 million. CBK (2009) attribute this to an increase in property prices due to high level of inflation and interest rates in 2011 and 2013. There was also shift in trends towards

variable rate mortgage (ARM) from fixed rate mortgage (FRM) due to volatility in interest rates.

As of December 2016, Central Bank of Kenya (2016) reported that mortgage loan assets totaled 203.3 billion. The volume of mortgage loans originated during the 2015 fiscal year increased by 23%. (Central Bank of Kenya, 2016). However, despite the incremental expansion in the mortgage business, the Central Bank of Kenya observed that it was insufficient to meet the market's needs and that different actions were required to boost the sector's growth (Central Bank of Kenya, 2016). Current urban housing demands are anticipated to be 150,000 units per year, however the production rate of new dwellings is estimated to be between 20,000 and 30,000 units per year, resulting in a housing deficit of over 120,000 units per year. Contrary to predictions, a research by CBK (2018) indicates that the high level of activity in the real estate industry is at odds with the sector's low level of borrowing to support its activities. Kenya has somewhat less than 20,000 mortgage accounts despite the fact that several banks provide mortgage financing since independence.

The property industry in Kenya has seen exponential expansion throughout the years. Despite the market's undersupply, finance costs for constructions remain expensive, particularly for households in the lower market segment. In 2016, the real estate industry contributed 8.2% of Kenya's GDP. The high finance costs involved with real estate development and the housing shortage have proved to be a hindrance to the growth of this industry. To rectify this, the government encouraged real estate investments via REITs, which are traded like stocks and whose shares may be bought and sold by investors. The Capital Markets Authority (CMA) regulates REITs Real Estate Investment Trusts enable fund-raising for development or purchase of real estate from multiple investors. There are only 3 Authorized Real Estate Investment Trusts in Kenya: The ILAM Fahari I-REIT, Acorn Student Accommodation Development Real Estate Investment Trust (Acorn D-REIT) and Acorn Student Accommodation Income Real Estate Investment Trust (ASA I-REIT).

A report by World Bank in 2016 indicated that the Kenyan mortgage market is underdeveloped and it is only affordable to a specific class of citizens with huge incomes, the majority of who are public servants. Despite the demand for the same having been increasing, the uptake has not moved in the same direction leading to a slower pace of development and growth in the mortgage sector.

Kariuki (2017) suggests that there is a need to address issues surrounding the slow growth of the mortgage sector by making loans available and accessible to a wider range of people. The house financing portfolio has remained low with a value of Ksh. 61.5B and less than 15000 mortgage accounts. This is too far below the expectation of over 156000 house units per year. Arvanitis (2013) the average amount of mortgage loan stood at Ksh. 6.6 million, both in banks and at the housing finance cooperation. The repayment of this amount will require installments of Ksh. 90,000 monthly for 20 years and above with a fixed rate of 12%. However, the report emphasized that these facilities, terms and conditions, are only accessible to citizens earning Ksh. 100,000 and over per month. This implies that most professionals still cannot afford the product. This eventually impacts on the level of uptake of mortgage loans and the development of the mortgage sector. (World Bank, 2017) a report revealed that there was a restriction on mortgage lending to 25% but the limit was raised by 15% as a strategy to enhance the development of the sector. Nevertheless, the uptake of mortgages remains low in Kenya contributing 2.5% to the GDP (World Bank, 2017).

The Central Bank of Kenya (CBK) (2012) report revealed factors that slow down the development of mortgage financing. The findings among others reported that the credit risk, high-interest rate, disparities in property pricing and long-term access to funds were some of the factors. The report cited immense variance between the short termed deposits and long-term mortgage loans as a hindrance to growth. The risk of defaulters was also singled out since the relevant bureaus fail to give reliable credit backgrounds. Mortgage lending institutions risk the unfavorable fluctuations in the rate of interest by the Central Bank of Kenya, which eventually affects the profitability of Banks. Hass Consult Survey (2013) in its survey established that the real estate market is characterized by uncertainties

in prices that are set without professional intervention, which in turn has an effect on repayment and the value of the credit. Consequently, the mortgage lending institutions set up a high-risk premium rendering the mortgage facility expensive.

Arvanitis (2013) suggested that citizens and real estate developers in Kenya should be sensitized to alternative and affordable housing options that involve the utilization of less fabricated materials. In addition, Arvanitis (2013) recommended that for the industry to grow, the government ought to invest in and support off-site infrastructure. Furthermore, the availability of long-term funding is a fundamental requirement for mortgage market growth in Kenya, since bank loans themselves can hardly meet the long-term funding nature of the mortgage market.

The National Construction Authority (NCA) in Kenya plays a significant role in the mortgage and housing sectors through its regulatory oversight, capacity building initiatives, and promotion of quality standards in construction (Etyang & Mwengei, 2019). The NCA is responsible for regulating the construction industry in Kenya, ensuring that construction projects adhere to set standards and regulations. This oversight helps maintain the quality and safety of housing units, which is crucial for the mortgage market (Gichuke, 2019).

By enforcing building codes, zoning laws, and construction standards, the NCA contributes to the creation of a conducive environment for mortgage financing. Lenders are more willing to provide financing for properties that meet established safety and quality standards, thereby facilitating homeownership through mortgages (Omboto & Tubey, 2017). The NCA promotes quality assurance in construction through certification programs, inspections, and monitoring of construction projects. By certifying construction professionals and ensuring compliance with quality standards, the NCA helps instill confidence in potential homeowners and mortgage lenders (Lagat et al., 2024).

Improved quality assurance reduces the risk of construction defects and building failures, which can negatively impact the value of properties and undermine the viability of

mortgage financing. Therefore, the NCA's efforts in this regard contribute to the stability and sustainability of the housing and mortgage markets (Otido & Omwenga, 2019).

The NCA engages in capacity building initiatives aimed at enhancing the skills and capabilities of construction professionals, including architects, engineers, and contractors. By providing training, education, and certification programs, the NCA helps improve the competency and professionalism of industry stakeholders. A skilled and competent workforce is essential for delivering high-quality construction projects, which in turn supports the growth of the housing sector and facilitates access to mortgage financing. The NCA's investment in capacity building helps address skill gaps and promotes industry best practices, ultimately benefiting the mortgage market (Omollo, 2019).

Through collaboration with other stakeholders, such as government agencies, industry associations, and financial institutions, the NCA contributes to the development of the housing market. By facilitating dialogue, sharing information, and promoting partnerships, the NCA helps create an enabling environment for investment in housing and mortgage financing (Shalom & Makau, 2023). Additionally, the NCA may advocate for policies and incentives that support affordable housing initiatives, thereby expanding homeownership opportunities and increasing demand for mortgage products (Tanui, 2019). By fulfilling its mandate effectively, the NCA contributes to the growth and sustainability of homeownership and mortgage financing in the country.

1.1.4 Commercial Banking Mortgage Finance

According to statistics from the Central Bank of Kenya (2016), 34 commercial banks provide mortgage services, with the Kenya Commercial Bank being the top lender. According to Ndungu (2017), Kenya mortgage services are available in banks as well as mortgage finance. The state government regulates the provision of mortgage loans. For instance, in 2002, the government stretched the mortgage loan payback period from 5 years to 11-26 years so that the facility could be affordable to a large number of citizens with varying specifications on housing.

On September 18, 2020, CBK announced the licensing of Kenya Mortgage Refinance Company (KMRC) as Kenya's first refinance mortgage corporation to offer long-term funding to main lending institutions (financial institutions and Savings and Credit Cooperatives) to assist the State's Big Four Objective of offering cost-effective homes to a larger segment of Kenya's citizenry (Central Bank of Kenya, 2021). KMRC in collaboration with several stakeholders is putting in place foundations for the eventual standardization of mortgage underwriting practices in Kenya to create efficiencies in participating financial institutions and, ultimately, a seamless experience for the borrower. Providing liquidity financing to Primary Mortgage Lenders entails supporting the development of the housing sector by bringing about a greater supply of housing finance and playing a significant role in increasing affordable housing finance.

Some of the leading Primary Mortgage Lenders in Kenya include Standard chartered bank with 12.2%, Citibank Kenya has 12.5% as the interest rate, Commercial Bank of Kenya at 12.9%, KCB Bank - 13.3%, NIC Bank Kenya - 13.4%, CFC Stanbic Bank Kenya - 14.1%, Barclays Bank of Kenya - 14.4%, Co-operative Bank -14.9%, Consolidated bank - 15.1% and the Housing finance group -13% (which has been in this business for more than a decade) (CBK, 2021). KMRC is currently drawing down funds for lending from the credit lines facilitated by National Treasury to raise long term finance efficiently and sustainably.

1.1.5 Macro-Economic Variables

Macroeconomic variables are factors in the economy affect everybody in the society (Baranidharan & Dhivya, 2020). Chandrashekar and Sakthivel (2018) posits that macroeconomic variables as factors whose slight shift results in a global and material change that is spelt out in the economy or even at the national level and not just at an individualized level. These factors include interest rates, industrial production, inflation rates, fiscal policy, Gross Domestic Product, national income, employment, economic growth rate, international trade, retail sales and business cycle among others. The inflation

rate, interest rates, foreign exchange rate, GDP and money supply are the most influential macroeconomic factors in any economy (Sahoo & Sahoo, 2019).

As per Filotto et al. (2021) the macro-economic variables influence the mortgage and real estate sectors. The available monetary assets in an economy at a certain time period are the money supply or money stock (Yakub et al., 2020). Money supply is a broad measure of money in an economy. The monetary bases such as M1 and M2 are the standard measures of money supply. They can be described as the total amount of currency in circulation and reserve balances (Batarseh, 2021).

Inflation is the persistent rise in the prices of goods and services available in an economy over a certain length of time (Binder & Kamdar, 2022). It is the sustained rise in the prices of a variety of products. For Dharma et al. (2020), inflation is the general price level increase as a result of volume of money and credit compared to the available goods and services. According to Reis (2022) the inflation rate will account for the various changes in the average price level as it is based on a price index. High inflation erodes the purchasing power of money, leading to higher costs for goods and services, including housing. As inflation rises, mortgage lenders may increase interest rates to compensate for the decreased value of money over time, making mortgage financing more expensive (Rogoff, 2022). Candia et al. (2021) showed that the level of inflation in an economy is arrived at by measuring the changes in the Consumer price index (CPI). The index is a measure of the prices of retail of those goods and services that are purchased by households in the economy. Adding total consumer, investment, government spending and exports less the value of imports arrives at the GDP. The amount of interest to be paid is determined by a specified percentage for a particular period of time (Kitrar & Lipkind, 2021).

As per Mattick (2020), the rates of interest are a representation of the cost of borrowing the capital for a period. Blanchard (2019) noted that borrowers pay for the use of money lent at a higher rate than the amount borrowed. The rates of interest are used to compute the charge. Brunnermeier and Koby (2018) noted that interest rate is the cost that the

borrower pays the lender for the borrowed finances for an agreed period of time. Interest rates directly influence the cost of borrowing money. When interest rates are low, borrowing becomes cheaper, encouraging individuals and businesses to take out mortgages to purchase homes or invest in real estate. Conversely, high interest rates increase the cost of borrowing, which can deter borrowing and investment in real estate (Beutler et al., 2020).

Oduwole and Adenomon (2022) stated that GDP is the primary measure of an economy's performance. Rawski (2018) defined GDP as a measure of overall economic activity. Gleditsch (2017) described GDP as the market value of the entire amount of final goods and services that are produced in a country for a length of time. Krausmann et al (2019) defined GDP as the entire total market value of all the final goods and services that are produced in a nation in a given year. It can also be described as the final value of the services and goods that are produced in the boundaries of a country within a particular period.

According to DeRock (2021) GDP measures the total value of goods and services produced within a country's borders over a specific period. A growing GDP typically indicates a healthy economy with increased consumer spending and investment. In such an environment, demand for housing tends to rise, leading to higher demand for mortgage financing.

Money supply refers to the total amount of money available in an economy at a given time, which includes currency in circulation, demand deposits, and other liquid assets (Ekpeyong et al., 2020). It is a key determinant of the overall level of economic activity and can have significant implications for mortgage financing. Changes in the money supply can influence interest rates, particularly short-term rates controlled by central banks. When the money supply increases, central banks may implement monetary policy measures such as lowering interest rates to stimulate borrowing and economic activity. Lower interest rates make borrowing cheaper, including mortgage loans, which can lead to increased demand for mortgages. An ample money supply generally translates to

increased liquidity in financial markets, which can make it easier for banks and financial institutions to extend credit, including mortgage loans. When there is abundant liquidity, lenders may be more willing to offer mortgage financing to borrowers, leading to expanded access to housing finance.

Monetary policy in Kenya is primarily formulated and implemented by the Central Bank of Kenya (CBK). The CBK's monetary policy aims to achieve price stability, support economic growth, and maintain stability in the financial system. One of the tools commonly used by the CBK to influence monetary conditions is the issuance and management of treasury bills (Nyamongo, Maana & Kamau, 2021). Treasury bills (T-bills) are short-term debt instruments issued by the government to raise funds from the public. They typically have maturities ranging from 91 days to 364 days. When the CBK issues T-bills, it essentially absorbs liquidity from the financial system, reducing the amount of money available for lending by commercial banks. This action is known as open market operations and is used by the CBK to regulate the level of money supply in the economy (Yigermal, 2017).

When the CBK sells T-bills to commercial banks and other investors, it drains liquidity from the banking system, leading to an increase in short-term interest rates. Higher interest rates make borrowing more expensive for commercial banks, including for mortgage lending. As a result, the growth of mortgages may slow down, helping to moderate excessive credit expansion and potential inflationary pressures in the economy (Abdelsalam et al., 2020). By adjusting the supply of money through T-bill operations, the CBK can influence inflationary pressures. If the economy is overheating and inflation is rising above the target range, the CBK can sell T-bills to mop up excess liquidity, thereby curbing inflationary pressures. Controlling inflation is crucial for maintaining the purchasing power of the currency and ensuring stability in the housing market, including the growth of mortgages (Itimu & Abdul, 2018).

Effective monetary policy, including the issuance of T-bills, can also help stabilize exchange rates. When the CBK tightens monetary policy by selling T-bills and reducing

money supply, it can help prevent excessive depreciation of the currency. Stable exchange rates provide certainty to lenders and borrowers in the mortgage market, reducing currency risk and supporting the growth of mortgage financing. By moderating the effects of macroeconomic variables such as interest rates, inflation, and exchange rates, effective monetary policy contributes to overall economic stability. A stable macroeconomic environment is conducive to sustainable growth in the housing market, including mortgage financing. It fosters investor confidence, encourages long-term investment in real estate, and supports the expansion of homeownership opportunities (Yigermal, 2017).

1.2 Statement of the Problem

Despite the critical role mortgage financing plays in providing access to affordable housing in Kenya, the growth of this sector has been sluggish, even with Central Bank interest rate capping measures in place. This decline in mortgage accounts, as evidenced by decreases in customer numbers at leading mortgage lenders like KCB Bank and Housing Finance, underscores a pressing issue (CBK, 2017). The stagnation in mortgage financing growth not only undermines the objectives of Vision 2030, which emphasizes affordable housing as a cornerstone for national development, but also poses significant challenges to individuals and the economy at large (Ochieng, Mbatha & Syagga, 2017).

The repercussions of poor mortgage financing are multifaceted, impacting access to affordable housing, economic growth, homeownership rates, inequality, and financial stability. This situation leads to a vicious cycle where individuals struggle to repay loans, leading to defaults and foreclosures, thereby affecting property values and increasing financial strain on both homeowners and lenders (Feather & Meme, 2018).

While previous studies in Kenya have explored various aspects of mortgage financing, including the relationship between property prices and real estate financing or mortgage lending, there remained a gap in understanding the influence of macroeconomic factors, such as interest rates, money supply, inflation rates, and exchange rates, on the growth of mortgage financing (Jumbale, 2016; Muli, 2016; Leonard & Owiti, 2013; Agao, 2014).

Additionally, the role of monetary policy as a potential moderator of these macroeconomic factors on mortgage financing growth had not been adequately explored.

Therefore, this study aimed to address this gap by examining the linkages between macroeconomic factors and the growth of mortgage financing among commercial banks in Kenya. Specifically, it sought to assess the impact of interest rates, money supply, inflation rates, and exchange rates on mortgage financing growth, while also exploring how monetary policy moderate these effects. By doing so, this research aimed to provide insights that can inform policymakers, financial institutions, and other stakeholders in devising strategies to stimulate the growth of mortgage financing in Kenya, thus contributing to the realization of Vision 2030 goals and fostering sustainable economic development.

1.3 Research Objectives

This section outlines the objectives, which the study addresses.

1.3.1 General Objective

The study's general objective was to find out the effect of macroeconomics factors on the growth of the Mortgage financing among commercial banks in Kenya.

1.3.2 Specific Objectives

i. To examine how interest rates affect the growth of mortgage financing among commercial banks in Kenya.
ii. To examine how economic growth affect the growth of mortgage financing among commercial banks in Kenya.
iii. To establish if the supply of money has any effect on the growth of mortgage financing among commercial banks in Kenya.
iv. To determine if the inflation rate has any impact on the development and growth of mortgage financing among commercial banks in Kenya.

v. To assess whether exchange rates have any impact on the growth of mortgage financing among commercial banks in Kenya.

vi. To test the moderating effect of monetary policy on the effect of macroeconomic factors on growth of mortgage financing among commercial banks in Kenya.

1.4 Research Hypotheses

This study was guided by the following research hypotheses;

H_{01}: Interest rate has no effect on the growth of mortgage financing among commercial banks in Kenya.

H_{02}: Economic growth has no effect on the growth of mortgage financing among commercial banks in Kenya.

H_{03}: Money supply has no effect on the growth of the mortgage financing among commercial banks in Kenya.

H_{04}: Inflation rate has no effect on the growth of the mortgage financing among commercial banks in Kenya.

H_{05}: Exchange rate has no effect on the growth of the mortgage financing among commercial banks in Kenya.

H_{06}: Monetary policy has no moderating effect on the effect of macroeconomic factors on growth of mortgage financing among commercial banks in Kenya.

1.5 Significance of the Study

The study findings, conclusions and recommendations may be essential for the different entities that are actively involved in the providing products and services towards mortgage financing in Kenya. These include the regulators, commercial banks, investors, scholars and other stakeholders across the world.

1.5.1 Regulators

The findings from the study may be used by various regulators in different jurisdictions to improve on their mortgage financing approaches and create additional prudential guidelines and policies which may help spur growth unnecessary among the commercial banks and. Central banks of Kenya as a regulator of commercial banks may understand the importance of adjusting their regulations actively and pre-emptively to offset the incipient inflationary or deflationary pressures which affect mortgage financing. The regulations may help to put macro-economic factors to manageable levels which in turn could boost financial performance of commercial banks through an increase of investors entering the mortgage sector through the banking industry.

1.5.2 Commercial Banks

The findings of this study may assist the banks to monitor the key macro-economic factors and understand; the extent to which these factors affect mortgage financing of commercial banks. Commercial banks may easily determine the necessity of seriously taking into account the various market trends as far as the macro economic factors are concerned in order to remain competitive. Commercial banks may be made to understand better the macroeconomic factors that affect mortgage financing in a view of increasing the numbers of those accessing mortgage financing and the courses against the same. Further, to identify measures that can be put in place to avoid unnecessary negative fluctuations brought about by the macro-economic factors under the study.

1.5.3 Investors/Customers

Information acquired from this study may help the investors and customers understand the key macroeconomic factors and how they affect the mortgage financing among commercial banks in Kenya, on the other hand strengthening in the banking industry on how to overcome the effect of factors under study which may lead to the risk of default or otherwise. As a result, they may make informed investment decisions.

1.5.4 Scholars

This study sought to fill the gap that exists in the literature concerning the effect of macro – economic factors on the financing of mortgages among the commercial banks in Kenya. The findings may add to the already existing body of knowledge in the field of mortgage financing. In addition, the study may provide for opportunities for further research in the area of mortgage financing among the banking sector in Kenya.

1.5.5 Policy makers

The information gotten from this study may be useful tool to policy-makers in the banking sector especially commercial banks in Kenya to strengthen policy considerations and regulatory framework. Such policy improvement and regulations may come in handy in ensuring better financial performances in commercial banks and other financial institutions. As a result, this may improve the management of commercial banks and the financial services being provided which may improve the investor attitude in turn this may lead to the growth of the mortgage sector among the banking sector.

The study on macroeconomic factors and the growth of mortgage financing of commercial banks in Kenya can provide valuable insights and evidence-based recommendations to the National Construction Authority, enabling informed decision-making, policy formulation, and collaboration with stakeholders to address housing challenges and promote sustainable development.

1.6 Scope of the Study

The study focused on the effect of macroeconomics factors on the growth of the Mortgages among commercial banks in Kenya. The macroeconomics factors of focus were; interest rates, economic growth, money supply, inflation rate and exchange rates. The study also focused on the moderating effect of monetary policy on the effect of macroeconomic factors on growth of mortgage financing among commercial banks in Kenya.

The study targeted the 43 commercial banks in Kenya. The Central Bank of Kenya and financial statements obtained the data from both the annual financial reports by the commercial banks. The data collection covered a five (10) year period from 2014 to 2023. This period of years was selected for the study in order to establish the changes in commercial bank over time and to base the analysis on as recent data as possible. The study considered a period of ten years to be adequate as it provides enough data points to identify the underlying trend and assess its direction and magnitude.

This could also be important since several banking regulations for financial institutions had been put in place while there are many other factors that can affect financing services of a financial institution. A case in point being the two regime of Central Bank of Kenya, one before the interest rate cap and after the interest rate cap. The study only focused on the macro- economic factors that have been used by earlier scholars, and those consistent with available theories and could be identified from the financial statement of commercial banks in Kenya. Macro-economic factors used in the study were; interest rates, money supply, inflation rate and exchange rate while mortgage financing measures to be used were; percentage interest rate changes, inflation rate, overall productivity mortgage outstanding and growth rate and housing sales. The study utilized secondary data obtained from both commercial banks and CBK reports.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Theoretical and empirical literature of the study was reviewed. Based on the literature, a conceptual framework was developed, which formed the basis for data analysis. The chapter is organized as follows: theoretical literature review, conceptual framework, and empirical review, critique of existing literature.

2.2 Theoretical Review

This section reviews relevant theories in the area of mortgages. The Loanable Funds Theory, Neoclassical Growth Theory, Quantity Theory of Money Demand, Fisher's Effect Theory, Purchasing Power Parity Theory, The Title theory and the Keynes's theory of monetary policy are the theories discussed in this section.

2.2.1 Loanable Funds Theory

The Loanable Funds Theory is a foundational economic concept that explains how interest rates are determined in a market economy (Kohn, 1981). According to this theory, interest rates are determined by the supply and demand for loanable funds in the financial market. The supply of loanable funds comes from savers who deposit their money in banks, invest in bonds, or engage in other forms of saving. The demand for loanable funds comes from borrowers who seek to finance investments, such as purchasing homes, starting businesses, or funding government projects (Bertocco, 2013).

In the context of mortgage financing, the Loanable Funds Theory guides how changes in interest rates affect the growth of mortgage financing. When interest rates are high, the cost of borrowing increases, leading to a decrease in demand for loans, including

mortgages. Conversely, when interest rates are low, borrowing becomes more affordable, stimulating demand for mortgages (Tsiang, 1989).

When interest rates are low, individuals are more inclined to take out mortgages to purchase homes or invest in real estate. Lower interest rates reduce the cost of borrowing, making homeownership more affordable and attractive. As a result, there is an increase in demand for mortgages, leading to growth in mortgage financing (Bailey et al., 2019).

Lower interest rates may also influence the behavior of savers and investors. With lower returns on savings accounts and other fixed-income investments, individuals may be less inclined to save and more willing to invest in riskier assets, including real estate. This can lead to an increase in the supply of loanable funds available for mortgage financing (Harris, 1989).

Central banks play a significant role in shaping interest rates through monetary policy tools such as setting the benchmark interest rate or conducting open market operations. By adjusting these policy tools, central banks can influence the overall level of interest rates in the economy, thereby affecting the cost of mortgage financing (Green & Shoven, 1983).

Changes in interest rates can have both short-term and long-term effects on the growth of mortgage financing. In the short term, fluctuations in interest rates may lead to changes in mortgage demand and lending activity. In the long term, sustained changes in interest rates can impact housing affordability, homeownership rates, and the overall health of the mortgage market (Di Maggio et al., 2019). The Loanable Funds Theory provides a framework for understanding how changes in interest rates influence the growth of mortgage financing. By considering the dynamics of supply and demand for loanable funds, policymakers, financial institutions, and individuals can better anticipate and respond to fluctuations in interest rates and their impact on the housing market.

2.2.2 Neoclassical Growth Theory

Neoclassical Growth Theory, also known as the Solow-Swan model, was developed by economists Robert Solow and Trevor Swan in the 1950s. This theory provides a framework for understanding long-term economic growth by focusing on the accumulation of capital, technological progress, and steady-state equilibrium (Solow, 1956).

One of the central principles of neoclassical growth theory is the role of capital accumulation in driving economic growth. According to this theory, increases in the stock of physical capital, such as machinery, equipment, and infrastructure, contribute to higher levels of output and income over time. Capital accumulation is driven by saving and investment decisions made by households, firms, and governments. Neoclassical growth theory assumes that the marginal productivity of capital diminishes as the stock of capital increases. In other words, each additional unit of capital contributes less to output growth than the previous unit. This principle reflects the idea that there are limits to the productivity gains that can be achieved through capital accumulation alone (Ugwuanyi & Ugwunta, 2017).

While capital accumulation is important for economic growth, neoclassical growth theory also emphasizes the role of technological progress. Technological advancements enable firms to produce more output with the same amount of inputs, leading to increases in productivity and economic growth. In the neoclassical model, technological progress is often treated as exogenous, meaning it occurs independently of economic factors.

Neoclassical growth theory suggests that economies converge to a long-run equilibrium state known as the steady state. In the steady state, the growth rates of output, capital, and population stabilize, and the economy reaches a balanced level of consumption and investment. In this equilibrium, the marginal product of capital equals the economy's savings rate and population growth rate.

The Solow-Swan growth model predicts that in steady-state equilibrium the level of GDP per capita is also determined by the prevailing technology and the exogenous rates of saving, population growth and technical progress (Dewan & Shajehan, 2001). The economic growth theory further states that economic growth paths usually consist of short periods of collapse and longer periods of relatively stable growth although patterns and paces vary significantly from country to country (Dellink, Chateau, Lanzi & Magné, 2017).

The theory assumes that economic growth is driven by the accumulation of physical and human capital. This means that countries that invest in infrastructure, education, and other forms of capital will experience higher rates of economic growth. The theory also assumes that technological progress is a key driver of economic growth. Countries that invest in research and development, and adopt new technologies, are more likely to experience higher rates of economic growth. The theory further assumes that free markets are the most efficient way to allocate resources and promote economic growth. This means that policies that promote free trade, deregulation, and competition are likely to be beneficial for economic growth (Osiobe, 2019).

The theory also holds the assumption that individuals and firms behave rationally and make decisions based on their self-interest. This means that policies that provide incentives for individuals and firms to invest in capital and technology will be more effective than policies that rely on government intervention. More so, the theory assumes that a stable macroeconomic environment, characterized by low inflation, low unemployment, and stable interest rates, is necessary for sustained economic growth. This means that policies that promote macroeconomic stability are likely to be beneficial for economic growth (Van den Berg, 2016).

While the Economic Growth Theory has contributed to our understanding of economic growth, it is not without its flaws. The theory assumes that economic growth is always beneficial, but it fails to account for externalities such as pollution, climate change, and other negative impacts of growth on the environment and society. He theory assumes that

the benefits of economic growth will trickle down to all members of society, but this is often not the case. In reality, economic growth can exacerbate income inequality and lead to social unrest (Lewis, 2013).

Economic growth affects performance of all economic sectors and economic growth forms the basis of asset allocation decisions. Thus, mortgage products are also affected by economic performance of a country since economic growth affects the disposable income of the population, which influences mortgage affordability. This theory therefore underpins the economic growth variable.

2.2.3 Quantity Theory of Money

The Quantity Theory of Money Demand was founded by Fisher (1911) and explains the relationship between the supply of money in an economy and the demand for money by individuals and firms. According to this theory, the demand for money is directly proportional to the level of nominal income in the economy (Marcuzzo, 2017). According to theory, the money demand is subject to the transactions volume. This means that people demand for cash is a function of what they need for transactions. The association between the two can be illustrated as $MV = PT$. According to Fisher (1911) individual want money to conduct transactions and this demand is not responsive to changes in interest. The Cambridge school later altered or rather modified the equation so that T was replaced with Y.

Thus, Y which denotes output is a function of T since the more production in an economy, where more products and services are acquired. The equation of exchange becomes: MV=PY After modification, it then follows that there is equilibrium, where the money demanded should equal the supply of money. In case of a slight change in the money supply, the equilibrium is affected, when interests on loan changes upward, the mortgage facility will no longer appealing to investors (Grubb, 2019).

The theory assumes that; the velocity of money is constant i.e. that the speed at which money circulates in the economy is fixed and does not change with changes in the money supply, however, in reality, the velocity of money fluctuates, making the QTM less accurate. It assumes that real output is fixed, i.e. that the level of real output, or the amount of goods and services produced in the economy, remains constant in the short run, money is neutral, i.e. that changes in the money supply only affect nominal variables (such as prices and wages) and do not affect real variables (such as output and employment), people hold money for transactions purposes i.e. that people hold money only for transaction purposes and not for speculative purposes, and there is perfect foresight where individuals in the economy have perfect foresight and can accurately predict future events, such as changes in the money supply (Marcuzzo, 2017).

The QTM focuses solely on monetary factors and neglects the role of real factors, such as productivity, technology, and resources. These real factors can affect the price level independently of changes in the money supply. The QTM assumes that markets are perfectly competitive, however, in reality, markets are not always perfectly competitive, and prices and wages may not adjust immediately (Grubb, 2019).

The money supply in the economy is determined by the actions of the central bank, which controls the money supply through its monetary policy tools. The central bank can increase the money supply by purchasing government securities or other financial assets from banks, which increases the reserves of these banks and allows them to lend more money. The theory is linked to the money supply variable.

2.2.4 Fisher's Effect Theory

This theory was founded by Irving Fisher (1960) it explains the link that exists between inflation, real interest and nominal rates of interest. A country's or more countries' nominal rates of interest should be equal to the sum of needed actual return to the investors and caution the anticipated inflation amount per Nation (Dimand, 2003). According to Fama and Schwert (1977), with a perfect market, the stocks prices gets adjusted in a way

that expects nominal return from t-1 to t, is the total sum of the appropriate equilibrium expected on real rate and the markets' assessment of expected inflation rate for the same time period (Fama & Schwert, 1977).

According to the fisher effect theory, shares are used as hedges against inflation because they represent claims to real assets, which suggest a positive share price is correlated to the expected inflation (Demand, 2003). Real money is made less valuable in future by inflation and it is factored that is put into consideration when determining the nominal interest rate. Thus; nominal rate = real rate + inflation rate.

The theory assumes that money is the only factor that affects the price level however there are many other factors that can affect the price level, such as changes in technology, productivity, and resource availability. The study assumes that money is neutral in the long run, meaning changes in the money supply only affect nominal variables (prices, wages, etc.) and not real variables (output, employment, etc.) however, changes in the money supply can affect real variables in the short run, such as output and employment (Dimand, 2019).

The study assumes that there is a stable relationship between the quantity of money and the price level and that people hold money for transaction purposes and for its purchasing power, and they adjust their money holdings based on changes in the interest rate. However, the relationship between the quantity of money and the price level is not always stable, as it can be affected by changes in the velocity of money (how quickly money changes hands) and changes in the demand for money (Cochrane, 2018). In addition people do not only hold money for transaction purposes and for its purchasing power. In reality, people also hold money for speculative purposes and for other reasons not related to transactions. This theory was deemed viable to this study as it addresses the inflation variable. Inflation rate is influenced by demand-pull and cost push of goods and services within an economy. The theory is linked to the inflation rate variable.

2.2.5 Purchasing Power Parity Theory

Purchasing Power Parity (PPP) is Gustav Cassel developed a theory of exchange rate determination in its modern form in 1918. The theory suggests that in the long run, exchange rates between two countries will equalize the price levels of a basket of goods in both countries. In other words, PPP theory suggests that the exchange rate between two currencies should adjust so that the same product or service would cost the same amount in both countries, when expressed in the same currency (Bahmani-Oskooee, Chang & Lee, 2016). The theory assumes that the actions of importers and exporters (motivated by cross-country price differences) induce changes in the spot exchange rate. In another vein, PPP suggests that transactions on a country ‘s current account affect the value of the exchange rate on the foreign exchange (Forex) market. This is in contrast with the interest rate parity theory, which assumes that the actions of investors (whose transactions are recorded on the capital account) induce changes in the exchange rate. PPP theory is based on an extension and variation of the ―law of one price as applied to the aggregate economy (Devereux & Engel, 2016).

To explain this theory, it is best to first review the idea behind the law of one price. Purchasing power parity is both a theory about exchange rate determination and a tool to make more accurate comparisons of data between countries. It is probably more important in its latter role since as a theory it performs pretty poorly. Its poor performance arises largely because its simple form depends on several assumptions that are not likely to hold in the real world and because the amount of foreign exchange activity due to importer and exporter demands is much less than the amount of activity due to investor demands. Nonetheless, the theory remains important to provide the background for its use as a tool for cross-country comparisons of income and wages, which is used by international organizations like the World Bank in presenting much of their international data.

The theory assumes that there are no trade barriers or transportation costs, and that the goods in the basket are identical across all countries (Huerta, Swartz & Lilja, 2022). In practice, however, there are many factors that can prevent PPP from holding true in the

short run, such as tariffs, taxes, and differences in the quality of goods. Despite its limitations, PPP theory remains a useful tool for comparing the relative costs of living between countries and for predicting long-term changes in exchange rates. The theory guided the exchange rate variable of this study.

2.2.6 Title Theory

The Title theory on the other hand was introduced by Gilbert (1968) and states that after making the mortgage, the mortgagor passes title of the property, the subject of the mortgage, to the mortgagee, subject to a condition subsequent (Nwankwo, 2014). In a title theory bank, the mortgage is treated as having transferred title to the mortgage, subject to the mortgagee's duty to recovery if payment is made. The title is said to remain in the mortgagee until the mortgage has been satisfied and foreclosed. Although the mortgagee has the right of possession to the property, there is generally an express agreement giving the right of possession to the mortgagor (Makori & Memba, 2015).

Title theory gives the mortgage some type of legal title to the property. Under the theory, the mortgagee has the right upon foreclosure, to possession and rents on the property (Jennings, 2013). In the title theory of mortgages, title is usually vested in the lender when the mortgage loan is made and reconveyed to the borrower when the loan is repaid. In addition to having title, the lender is empowered to take certain steps in the event that the borrower defaults (Brueggeman & Fisher, 2018).

In title theory, the property-law doctrine states that a mortgage transfers title to a property to the mortgagee, who holds it until the mortgage has been paid off, at which time title passes to the mortgagor (Akenga, Olang & Galo, 2015). The rationale behind the title theory is that up until default and subsequent foreclosure, the mortgagor maintains full control and possession of the property.

The practical application is that a mortgagor can otherwise deal with the property as his own estate, conditioned on the mortgage (Morgan, 2015). Although the mortgagee has the

right of possession to the property, there is generally an express agreement giving the right of possession to the mortgagor. The mortgagee is said to hold the title for security purposes only, the mortgagor is given the right of possession (Buckely & Kalarickal, 2004).

In this study this theory assisted the researcher find out how the various securities are going to influence the access of funds or mortgage loans as guarantees for repayment on the other hand safeguarding the financial institutions against nonperforming loans. In the long run it determines who will access the finances thus more or fewer people will be given mortgage finance thus having an effect on the mortgage uptake.

2.2.7 Keynes's Theory of Monetary Policy

Keynes's theory of monetary policy provides insights into how changes in monetary policy can influence economic activity, including the growth of mortgage financing. Keynesian economics emphasizes the role of aggregate demand in driving economic output and employment, and it suggests that changes in the money supply and interest rates can affect overall spending and investment decisions in the economy (Dickens, 2011).

Keynesian economics highlights the importance of interest rates in influencing investment decisions, including those related to mortgage financing. According to Keynes, changes in interest rates can affect the cost of borrowing for households and businesses, influencing their decisions to invest in housing and other real estate assets. Lower interest rates, for example, can stimulate demand for mortgages by reducing borrowing costs and making homeownership more affordable (Bibow, 2013).

Keynesian theory emphasizes the role of monetary policy in managing aggregate demand to achieve macroeconomic stability. By adjusting the money supply and interest rates, central banks can influence spending patterns, investment decisions, and overall economic activity. During periods of economic downturn or recession, expansionary monetary policy, such as lowering interest rates and increasing the money supply, can stimulate

demand for mortgages and support the growth of mortgage financing (Brunner & Meltzer, 1972).

Keynesian economics advocates for counter-cyclical policy measures to smooth out fluctuations in economic activity. During periods of economic expansion, when inflationary pressures may arise, monetary authorities can implement contractionary monetary policy measures, such as raising interest rates, to cool down demand and prevent overheating in the housing market. Conversely, during economic downturns, expansionary monetary policy can help support mortgage lending and housing demand to stimulate economic recovery (Dalziel, 2002).

Keynesian theory also emphasizes the importance of coordination between monetary and fiscal policy measures to achieve macroeconomic objectives. In the context of mortgage financing, fiscal policy measures, such as government incentives for homebuyers or subsidies for affordable housing programs, can complement monetary policy actions aimed at promoting mortgage lending and homeownership (Bibow, 2013).

Keynes's theory of monetary policy provides a framework for understanding how changes in monetary policy instruments, such as interest rates and the money supply, can influence the growth of mortgage financing by affecting borrowing costs, investment decisions, and overall economic activity. By considering Keynesian principles, policymakers can design and implement effective monetary policy strategies to moderate the impact of macroeconomic factors on mortgage financing and support sustainable economic growth.

2.3 Conceptual Framework

A conceptual framework is a representation of the ideas diagrammatically that are gathered from various sectors of choice to illustrate the relationship that exists among variables (Childs, 2018). A conceptual framework has potential to be used as a tool to assist the researcher to make meaning of the findings. It forms part of the agenda for the items to be scrutinized, reviewed, tested and reorganized for purposes of the study's

instigation; it explains the possible linkages between the variables (Durham & Stokes, 2015). The framework represents the theoretical outlook of the study, which indicates the connectivity between the variables under study (Sykes & Piper, 2015). Conceptual frameworks are pivotal to research as they clarify and integrate philosophical, methodological and pragmatic aspects of doctoral thesis while helping the profession to be seen as a research-based discipline, comfortable with the language of meta-theoretical debate (Sykes & Piper, 2015).

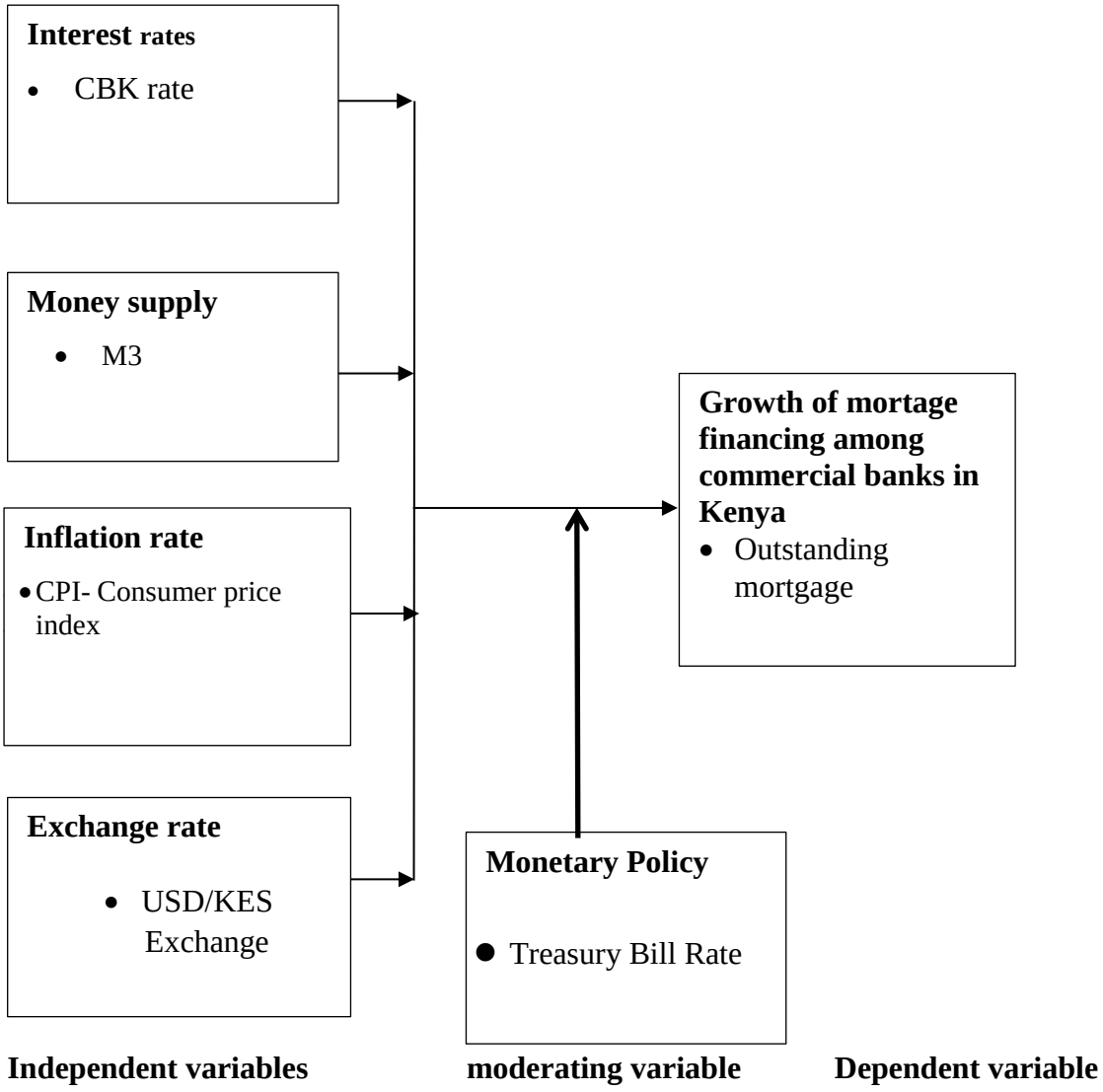

Figure 2.1: Conceptual Framework

2.3.1 Interests Rate

Interest rate is the amount a borrower pays a financial institution for the usage of borrowed funds (Gonzalez-Vega, 2021). Typically, interest rates are given as a percentage over a one-year period. The most prevalent mortgage kinds are fixed-rate and adjustable-rate mortgages (Albertazzi et al., 2020). Moreover, he noted that fixed-rate mortgages are the most frequent form of mortgages since the borrower pays the same interest rate throughout the life of the loan, regardless of fluctuations in market interest rates. The interest rate on

an adjustable-rate mortgage (ARM) fluctuates throughout the life of the loan. ARMs have lower interest rates than fixed-rate mortgages since the borrower assumes a portion of the market risk. The negative correlation between interest rates and bond prices creates market risk.

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 (Ampofo, 2020). 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 Kish (2022), 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 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.

2.3.2 Economic Growth

Economic growth is the increase in the standard of living in a nation's population with sustained growth from a simple, low-income economy to a modern, high-income economy (Acharya & Pathak, 2019). The growth of an economy is thought of not only as an increase in productive capacity but also as an improvement in the quality of life to the people of that economy. Many countries were facing financial constraints particularly developing countries like Kenya, where bank loans are restricted to some favorable groups of

companies and personage investors. There exist models of economic growth based on reasonable looking axioms that predict the cessation of growth in a few decades, or that predict the rapid convergence of the living standards of different economies to a common level, or that otherwise produce logically possible outcomes that bear no resemblance to the outcomes produced by actual economic systems (Stenberg et al., 2017).

In weakening economy investors require a higher risk premium on firms with distress characteristics (O'Sullivan, Arthur & Sheffrin 2003). Gross domestic product is defined as the monetary value of all the finished goods and services produced within the country borders in a specific time period. This includes value of production of monetary and non-monetary goods and services within a country. An alternative concept, gross national product, or GNP, counts all the output of the residents of a country.

After independence, Kenya promoted rapid growth through public investments, encouragement of smaller holder agricultural production, and incentives for private (often foreign) industrial investment. Gross domestic product (GDP) grew at an annual average of 6.6% from 1963 to 1973. Agricultural production grew by 4.7% annually during the same period, stimulated by redistributing estates, diffusing new crop strains, and opening new areas to cultivation. Between 1974 and 1990, however, Kenya's economic performance declined. Kenya's inward-looking policy of import substitution and rising oil prices made Kenya's manufacturing sector uncompetitive. The government began a massive intrusion in the private sector. Lack of export incentives, tight import controls, and foreign exchange controls made the domestic environment for investment even less attractive (KNBS, 2013).

2.3.3 Money Supply

Money supply can be defined as the total stock of money circulating in the economy. The circulating money involves the currency, printed notes, money in the deposit accounts and in the form of other liquid assets. Valuation of the money supply helps analysts and policy makers to frame the policy or to alter the existing policy of increasing or reducing the

supply of money. The valuation is important as it ultimately affects the business cycles and thereby affects the economy (Okereke et al., 2021).

There are several standard measures of the money supply, including the monetary base, M1, M2 and M3. The monetary base defines the sum of currency in circulation and reserve balances (deposits held by banks and other depository institutions such as micro-financing institutions in a given country (Colunga Ramos & Valcarcel, 2020). M1 is defined as the sum of currency held by the public and transaction deposits at the depository institutions), financial institutions which obtain their funds mainly through deposits from the public, such as commercial banks, savings and loans associations, savings unions and credit unions.

M2 refers to M1 plus deposits issued in amounts less than $ 100,000 standard currency and retail market money. Broad money (M3) includes currency, deposits with an agreed maturity of up to two years, deposits redeemable at notice of up to three months and repurchase agreements, money market fund shares/units and debt securities up to two years (Iranmanesh & Jalaee, 2021). In Kenya, data on monetary aggregates are reported by the Central Bank of Kenya through its bi-annual monetary policy reports issued under the Central Bank of Kenya Act, CAP 491 (Abdullah & El-Rasheed, 2019).

2.3.4 Inflation Rate

Inflation is persistent increase in prices for abroad range of commodities (Pindyck & Rotemberg, 2019). Inflation is measured by the changes in the Consumer Price Index (CPI), which measures the retail prices of goods and services purchased by households (Forbes, 2019). It is theoretically expected that the higher the inflation rate the higher the house price and therefore the lower the mortgage loan uptake.

Inflation effects on an economy are various and can be simultaneously positive and negative. Negative effects of inflation include an increase in the opportunity cost of holding. According to Dinh (2020) the fall in prices is also a result of economic

depression, which slowdown consumer spending as household no longer borrows in the mortgage market. Higher inflation rate lowers the disposal income and lowers purchasing power of borrowers making mortgage repayment expensive for customer (Yusuf et al., 2021). Large inflows of foreign funds create easy credit conditions for mortgage financing. Adenekan and Itodo (2019) argues that management of exchange rate is necessary to avoid excessive exchange rate induced inflation. Ahmed et al. (2021) says inflation is a systematic risk factor that affects mortgage delinquency and default by increasing nominal interest rates and hence a repayment burden. In the long run however, higher inflation may dampen housing demand therefore, cause a decrease in mortgage loan demand.

2.3.5 Exchange Rate

Typically, banks in developing nations denominate their loans in foreign currencies to mitigate exchange rate risk. In an economy where foreign-currency loans are the primary source of financing economic activity, a depreciation of the local currency produces a negative feedback process that leads to an increase in the probability of default and a drop in mortgage loan demand. Demir and Razmi (2022) suggest that increases in banks' access to foreign currency deposits will lead them to offer more foreign currency mortgage loans. At macroeconomic levels, households will be more likely to request foreign currency mortgage loans if the interest rate differential between local currency and foreign currency credit is high and the volatility of the exchange rate is low. Low credibility of domestic monetary policy makes banks reluctant to lend in local currencies, especially at longer maturities like mortgage loan. Sugiharti et al. (2020) however argue that wholesale foreign currency funding of banks in Eastern Europe is not the key driver of foreign currency dominated loans mortgage.

2.3.6 Growth of Mortgage Financing

Mortgage financing is an important means of financing investment in real estate (Hofman & Aalbers, 2019). 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, 2017). According to Giddings (2017) 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.

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). 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.

2.3.7 Monetary Policy

Monetary policy refers to the combination of measures designed to regulate the value, supply and cost of money in an economy (Bernanke, 2020). It can be described as the art of controlling the direction and movement of credit facilities in pursuance of stable price and economy growth in an economy. Monetary policy covers the monetary aspect of the general economic policy which requires a high level of co-ordination between monetary policy and other instruments of economic policy of the country. The effectiveness of

monetary policy and its relative importance as a tool of economic stabilization varies from one economy to another, due to differences among economic structures, divergence in degrees of development in money and capital markets resulting in differing degree of economic progress, and differences in prevailing economic conditions (Kamaan & Nyamongo, 2014).

2.4 Empirical Literature Review

This section entails the review of past studies on the effect of macroeconomic factors on the development and growth of mortgage financing among commercial banks offering mortgages in Kenya.

2.4.1 Effect of Interest Rates on the Growth of Mortgage Financing

Mixed evidence has been reported by prior studies of the effect of interest rate on banks' profitability, for instance, Rashid and Jabeen (2016) reported a negative effect of interest rate on banks' performance, Yahya, Akhtar, and Tabash (2017) found a positive effect. The high interest rate in Kenya according to Estate, (2016) is among the principal reason as to why the mortgage market remains underdeveloped. Estate (2016) concludes that compared to its counter in Sub-Sahara, (South Africa) which has a mortgage debt to GDP ratio of 20%, Kenya's stands at a mere 4.5%.

The CBK, (2015) also notes that it's significantly smaller compared to that of the US, which stood at 70%. The high interest rate environment is as a result of the high inflation prevalent in Kenya which according to Boamah, (2017) stifles the development of a mortgage market. Boleat, (2014) argues that both high inflation and high interest rates make it difficult to service long term loans while Cytonn, (2015) argues that it has an additional impact of reducing the uptake of mortgage due to the reduced internal rate of return the investor would otherwise receive.

Boleat, (2003) further argues that in order to correct this, the state of borrowing should be around four percent above cost of funding. This is way below Kenya's cost of funding

which according to Cytonn, (2015) hovered around eight to nine percent above cost of funds in the 2015/16 year. IDB (2015) argues that the high interest rate becomes a hindrance to the successful development of the mortgage market in Kenya.

According to IDB (2015), interest rate instability is one of the factors that could explain the small size of the mortgage market in Latin America. The study asserts that the typical annual variation in the real interest rate for borrowing is 5.3 percentage points in Latin American countries, whereas in developed countries it is 1.6 percentage points. In countries like Argentina, Brazil, Ecuador, and Peru, the typical real interest rate variation in the previous decade was between 17 and 18 percentage points, and only in Belize and Panama was it similar to or less than in AR developed countries.

Green and Wachter (2017) emphasize on the availability and cost of mortgages as crucial determinants in the functioning housing markets across countries. They cited the decline in nominal prime interest rates from an average of 15 percent in 1980 to 4.4 percent in 2004 across several countries. The major outcome of this was improved access to mortgages, an increase in demand for housing, and increase in house prices across most of the industrialized countries in the world. It was clear from their study that fall in interest rates induces higher demand for mortgages.

Crowley (2017) alludes that before 1980s, the mortgages were only available from the building societies. Later on, there was a deregulation and other institutions came into play and started offering the mortgage services, resulting to a competition. The institutions were banks and other financial institutions. After this event, most of these societies demutualized into public limited companies and were eventually banks. This led to competition in the mortgage sector where mortgages became readily available at the customers' disposal. According to CBK (2017), in a research found majority of the hindrances to mortgage financing being rates of interest and accessibility of long term finances. CBK (2017) interest rate above the rate of inflation is deemed positive and is vital to sustain financing. The reason behind the increased interest rate on mortgage is due to; the speculation for inflation.

Elius (2022) sought the relationship between macroeconomic factors and growth of mortgage financing in Kenya. This study was guided by the monetary theory of inflation, the loanable funds theory, the classical growth theory and the quantity theory of money. The study took a quantitative approach drawn from the positivism research philosophy. Therefore, the study was a time series research design, which was used to track the growth of mortgage financing in Kenya for the last 20 years – from the year 2002 to 2021. The study targeted the time-series quarterly data from CBK for the last 20 years. Items to be collected included the following: quarterly average mortgage interest rate, quarterly Inflation rate, quarterly GDP growth rate, Quarterly M3 (M2 plus large time deposits in banks) and quarterly growth of mortgage financing. The study used secondary data which was extracted from CBK quarterly data reports website for the period 2002 to 2021. The quantitative secondary data was analyzed by use of descriptive and inferential statistics. A 95% confidence interval was the statistical error variance used. Data was coded and analyzed using STATA 14 (or EViews 14.0).

The findings were displayed in the form of spreadsheets, tables, graphs and charts. The findings indicate that lending interest rate and growth of mortgage financing in Kenya are negatively and significantly related. Likewise, inflation rate and growth of mortgage financing in Kenya are negatively and but insignificantly related. However, the findings show that money supply (M3) and growth of mortgage financing in Kenya are positively and but insignificantly related. GDP growth rate and growth of mortgage financing in Kenya from the regression findings are positively and significantly related. Therefore, the study concludes that lending interest rate and inflation rate are negatively and significantly related to the growth of mortgage financing in Kenya. On the other hand, GDP growth rate and money supply (M3) are positively and significantly related to the growth of mortgage financing in Kenya.

Alper et al. (2020) examined the effect of interest rate restrictions in Kenya, which were implemented in September 2016 to lower borrowing costs, expand access to credit, and increase the saving rates. The study conducted an accounting decomposition exercise using bank balance sheets and income statements of the interest rates, loan loss provisions,

operating costs and pretax profit margins on private sector lending. The study discovered that the interest rate control scheme has resulted in a breakdown of loans to SMEs, a dwindling of micro-financial institutions' loan books, and lower debt facilitation. Interest rate caps were also shown to decrease the sensing impact of monetary policy. These findings show that the negative consequences may be avoided particularly if the threshold (cap) was fixed higher enough to enable lending to somewhat high-risk depositors, and that substitute attempts to alleviate the high cost of borrowing could be desired.

Musiaowski (2019) examined how the inflation rate (consumer price index) impacts the cost of an adjustable-rate mortgage from the standpoint of personal finances. The study consisted of two mortgage simulations: one for a mortgage taken out on 1 January 2001 for a 15-year-term and the second one taken out on 1 January 2006 for 10-yearterm. Mortgage models with adjustable rates were employed. The results reveal that as the consumer price index rises, so does the true cost of a loan. That is, there is a negative link between the rate of 28 inflation and mortgage cost-effectiveness. Inflation fell over the evaluation period, lowering both the actual and nominal costs of the loan. The WIBOR 3M rate, on the other hand, has a high positive association with the consumer price index. The link between the consumer price index and the real cost of borrowing was also significant, although unfavourable. Real mortgage rates climbed when the consumer price index fell, and vice versa.

Njoroge (2021) examined the Kenyan residential real estate market from 2005 to 2018 to determine the impact of market prices on the profitability of the Kenyan residential market. Causal research design was employed where 56-market quarterly observations were studied using secondary data techniques. Vector error correction model and autoregressive distributed lag model were used to analyze the data. The data revealed that commercial bank interest rates, consumer price index, currency rate, and stock market prices all had a substantial negative influence. Financial institution lending interest rate, consumer price index, and currency exchange had a long-run negative influence on residential real estate market efficiency to residential property market performance,

whereas stock prices had a long-run beneficial impact on housing property market efficiency.

Olweny (2011) studied the effect of Macro-economic factors on the stock return volatility on the Nairobi Securities Exchange, Kenya. The study focused on the effect of foreign exchange rate, interest rate and inflation rate fluctuation on stock return volatility at the Nairobi Securities Exchange. It used monthly time series data for a ten years period between January 2001 and December 2010. Empirical analysis employed was Exponential Generalized Autoregressive Conditional Heteroscedasticity (EGARCH) and Threshold Generalized Conditional Heteroscedasticity (TGARCH). The main findings of the research study were that IR volatility has a positive correlation with the interest rates that are of short term in nature. A positive and significant correlation existed on volatility and the rates of interest.

Muguchia (2017) sought to find out how, mortgage financing; is influenced by flexible interest rates. The findings of this study conducted on 26 commercial banks in Kenya and the Housing Finance of Kenya relied on secondary data from annual reports of the banks. A negative and significant relationship found in the study variables. Regression analysis was mainly used to reveal that flexible interest rates charged by the financial institutions have a negative effect on mortgage financing. 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 recommended fixed interest rates to be established by the banks so that investors can project and plan the possible interest amount to pay back; hence increasing on the uptake for mortgage.

Ngacha (2013) sought the effects of interest rate volatility on mortgages. The study used a descriptive correlation research design. The population of the study comprised all the forty-four commercial banks and one mortgage finance company registered with the central bank. The study used secondary data collected from the Central Bank of Kenya, Central Bureau of Statistics and Banks published financial statements starting 2008 – 2012. The data obtained was analyzed using multiple linear regression technique. The

study arrived a positive and significant correlation, which exists, between the level of IR and the default rate. The higher in the percentage of interest rate, the level of default in loans will also increase in the same manner.

Ariso (2015) sought the effect of mortgage interest rates on the growth of mortgage financing amongst financial institutions in Kenya for the financial period 2012-2014. The target population was the 44 licensed commercial banks and housing finance company. Data was collected from secondary sources and a descriptive research design was employed. Regression analysis was used to carry out inferential analysis. The regression analysis conducted at level of significance 0.05 revealed a very weak positive relationship between mortgage interest rates and growth of mortgage financing. The analytical model used in the study accounted for only 11 percent of growth of mortgage financing.

Kiguru (2015) assessed the determinants of mortgage uptake in Kenya. The study was guided by the following research questions: The total population for this study comprised of one hundred and fifty respondents. The study adopted a descriptive research design. The sampling technique adopted in this study was simple random sampling. The data analysis involved measures of central tendency and frequencies. The study revealed a negative relationship between mortgage uptake and interest rates.

Omondi (2018) sought to determine the effects of macro-economic variables on mortgage uptake. The study adopted descriptive research design and descriptive statistics, correlation analysis and regression analysis as analytical tools with application of SPSS. The study was conducted in selected mortgage lender institutions of Housing Finance Corporation of Kenya and Kenya Commercial Bank in Nairobi City County. The target population was their employees in Credit department and the target area was all their branches in the four zones of Nairobi of Nairobi North, Nairobi East, Westland, and Nairobi West. 120 employees from Credit sections were selected using clustering and stratified sampling72 from KCB and 48from HFCK each from the two lenders. Both primary and secondary data were used in the study. Primary data was collected using open-

ended questionnaires and closed ended questionnaires. The research finding indicated that mortgage interest rate changes have significant influence on mortgage loan uptake.

2.4.2 Effects of Economic Growth on the Growth of Mortgage Financing among Kenyan Commercial Banks

Numerous studies have used GDP as a macroeconomic factor and a common measure that is used to measure the aggregate economic activity within an economy (Francis, 2013; Marijana & Kristina, 2017; Masood, Ashraf & Turen 2015; Ongore & Kusa, 2013; Pasiouras & Kosmidou, 2007; Petria et al., 2015; Rani & Zergaw, 2017; Saona, 2016; Singh & Sharma, 2016).

Filotto, Giannotti, Mattarocci and Scimone (2018) evaluated the impact of macroeconomic condition and real estate price trend on the amount of residential loan. The study used a sample of 16 European Countries for the time period 2007–2015. The analysis was performed by using a vector autoregressive (VAR) and generalized VAR approach for the full sample and for each country considered. The main results for the long-term horizon are that a GDP shock has a positive and persistent effect on the amount of mortgages, a shock to HPI has a negative and persistent effect on mortgages and a shock to the amount of mortgages seems to have no persistent effect on the GDP or the HPI. Moreover, the analysis shows that a spillover risk among countries exists and a GDP shock in a European area has an effect on the GDP, real estate prices and residential mortgages in almost all European countries.

Filotto et al. (2018) assessed the influence of macroeconomic conditions and real estate price trends on the volume of residential loans. They used a sample of 16 European countries from 2007 to 2015 to examine how changes in gross domestic product (GDP) growth and inflation rates affected the volume of residential loans. The analysis employed a vector autoregressive (VAR) and generalized VAR approach for the entire sample as well as for each individual country. In the short term, shocks to mortgages, the house price index (HPI), and GDP had a positive impact on GDP. A shock to the volume of mortgages

positively influenced mortgage supply, while a GDP shock negatively affected HPI. For the long term, a GDP shock had a positive and persistent effect on the volume of mortgages, whereas a shock to HPI had a negative and persistent effect on mortgages. Surprisingly, a shock to the volume of mortgages appeared to have no persistent effect on GDP or HPI. Additionally, the analysis revealed the presence of spillover risk among countries, where a GDP shock in one European area affected GDP, real estate prices, and residential mortgages in nearly all European countries.

In Brazil, Tabak, Gomes and da Silva Medeiros (2015) studied the relationship between Gross Domestic Product and rate of credit uptake. The data analysis involved Vector Error Correction. The study was based on the assumption that a sound state of the economy would translate into investor optimism towards growth. Due to their high expectation of wealth accumulation in the future, they resort to obtaining credit. The study indicated that, there is a positive and significant relationship that exists between GDP and rate of credit uptake.

Theuns (2012) studied the economic variables that affect mortgage financing. The researcher utilized panel data for the period 2006-2012. Both quantitative and qualitative data was collected meaning a mixed research design was utilized. The independent variables were disposable income and GDP. The linear regression analysis established that the R^2 was 69% meaning that the variation in mortgage financing is explained by; disposable income and GDP. 31% of the variations within the dependent variable were explained by other factors; not within the model.

Muli (2016), on factors influencing the growth of real estate investment within Kenya. The study variables being inflation, GDP, population growth and interest rates. Quantitative research design was used where; study findings showed, greatest influence on gross domestic product, followed by inflation, then interest rate. Jointly, the variables explained 51% of the variations in the increase in growth of real estate. There was no association between population growth and growth in real estate.

2.4.3 Effect of Money Supply on the Growth of Mortgage Financing

Wang, Hao, Tao and Su (2020) adopted a wavelet-based analysis to evaluate whether money supply affects growth drive housing boom in China. After controlling for the simultaneous impact of inflation and interest rates, the correlations become considerably strong in the short term since the early 2000s, which proves for an increasingly close interaction between money supply growth and real estate market. The results provide further evidence of the value of steady money supply growth for the maintenance of healthy and effective operation of the real estate market. Moreover, appropriate signal released by monetary authorities is rapidly assimilated by the real estate market, which highlights that policy adjustments should focus on the short term horizons in order to improve policy pertinence and flexibility.

Zhu, Betzinger and Sebastian (2017) investigated how monetary policy stance and mortgage market structure affect non-fundamental house price movements in eleven Euro area countries. Based on a three-stage approach, the empirical evidence suggests that a one-time monetary-easing shock can significantly trigger house price booms in Euro area countries with liberal mortgage markets. Such shocks can explain over 20% of the forecasting error variance of non-fundamental house price runups in Ireland and Spain. The study finds that, in countries with more regulated mortgage markets, monetary policy stance does not significantly affect non-fundamental house prices.

Karoki (2013) applied a descriptive research approach to find out what determines prices of the real estate sector in Kenya. To establish the determinants, a multivariate regression analysis was conducted. On the outcomes; interest rates, GDP and supply of money had an influence on prices of real estate which were positive and significant. The greatest influence on the dependent was interest rates, followed by GDP and then money supply.

Mwangi (2006) sought to identify the determinants of mortgage finance uptake. The study covered the period from 2001 to 2005. The independent variables were money supply, liquidity ratio and inter-bank funds rate. The study utilized secondary data from the CBK.

The study findings showed that money supply had the greatest effect, explaining 41% of the variations in mortgage finance uptake. Liquidity ratio and inter-bank funds rate were found to have an insignificant influence on mortgage finance uptake. Income levels in Kenya are both low in absolute terms and also very unevenly distributed. This is a common occurrence in the majority of sub-Saharan Africa and is one of the single most difficult barriers to overcome in building a vibrant mortgage market (World Bank, 2011). As far as the informal sector is concerned, according to Mokaya (2016), Kenya is highly reliant on the informal economy which is characterized by small and intermittent salaries. The lack of a consistent salary payment, therefore, disqualifies them from gaining access to the mortgage market, which requires servicing of loans over a long period of time.

2.4.4 Effect of Inflation on the Growth of Mortgage Financing

Inflation is a persistent increase in the general price level of goods and services in an economy over a period of time (Mugambi & Okech, 2016). Inflation can also be defined as a permanent increase in the aggregate price level which implies a diminishing of the purchasing power and an increase the cost of living. Anticipated inflation affects the nominal interest rate charged, leading to high quoted repayments and thus the front-loading of payments to compensate for loss in purchasing power over time (Bank of Ghana, 2007).

Inflation reflects the increasing trend in the general level of levels of goods and services prices. Further, it reflects the purchasing power of a currency (Singh & Sharma, 2016). The inflation rate has been widely used by prior studies of banks' profitability (Anbar & Alper, 2011; Chowdhury & Rasid, 2017; Jara-Bertin et al., 2014; Masood, Ashraf & Turen 2015). Imbuga (2014) argues that an increase in the rate of inflation could have at first negative consequences on financial sector performance through credit market frictions, which entail the rationing of credit leading to a reduction in intermediary activity as well as capital formation. Taner, (2016) states that when market rates of interest rise, and when expectations of higher inflation in the long run keep interest rates at the higher levels, it

would not reduce housing demand permanently because after a time lag, wages and house prices would adjust to the higher anticipated inflation.

Using regression analysis, Walley (2013) found that inflation is negatively and significantly associated with mortgage market development. Inflation volatility is negatively and significantly associated with Mortgage depth, while positively and significantly with Housing Loan Penetration, which may indicate the use of housing loans (and thus real estate more generally) as a hedge against inflation, where available.

In a study covering 61 countries, Warnock and Warnock (2008) examined the extent to which markets enable the provision of housing finance across a wide range of countries. Across all countries, controlling for country size, we find that countries with stronger legal rights for borrowers and lenders (through collateral and bankruptcy laws), deeper credit information systems, and a more stable macroeconomic environment have deeper housing finance systems.

These same factors also help explain the variation in housing finance across emerging market economies. Across developed countries, which tend to have low macroeconomic volatility and relatively extensive credit information systems, variation in the strength of legal rights helps explain the extent of housing finance. The study found that deeper mortgage markets were associated with a stable macroeconomic climate of low and stable inflation. The macro-economic climate affected the mortgage markets. The mortgage markets performed well, when the inflation rate were low.

Dobson (2018) avers that inflation is denoted by the rise of commodity and service prices in an economy. With the growing up in prices, currency values fall. Therefore, each currency unit pays for a lesser amount of commodities and services. As a result, there is reduced purchasing power for each unit of currency. IDB (2015) on the effect of macro volatility on mortgage demand; Recurrent inflation coupled with a violation of property rights led to an increase in investment in real estate. As a result, there was a raise in the

house prices and this impacted negatively to households who hardly raised sufficient income to acquire mortgages.

Taner (2016) research on an investigation of the effects of inflation uncertainty on credit markets by using a disequilibrium framework. The study focused on both the developed and developing countries. The researcher utilized secondary data for the period 1990-2005. The outcomes showed that inflation uncertainty had a negative and significant impact on demand for credit.

Walley (2013) focused on the linkage between inflation and housing finance in Pakistan where a regression model was used to determine the association. An inverse association between rates of inflation and growth in mortgage financing was indicated. An increase in inflation triggered a downward demand for mortgage loans.

Auguste, Bebczuk and Moya (2011) analyze mortgage loan demand in Argentina using a new survey administered in the Buenos Aires Metropolitan Area. It finds that recurring macro volatility and violation of financial property rights have increased demand for real estate as an investment, which in turn boosts housing prices and makes it more difficult for consumer households to meet minimum income requirements for obtaining a mortgage. Affordability thus seems to offer a better explanation than standard supply side constraints for the small size of the mortgage market in Argentina. Overall, the shallow mortgage market has not posed a major impediment to home ownership in Argentina and the small (and shrinking) mortgage market has more to do with lack of demand than credit supply constraints.

Kuang and Liu (2015) conducted a study on inflation and house prices: theory and evidence from 35 major cities in China. Inflation and House Prices: Theory and Evidence from 35 Major Cities in China. By using panel databases of 35 major cities in China during the period of 1996-2010, the study find that the association between house prices and inflation is asymmetric. The impact of inflation on housing prices is greater than that of housing prices on inflation, which implies that housing prices effectively hedge inflation.

Secondly, household income positively affects housing prices, but interest rates negatively influence housing prices.

Bett (2016) sought to evaluate the effect of inflation and interest rates on mortgage financing by Kenyan commercial banks. This research relied on secondary, which were obtained from banks' annual reports and financial statements and the Kenyan Economic Surveys over a period of fives between the years 2008-2012. The research findings revealed that there was a strong positive relationship (R= 0.717) between the variables. The study also revealed that 51.4% of mortgage financing in Kenya could be explained by inflation and interest rates. From this study it was evident that at 95% confidence level, the variables produced statistically significant values and can be relied on to explain mortgage financing by Kenyan commercial banks. However, interest rates explain mortgage uptake in Kenya than inflation rates.

Owuor, Githii and Mwangi (2018) studied the relationship between macroeconomic factors and mortgage market growth in Kenya. The study theories that informed the study included lien theory of mortgages and capital assets pricing theory. On the outcome of the study a significant association between inflation, GDP and growth in mortgage market was reported. Conclusion made by the researcher reviled; that rate of inflation and growth in GDP is key factors that determine the mortgage market uptake in Kenya.

Imbuga (2014) studied the effect of inflation on loan repayment among financial intermediaries in Kenya. Results showed an inverse association between the two variables. In periods of economic downturn, there were increased levels of loan defaults. During such periods, the CBK increases the base lending rates as a way of reducing the supply of money in the economy. In periods of economic stability, the borrowers were aggressive in making loan repayments. The study further established that increased inflation negatively influences loan repayment.

The uncertainty created by the persistent instability of a currency due to unstable inflation hinders access to external long-term finance for mortgage lending (Bank of Ghana, 2007).

Low inflation is an essential ingredient of a successful mortgage market, as it will lead to low and stable interest rates. High inflation leads to high interest rates as lenders seek to compensate loss of purchasing power of their money (Ariemba, Kiweu & Riro, 2015). Further, high inflation has the tendency of distorting economic activity; thus, an increase in the rate of inflation will reduce the level of economic growth (Mugambi & Okech, 2016).

2.4.5 Effect of Exchange Rate and Growth of Mortgage Financing

The average of the exchange rate during a fiscal year is used as a measurement for exchange rate. Chowdhury and Rasid (2017) and Menicucci and Paolucci (2016) suggested that foreign exchange rate should be used as an important factor for banks' profitability. Boamah, (2017) also argues that a stable currency is an essential ingredient of a successful mortgage market. This is because unstable exchange rates will not attract long-term foreign capital.

According to Ariemba et al (2015), the devaluation occurred after baht came under intense speculative attack, forcing Thailand's Central Bank to abandon its peg to the US dollar and float the currency. This triggered a financial collapse that affected economy of Thailand and also South Korea, Hong Kong, Indonesia and Malaysia. The currency contagion led to a severe contraction in these economies as bankruptcies, a drop in demand for loans including mortgage loan plunged.

Liwali (2018) noted that the demand for housing in Sub-Saharan Africa (SSA) has surpassed the supply. In an effort to meet this demand a few International Housing Finance Institutions (IHFI) have come into play. These include Shelter Afrique, overseas investment corporation, East African Development Bank (EADB) and PTA bank among others.

Butler, (2016) identifies currency risk as one of the major risks in the establishment of a mortgage market in developing countries. He gives an example of the global financial

crisis when lenders of hedge funds in the U.S. demanded their funds back due to liquidity problems in the financial markets. The hedge funds therefore sold many of their liquid financial assets in the developing countries to respond to the demands of their lenders leading to currency outflows that created a problem in the affected financial markets.

Tse (2016) assessed the relationship between Hong Kong house prices and mortgage flows under deposit-rate ceiling and linked exchange rate in Hong Kong. The findings showed that there is a Granger causality relationship between house prices and mortgage flows in Hong Kong where there is a deposit-rate ceiling and linked exchange rate. While the demand for housing units is distorted by mortgage constraint, any changes of housing demand or house prices would have a feedback on mortgage lending, and thus tend to iron out the housing demand to a level consistent with the short-run availability of financing. The results strongly suggest that house prices in Hong Kong tend to lead the mortgage flows, not vice versa. Sudden unexpected changes in housing demand may not affect aggregate mortgage availability within a short period of time.

Yang and Zhiqiang (2017) examined the relationship between RMB real effective exchange rate and real estate price by VAR test by using the monthly data from Jan, 2007 to Dec, 2010. The empirical result shows in the short run, raise of housing price will cause the depression of RMB exchange rate, however, in the long run, real estate has a positive impact on RMB exchange rate.

Sumer and ÖZorhon (2018) examine the effect of exchange rates (USD/TL) on the return rates of REIT and housing sales price indices in Turkey by using time series analysis covering the monthly period of January 2004-December 2016. VAR econometric model is used to test the effect of the exchange rates on the return rates of both indices, and Augmented Dickey-Fuller and Granger Causality Tests were also employed. The results of the study exhibited that while REIT index return rate is affected by exchange rates, there is no statistically significant effect of exchange rates on housing sales price return rates.

Siemińska and Krajewska (2015) studied the influence of exchange rate risk on the mortgage market in Poland. The method employed was the critical analysis of the most-recent reports and recommendations of the National Bank of Poland, Polish Financial Supervision Authority, Polish Banking Union, and other experts on the subject of financing the real estate market, as well as a comparative analysis of solutions regarding currency risk in selected countries. The study found that exchange rate risk causes the problem of the inadequacy of the collateral for the mortgage following an increase in the exchange rate of the currency in which it was granted.

Owuor, Githii and Mwangi (2018) studied the effect of exchange rate on the growth of mortgage market in Kenya. The study was descriptive in nature and used secondary quarterly data from 2007 to 2016 obtained from the central bank. A multiple linear regression was used to analyze the data. The study outcomes were that exchange rate had a positive insignificant relationship with the growth of mortgage market in Kenya.

2.4.6 Growth of Mortgage Financing

In Asia, Collyns and Senhadji (2017) revealed that real estate prices are significantly affected by credit growth. Likewise, Martinez and Maza (2017) findings showed a significant and positive correlation between real estate prices and disposable income; interest rate was found to impact negatively on real estate growth. On the effect of mortgage growth; on performance of commercial banks in Rwanda, a rise in mortgage lending resulted to arise in the bank’s profits; which were measured using ROA and ROE (Tsatsaronis & Zhu, 2014).

Asabere et al. (2016) investigated the relationship between mortgage financing and economic development in African countries, addressing a gap in the existing literature on this subject. The authors recognized the significance of developing mortgage markets for overall country development. Policymakers and international institutions, such as the World Bank, have advocated for the expansion of Africa's emerging mortgage markets as a means to stimulate economic growth and development. Specifically, the authors

analyzed the association between the size of the mortgage market and gross national income (GNI) per capita for African countries. Their findings revealed a significant positive correlation between the size of the mortgage market and GNI per capita, suggesting that mortgage financing can contribute to growth and development.

The authors employed a hedonic framework to examine the relationship between mortgage financing and GNI per capita across African countries. The authors confirmed their hypothesis by identifying a significant positive correlation between the size of the mortgage market and the level of GNI per capita among African countries. An economically plausible interpretation is that the availability of mortgage financing fosters a more efficient financial system, which, in turn, facilitates growth and development.

In another study Ndirangu (2015), studied the influence of lending varied mortgage types on profitability of institutions providing mortgages in Kenya. Where adopting various mortgage types positive affected the bank's profitability due to varied preferences by the investors.

Nkirote (2014) focused on the strategic responses of mortgage lending institutions and commercial banks in the face of environmental turmoil that brought were about by competition. The study findings revealed by offering products that were tailored to meet the customer needs; banks and mortgage lending institutions, were able to survive in a competitive environment.

Mutero (2017) researched on affordability of housing credit in African banks. In the review of literature, the researcher found that the monetary system in Kenya is effectively regulated despite the fact that the industry is competitive. This sector was however found to be of benefit to only the high income earners. The researcher recommended the need to develop different types of mortgages targeting different market segments including those that were made of low-income earners.

Mwega (2015) revealed that Kenya was in a critical point, in the 1993 to 2002 since the banks and mortgage lending institutions opted for investments in government securities as they depicted lower risks and uncertainties. This period was not a favorable; as far as mortgage sector was concerned. This was due to the fact that they could hardly access the financing they required from the banks. Ndungu (2017) reported that more than 30 banks able to conveniently offer mortgage facilities. In 2016, there was a 38% growth in mortgage financing in comparison to 2015. In 2016, the growth increased by a further 25%. On average, the growth in mortgage financing grew by 31% for the two years (Ndungu, 2017).

2.5 Critique of Existing Literature

From the reviewed literature, it came out strongly from several scholars have discussed housing affordability problems as a way of addressing mortgage financings (Green & Wachster, 2017). There was no universal model of availing mortgage finance among different countries but this depends on macroeconomic conditions, taxation, subsidy programs, and the structure of the housing market, banking regulations and banking system size, (Warnock & Warnock 2018). The results indicated that the likelihood of cheap mortgage substitutes resulting to low demand for mortgage finance in Kenya was 4.911 times higher than costlier mortgage substitutes. The findings further indicated that the likelihood of high legal cost and high stump duty cost causing low mortgage demand are 2.550 and 2.274 times higher than when the costs are low. The findings also indicated that the likelihood of low-income levels causing low demand for mortgage substitutes was 6.369 high than high-income levels. Finally, the findings indicated that the likelihood of lack of promotion causing low mortgage demand was 5.808 higher than having promotion.

In a study by Aguko (2016) where he sought to determine the determinants for the demand of mortgage finance in Kenya. The results indicated cheap mortgage substitutes resulting to low demand for mortgage finance in Kenya was 4.911 times higher than costlier mortgage substitutes. The findings further indicated high legal cost and high stump duty cost causing low mortgage demand. Low-income levels also caused low demand for

mortgage. Lack of promotion caused low mortgage demand of 5.808 higher than having promotion. The study recommended that mortgage-financing institutions should consider the cost of mortgage substitutes, cost of mortgage, income level and promotion in order to increase the demand for mortgage finance in Kenya.

However, this has not translated to the growth of the mortgage sector since market forces drive mortgages. In contrast with Ndungu (2017) study who segmented the growth of commercial bank in large, medium and small and actually points out that the mortgage sector is growing at a rate of 24%, 25% and 38% respectively and did not mention the factors leading to this. The study should factor in other players like investment companies, Cooperative Housing Society's, Pensions funds, and Insurance funds that are also contributing to this sector.

World Bank report (2011) argued that the property markets in most African cities are segmented into various categories ranging from low, middle and up market. The development of the upper market allows banks to value their property more accurately giving them comfort that should they need to realize their loan collateral; a relatively liquid market exists where they can sell their loan collaterals. However, lower and middle-income parts of the market may not support the secondary market due to lower purchasing power. This lacks inclusiveness and thus some of the reason of low uptake of mortgage financing.

According to IDB (2015) interest rate instability is one of the factors that could explain the small size of the mortgage market however the findings were based in Latin America. CBK (2017) in a research found majority of the hindrances to mortgage financing being rates of interest and accessibility of long-term finances. Nonetheless, the current study was not accessibility on macroeconomic factors and growth of the mortgage financing. Elius (2022) sought the relationship between macroeconomic factors and growth of mortgage financing in Kenya based on a time series research design, which was used to track the growth of mortgage financing in Kenya but the current study, adopted a panel model. Musiaowski (2019) examined how the inflation rate (consumer price index)

impacts the cost of an adjustable-rate mortgage but the current study was limited on mortgage finance growth.

Njoroge (2021) examined the Kenyan residential real estate market from 2005 to 2018 to determine the impact of market prices on the profitability of the Kenyan residential market. Nonetheless the study subject was on profitability of residential market. Olweny (2011) studied the effect of Macro-economic factors on the stock return volatility on the Nairobi Securities Exchange, Kenya. Muguchia (2017) sought to find out how, mortgage financing; is influenced by flexible interest rates but was limited to only one macroeconomic variable.

Omondi (2018) sought to determine the effects of macro-economic variables on mortgage uptake but the study relied on primary data, which could be subject to bias. The current study relied on secondary data from CBK and commercial banks reports. Theuns (2012) studied the economic variables that affect mortgage financing. The researcher utilized panel data for the period 2006-2012. The Study does not however present the recent status of the mortgage financing. Muli (2016), on factors influencing the growth of real estate investment within Kenya. The local study was focused on real estate investment and the current study sought on growth of mortgage financing. The established reviewed literature thus presented research gaps that needed to be filled. The following section presents the research gaps identified from a critique of the literature review.

2.6 Research Gaps

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.

Several researches have been done on mortgage financing, however, none of these studies has dealt to establish the linkage of macro-economic factors and how it affects mortgage financing among commercial banks to necessitate the expected growth in the mortgage sector. 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 the mortgage market to grow, it should encompass the whole population. The research focuses on macroeconomic variables namely; interest rates, money supply, inflation and exchange rate that affect mortgage financing among commercial banks in Kenya. There was 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 the untapped studies on macroeconomic variables in relation to mortgage financing exists and therefore a gap to be filled in relation to knowledge and empirical studies.

Wang, Hao, Tao & Su, (2020) adopted a wavelet-based analysis to evaluate whether money supply affects growth drive housing boom in China, Zhu, Betzinger and Sebastian (2017) investigated how monetary policy stance and mortgage market structure affect non-fundamental house price movements in eleven Euro area countries, Walley (2013) focused on the linkage between inflation and housing finance in Pakistan, Kuang and Liu (2015) conducted a study on inflation and house prices: theory and evidence from 35 major cities in China, Siemińska and Krajewska (2015) studied the influence of exchange rate risk on the mortgage market in Poland. The studies however, presented contextual gaps as the findings were not generalizable to suit the current study, which sought to find out the effect of macroeconomics factors on the growth of the Mortgages among commercial banks in Kenya.

Locally, Musiaowski (2019) examined how the inflation rate (consumer price index) impacts the cost of an adjustable-rate mortgage, Kiguru (2015) assessed the determinants of mortgage uptake in Kenya, Omondi (2018) sought to determine the effects of macro-

economic variables on mortgage uptake, Muli (2016), on factors influencing the growth of real estate investment within Kenya, Karoki (2013) applied a descriptive research approach to find out what determines prices of the real estate sector in Kenya, Bett (2016) sought to evaluate the effect of inflation and interest rates on mortgage financing by Kenyan commercial banks. However, the studies adopted different methodologies that could not suit the current study. In addition, the studies had different focuses, which did not establish the relation between the variables in the study on the growth of mortgage financing.

From the foregoing review of literature, it is evident that research in the area of mortgage financing has been done specifically on its effect on the performance of commercial banks, factors influencing the uptake of mortgage financing, survey analysis of mortgages in the Kenya, mortgage rates – implication to home owners among other studies. In addition, there were inadequate studies on the effect of macro - economic factors in banking industry. This study therefore sought to fill the knowledge gap of identifying how the macro – economic factors effect the mortgage financing of commercial banks in Kenya by establishing how this factor can drive and spur the growth in the sector banking sector thus necessitating the current study.

2.7 Summary of Literature

This chapter identified and discussed both the literature and empirical review that is relevant to macro-economic factors and mortgage financing among commercial banks in Kenya. The literature review of interest rate, money supply, inflation rate and exchange rate all of which are the specific objectives of the study are macro-economic factors. This chapter examined their effect on the growth of mortgage financing of Commercial banks in Kenya, this chapter developed and presented a conceptual framework.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter focused on the research approach, presenting the research philosophy, research design, population, sampling frame, sample and sampling technique, data collection instruments, data processing and analysis, diagnostic tests.

3.2 Research Philosophy

This research project was based on the positivism paradigm. The research paradigm of the study reflected the nature and approach taken when conducting research. Research paradigms can be identified by their research philosophy and research methods. Research philosophy relates to the development of knowledge and the nature of that knowledge (Saunders, Lewis, & Thornhill, 2009). New paradigms offer new ways to think about the world, by asking new questions and pursuing them in new ways. This is the essential nature of paradigms as "worldviews," and those who value the possibilities that come from combining qualitative and quantitative methods need to promote a worldview that encourages others to share beliefs (Morgan & Morgan, 2007). Research methods on the other hand are the techniques used to gather and analyze data in a study.

Two research paradigms underpin research, that is, positivism and social constructivism. The positivism stance is appropriate for this study based on the underlying assumptions of this paradigm relative to social constructivism. Positivism is a research philosophy that is based on the belief that knowledge can be acquired through empirical observation and scientific methods. Positivists believe that research should be objective and free from personal biases or opinions. They also believe that research should be based on measurable and observable phenomena.

Positivism assumes in its understanding of the world that the environment and the events of interest are objective, external and independent of the researcher (Saunders et al., 2009). Social constructivism, however, assumes that the understanding of the environment and events of interest in it are socially constructed and subjective from the researcher's point of view (Peter, Artur, & Peter, 2015). This study followed the principle of deduction as elucidated by positivism: hypotheses were first derived from a theory after which data was collected and tested empirically to support or reject the hypotheses.

In the context of the research, the positivism paradigm emphasizes the use of quantitative methods to collect and analyze data. This approach involves using a structured research design, such as experiments or surveys, to collect data that can be analyzed statistically. As a result of these methodological considerations, the research project relied on quantitative research methods.

3.3 Research Design

The study adopted a correlational research design. A correlational research design is a type of research design that examines the relationship between two or more variables without manipulating them (Seeram, 2019). Correlational studies measure the degree of association between variables, but cannot establish causality (Curtis, Comiskey & Dempsey, 2016).

In a correlational research design, researchers collect data on two or more variables and examine the relationship between them using statistical analysis. The variables may be positively or negatively correlated, or there may be no correlation at all. Positive correlation means that the variables increase or decrease together, while negative correlation means that one variable increases while the other decreases (Asamoah, 2014).

Polit, Beck, and Owen (2016) define a research design as the overall plan, for obtaining answers, to the study questions. Nachmias and Nachmias, (2016) explain a research design as the road map that guides the researcher during the collection of data, analysis of data,

and interpretation of observations of the study. The choice of research strategy according to (Saunders et al., 2009) is guided by the research question(s), objective(s), the extent of existing knowledge, amount of time and resources available as well as the philosophical underpinning. The choice of research strategy according to (Saunders et al., 2009) is guided by the research questions, objectives, extent of existing knowledge, amount of time and resources available as well as the philosophy guiding the study.

Correlational research design has been used before in studies like Ojha (2018) on Macroeconomics and bank-specific factors affecting liquidity: A study of Nepali commercial banks, Kung'u (2017) on the effect of liquidity management practices on profitability of manufacturing industry in Kenya, Kiganda (2014) on the effect of macroeconomic factors on commercial banks profitability in Kenya: Case of equity bank limited. In view of the above descriptions and strengths, correlational research design was, therefore, the most appropriate design for this study.

3.4 Population

Population refers to the subjects or items under study. These items ought to have similar characteristics to enhance the generalization of the findings (Mugenda & Mugenda, 2003). Dawson (2009) defined a target population as the population in research to which the researcher can apply their conclusions. Populations fall under two main categories; the target and accessible (Borge & Gall, 2017). The target population for this study consisted of all 43 commercial banks in Kenya (Appendix III). A period of 10 years (2014 to 2023) was considered for the study.

3.5 Sampling Frame

A sample is a list of selected participants from a population (Polit & Beck, 2016). Sampling refers to the selection of a few items from the population (Cooper and Schinder, 2003). Lavrakas (2014) defines a sampling frame as a list of the target population from which the sample is selected and that for descriptive survey designs, a sampling frame

usually consists of a finite population. Polit, Beck and Owen (2016) refer to a sampling frame as the technical name for the list of the elements from which the sample is chosen. Kothari (2010) argues a sampling frame is a list that contains the names of all the elements in a universe. For this study, the sampling frame was the list of the 43 commercial banks in Kenya.

3.6 Sample and Sampling Technique

Sampling design is a definite plan for obtaining a sample from a given population. It refers to the technique or the procedure the researcher would adopt in selecting items for the sample (Kothari, 2004). Saunders, Lewis and Thornhill (2009) argue that sampling will only be necessary if; it will be impracticable to survey the entire population, there is budgetary constraint, there is an expected time constraint and the population size is unmanageable. Kothari (2004) describes a sample as a collection of units chosen from the universe to represent it.

The study adopted census and collected data from the 43 commercial banks. Census is a method of sampling where data is collected from every member of a population rather than from a sample of the population (Wilson, 2014). In other words, census involves surveying or collecting data from the entire population of interest. Census is often used when the population of interest is small, homogeneous, and easily accessible (Hautaniemi, Anderton & Swedlund, 2013). The census in the study was thus adopted since the population of interest was small and homogeneous. The study collected data for a ten year period from 2014 to 2023.

3.7 Data Collection Instruments

Data on the dependent and independent variables was collected by the use of secondary data, mainly from the reports by the CBK and financial statements of the 43 commercial banks in Kenya offering mortgage financing (Appendix I & II) between the years 2014-2023. Miles, Huberman and Johnny (2014) defined data collection as the process of

gathering and measuring information on study variables in a systematic way that enables the interviewee to come up with relevant questions and determine the expected outcome.

According to Johnston (2014), quantitative research prefers a secondary data analysis to primary source of analysis. Due to enhanced overall efficiency of secondary data analysis of the existing research, the researcher notes the increasing popularity of the method unlike to primary analysis. Johnston (2014) further argued that secondary data has much clearer categorization because it avoids confusion.

Hui and Phillips (2014) argues that use of secondary data analysis is viable since it utilizes the process of inquiry, especially in studies that are prone to biases. secondary analysis is an empirical exercise that applies the same basic research principles as studies utilizing primary data and has steps to be followed just as any research method (Arain, Campbell, Cooper, & Lancaster, 2010; Johnston, 2014). Saunders, Lewis and Thornhill (2009) defined secondary data as reanalyzing data that has already been collected for some other purpose and it include published data. Dawson (2009) argues that secondary research data involves the data collected using information from studies that other researchers have made on a subject.

The data collection covered a period of ten (10) years from 2014 to 2023, this period is selected for the study in order to establish the changes in the commercial banks over time and to base the analysis on as recent data as possible. This could also be important since several banking regulations for financial institutions had been put in place. This includes the regime before and after the interest rate capping. Kosikoh (2014) argues that a period of five years could help in the computation of various ratios of both the independent and dependent variables for several years for better analysis. Therefore, data about the independent variables was collected from the CBK reports and data on dependent variable from the financial statements of the 43 commercial banks using secondary data collections guide/form. The secondary data collected was financial information that was necessary for the data analysis of this study.

Various studies have relied on secondary data to collect data, especially where quantitative data is required, Olweny and Themba (2011) examined the effects of banking sectorial factors on the profitability of commercial banks in Kenya and adopted an explanatory approach for collecting secondary data from 38 commercial banks in Kenya from 2002 to 2008. Ongore and Kusa (2013) used an explanatory study that was based on secondary time series data obtained from the published statement of accounts for ten years and thereby ignoring the use of primary data.

3.8 Data Processing and Analysis

After data collection, cleansing of the data was done to ensure that it is complete. It was then organized, coded and entered into Excel worksheets. Time series data analysis was done by the use of STATA software.

3.8.1 Analytical Model

The affinity in the dependent alternative (growth on mortgage financing) and the independent macroeconomic variables; interest rate, economic growth, Money supply, inflation rate and exchange rate were analyzed by the use of the tie series data models.

The models were as follows:

To test the significance of each independent variable a simple time series regression model one was used;

Y represents $\beta 0 + \beta_1 X + \varepsilon$ ……..(equation i)
Where
Y represents dependent variable (growth of mortgage finance)
X represents the independent variable.

The study used equation (ii) to test the combined influence of the macro-economic variables on growth on mortgage financing.

Y represents $\beta o + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 + \beta_5 X5 + e$…(equation ii)

Y represents dependent variable (growth of mortgage finance)

X1, X2, X3, X4, X4, X5 represents the independent variables.

β_0 represents constant, the value of Y when all X's are zero

ε_t represents Error term

The moderation effect test model was as follows;

$$Y=\beta o+\beta 1X1 +\beta 2X2+ \beta 3X3+ \beta 4X4 + \beta 5X5+ \beta 6Z +\beta 7(X1*Z) +\beta 7(X2*Z)+ \beta 7(X3*Z)+ \beta 7(X4*Z) + \beta 8(X5*Z) + e$$

The strength of the model through ANOVA was by use of significance of F Statistics at a 5% level of significance as well as using the coefficient of determination (R^2). A positive correlation coefficient signifies that the two variables move in one direction. A negative correlation coefficient means; that the variables move in the opposite direction. The analysis was done using STATA software to code, enter, and compute the measurements and the results presented in tables.

3.8.2 Operationalization of Variables

Table 3.1 shows how the study variables were measured and the specific data source for the variables.

Table 3.1: Measurement of Variables

	Variables	Measures	Source
Independent Variables	Interest rates	CBK Rate	CBK Report
	Economic growth	GDP	CBK
	Money supply	M3	CBK
	Inflation rate	Consumer price index –CPI	CBK
	Exchange Rate	Average rate of devaluation of Kenyan currency (USD/KES Exchange)	CBK
Moderating Variable	Money policy	Treasury Bill Rate	CBK
	Growth of mortgage financing in Kenya	Outstanding mortgage	Financial statement

3.9 Diagnostic Tests

3.9.1 Normality Test

This data was subjected to a normality test before correlation and regression analysis because correlation and regression analysis are based on the assumption that the data is normality distributed. If the data is not normal, then the results of correlation and regression will be misleading. The Shapiro-Wilk test and Durban-Watson tests is most appropriate for small sample sizes. If the significance value of the Shapiro-Wilk test is greater than 0.05, the data is normal. If it is below 0.05 the data significantly deviate from normal distribution (Shapiro & Wilks, 1968).

3.9.2 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) was used to test for the presence of heteroscedasticity.

3.9.3 Multicollinearity Test

Multi-collinearity is a situation where two or more independent variables (predictors) in a regression model are moderately or highly correlated. Multi collinearity is assessed by examining tolerance and the variance inflation factor (VIF) measures the impact of collinearity among the variables in a regression model.

3.9.4 Autocorrealtion

Regression assumes that that the errors associated with one observation are not correlated with the errors of any other observation. Wooldridge test for autocorrelation was used.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

The chapter covers the analysis of the data, results presentation and the discussion of the findings. The chapter starts with the descriptive statistics, diagnostics tests, correlation analysis and the regression analysis. The analysis is presented in accordance to the study objectives. The study general objective was to find out the effects of macroeconomic factors on development and growth of the Mortgages among Kenyan banks. The specific objectives were; to examine the how interest rates affect the growth of mortgage financing among Kenyan commercial banks, to find out how economic growth effects growth of mortgage financing among Kenyan commercial banks, to establish if money supply has any effect on the growth of mortgage financing among Kenyan commercial banks to determine if the inflation rate has any impact on the development and growth of mortgage financing among Kenyan commercial banks., to interrogate whether exchange rates has any impact on the growth of mortgage financing among Kenyan commercial banks and finally to analyze the moderating impact of monetary policy on the effect of above macroeconomic factors on growth of mortgage financing among commercial banks in Kenya.

4.2 Descriptive Statistics

The descriptive statistics was divided into the summary statistics, which described the data in terms of their means, standard deviations, the minimum values and their maximum values and the graphical trends, which presents graphs showing the trend of the macroeconomic factors across the 10 years.

4.2.1 Descriptive Summary Statistics

Table 4.1: Descriptive Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Interest rate	10	9.21	1.513972	7	10.9
GDP	10	4.42	2.014834	-.3	7.6
M3 (millions)	10	3586275	1157743	2007329	5402600
Inflation R ≈ E	10	5.97	.7944949	4.7	7.1
Exchange Rate	10	107.64	14.56046	87.9	139.8
Tbrate	10	13.55	2.369365	10.1	16.5
Mortgage	10	47857.1	13544.7	32501	65554

The mean interest rate is 9.21%, with a standard deviation of 1.51. Interest rates range from a minimum of 7% to a maximum of 10.9%. The mean GDP is 4.42, with a standard deviation of 2.014834. GDP values range from a minimum of -0.3 to a maximum of 7.6. The mean money supply is 3,586,275 million units, with a standard deviation of 1,157,743. Money supply values range from a minimum of 2,007,329 to a maximum of 5,402,600. The mean inflation rate is 5.97%, with a standard deviation of 0.79. Inflation rates range from a minimum of 4.7% to a maximum of 7.1%. The mean exchange rate is 107.64 units, with a standard deviation of 14.56. Exchange rates range from a minimum of 87.9 units to a maximum of 139.8 units. The mean treasury bill rate is 13.55%, with a standard deviation of 2.37. Treasury bill rates range from a minimum of 10.1% to a maximum of 16.5%. The mean mortgage amount is 47,857.1 units, with a standard deviation of 13,544.7. Mortgage amounts range from a minimum of 32,501 million units to a maximum of 65,554 million units.

4.2.2 Graphical Trends

Trend analysis provides context for individual data points by showing how they fit into a broader historical picture. Graphical trends play a crucial role in the analysis by enhancing data visualization, facilitating trend analysis, supporting comparative analysis.

4.2.2.1 Interest Rate Trend

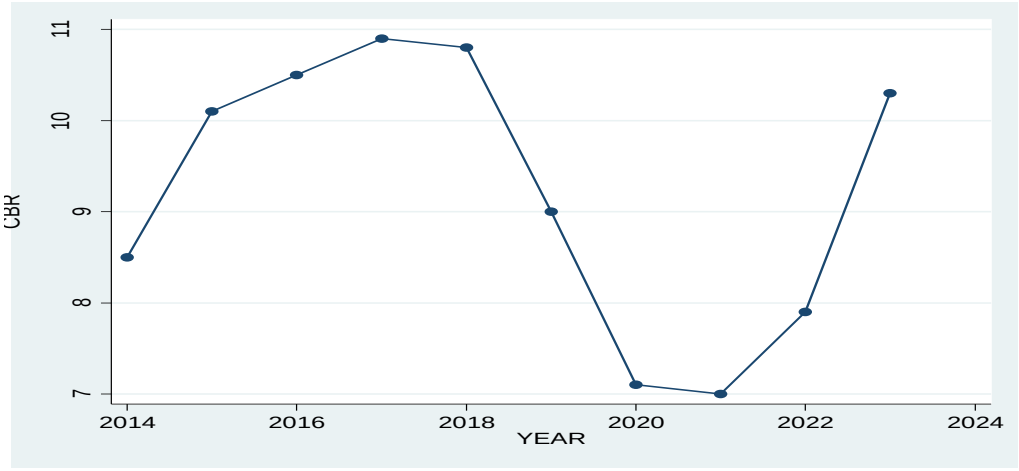

Figure 4.1: Interest Rates Trend

Figure 4.1 shows that the interest rates have been gradually increasing from 2014 up to 2017 where it then continues at an almost constant rate to 2018. The constant rate of interest rate is attributed to the interest rate capping that was effected towards the end of 2016. The interest rate declined upto 2021 which could be as a result of the COVID-19 pandemic which resulted in significant disruptions to economic activity globally, including in Kenya. Measures such as lockdowns, travel restrictions, and social distancing policies led to reduced consumer spending, disrupted supply chains, and decreased investment. In response, central banks often lowered interest rates to stimulate economic activity and support recovery.

4.2.2.2 Economic Growth Trend

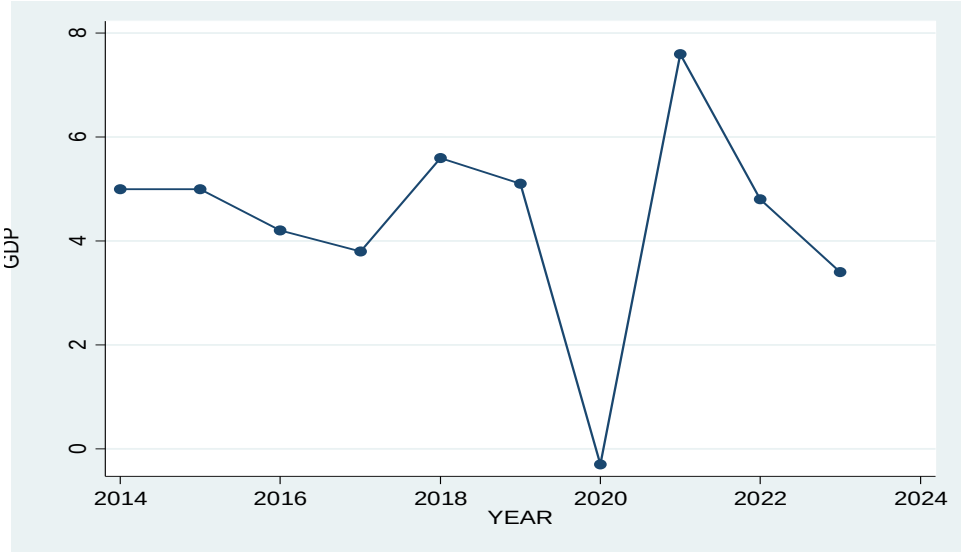

Figure 4.2: Economic Growth Trend

From the figure 4.2, the economy was GDP growth experienced fluctuations, with a peak in 2015 (5%) and a significant drop in 2020 (-0.3%) likely due to the economic impact of the COVID-19 pandemic. The drop of the economic growth in 2017 is attributed to the general elections held in 2017. It rebounded in 2021 (7.6%) and remained relatively stable in 2022 and 2023.

4.2.2.3 Money Supply Trend

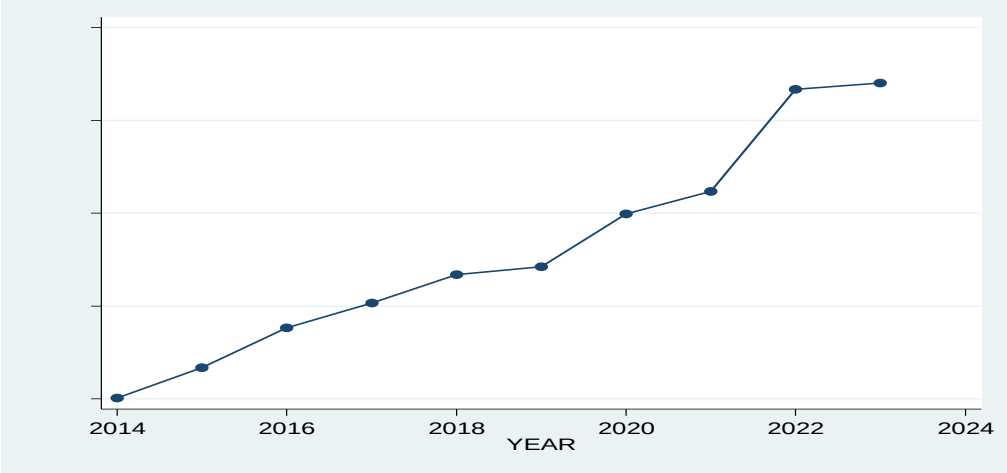

Figure 4.3: Money Supply Trend

From the figure 4.3, money supply (M3) increased steadily over the years, indicating expansionary monetary policy and growing liquidity in the economy.

4.2.2.4 Inflation Trend

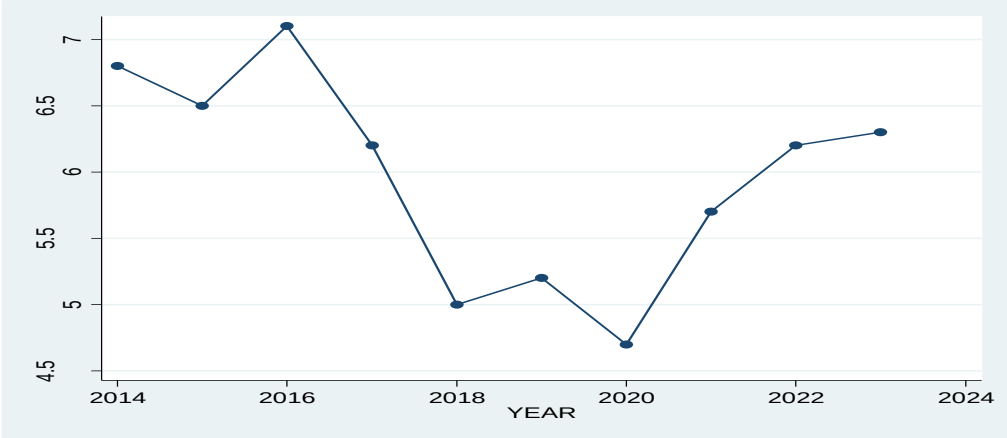

Figure 4.4: Inflation Trend

From the figure 4.4 the inflation rate varied but generally remained within a moderate range. There was a slight increase from 2014 to 2016, followed by relatively stable inflation levels until a notable uptick in 2023 (6.3%).

4.2.2.5 Exchange Rate Trend

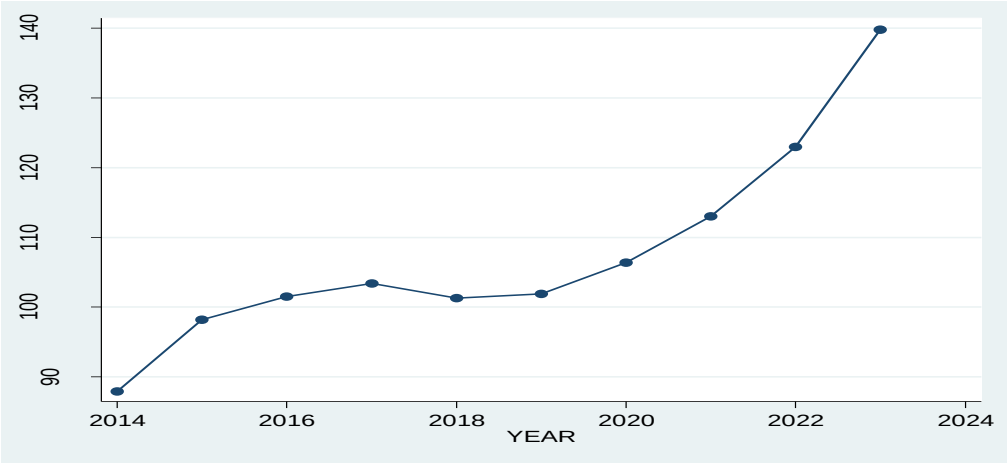

Figure 4.5: Exchange Rate

From the figure, the exchange rate showed fluctuations over the years, with a slight increase from 2014 to 2017, followed by more significant fluctuations in 2020 and 2021, likely influenced by economic and external factors.

4.2.2.6 Treasury Bill Rate

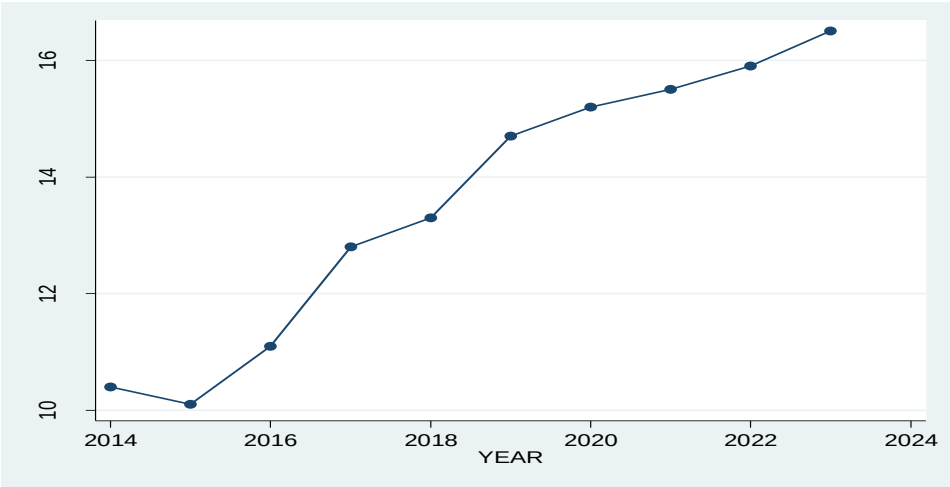

Figure 4.6: TB Rate

The Treasury bill rate increased steadily over the years, indicating changes in government borrowing costs and monetary policy.

4.3 Diagnostic Tests

Various diagnostic tests were carried out to ascertain the appropriateness of the data for regression analysis. Tests for normality, multicollinearity and heteroscedasticity and autocorrelation were conducted.

4.3.1 Normality Test

For unbiased t-tests and regression results, the assumption of normality of data distribution should be met though it may be difficult for financial data to meet this condition (Gujarati, 2016). Shapiro-Wilk test was used to test for the normality of data. According to Bhattacherjee (2012), Shapiro Wilk Test is considered more appropriate for samples below 50. In addition, the Shapiro-Wilk test is considered to be a specific normality test. Therefore, this study made use of Shapiro–Wilk test to examine the normality of data. The null hypothesis in Shapiro–Wilk test is that the variables have normally distributed data.

Therefore, for the variables to have normally distributed data, the p-value has to be more than the significance level (0.05).

Table 4.2: Skewness and Kurtosis Test for Normality

Skewness /Kurtosis tests for Normality				**Joint**	
Variable	Obs	Pr (Skewness)	Pr (Kurtosis)	Adj chi2 (2)	Prob>chi2
Residuals	10	0.3949	0.6735	0.91	0.6333

Ho; Normal distribution of data

The probability of skewness is 0.3949 implying that skewness is asymptotically normally distributed (p-value of skewness > 0.05). kurtosis is also normally (p-value of kurtosis 0.6735> 0.05). Most crucial chi(2) 0.6333>0.05. Since both p-values for skewness and kurtosis tests are greater than a common significance level (such as 0.05), there is insufficient evidence to reject the null hypothesis (Ho). This suggests that the data may follow a normal distribution. The adjusted chi-squared statistic and its associated p-value provide a joint test for both skewness and kurtosis. Again, the p-value is greater than the significance level, supporting the conclusion that the data may be approximately normally distributed. Overall, based on these test results, there is no strong evidence to suggest departure from normality for the data under consideration.

4.3.2 Multicollinearity Test

Multicollinearity refers to high intercorrelations or inter-associations among the independent variables. The presence of multicolinearity in the data reduces the reliability of the statistical inferences made about the data.

Table 4.3: Multicollinearity Statistics

Variable	VIF	1/VIF
IR	1.31	0.763359
M3	1.07	0.934579
FOREX	1.16	0.862069
INFLATION	1.22	0.819672
GDP	1.19	0.840336
Mean VIF	1.19	

The evidence of multicollinearity exists if there is a low tolerance (less than 0.75) or high VIF (more than 10) in any of the predictor variables (Ruginski, 2016). Multicollinearity was tested for the data using the variance inflation factor (VIF) which quantifies how much the variance is inflated. The findings indicate that the VIF values were close to 1 as illustrated by a mean VIF of 1.19 indicating that the variance of the variables was inflated at a very low level. The analysis exhibits signs of multicollinearity though low levels of VIF as recommended by (Field, 2009). Thus, all the variables based on the VIF indicators have no multicollinearity problem. Interest rate had a VIF of 1.31 and a tolerance of 0.76, Money supply had a VIF of 1.07 and a tolerance of 0.93, Foreign exchange rate had a VIF of 1.16 and a tolerance of 0.86, inflation had a VIF of 1.22 and a tolerance of 0.82 and GDP had a VIF of 1.19 and a tolerance of 0.84. After removing the problem of multicollinearity from a regression model, some of the variables can become significant. Ways of removing multicollinearity include increasing sample size, transformation of Variables and removing variables though removal of variables should be the last option because that variable may be very important to explain the dependent variable (Tamura et al., 2017).

4.3.3 Test for Heteroscedasticity

The study used Breusch-Pagan/Cook-Weisberg test for heteroscedasticity. Homoscedasticity describes a situation in which the error term (that is, the “noise” or random disturbance in the relationship between the independent variables and the dependent variable) is the same across all values of the independent variables.

Heteroscedasticity (the violation of homoscedasticity) is present when the size of the error term differs across values of an independent variable. The linear regression model assumes that the error term should be homogeneous in nature. Whenever that assumption is violated, then one can assume that heteroscedasticity has occurred in the data. Breusch-pagan test for heteroscedasticity was conducted.

Table 4.4: Breusch-Pagan Test for Heteroscedasticity

Breusch-Pagan/Cook-Weisberg test for heterosce	
Ho: Constant variance dasticity	
Variables: fitted values of GMF	Chi2(1) = 0.25
	Prob>chi2 = 0.6839

The null hypothesis for this test is that the error variances are all equal. From the findings, the chi-square value was low, indicating heteroscedasticity was not a problem. Also, it was revealed that the p value of 0.6839 was more than 0.05 significant level implying that the study did not reject the null hypothesis of homoscedasticity and thus there was no heteroscedasticity.

4.3.4 Autocorrelation

Regression assumes that that the errors associated with one observation are not correlated with the errors of any other observation. Wooldridge test for autocorrelation was used.

Table 4.5: Breusch-Godfrey LM Test for Autocorrelation

Breusch-Godfrey LM test for autocorrelation
H0: no first-order autocorrelation
F(1) = 0.196
Prob>F= 0.6613

Null hypothesis is that there is no autocorrelation. From the above, P 0.6613> 0.05, therefore we fail to reject the null and conclude the data does not have first-order autocorrelation.

4.5 Correlation Analysis

Correlation analysis statistics were worked out to establish the relationship between the predictor variables and the dependent variable. Correlation ranges between -1 and +1 and quantifies the direction and strength of the linear association between the two variables. The sign of the correlation coefficient indicates the direction of the association. The magnitude of the correlation coefficient indicates the strength of the association. Zero correlation values indicate the existence of zero association between dependent and independent variables. Correlation values of ±1.0 indicate existence of a completely positive or negative relationship (Taylor, 2015).

Table 4.6: Correlation Matrix

	Mortgage	**intere˜e**	**GDP**	**M3mill˜S**	**Inflat˜e**	**Exchan˜e**
Mortgage	1,000					
	10					
Interest rate	-0.7193	1.0000				
	0.0190					
	10	10				
GDP	0.1446	0.0666	1.0000			
	0.0003	0.8550				
	10	10	10			
M3 (Millions)	0.4498	-0.3048	-0.1317	1.0000		
	0.021	0.3918	0.7168			
	10	10	10	10		
Inflation rate	-0.0380	0.3402	0.2510	-0.3802	1.0000	
	0.0171	0.3361	0.4843	0.2785		
	10	10	10	10	10	
Exchange Rate	-0.4840	-0.0637	-0.1076	0.8985	-0.0428	1.0000
	0.0168	0.8612	0.7674	0.1004	0.9065	
	10	10	10	10	10	10

The outputs of the correlation matrix in Table 4.6 show that interest rate has a significant negative relationship with the growth of mortgage financing. This is demonstrated by a correlation coefficient of -0.7193 and a significance level of 0.019. This means that when the interest rate is high, mortgage financing is low. The position is supported by the classical theory of interest rate, which holds that interest rate determines the demand for

capital (Drumond & Jorge, 2013). Thus when interest rate lowers, the demand for capital goes up since many people are encouraged to borrow (Hass Consult, 2013), taking up mortgage loans leading to the growth of mortgage financing among commercial banks.

The economic growth as measured by gross domestic product has a positive and significant relationship with growth of mortgage financing. This is depicted by a correlation coefficient of 0.1446 and a significance level of 0.0003. This means that when the economy grows mortgage financing grows as well. This is consistent to the findings of Tecles and Tabak, 2015 in Brazil. Their study indicated that there is a positive and significant relationship that exists between GDP and rate of credit uptake. Investors become optimistic for growth in a good economy and due to the high anticipation, they take up loans including the mortgage loans resulting to the growth in mortgage financing. The findings are in support of the economic growth theory that economic growth affects performance of all economic sectors and economic growth forms the basis of asset allocation decisions (Ritter, 2005). This is to mean that the amount of mortgage financing is correlated to the extent of the economic growth as also revealed by the current study.

The correlation output further shows that there is a positive and significance correlation between money supply and growth of mortgage financing. This is clearly illustrated by a correlation coefficient of 0.4498 and a significance level of 0.021. This finding means that when the amount of money in circulation increases mortgage financing on the other hand also increases. Similarly, Karoki (2013) applied a descriptive research approach to reveal what controls prices of real estate sector in Kenya and found that supply of money had an influence on prices of real estate, which was positive and significant.

The correlation between inflation and growth of mortgage financing was found to be negative but significant as illustrated by a correlation coefficient of -0.0380 and a significance level of 0.0171. This shows that when there is a general increase in the price of goods and services in the economy, mortgage financing drops. A similar inverse relationship between inflation and the growth of mortgage financing in was established in Pakistan by Walley (2013) in study on the linkage between inflation and housing finance

in Pakistan where an increase in inflation was found to cause a downward demand for mortgage loans. In Argentina, Warnock and Warnock, (2008) established an inverse relationship between mortgage markets performance and inflation rate.

The correlation output further shows that the association between exchange rate and growth of mortgage financing was negative and significant. This was evidently shown by the Pearson's r of -0.4840 and a significance level of 0.0164. The findings were supported by Siemińska and Krajewska (2015) who also found a negative correlation between exchange rate and mortgage growth in Poland. In contrast to the findings, Owuor, et al., (2018) on the effect of exchange rate on the growth of mortgage market in Kenya found that exchange rate had a positive insignificant relationship with the growth of mortgage market in Kenya.

4.6 Regression Analysis

Regression analysis was executed on the data with the aim determining the effects of macroeconomic drivers on the growth of the mortgage financing among Kenyan commercial banks. A simple linear regression was used in testing significance levels of each of the five macroeconomic variables in predicting their exploratory power on the independent variable.

4.6.1 Effect of Interest Rates on Growth of Mortgage Financing

To examine how interest rate affect the growth of mortgage financing among Kenyan commercial banks a simple linear regression was conducted with interest rate as the independent variable and growth of mortgage financing as the dependent variable. Model (i) was applied in this case.

Y represents $\beta 0 + \beta_1 X + \varepsilon$ ……..(equation i)

Y- represents growth of mortgage financing, X- Represents interest rate

Table 4.7: Regression Summary between Interest Rates and Growth of Mortgage Financing

Source	SS	df	MS	Number of obs = 10	
Model	.069663267	1	.069663267		
Residual	.064980253	8	.008122532	F(1, 8) = 8.58	
Total	.13464352	9	.014960391		
				Prob > F = 0.0190	
				R-squared = 0.5174	
				Adj R-squared = 0.4571	
				Root MSE = 0.9013	
Mortgage	Coef.	Std. Err.	t	$p > \|t\|$	[95% Conf. Interval]
Interest rate	-.0581116	.019843	-2.93	0.019	-.0123536 -.103869
_cons	4.129169	.1849626	22.32	0.000	3.702644 4.555694

Table 4.7 presents the R squared and ANOVA results of the effect of interest rates on the growth of mortgage financing among Kenyan commercial banks. The NOVA output shows that the probability F test value was 0.019 an implication that the variable is statically significance at 95% confidence level. This means that interest rate has significant explanatory power on growth of mortgage financing.

R squared is the coefficient of determination. The results indicate that interest rate has 0.5174 or nearly 51.74% power in explaining growth of mortgage financing as illustrated by the coefficient of determination (R-sq). The results demonstrate the model's fitness as a good estimator of the effect of interest rates on the growth of mortgage financing among Kenyan commercial banks.

From Table 4.7, the p value for t test is 0.019 which is less than the 0.005 meaning that interest rate has a significant effect on growth of mortgage financing among Kenyan commercial banks at 95% confidence level. The coefficient of interest rate is -0.058 and the coefficient of the constant is 4.129. This shows that when interest rate is 0 growth of mortgage financing is 4.129.

The coefficient of interest rate is a negative coefficient meaning that the relationship is negative in that a unit rise in interest rate would reduce the growth of mortgage financing among Kenyan commercial banks by 0.058 units. The findings were consistent the sentiments of other authors. For instance, mortgage availability and pricing are emphasized by Green and Wachter (2017) as key factors affecting how well housing markets operate internationally. They mentioned the drop in nominal prime interest rates, which were on average 15% in 1980 but only 4% in 2004 across many nations. The main effects of this were increased mortgage availability, rising housing demand, and rising home prices in the majority of developed nations. Their analysis made it quite evident that falling interest rates increase demand for mortgages. Elius (2022) also found that lending interest rate and growth of mortgage financing in Kenya are negatively and significantly related.

4.6.2 Effect of Economic Growth on Growth of Mortgage Financing

To examine how economic growth affects the growth of mortgage financing among Kenyan commercial banks a simple panel regression was conducted with economic growth as the independent variable and growth of mortgage financing as the dependent variable. Model (i) was applied in this case.

Y represents $\beta 0 + \beta_1 X + \varepsilon$……..

Y- represents growth of mortgage financing, X- Represents economic growth

Table 4.8: Regression Summary between Economic Growth on Growth of Mortgage Financing

Source	**SS**	**df**	**MS**	Number of obs	=	10
Model	.002813759	1	.002813759			
Residual	.131829761	8	.01647872	F(1, 8)	=	7.17
Total	.13464352	9	.014960391			
				Prob > F	=	0.0003
				R-squared	=	0.0209
				Adj R-squared	=	-0.1015
				Root MSE	=	.12837
Mortgage	Coef.	Std. Err.	t	$p > \|t\|$	[95% Conf.	Interval]
GDP	.0724757	.0212374	3.41	0.000	-.0401978	.0577492
_cons	4.625588	.1022708	45.23	0.000	4.389751	4.861425

The study presents regression R squared and ANOVA results on table 4.8 on the effect of economic growth (GDP) on the growth of mortgage financing among Kenyan commercial banks. The outcomes point out that economic growth has 0.0209 or approximately 2.1% explanatory power on growth of mortgage financing among Kenyan commercial banks as is evidently revealed by the coefficient of determination (R-sq).

The analysis of variance (ANOVA) outcomes additionally indicate that the regression model is significant. This is noticeably pointed out by probability of the F-statistic (0.0003). The outcomes illustrate the model's fitness as good estimator of the on the effect of economic growth (GDP) on the growth of mortgage financing among Kenyan commercial banks.

From Table 4.8, the beta coefficient of economic growth (GDP) is significant at conventional level of significance. This is demonstrated by the p-value of the t statistic which is at 0.000 as presented in Table 4.8. It is also evident that economic growth (GDP) has positive beta coefficient (0.0725), which gives a suggestion that economic growth enhances the growth of mortgage financing among Kenyan commercial banks. The outcomes show that economic growth is a significant variable that affects the growth of

mortgage financing among Kenyan commercial banks. Similarly, in Brazil, Tabak et al. (2015) study indicated that, there is a positive and significant relationship that exists between GDP and rate of mortgage credit uptake.

4.6.3 Effect of Money Supply on the Growth of Mortgage Financing

To examine how money supply affects the growth of mortgage financing among Kenyan commercial banks a simple panel regression was conducted with money supply as the independent variable and growth of mortgage financing as the dependent variable. Model (i) was applied in this case.

Y represents $\beta 0 + \beta_1 X + \varepsilon$ ……..(equation i)

Y- represents growth of mortgage financing, X- Represents money supply

Table 4.9: Regression Summary between Money Supply on Growth of Mortgage Financing

Source	**SS**	**df**	**MS**		Number of obs = 10	
Model	.02724072	1	.02724072			
Residual	.1074028	8	.01342535		F(1, 8) = 8.03	
Total	.13464352	9	.014960391			
					Prob > F = 0.0211	
					R-squared = 0.02023	
					Adj R-squared = 0.1026	
					Root MSE = .11587	
Mortgage	Coef.	Std. Err.	t	$p > \|t\|$	[95% Conf. Interval]	
M3millions	.386744	.1130835	3.42	0.021	1.012835	.2393466
_cons	7.191357	1.774385	4.05	0.004	3.099617	11.2831

Table 4.9 presents the R squared and ANOVA results of the effect of money supply on the growth of mortgage financing among Kenyan commercial banks. The NOVA output shows that the probability F test value was 0.0211 an implication that the variable is statically significance at 95% confidence level. The variable has explanatory power. R squared is the coefficient of determination. The results indicate that money supply has

0.2023 or nearly 20.2% power in explaining growth of mortgage financing as illustrated by the coefficient of determination (R-sq). The results demonstrate the model's fitness as a good estimator of the effect of money supply on the growth of mortgage financing among Kenyan commercial banks.

Table 4.9 shows that the p value for t test is 0.021which is less that the 0.005 meaning that money supply has a significant effect on growth of mortgage financing among Kenyan commercial banks at 95% confidence level. The coefficient of money supply is 0.387 and the coefficient of the constant is 7.1913. This shows that when money supply is 0 growth of mortgage financing is 7.1913. The coefficient of money supply is a positive coefficient meaning that the relationship is positive in that a unit rise in money supply would raise the growth of mortgage financing among Kenyan commercial banks by 0.387 units.

In corroboration with the findings, Zhu, Betzinger and Sebastian (2017) investigated how monetary policy stance and mortgage market structure affect non-fundamental house price movements in eleven Euro area countries and found that in countries with less regulated mortgage markets, monetary policy stance significantly affect fundamental house prices.

4.6.4 Effect of Inflation Rate on Growth of Mortgage Financing

To examine how inflation rate affects the growth of mortgage financing among Kenyan commercial banks a simple panel regression was conducted with inflation rate as the independent variable and growth of mortgage financing as the dependent variable. Model (i) was applied in this case.

Y represents $\beta 0 + \beta_1 X + \varepsilon$ ……..(equation i)

Y- represents growth of mortgage financing, X- Represents inflation rate

Table 4.10: Regression Summary between Inflation Rate and Growth of Mortgage Financing

Source	**SS**	**df**	**MS**	Number of obs = 10	
Model	.000194121	1	.000194121		
Residual	.134449399	8	.016806175	F(1, 8) = 0.01	
Total	.13464352	9	.014960391		
				Prob > F = 0.0171	
				R-squared = 0.0014	
				Adj R-squared = -0.1234	
				Root MSE = .12964	
Mortgage	Coef.	Std. Err.	t	$p > \|t\|$	[95% Conf. Interval]
Inflation Rate	-.0058455	.0018758	-3.11	0.017	-.13127 .1195789
_cons	4.699275	.3272882	14.36	0.000	3.944547 5.454002

The study presents R squared and ANOVA results on table 4.10 on the effect of inflation on the growth of mortgage financing among Kenyan commercial banks. The outcomes point out that inflation has 0.0014 or approximately 0.14% explanatory power on growth of mortgage financing among Kenyan commercial banks as is evidently revealed by the coefficient of determination (R-sq). The analysis of variance (ANOVA) outcomes additionally indicate that the regression model is significant. This is noticeably pointed out by probability of the F-statistic (0.001). The outcomes illustrate the model's fitness as good estimator of the on the effect of inflation on the growth of mortgage financing among Kenyan commercial banks.

The beta coefficient of inflation is significant at conventional level of significance. This is demonstrated by the p-value of the t statistic, which is at 0.017 as presented in Table 4.10. It is also evident that inflation has a negative beta coefficient (-0.0058455), which gives a suggestion that a rise in inflation deteriorates the growth of mortgage financing among Kenyan commercial banks. The outcomes show that inflation is a significant variable that affects the growth of mortgage financing among Kenyan commercial banks. The findings are in support of the findings IDB (2015) that recurrent inflation raise the house prices and this impacted negatively to households who hardly raised sufficient

income to acquire mortgages. In addition, Taner (2016) research on an investigation of the effects of inflation uncertainty on mortgage credit markets and the outcomes showed that inflation uncertainty had a negative and significant impact on demand for mortgage credit thus reducing the mortgage financing as potential mortgage consumers are not willing to take up the mortgage at a high credit.

4.6.5 Effect of Exchange Rates on Growth of Mortgage Financing

To examine how exchange rate affects the growth of mortgage financing among Kenyan commercial banks a simple panel regression was conducted with exchange rate as the independent variable and growth of mortgage financing as the dependent variable. Model (i) was applied in this case.

Y represents $\beta 0 + \beta_1 X + \varepsilon$……..(equation i)

Y- represents growth of mortgage financing, X- Represents exchange rate

Table 4.11: Regression Summary between Exchange Rates and Growth of Mortgage Financing

Source	**SS**	**df**	**MS**		Number of obs = 10
Model	.031538236	1	.031538236		
Residual	.103105284	8	.01288816		F(1, 8) = 9.45
Total	.13464352	9	.014960391		
					Prob > F = 0.0164
					R-squared = 0.2342
					Adj R-squared = 0.1385
					Root MSE = .11353
Mortgage	Coef.	Std. Err.	t	$p > \|t\|$	[95% Conf. Interval]
Exchange Rate	-.0040656	.001142	-3.56	0.016	-.0100588 .0019276
_cons	5.101996	.2820458	18.09	0.000	4.451597 5.752394

Table 4.11 presents the regressions results of the effect of exchange rate on the growth of mortgage financing among Kenyan commercial banks. The ANOVA output shows that

the probability F test value was 0.0164 an implication that the variable is statically significance at 95% confidence level. The variable has explanatory power.

R squared is the coefficient of determination. The results indicate that exchange rate has 0.2342 or nearly 23.42% power in explaining growth of mortgage financing as illustrated by the coefficient of determination (R-sq). The results demonstrate the model's fitness as a good estimator of the effect of exchange rate on the growth of mortgage financing among Kenyan commercial banks.

The p value for t test is 0.016 which is less that the 0.005 meaning that exchange has a significant effect on growth of mortgage financing among Kenyan commercial banks at 95% confidence level. The coefficient of exchange rate is -0.0040656 and the coefficient of the constant is 5.101996. This shows that when exchange rate is 0 growth of mortgage financing is 5.101996. The coefficient of exchange rate is a negative coefficient meaning that the relationship is negative in that a unit rise in exchange rate would lower the growth of mortgage financing among Kenyan commercial banks by 0.0040656 units. Similarly, Siemińska and Krajewska (2015) found that exchange rate risk causes the problem of the inadequacy of the collateral for the mortgage following an increase in the exchange rate of the currency in which it was granted. However, in consistent with the findings, Sumer and ÖZorhon (2018) examine the effect of exchange rates (USD/TL) on the return rates of REIT and housing sales price indices in Turkey and the study exhibited that while REIT index return rate is affected by exchange rates, there is no statistically significant effect of exchange rates on housing sales price return rates. The findings were further inconsistent with local findings by Owuor, Githii and Mwangi (2018) whose outcomes were that exchange rate had a positive insignificant relationship with the growth of mortgage market in Kenya.

4.6.6 Combine Regression Analysis

A joint regression was conducted on the effect of macroeconomic factors on growth of mortgage financing among commercial banks in Kenya.

The model for the regressions was as follows;

Y it represents βo+β1X1+β2X2 + β3X3+ β4X4+ β5X5 + e

Where X1 represents interest rate, X2 represents economic growth, X3 represents money supply, X4 represents inflation and X5 represents exchange rate.

Table 4.12: Combined Regression Analysis

Source	**SS**	**df**	**MS**	Number of obs = 10	
Model	.121414337	5	.024282867		
Residual	.013229184	4	.003307296	F(5, 4) = 7.34	
Total	.13464352	9	.014960391		
				Prob > F = 0.0382	
				R-squared = 0.4017	
				Adj R-squared = 0.4789	
				Root MSE = .05751	
Mortgage	Coef.	Std. Err.	t	$p > \|t\|$	[95% Conf. Interval]
Interstate	-.0796277	.0157351	-5.06	0.007	-.0359402 .1233152
GDP	.0046399	.0013410	3.46	0.006	-.0233659 5.752394
M3	.036011	.0095267	3.78	0.004	-.5777478 2.64977
Inflation Rate	-.0102442	.0034033	3.78	0.004	-.1143335 .1148219
Exchange Rate	-.0125623	.0036622	-3.43	0.022	-.0269366 .001812
_cons	-1.508033	.3404137	-4.43	0.000	-11.28376 8.267698

From the table 4.12, the five independent variables; interest rate, economic growth, money supply, inflation and exchange rate had a combined explanatory power of 0.3409 or 34.09% on growth of mortgage financing as illustrated by the obtained R squared value. The low explanatory power is due other factor such as capital market, mortgage terms and credit scores (Leonard & Owiti, 2013).

The output further shows that the analysis of variance (ANOVA) findings imply that the regression model is significant at 0.05 significance level as illustrated by the probability of the F statistics, which is 0.0382. This further demonstrates that the model fits is a good

estimator of the effect of the macroeconomic factors on the growth of mortgage financing among commercial banks in Kenya.

H_{01}: Interest rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks

The regression output in table 4.12 shows that the beta coefficient of interest rate is significant predictor of the growth in in mortgage financing as shown by the p value of the t statistics of 0.007. It is also observed that interest rate has a negative beta coefficient which is -0.0796277 which means that interest rate has a negative effect on growth of mortgage financing. This means that when the interest rate is on the rise, growth of mortgage financing is slowed down. We therefore reject the null hypothesis that interest rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks. Thus the findings show that interest rate has significant effect on the growth of mortgage financing among Kenyan commercial banks. The findings of the study are supported by other empirical studies from both developed and developing countries. A study by Green and Wachter (2017) revealed that the decline in nominal prime interest rates from an average of 15 percent in 1980 to 4.4 percent in 2004 across several countries lead to improved access to mortgages, increase in demand for housing, and increase in house prices across most of the industrialized countries in the world. It was clear from their study that fall in interest rates induces higher demand for mortgages. This demand therefore led to the rise in mortgage financing. A study by Muguchia (2017) on how, mortgage financing is influenced by flexible interest rates also established a negative and significant relationship between interest rate and mortgage financing. Similarly, Cytonn (2015) argues that the high interest rate becomes a hindrance to the successful development of the mortgage market in Kenya.'

H_{02}: Economic growth has no significant effect on the growth of mortgage financing among Kenyan commercial banks

Economic growth has a positive coefficient of 0.0046 which shows that a unit increase in economic growth would positively influence the growth of mortgage financing. Economic growth is a significant predictor of growth of mortgage financing as shown by the p value of 0.006. We therefore reject the null hypothesis that economic growth has no significant effect on the growth of mortgage financing among Kenyan commercial banks and conclude that economic growth has significant effect on the growth of mortgage financing among Kenyan commercial banks. Consistent to the findings, Muli (2016), in study on the factors influencing the growth of real estate investment within Kenya found that gross domestic product had the greatest influence on the growth of real estate investment.

Theuns (2012) studied the economic variables that affect mortgage financing. Panel data was utilized by the researcher for the period 2006-2012 using a mixed research design. The study found that the variation in mortgage financing is explained by disposable income and GDP. In Brazil, a study on the relationship between Gross Domestic Product and rate of credit uptake was undertaken by Tecles and Tabak (2015). Using Vector Error Correction in the analysis the study determined that economic growth projects high wealth accumulation in the future and therefore motivating investors to take up loans. The study found a positive and significant relationship that between GDP and rate of credit uptake which is inclusive of mortgage loans.

H_{03}: Money supply has no significant effect on the growth of the mortgage financing among Kenyan commercial banks

The beta coefficient of money supply (0.036011) is positive and significant (p value 0.004). A unit change in money supply would change growth of mortgage financing positively by 0.036 units. We therefore reject the null hypothesis that money supply has no significant effect on the growth of the mortgage financing among Kenyan commercial banks and conclude that money supply has a significant effect on the growth of the

mortgage financing among Kenyan commercial banks. The findings of the study were consistent to that Karoki (2013) who applied a descriptive research approach to find out what diatremes prices of real estate sector in Kenya. Using a multivariate regression analysis, the study found that supply of money had an influence on prices of real estate which was positive and significant. In another study by Mwangi, (2006) on identify the determinants of mortgage finance uptake, covering the period from 2001-2005, the study findings showed that money supply had the greatest effect, explaining 41% of the variations in mortgage finance uptake.

H_{04}: Inflation rate has no significant effect on the growth of the mortgage financing among Kenyan commercial banks

Inflation had a negative coefficient of -0.0102442 and a p value of 0.006. This demonstrates that inflation had negative but significant effect on the growth of mortgage financing. A unit increase in inflation in Kenya would lead to a decline in mortgage financing among Kenyan commercial banks by 0.01 units. We therefore reject the null hypothesis that inflation rate has no significant effect on the growth of the mortgage financing among Kenyan commercial banks and conclude that inflation rate has a significant effect on the growth of the mortgage financing among Kenyan commercial banks.

The findings were supported by Walley (2013) who by using regression analysis, found that inflation is negatively and significantly associated with mortgage market development. In another study covering 61 countries, Warnock and Warnock (2008) found that a stable macroeconomic climate of low and stable inflation was associated with deeper mortgage markets. A similar proposition was supported by Huybens (1998) who argued that an increase in the rate of inflation could have at first negative consequences on financial sector performance through credit market frictions which entail the rationing of credit leading to reduction in intermediary activity as well as capital formation. More so, according to the fisher effect theory, real estate prices is correlated to the expected inflation (Demand, 2003).

H_{05}: Exchange rate has no significant effect on the growth of the mortgage financing among Kenyan commercial banks

Exchange rate has a negative beta coefficient of -0.0125623. This shows that a unit increase in exchange rate would reduce the growth of mortgage financing by 0.0125 units. The beta coefficient is significant as illustrated by a p value of 0.022. We therefore reject the null hypothesis that exchange rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks. Thus the findings show that exchange has significant effect on the growth of mortgage financing among Kenyan commercial banks. In contrast to the findings, in their study Owuor, et al., (2018) on the effect of exchange rate on the growth of mortgage market in Kenya found that exchange rate had a positive relationship with the growth of mortgage market in Kenya. The study was descriptive in nature and used secondary similar to the current study. However, the study used quarterly data from 2007 to 2016 obtained from the central bank while the current study used annual data from 2014 to 2023. A multiple linear regression was used to analyze the data.

4.6.7 Testing for Moderation Effect

The sixth objective of the study was to analyze the impact of monetary policy on the macroeconomic factors and its effect on growth of mortgage financing among commercial banks in Kenya. To test the moderating effect of monetary policy on the effect of macroeconomic factors on growth of mortgage financing among commercial banks in Kenya, a second regression with the moderation of the monetary supply was conducted. Change statistics was further computed to analyze the moderation effect of monetary supply on the effect of macroeconomic factors on growth of mortgage financing among commercial banks in Kenya.

The overall model with moderation was as follows;

$$Y=\beta o+\beta 1X1 +\beta 2X2+ \beta 3X3+ \beta 4X4 + \beta 5X5+ \beta 6Z +\beta 7(X1*Z) +\beta 7(X2*Z)+ \beta 7(X3*Z)+ \beta 7(X4*Z) + \beta 8(X5*Z) + e$$

Table 4.13: Moderation Effect Regression Analysis

Source	SS	df	MS	Number of obs = 10
Model	.127487927	5	.025497585	F(5, 4) = 14.25
Residual	.007155593	4	.001788898	Prob > F = 0.0117
Total	.13464352	9	.014960391	R-squared = 0.4469
				Adj R-squared = 0.4804
				Root MSE = .0423

Mortgage	Coef.	Std. Err.	t	$p > \|t\|$	[95% Conf.	Interval]
Interstate	-.0161049	..0050213	-3.20	0.000	-.0013424	.0015523
GDP	.0108465	.003789	2.86	0.046	.0003264	.0213665
M3	.0033937	.0010854	3.16	0.01	-.0047286	.0115161
Inflation Rate	-.008449	.0002128	-3.97	0.017	-.001436	-.0002541
Tbate	.0059269	.0008417	7.04	0.002	.0035901	.0082637
IR by TB	-.1719526	.037544	-4.58	0.005	-1.120707	.7768015
GDP by TB	.0001048	.0000201	5.18	0.000	-.0017126	.0019223
M3by TB	.0369607	.0131555	2.81	0.006	-.107758	.181692
IFR by TB	-.0233169	.0076957	-3.03	0.002	-.0068915	.0135253
Forex by TB	-.0009545	.0003008	.3.17	0.050	-.0019118	2.75e-0.6
-cons	4.098923	.384291	10.67	0.002	2.875938	5.321909

H_{06}: Monetary policy has no effect on the growth of the mortgage financing among Kenyan commercial banks

From the table 4.13, the five independent variables; interest rate, economic growth, money supply, inflation and exchange rate moderated by monetary policy had a combined explanatory power of 0.4469 or 44.69% on growth of mortgage financing as illustrated by the obtained R squared value. The output further shows that the analysis of variance (ANOVA) findings imply that the regression model is significant at 0.05 significance level as illustrated by the probability of the F statistics which is 0.0117. This further demonstrates that the model fits is a good estimator of the moderating effect of the

macroeconomic factors on the growth of mortgage financing among commercial banks in Kenya.

The findings show that the beta coefficients of moderated interest rate, economic growth, money supply, inflation and exchange rate are significant at 95% confidence level. This is illustrated by the p values of the t statistics which are at 0.000 for interest rate, 0.046 for economic growth, 0.011 for money supply, 0.017 for inflation and 0.002 for exchange rate. The findings show that with moderation, all the variables are significant at 95% confidence level.

Table 4.14: Change Statistics

	Model without moderation	**Model with moderation**	**Change statistics**
R- squared	0.4017	0.4469	0.0452
F statistics	7.34	14.25	6.91
Probability F	0.0382	0.0117	0.0265

The change statistics between the model with and without moderation was computed as presented in Tale 4.14. The findings show that moderation has enhanced the model's explanatory power by 4.5% from (0.4017- 0.4469) or 40.17% to 44.69% which shows that the moderating effect of monetary policy is significant. These results, rejects the null hypothesis of no significant moderating effect of monetary policy on the effect of macroeconomic factors on the growth of the mortgage financing among Kenyan commercial banks. We therefore conclude that there is a significant moderating effect of monetary policy on the effect of macroeconomic factors on the growth of the mortgage financing among Kenyan commercial banks.

Table 4.15: Summary of Hypothesis Tests

Variable	Hypothesis	Criteria	Conclusion
Interest rate	Interest rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks	The study rejects the null hypothesis that interest rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks	Interest rate has a significant effect on the growth of mortgage financing among Kenyan commercial banks
Economic growth	Economic growth has no significant effect on the growth of mortgage financing among Kenyan commercial banks	The study rejects the null hypothesis that economic growth has no significant effect on the growth of mortgage financing among Kenyan commercial banks	Economic growth has a significant effect on the growth of mortgage financing among Kenyan commercial banks
Money supply	Money supply has no significant effect on the growth of the mortgage financing among Kenyan commercial banks	The study rejects the null hypothesis that money supply has no significant effect on the growth of the mortgage financing among Kenyan commercial banks.	Money supply has a significant effect on the growth of the mortgage financing among Kenyan commercial banks
Inflation rate	Inflation rate has no significant effect on the growth of the mortgage financing among Kenyan commercial banks	The study rejects the null hypothesis that inflation rate has no significant effect on the growth of the mortgage financing among Kenyan commercial banks	Inflation rate has a significant effect on the growth of the mortgage financing among Kenyan commercial banks
Exchange rate	Exchange rate has no significant effect on the growth of the mortgage financing among Kenyan commercial banks	The study rejects the null hypothesis that exchange rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks	Exchange rate has a significant effect on the growth of mortgage financing among Kenyan commercial banks
Monetary policy	Monetary policy has no effect on the growth of the mortgage financing among Kenyan commercial banks	The study rejects the null hypothesis of no significant moderating effect of monetary policy on the effect of macroeconomic factors on the growth of the mortgage financing among Kenyan commercial banks	There is a significant moderating effect of monetary policy on the effect of macroeconomic factors on the growth of the mortgage financing among Kenyan commercial banks

CHAPTER FIVE

SUMMARY CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the summary conclusions and recommendations of the study. The goal of this study was to investigate the effects macroeconomic drivers on the growth of mortgage financing among Kenyan Commercial banks. Precisely explore the effects regarding interest rate, Economic growth, Money supply, inflation rate, Exchange rate and Monetary policy have on the growth of mortgage financing within Kenya's commercial banks.

5.2 Summary of Findings

5.2.1 Effect of Interest Rate on the Growth of Mortgage Financing

The first objective was to examine how interest rate affects the growth of mortgage financing among Kenyan commercial banks. Interest Rate measured by the average lending interest rate for each year in the period 2014 to 2024. The results showed that the interest rates have been gradually increasing from 2014 up to 2017 where it then continues at an almost constant rate to 2018. The constant rate of interest rate is attributed to the interest rate capping that was effected towards the end of 2016. The interest rate declined upto 2021.

Interest rate has a significant negative relationship with the growth of mortgage financing meaning that when the interest rate is high, mortgage financing is low. The position is supported by the classical theory of interest rate which holds that interest rate determines the demand for capital. The panel regression analysis revealed that interest rate has a significant effect on growth of mortgage financing among Kenyan commercial banks at 95% confidence level. The relationship is negative thus a unit rise in interest rate would reduce the growth of mortgage financing among Kenyan commercial banks. The study

therefore reject the null hypothesis that interest rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks.

5.2.2 Effect of Economic Growth on Growth of Mortgage Financing

Secondly, the study sought to find out how economic growth affects growth of mortgage financing among Kenyan commercial banks. The economy experienced fluctuating GDP growth over the mentioned period. It peaked in 2015 but saw a significant drop to in 2020, largely due to the economic effects of the COVID-19 pandemic. In 2017, there was another drop attributed to the general elections held that year. However, there was a rebound in 2021 and remained relatively stable in 2022 and 2023.

The economic growth as measured by gross domestic product has a positive and significant relationship with growth of mortgage financing. The outcomes show that economic growth is a significant variable that positively affects the growth of mortgage financing among Kenyan commercial banks. The findings are in support of the economic growth theory that economic growth affects performance of all economic sectors. The study therefore rejects the null hypothesis that economic growth has no significant effect on the growth of mortgage financing among Kenyan commercial banks.

5.2.3 Effect of Money Supply on the Growth of Mortgage

The third objective of the study was to establish if money supply has any effect on the growth of mortgage financing among Kenyan commercial banks. Money supply was indicated by the aggregate amount of monetary assets, (M3). Money supply increased steadily over the years, indicating expansionary monetary policy and growing liquidity in the economy. The correlation output reveled that there is a positive and significance correlation between money supply and growth of mortgage financing. This finding means that when the amount of money in circulation increases mortgage financing on the other hand also increases.

The regression showed that the relationship between money supply and the growth mortgage financing among Kenyan commercial banks is positive and significant. The study therefore rejects the null hypothesis that money supply has no significant effect on the growth of the mortgage financing among Kenyan commercial banks.

5.2.4 Effect of Inflation Rate on the Growth of Mortgage

The fourth objective aimed at determining if the inflation rate has any impact on the development and growth of mortgage financing among Kenyan commercial banks. Inflation measure considered in the study was the annual change in the Consumer Price Index. There was a slight increase from 2014 to 2016, followed by relatively stable inflation levels until a notable uptick in 2023.

The correlation between inflation and growth of mortgage financing was found to be negative but significant. Thus when there is a general increase in the price of goods and services in the economy, mortgage financing drops. The regression outcomes show that inflation is a significant variable that negatively affects the growth of mortgage financing among Kenyan commercial banks. The study therefore rejects the null hypothesis that inflation rate has no significant effect on the growth of the mortgage financing among Kenyan commercial banks.

5.2.5 Effect of Exchange Rates on the Growth of Mortgage Financing

The fifth objective of the study was to interrogate whether exchange rates has any impact on the growth of mortgage financing among Kenyan commercial banks. The exchange rate considered in this study was the Ksh/USD rate. The exchange rate showed fluctuations over the years, with a slight increase from 2014 to 2017, followed by more significant fluctuations in 2020 and 2021.

The correlation output showed that the association between exchange rate and growth of mortgage financing was negative and significant. The regression findings further reveal

that exchange has a significant negative effect on growth of mortgage financing among Kenyan commercial banks.

5.2.6 Moderating Effect of Monetary Policy on the Effect of Macroeconomic Factors on Growth of Mortgage Financing

The sixth objective was to analyze the impact of monetary policy on the above macroeconomic factors and its effect on growth of mortgage financing among commercial banks in Kenya. The study established that the five independent variables; interest rate, economic growth, money supply, inflation and exchange rate had a combined explanatory power of 34.09% on growth of mortgage financing without moderation. However, moderated by monetary policy the combined explanatory power was 44.69% on growth of mortgage financing. With the significant moderation effect of monetary policy, the study rejects the null hypothesis of no significant moderating effect of monetary policy on the effect of macroeconomic factors on the growth of the mortgage financing among Kenyan commercial banks.

5.3 Conclusion of the Study

5.3.1 Interest Rate and the Growth of Mortgage Financing

The study concludes that interest rate has a significant negative relationship with the growth of mortgage financing among Kenyan commercial bank. The position is supported by the classical theory of interest rate which holds that interest rate determines the demand for capital. The study reject the null hypothesis that interest rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks. Thus interest rate has significant effect on the growth of mortgage financing among Kenyan commercial banks.

5.3.2 Economic Growth and the Growth of Mortgage Financing

The study concludes that economic growth as measured by gross domestic product has a positive and significant relationship with growth of mortgage financing. The findings are in support of the economic growth theory that economic growth affects performance of all economic sectors. The study therefore rejects the null hypothesis that economic growth has no significant effect on the growth of mortgage financing among Kenyan commercial banks. Economic growth is a significant variable that positively affects the growth of mortgage financing among Kenyan commercial banks.

5.3.3 Money Supply and the Growth of Mortgage Financing

The study concludes that there is a positive and significance correlation between money supply and growth of mortgage financing. When the amount of money in circulation increases mortgage financing on the other hand also increases. The study therefore rejects the null hypothesis that money supply has no significant effect on the growth of the mortgage financing among Kenyan commercial banks. Money supply has a significant effect on the growth of the mortgage financing among Kenyan commercial banks.

5.3.4 Inflation Rate and the Growth of Mortgage Financing

The correlation between inflation and growth of mortgage financing was found to be negative but significant. Thus when there is a general increase in the price of goods and services in the economy, mortgage financing drops. The regression outcomes show that inflation is a significant variable that negatively affects the growth of mortgage financing among Kenyan commercial banks. The study rejects the null hypothesis that inflation rate has no significant effect on the growth of the mortgage financing among Kenyan commercial banks.

5.3.5 Exchange Rates and the Growth of Mortgage Financing

The association between exchange rate and growth of mortgage financing was negative and significant. The regression findings further reveal that exchange has a significant negative effect on growth of mortgage financing among Kenyan commercial banks. The study reject the null hypothesis that exchange rate has no significant effect on the growth of mortgage financing among Kenyan commercial banks.

5.3.6 Moderating Effect of Monetary Policy

The study concludes that interest rate, economic growth, money supply, inflation and exchange rate had a combined effect on growth of mortgage financing without moderation. The study rejects the null hypothesis of no significant moderating effect of monetary policy on the effect of macroeconomic factors on the growth of the mortgage financing among Kenyan commercial banks and concludes that there is a significant moderating effect of monetary policy on the effect of macroeconomic factors on the growth of the mortgage financing among Kenyan commercial banks.

5.4 Recommendations of the Study

According to the findings, economic growth has a direct impact on mortgage financing in Kenyan banks. Since the government develops and implements policies on economic growth, this study proposes that the Kenyan government can implement policies aimed at increasing investment in infrastructure projects such as roads, bridges, and utilities. Improved infrastructure can stimulate economic activity, create jobs, and attract investments, ultimately leading to economic growth. This growth can in turn boost demand for housing and increase the uptake of mortgages.

The study concluded that interest rates, money supply, and inflation, all of which are part of the Central Bank of Kenya's monetary policy instruments, had a direct link on mortgage financing. The research proposes that Kenya's central banks put in place mechanisms to guarantee that interest rates, money supply, and inflation do not have an adverse impact

on commercial banks mortgage financing. The Central Bank of Kenya (CBK) should implement a transparent and predictable monetary policy framework aimed at maintaining stable interest rates and inflation within a targeted range. The CBK should use a combination of monetary policy tools, including open market operations such as buying or selling treasury bills, to manage money supply and control inflationary pressures.

Commercial banks can lower the interest rates they charge on mortgage loans to make them more affordable for potential borrowers. This can be particularly effective there is a competitive market where other banks are offering similar products. Banks can also offer limited-time promotions that provide extra incentives for borrowers to take out a mortgage. For example, they might offer a lower interest rate for the first year or waive certain fees associated with the loan.

To attract mortgage takers, policymakers should guarantee that the interest rates paid on mortgage facilities are competitive in the market. Since inflation and interest rates were identified as factors in the mortgage sector by the study, the government should implement regulations to safeguard the interests of both consumers and lenders in the market.

According to the findings, there is a strong link between exchange rates and mortgage finance. As a result, the study advises that the government guarantee currency stability since currency fluctuations may have a negative impact on commercial bank mortgage borrowing. Building and maintaining an adequate level of foreign exchange reserves provides a buffer against currency volatility. Promoting exports and attracting foreign direct investment can help support currency stability by increasing demand for the domestic currency. The government can implement policies to enhance competitiveness, remove trade barriers, and create a favorable investment climate.

Because monetary policy has a strong moderating impact on macroeconomic variables, the Central Bank of Kenya should carefully monitor the money supply and adjust its policies as needed to maintain a stable and healthy economy in order to boost mortgage uptake. To increase mortgage uptake in Kenya, the government should act to control

interest rates and keep them at appropriate levels. This is due to the considerable impact they have on mortgage uptake; they set lending rates and, as a result, influence demand by increasing or decreasing access to finance. Collaboration with other regulatory agencies, such as the Capital Markets Authority and the Insurance Regulatory Authority, can provide a comprehensive view of the financial system and help identify potential systemic risks that may affect mortgage financing.

5.5 Suggested Areas for Further Research

The study focused on only the commercial banks in Kenya; however other financial institutions offer mortgage loans. Thus further studies should consider incorporating the other financial institutions that offer mortgage loans.

The study used interest rates, money supply, exchange rate, economic growth and inflation macroeconomic variables and as such further studies could use other macroeconomic variables not included in the study. In addition, the study adopted specific measures of the study variables and thus suggests that other measures could be used by future researchers to ascertain the findings of the study.

The study was limited to monetary policy as the moderating variable, however, there may be other variables that could moderate on the effect of macroeconomic factors on growth of mortgage financing among commercial banks in Kenya. Thus further studies should focus on adopting other moderating variables on a similar study.

The five independent variables; interest rate, economic growth, money supply, inflation and exchange rate had a combined explanatory power of 34.09% on growth of mortgage financing, thus future studies could focus on the factors explain the remaining 65.91% of mortgage financing.

REFERENCES

Abdelsalam, A., Mohammed, A. M. E., Mohamed, Y. A., Barake, S., & Nobanee, H. (2020). The Role of the Central Bank of Kenya in the Financial Stability. *Journal of Financial Stability*, *54*(2021), 100854.

Abdullah, H., & El-Rasheed, S. (2019). Financial Sector Reforms, Monetary and Output Uncertainties and the Behavior of Money Demand in Kenya: The Divisia Index Approach. *Asian Economic and Financial Review*, 9(7), 766-777.

Acharya, K. P., & Pathak, S. (2019). Applied research in low-income countries: why and how? *Frontiers in Research Metrics and Analytics*, 4(3), 1-9

Adenekan, A.T.; Sanni, G. K. & Itodo, A. I. (2019). Investigating the Impact of Exchange Rate Volatility on Naira Exchange Rate in Nigeria. *Economic and Financial Review*, 57(3), 17-38

Agao, E. (2014). The effect of macroeconomic variables on the mortgage uptake for mortgage industry in Kenya. *Journal of Investment and Management*, 4(6), 334-347.

Aguko, J. (2016). Analysis of the Factors Influencing Mortgage Financing in Kenya a Case of Housing Finance Company of Kenya. *International Journal of Social Sciences and Entrepreneurship*, 1(5), 618-631

Agusto& Co Research (2011). *Nigerian Mortgage Banking Industry Report*. Sector report by the Research of Agusto& Co

Ahmed, R., Aizenman, J., & Jinjarak, Y. (2021). Inflation and exchange rate targeting challenges under fiscal dominance. *Journal of Macroeconomics*, 67, 103-281.

Akenga, G. M., Olang, M. A., & Galo, N. M. (2015). Effect of mortgage market risk on mortgage uptake: A case study of mortgage lenders in Kenya. *Journal of Investment and Management*, 4(6), 334-347.

Albertazzi, U., Fringuellotti, F., & Ongena, S. (2020). Fixed rate versus adjustable-rate mortgages: evidence from euro area banks. *Swiss Finance Institute Research Paper*, (20-99).

Alper, E., Clements, B., Hobdari, N., & Moya Porcel, R. (2020). Do interest rate controls work? Evidence from Kenya. *Review of Development Economics*, 24(3), 910-926.

Ampofo, J. A. (2020). The nature of mortgage repayment plans in Ghana. *Finance & Accounting Research Journal*, 2(3), 91-104.

Anbar, A., & Alper, D. (2011). Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey. *Business and economics research journal*, 2(2), 139-152.

Arain, M., Campbell, M. J., Cooper, C. L., & Lancaster, G. A. (2010). What is a pilot or feasibility study? A review of current practice and editorial policy. *BMC medical research methodology*, 10(1), 1-7.

Ariemba J.M., Kimeu R.M. & Riri, K. (2015). The Influence of Macro Economic factors on Mortgage Growth in Kenya, *Journal of Finance and Accounting,* 4(3), 77-85

Ariso, O. (2015). The effect of mortgage interest rates on the growth of mortgage financing amongst financial institutions in Kenya. *The European Journal of Finance*, 14(8), 687-699.

Arvanitis, A. V. (2013). "BIOPOLIS": Biopolicy for Greener and More Livable Cities. *Cadmus*, 2(1), 100.

Asabere, P. K., McGowan Jr, C. B., & Lee, S. M. (2016). A study into the links between mortgage financing and economic development in Africa. *International Journal of Housing Markets and Analysis*, *9*(1), 2-19.

Asamoah, M. K. (2014). Re-examination of the limitations associated with correlational research. *Journal of Educational Research and Reviews*, *2*(4), 45-52.

Auguste, S., Bebczuk, R., & Moya, R. (2011). The demand for mortgages under macro volatility: The Argentine case. *Economic systems*, 36(2), 279-293.

Bahmani-Oskooee, M., Chang, T., & Lee, K. C. (2016). Purchasing power parity in emerging markets: A panel stationary test with both sharp and smooth breaks. *Economic Systems*, 40(3), 453-460.

Bailey, M., Dávila, E., Kuchler, T., & Stroebel, J. (2019). House price beliefs and mortgage leverage choice. *The Review of Economic Studies*, *86*(6), 2403-2452.

Baranidharan, S., & Dhivya, N. (2020). Causal influence of macroeconomics factors shock on Indian stock market: evidence from BSE index. *Asian Journal of Economics, Finance and Management*, 39-48.

Batarseh, N. (2021). A Theory of Cryptocurrencies Employing Proof of Socially Beneficial Work. *Available at SSRN 4212699*.

Beck, M., Bryman, A., & Liao, T. (2016). *The Sage encyclopedia of social science research methods*. Sage Publications.

Bernanke, B. S. (2020). The new tools of monetary policy. *American Economic Review*, 110(4), 43-83.

Bertocco, G. (2013). On Keynes's Criticism of the Loanable Funds Theory. *Review of Political Economy*, *25*(2), 309-326.

Bett, M. (2016). Effects of inflation and interest rates on mortgage finance offered by commercial banks in Kenya. *Journal of Monetary Economics*, 54(5), 1441-1471.

Beutler, T., Bichsel, R., Bruhin, A., & Danton, J. (2020). The impact of interest rate risk on bank lending. *Journal of Banking & Finance*, *115*, 105797.

Bhattacherjee, A. (2012). *Social science research: Principles, methods, and practices*. Routledge

Bibow, J. (2013). *Keynes on monetary policy, finance and uncertainty: Liquidity preference theory and the global financial crisis*. Routledge.

Biernert, L. & Brauner, E. (2017). The Mortgage Lending Value: Prospect for Development within Europe. *Journal of Property Investment & Finance,* 25(6), 542-578. https://doi.org/10.1108/14635780710829289

Binder, C., & Kamdar, R. (2022). Expected and realized inflation in historical perspective. *Journal of Economic Perspectives*, *36*(3), 131-56.

Blanchard, O. (2019). Public debt and low interest rates. *American Economic Review*, *109*(4), 1197-1229.

Boamah, N. A. (2017). The global financial market integration of selected emerging markets. *International Journal of Emerging Markets*, 12(4), 683-707.

Boleat, M. (2003). Regulation of mortgage lending institutions. *Housing Finance International*, 18(1), 3-9.

Boleat, M. (2014). Inclusive capitalism: Searching for a purpose beyond profit. *The Guardian*, *27*.

Borge, W., R., & Gall, M., D. (2017). *Educational Research: An Introduction* (Seventh Edition). New York: Longman.

Brissimis, S. N., & Vlassopoulos, T. (2019). The interaction between mortgage financing and housing prices in Greece. *The Journal of Real Estate Finance and Economics*, 39(2), 146-164.

Brunner, K., & Meltzer, A. H. (1972). Friedman's monetary theory. *Journal of Political Economy*, *80*(5), 837-851.

Brunnermeier, M. K., & Koby, Y. (2018). *The reversal interest rate* (No. 25406). National Bureau of Economic Research.

Buckley, R. M., & Kalarickal, J. (2004). *Shelter strategies for the urban poor: idiosyncratic and successful, but hardly mysterious* (Vol. 3427). World Bank Publications.

Butler, K. C. (2016). *Multinational finance: Evaluating the opportunities, costs, and risks of multinational operations*. John Wiley & Sons.

Candia, B., Coibion, O., & Gorodnichenko, Y. (2021). *The Inflation Expectations of US Firms: Evidence from a new survey* (No. w28836). National Bureau of Economic Research.

Cassel, G. (1918). Abnormal deviations in international exchanges. *The Economic Journal*, *28*(112), 413-415.

Central Bank of Kenya (2009). FSD, Kenya, Financial institutions National Survey, June 2009.

Central Bank of Kenya (2012). *Kenya Monthly Economic Review*. Nairobi: Central Bank. Retrieved from https://centralbank.go.ke//images/docs/Monthly%20Economic%20Reviews /2012/MER2012.pdf.

Central Bank of Kenya (2013). *Kenya Monthly Economic Review*. Nairobi: Central Bank. Retrieved from: https://centralbank.go.ke//images/ docs/ Monthly%20Economic%20Reviews/2013/ MER2014.pdf

Central Bank of Kenya (2014). *Kenya Monthly Economic Review*. Nairobi: Central Bank. Retrieved from: https://centralbank.go.ke//images/docs/Monthly%20Economic% 20Reviews/ 2014/ MER2015.pdf

Central Bank of Kenya (2015). Bank Supervision Annual Report. Nairobi: Central Bank. Retrieved from: https://www.centralbank.go.ke/uploads/399346751_2015 %20Annua %20Repo rt.pdf.

Central Bank of Kenya (2016). Bank Supervision Annual Report. Nairobi: Central Bank. Retrieved from: https://www.centralbank.go.ke/uploads//banking_sector_ annual_reports/323855712_2016%20BSD%20ANNUAL%20REPORT%20V5.p df

Central Bank of Kenya (2018). *Bank Surveillance Report.* Pg. 21-23

Central Bank of Kenya (2021). Bank Supervision Annual Report. Nairobi: Central Bank. Retrieved from: https://www.centralbank.go.ke/uploads/ banking_sector_annual_ reports/2009197617_2021%20Annual%20Report.pdf

Central Bank of Kenya. (2017). Banking Supervision Annual Report. Nairobi: Central Bank.

Chandrashekar, R., & Sakthivel, P. (2018). Macroeconomic variables and stock prices in emerging economies: A panel analysis. *Theoretical & Applied Economics*, 25(3), 91-100

Childs, M. (2018). Learners' Experience of Presence in Virtual Worlds by Table of Contents. *he International Review of Research in Open and Distributed Learning*, *13*(4), 269-292.

Chowdhury, M. A. F., & Rasid, M. E. S. M. (2017). Determinants of performance of Islamic banks in GCC countries: Dynamic GMM approach. *Advances in Islamic Finance, Marketing, and Management*, (pp. 49–80). Emerald Group Publishing Limited. doi:10.1108/978-1-78635-899-820161005

Chris O. Udoka, Owor., Mary K., (2017). Mortgage Financing and Housing Development in Nigeria *International Journal of Research-Granthaalayah*, 5(5),182-206.

Claessens, S., Coleman, N., & Donnelly, M. (2017). 'Low-for-long'interest rates and banks' interest margins and profitability: cross-country evidence. *FRB International Finance Discussion Paper*, (1197).

Cochrane, J. H. (2018). Michelson-Morley, Fisher, and Occam: The radical implications of stable quiet inflation at the zero bound. *NBER Macroeconomics Annual*, 32(1), 113-226.

Colaniran, S. (2017). Iwundu, C. S. (2022). Mortgage Financing and Economic Growth in Nigeria during 1996–2020. *Asian Journal of Economics, Finance and Management*, 28-36.

Collyns, C., & Senhadji, A. (2017). *Lending booms, real estate Bubbles, and the Asian crisis. International Monetary Fund*. Working paper No. WP/02/20.

Colunga Ramos, F., & Valcarcel, V. (2020). A Divisia Measure of the Money Supply for Mexico. *Available at SSRN 3751830*.

Cooper, S., & Schinder, J. (2003). *Research Methodology Methods and Techniques*. New American Compensation Press

Crowley, J. (2017). Interest Rate Spreads in English-Speaking Africa. *IMF Working Paper*. P123-45.

Curtis, E. A., Comiskey, C., & Dempsey, O. (2016). Importance and use of correlational research. *Nurse researcher*, 23(6), 20-25

Cytonn, (2015). Business and Market Outlook. Retrieved from: https://cytonn.com/download/Cytonn_2015%20Business_and_Market_Outlook. p df

Cytonn, I. (2016). Business and Market Outlook. Retrieved from: https://cytonn.com/download/Cytonn_2016%20Business_and_Market_Outlook. p df

Dalziel, P. (2002). The triumph of Keynes: what now for monetary policy research?. *Journal of Post Keynesian Economics*, *24*(4), 511-527.

Dawson, S. (2010). 'Seeing'the learning community: An exploration of the development of a resource for monitoring online student networking. *British journal of educational technology*, *41*(5), 736-752.

Dellink, R., Chateau, J., Lanzi, E., & Magné, B. (2017). Long-term economic growth projections in the Shared Socioeconomic Pathways. *Global Environmental Change*, 42, 200-214.

Demand, M. (2003). The Fisher effect: new evidence and implications. *International Review of Economics & Finance*, *12*(4), 451-465.

Demir, F., & Razmi, A. (2022). The real exchange rate and development theory, evidence, issues and challenges. *Journal of Economic Surveys*, *36*(2), 386-428.

DeRock, D. (2021). Hidden in plain sight: Unpaid household services and the politics of GDP measurement. *New Political Economy*, *26*(1), 20-35.

Devereux, M. B., & Engel, C. (2016). Monetary policy in the open economy revisited: Price setting and exchange-rate flexibility. *The Review of Economic Studies*, *70*(4), 765-783.

Dewan, E., & Hussein, S. (2001). *Determinants of economic growth (Panel data approach)*. Suva Fiji: Economics Department, Reserve Bank of Fiji.

Dharma, F., Shabrina, S., Noviana, A., Tahir, M., Hendrastuty, N., & Wahyono, W. (2020). Prediction of Indonesian inflation rate using regression model based on genetic algorithms. *Jurnal Online Informatika*, 5(1), 45-52.

Di Maggio, M., Kermani, A., Keys, B. J., Piskorski, T., Ramcharan, R., Seru, A., & Yao, V. (2017). Interest rate pass-through: Mortgage rates, household consumption, and voluntary deleveraging. *American Economic Review*, *107*(11), 3550-3588.

Dickens, E. (2011). Keynes's theory of monetary policy: an essay in historical reconstruction. *Contributions to Political Economy*, *30*(1), 1-11.

Dimand, R. W. (2019). *Irving Fisher. In The Elgar Companion to John Maynard Keynes* (pp. 116-121). Edward Elgar Publishing.

Dimand, R. W., & Nyland, C. (Eds.). (2003). *The status of women in classical economic thought*. Edward Elgar Publishing.

Dinh, D. V. (2020). Impulse response of inflation to economic growth dynamics: VAR model analysis. *The Journal of Asian Finance, Economics and Business*, 7(9), 219-228.

Dobson, J. A. (2018). *Modelling survival data in medical research*. CRC press.

Doling, J., Vandenberg, P., & Tolentino, J. (2013). Housing and housing finance-A review of the links to economic development and poverty reduction. *Asian Development Bank Economics Working Paper Series*, (362).

Drumond, I., & Jorge, J. (2013). Loan interest rates under risk-based capital requirements: The impact of banking market structure. *Economic Modelling*, *32*, 602-607.

Durham, W. & Stokes, P. (2015). Conceptual frameworks and terminology in doctoral nursing research. *Nurse Researcher*, 23(2), 8-12. doi: 10.7748/nr.23.2.8.s3

Ekpeyong, A., Charles, E., Olugbemi Kolawole, O., & Ita, I. R. (2020). Money Supply, Inflation and Economic Growth in Nigeria. *International Journal of Banking and Finance Research*, *6*(2), 40-52.

Elius, O. A. (2022). Critical factors affecting affordability of mortgage housing in Kenya. *Journal of Housing and the Built Environment*, *33*, 111-131.

Estate, M. (2016). *Mortgage securities in emerging markets*. World Bank Publications.

Etyang, D. I., & Mwengei, O. K. (2019). An empirical examination of the effect of mortgage financing on performance of real estate sector in Kisumu City, Kenya. *International Journal of Recent Research in Commerce Economics and Management*, *6*(3), 141-155.

Fama, E. F., & Schwert, G. W. (1977). Asset returns and inflation. *Journal of financial economics*, *5*(2), 115-146.

Feather, C., & Meme, C. K. (2018). Consolidating inclusive housing finance development in Africa: Lessons from Kenyan savings and credit cooperatives. *African Review of Economics and Finance*, 10(1), 82-107.

Field, M., (2009). *Symmetry in chaos: a search for pattern in mathematics, art, and nature*. Society for Industrial and Applied Mathematics.

Filotto, U., Caratelli, M., & Fornezza, F. (2021). Shaping the digital transformation of the retail banking industry. Empirical evidence from Italy. *European Management Journal*, *39*(3), 366-375.

Filotto, U., Giannotti, C., Mattarocci, G., & Scimone, X. (2018). Residential mortgages, the real estate market, and economic growth: evidence from Europe. *Journal of property investment & finance*, 5(3), 351-360.

Filotto, U., Giannotti, C., Mattarocci, G., & Scimone, X. (2018). Residential mortgages, the real estate market, and economic growth: evidence from Europe. *Journal of property investment & finance*, *36*(6), 552-577.

Fisher, D. B. (1968). Protein staining of ribboned epon sections for light microscopy. *Histochemie*, *16*(1), 92-96.

Fisher, I. (1911). Recent changes in price levels and their causes. *The American Economic Review*, *1*(2), 37-45.

Forbes, K. (2019). *Inflation dynamics: Dead, dormant, or determined abroad?* (No. w26496). National Bureau of Economic Research.

Francis, R. (2013). *Report of the Mid Staffordshire NHS Foundation Trust public inquiry: executive summary* (Vol. 947). The Stationery Office.

Garcia, M., (2017). ICTs and the informal economy: mobile and broadband roles. *Digital Policy, Regulation and Governance*.

Gardiner, J. C., & Roman, L. A. (2019). Fixed effects, random effects and GEE: what are the differences? *Statistics in medicine*, *28*(2), 221-239.

Gerlach, S., Peng, W., & Shu, C. (2015). Bank for International Settlements Papers, 22.

Ghana, B. O. (2007). The housing market in Ghana. *BANK OF GHANA*.

Gichuke, R. R. (2019). *Private Construction Developers' Capacity and Compliance to National Construction Authority Regulations: a Case of Nairobi County* (Doctoral dissertation, University of Nairobi).

Giddings, S. (2017). *Housing Challenges & Opportunities in Sub-Saharan Africa*. Washington. D.C: International Housing Coalition.

Gleditsch, J. N. (2017). Latent Estimation of GDP, GDP per capita, and Population from Historic and Contemporary Sources. *arXiv preprint arXiv:1706.01099*.

Gonzalez-Vega, C. (2021). *Credit-rationing behavior of agricultural lenders: the iron law of interest-rate restrictions. Undermining rural development with cheap credit* (pp. 78-95). Routledge.

Grant, R. (2018). Innovations in interest rate policy. *The American Economic Review*, *56*(1/2), 178-197.

Green, J. R., & Shoven, J. B. (1983). The effects of interest rates on mortgage prepayments.

Green, K., & Wachter, S. (2017). "The American Mortgage in Historical and International Context." *Journal of Economic Perspectives*, 19(4), 93-114.

Grubb, F. (2019). Colonial American paper money and the quantity theory of money: an extension. *Social Science History*, 43(1), 185-207.

Gujarati, D. N. (2016). *Basic Econometrics*, (4th ed.). New York: McGraw-Hill.

Hahm, J. K. (2014). Sustainable entrepreneurship: A convergent process model. *Business Strategy and the Environment*, *26*(1), 1-17.

Hanson, J. (1951). The loanable funds fallacy in retrospect. *History of political Economy*, *32*(4), 789-831.

Harris, J. C. (1989). The effect of real rates of interest on housing prices. *The Journal of Real Estate Finance and Economics*, *2*, 47-60.

Hass Consult Survey. (2013). *Kenyan Property Market*. Nairobi: Hass Consult.

Hassler, B. (2016). Subordinate financialization and housing finance: The case of indexed mortgage loans' coalition in Argentina. *Housing Policy Debate*, *30*(4), 585-605.

Hausman, J., Stock, J. H., & Yogo, M. (2005). Asymptotic properties of the Hahn–Hausman test for weak-instruments. *Economics Letters*, 89(3), 333-342.

Hautaniemi, S. I., Anderton, D. L., & Swedlund, A. (2013). Methods and validity of a panel study using record linkage: Matching death records to a geographic census sample in two Massachusetts towns, 1850–1912. *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 33(1), 16-29.

Hofman, A., & Aalbers, M. B. (2019). A finance-and real estate-driven regime in the United Kingdom. *Geoforum*, 100, 89-100.

Huerta, Y. A., Swartz, B., & Lilja, D. J. (2022, February). Enhancing the top-down microarchitectural analysis method using purchasing power parity theory. In *Languages and Compilers for Parallel Computing: 33rd International Workshop, LCPC 2020, Virtual Event, October 14-16, 2020, Revised Selected Papers* (pp. 163-177). Cham: Springer International Publishing.

Hui, C., & Phillips, M. (2014). Secondary analysis of existing data: opportunities and implementation. *Shanghai archives of psychiatry*, 26(6), 371-388.

Huybens, E. (1998). Financial market frictions, monetary policy, and capital accumulation in a small open economy. *Journal of economic theory*, *81*(2), 353-400.

IDB. (2015). *Unlocking Credit: The Quest for Deep and Stable Bank Lending*. The John Hopkins. University Press.

Imbuga, B. M. (2014). An assessment of the effect of inflation on loan repayment among commercial banks in Kenya. *Advances in Management and Applied Economics*, 3(2), 135-141.

Iranmanesh, N., & Jalaee, S. A. (2021). Testing the long-run neutrality and superneutrality of money in a developing country: Evidence from Iran. *MethodsX*, 8, 101251.

Itimu, S. M., & Abdul, F. (2018). Determinants of average lending rates among selected commercial banks in Kenya. *International Academic Journal of Economics and Finance*, *3*(1), 142-158.

Jara-Bertin, M., Arias Moya, J., & Rodriguez Perales, A. (2014). Determinants of bank performance: evidence for Latin America. *Academia Revista Latinoamericana de Administración*, *27*(2), 164-182.

Johnston, M. (2014). *Corruption, contention and reform: The power of deep democratization*. Cambridge University Press.

Jumbale, D., K. (2016). The Relationship between House Prices and Real Estate Financing in Kenya. *Journal of Real Estate Finance & Economics*, 2(1), 340-367.

Kamaan, C. K., & Nyamongo, E. M. (2014). The effect of monetary policy on economic growth in Kenya. *International Journal of Business and Commerce*, 3(8), 11-24.

Kariuki, P. W. O. (2017). *Firm characteristics and financial intermediation efficiency of deposit taking saving and credit co-operative societies in Kenya* (Doctoral dissertation, COHRED, JKUAT).

Karoki, R. W. (2013). Determinants of residential real estate prices in Kenya (Doctoral dissertation, University of Nairobi)

Keys, T. (2015). No price like home: Global house prices, 1870–2012. *American Economic Review*, *107*(2), 331-353.

Kiganda, E. O. (2014). Effect of macroeconomic factors on commercial banks profitability in Kenya: Case of equity bank limited. *Journal of Economics and Sustainable development*, 5(2), 46-56.

Kiguru, F. N. (2015). Determinants of Real Estate Mortgage Uptake in Kenya. *Journal of Investment and Management*, 4(6), 434-547.

Kish, R. J. (2022). The Dominance of the US 30-Year Fixed Rate Residential Mortgage. *Journal of Real Estate Practice and Education*, 24(1), 1-16.

Kitrar, L., & Lipkind, T. (2021). Assessment of GDP Growth After the Corona Crisis Using the Results of Business And Consumer Surveys. *Higher School of Economics Research Paper No. WP BRP*, *118*.

KNBS, K. (2013). Economic survey 2013 highlights. *Ministry of Devolution and Planning, Kenya National Bureau of Statistics*.

Kohn, M. (1981). A loanable funds theory of unemployment and monetary disequilibrium. *The American Economic Review*, *71*(5), 859-879.

Kosikoh, J. C. (2014). *Determinants of Financial Distress in Insurance Companies in Kenya*. (Published Thesis, Jomo Kenyatta University of Agriculture and Technology).

Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.

Kothari, T. H. (2010). *Research methodology: Methods and techniques. A research platform.* New Age International.

Krausmann, F., Streeck, J., Wiedenhofer, D., & Haberl, H. (2019). Stock-flow relations in the socio-economic metabolism of the United Kingdom 1800–2017. *Resources, Conservation and Recycling*, *161*, 104960.

Kuang, W., & Liu, P. (2015). Inflation and house prices: theory and evidence from 35 major cities in China. *International Real Estate Review*, 18(1), 217-240.

Kung'u, J. (2017). Effect of liquidity management practices on profitability of manufacturing industry in Kenya. *IOSR Journal of Economics and Finance*, 8(1), 84-89.

LaCour-Little, M. (2020). Flood risk and the US housing market. *Journal of Housing Research*, *29*(sup1), S3-S24.

Lagat, D., Kivaa, T., Njuguna, M., Nyakondo, S., Maklago, E., Onkangi, R., ... & Kimathi, B. (2024). Factors Affecting the Physical and Functional Performance of Buildings in Kenya. *Journal of the Kenya National Commission for UNESCO*.

Lavrakas, P. J. (2014). Online panel research. *Online Panel Research: Data Quality Perspective, A*, 1-22.

Leonard, G. M. & Owiti, K. (2013). The Determinants of Mortgage Uptake in Kenya using Capital Market indicators. *Journal of Investment and Management*, 4(6), 334-347.

Lewis, W. A. (2013). *Theory of economic growth*. Routledge.

Liwali, D. (2018). Migration of nurses from Sub-Saharan Africa: a review of issues and challenges. *Health services research*, *42*(3p2), 1373-1388.

Loutskina, E., & Strahan, P. E. (2017). Stress tests and small business lending. *Journal of Financial Economics*, *136*(1), 260-279.

Madura, J., & McDaniel, W. R. (1989). Market reaction to increased loan loss reserves at money-center banks. *Journal of Financial Services Research*, *3*(4), 359-369.

Makena, S. M. (2016). *Factors Influencing Women Participation In Government Procurement: A Case of Nyeri Central Sub-county, Kenya* (Doctoral dissertation, University of Nairobi).

Marcuzzo, M. C. (2017). The "Cambridge" critique of the quantity theory of money: A note on how quantitative easing vindicates it. *Journal of Post Keynesian Economics*, 40(2), 260-271.

Marijana, B., & Kristina, D. (2017). Cluster Analysis of Research and Development Expenditure in EU. In *Central European Conference on Information and Intelligent Systems* (pp. 161-165). Faculty of Organization and Informatics Varazdin.

Martinez Pages, J., & Maza, L. Á. (2018). *Analysis of house prices in Spain* (No. 0307). Banco de España.

Masood, O., Ashraf, M., & Turen, S. (2015). Bank-specific and macroeconomic determinants of bank profitability: Evidence from Member States of the OIC. *Journal of Islamic Financial Studies*, 1(01), 43-56

Mattick, P. (2020). *Marx and Keynes: the limits of the mixed economy* (Vol. 33). Pattern Books.

Meltzer, A. H. (1976). Monetary and other explanations of the start of the Great Depression. *Journal of Monetary Economics*, *2*(4), 455-471.

Menicucci, E., & Paolucci, G. (2016). The determinants of bank profitability: empirical evidence from European banking sector. *Journal of financial reporting and Accounting*, *14*(1), 86-115.

Miles, M. B. Huberman. M. & Johnny S. (2014). *Qualitative Data Analysis: A Methods Sourcebook.* Sage Publications

Mishkin, S. Eakins, F. (2009). *Financial markets and institutions*. Routledge

Mitchell, O. S., & Piggott, J. (2016). Workplace-linked pensions for an aging demographic. *Handbook of the economics of population aging*, *1*, 865-904.

Mohammed, I., (2014). Pro-poor urban housing provision in Ghana: implementation challenges and prospects. *Open House International*, *42*(4), 98-107.

Mokaya, S. B., (2016). *Access to Water among Slum Dwellers in Nakuru Town, Kenya: Lessons from Kaptembwa Location*. Act Press.

Morgan, B. K. (2015). Property-Foreclosure, Is It by Entry or for Ease of Entry: Issues of Fairness regarding the Massachusetts Foreclosure by Entry Provision. *W. New Eng. L. Rev.*, *37*, 91.

Morgan, D. L. & Morgan, A. S. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of mixed methods research*, *1*(1), 48-76.

Moss, V. (2016). Preview of housing finance systems in four different african countries: South Africa, Nigeria, Ghana and Tanzania. *International Union for Housing Finance, London*.

Mugambi, M. & Okech, T. C. (2016). Effect of macroeconomic variables on stock returns of listed commercial banks in Kenya. International Journal of Economics, Commerce and Management, United Kingdom, 4(6), 390-418

Mugenda, O., & Mugenda, A.G. (2003). *Research Methods: Quantitative and Qualitative Approaches.* Acts Press, Nairobi.

Muguchia, L. (2017). Effects of flexible interest rates on the growth of mortgage financing in Kenya. *Journal of Economic Perspectives*, 19(4), 93-114.

Muli, N. F. (2016). An assessment of the factors affecting the growth in real estate investment in Kenya. *Journal of Urban Economics*, 25(3), 282-294.

Muli., L. (2016). Investment performance indicators of selected Lagos commercial properties. *Journal of Property Investment & Finance*, 34(1), 83-97.

Musiałowski, T. (2019). The impact of inflation on the cost of adjustable-rate mortgages. *The Central European Review of Economics and Management*, 3(4), 113-134

Mutero, J. (2017). *Access to Housing Finance in Africa:* Exploring the Issues: Kenya. Finmark Trust.

Mwangi, D. (2006). Determinants of Disclosure Level by Deposit Taking savings and Credit Co-operative Societies in Kenya. *International Journal of Current Aspects in Finance, Banking and Accounting*, 3(1), 1-21.

Mwega, F. M. (2015). Global Financial Crisis Discussion Series Paper 17: Kenya Phase 2. *Overseas Development Institute, London*.

Nachmias, C. F., & Nachmias, D. (2016). Research methods in the social sciences. 5th edition. London: Arnold.

Naoi, K., Kim, C. J., & Huang, M. C. (2018). *The privatization of Japan railways and Japan post: Why, how, and now* (pp. 133-155). Springer Singapore.

Naudé, W. (1995). *Financial liberalisation and interest rate risk management in Sub-Saharan Africa*. University of Oxford, Institute of Economics and Statistics, Centre for the Study of African Economies.

Ndirangu, J. G. (2015). Effect of types of mortgages on financial performance of mortgage institutions in Kenya. *American Journal of Finance*, 1(5), 49-62.

Ndungu, D. N. (2017). The Effects of Rewards and Recognition on Employee Performance in Public Educational Institutions: A Case of Kenyatta University, Kenya. *Global Journal of Management and Business Research, 17*(A1), 43-68.

Ng'etich. J. C., & Wanjau. K. (2015). The Effects of Interest Rate Spread on the Level of Non-Performing Assets: A case of Commercial bank in Kenya, *International Journal of business and public management* 1(1), 58-65.

Ngacha, S. W. (2013). The effect of interest rate volatility on mortgage default rate in Kenya. *Journal of Financial Economics*, 94(1), 47-66

Njoroge, G. M. (2021). Financing Options and Growth Rate of Real Estate Development Companies in Kenya. *International Journal of Current Aspects in Finance, Banking and Accounting*, 3(2), 79-103.

Nkirote, A. (2014). Environmental challenges and the strategic responses in the mortgage industry in Kenya. *Journal of Financial Economics*, 128(2), 344-362.

Nubi, L. (2016). Innovative construction technology for affordable mass housing in Tanzania, East Africa. *Construction management and economics*, *23* (1), 69-79.

Nyamongo, E., Maana, I., & Kamau, A. (2021). Dynamics of Monetary Policy in Kenya. *50 Years of Central Banking in Kenya*, 281.

Ochieng, A., Mbatha, C. M., & Syagga, P. M. (2017). Determinants of accessibility to quality housing by the low/middle income earners in Kenya. *International Journal of Innovative Research and Knowledge*, 2 (5), 102-115.

Oduwole, H. K., & Adenomon, M. O. (2022). Dynamics of Inflation, Interest and Exchange Rates with the Effects of Money Supply and GDP in Nigeria: Evidence from BVARX Models. *Asian Journal of Probability and Statistics*, 122-131.

Ojha, P. R. (2018). Macroeconomics and bank-specific factors affecting liquidity: A study of Nepali commercial banks. *Journal of Business and Social Sciences*, 2(1), 79-87.

Okereke, E. J., Chigbu, E. E., & Augustine, O. O. (2021). Impact of money supply on exchange rate in Nigeria:(1980-2011). *Asian Journal Of Multidimensional Research*, 10(4), 808-818.

Olweny, T., & Themba, S.M. (2011). Effects of banking sectoral factors on the profitability of commercial banks in Kenya. *Economics and Finance Review*, *1*(5), 1-30.

Olweny.T. (2011). Modelling Volatility of Short-term Interest Rates in Kenya. *International Journal of Business and Social Science, Vol. 2* No. 7; Special Issue –April 2011.

Omboto, P. I., & Tubey, R. (2017). Factors influencing implementation of commercial housing projects in Kisumu County, Kenya. *International Journal of Innovative Research and Development*, *6*(4).

Omodero, C. O., & Alpheaus, O. E. (2019). The effect of foreign debt on the economic growth of Nigeria. *Management Dynamics in the Knowledge Economy*, *7*(3), 291-306.

Omollo, W. O. (2019). Barriers to the Effective Regulation of the Building Construction Industry: An Empirical Analysis. *Journal of Construction Business and Management*, *3*(2), 49-58.

Omondi, O. B. (2018). Effects of macro-economic variables on mortgage loan uptake. *International Journal of Business Management, Entrepreneurship and Innovation*, 2(4), 72-82.

Ongore, V. O., & Kusa, G. B. (2013). Determinants of financial performance of commercial banks in Kenya. *International journal of economics and financial issues*, 3(1), 237-252.

Osiobe, E. U. (2019). A literature review of human capital and economic growth. *Business and Economic Research*, 9(4), 179-196.

O'sullivan, A., & Sheffrin, S. M. (2003). *Economics: Principles in action*. Sage Publications

Otido, J., & Omwenga, J. Q. (2019). Factors Affecting National Construction Authority On Regulating Building Construction Projects In Nairobi City County, Kenya. *The Strategic Journal of Business & Change Management*, *6*(2), 2354-2368.

Otwoma, F. B. (2013). The effect of interest rates on property prices in the Kenyan real estate market. *International Journal of Economics and Financial Issues*, 6(1), 354-360.

Owuor, N. D., Githii, W., & Mwangi, M. (2018). The relationship between macroeconomic factors and mortgage market growth in Kenya. *European Scientific Journal*, 14(10), 68-82.

Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, 21(2), 222-237.

Peter, T., Artur, E. J., & Peter, Q. T. (2015). Race, methodology, and social construction in the genomic era. *The ANNALS of the American Academy of Political and Social Science*, *661*(1), 109-127.

Petria, N., Capraru, B., & Ihnatov, I. (2015). Determinants of banks' profitability: evidence from EU 27 banking systems. *Procedia economics and finance*, *20*, 518-524.

Pindyck, R. S., & Rotemberg, J. J. (1990). The excess co-movement of commodity prices. *The Economic Journal*, 100(403), 1173-1189.

Polit, D. F., Beck, T., & Owen, S. V. (2016). Focus on Research Methods Is the CVI an acceptable Indicator of Content Validity? Appraisal and Recommendations. *Research in Nursing & Health*, 30(6), 459–467.

Rani, D. M., & Zergaw, L. N. (2017). Bank specific, industry specific and macroeconomic determinants of bank profitability in Ethiopia. *International Journal of Advanced Research in Management and Social Sciences*, 6(3), 74-96.

Rashid, A., & Jabeen, S. (2016). Analyzing performance determinants: Conventional versus Islamic banks in Pakistan. *Borsa Istanbul Review*, *16*(2), 92-107.

Rawski, T. G. (2018). *Chinese history in economic perspective* (Vol. 13). University of California Press.

Reis, R. (2022). Losing the inflation anchor. *Brookings Papers on Economic Activity, 2021*(2), 307-379.

Renke, S., & Steennot, R. (2020). The marketing of consumer and mortgage credit as a responsible lending tool: A comparison of South African, European and Belgian Law: Part 1. *Potchefstroom Electronic Law Journal/Potchefstroomse Elektroniese Regsblad*, 23(1), 1-26.

Ritter, J. R. (2005). Economic growth and equity returns. Pacific-Basin Finance Journal, 13(5), 489-503.

Rodríguez-Planas, N. (2018). Mortgage finance and culture. *Journal of Regional Science*, *58*(4), 786-821.

Rogoff, K. S. (2022). The age of inflation: easy money, hard choices. *Foreign Aff.*, *101*, 120.

RoK (2017). *Vision 2030 Blueprint*. Government Press.

Ruginski, I. (2016). Checking the Assumptions of Linear Regression. Accessed, 11,2018.

Ryan-Collins, J. (2021). Breaking the housing–finance cycle: Macroeconomic policy reforms for more affordable homes. *Environment and Planning A: Economy and Space*, *53*(3), 480-502.

Sahoo, M., & Sahoo, J. (2019). The relationship between unemployment and some macroeconomic variables: Empirical evidence from India. *Theoretical & Applied Economics*, *26*(1).

Saona, P. (2016). Intra-and extra-bank determinants of Latin American Banks' profitability. *International Review of Economics & Finance*, 45, 197-214.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*. Pearson education.

Scanlon, P. (2017). The politics of mortgage credit expansion in the small coordinated market economies. *West European Politics*, *43*(2), 366-89.

Seeram, E. (2019). An overview of correlational research. *Radiologic technology*, 91(2), 176-179.

Shahini, I. (2019). The impact of economic growth in housing loans demand in Albania. *European Scientific Journal*, *10*(19).

Shalom, B., & Makau, I. (2023). Addressing Construction Related Disputes in Kenya Taking into Consideration Environmental Factors. *Addressing Construction Related Disputes in Kenya Taking into Consideration Environmental Factors (June 30, 2023)*.

Shapiro, S., & Wilk, M. (1968). A comparative study of various tests for normality. *Journal of the American statistical association*, 63(324), 1343-1372.

Sharma, G. (2017). Pros and cons of different sampling techniques. *International journal of applied research*, 3(7), 749-752.

Siemińska, E., & Krajewska, M. (2015). Exchange rate risk on the mortgage market. *Real Estate Management and Valuation*, 23(4), 74-84.

Singh, S., & Sharma, B. (2016). Lead phytochemicals for anticancer drug development. *Frontiers in plant science*, 7, 1667.

Sitek, M. (2021). The Role of Mortgage Loans in Financing The Housing Needs of University Graduates in the Aspect of Credit Management. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *12*(7), 2944-2951.

Solow, R. M. (1956). A contribution to the theory of economic growth. *The quarterly journal of economics*, 70(1), 65-94.

Stenberg, K., Hanssen, O., Edejer, T. T. T., Bertram, M., Brindley, C., Meshreky, A., ... & Soucat, A. (2017). Financing transformative health systems towards achievement of the health Sustainable Development Goals: a model for projected resource needs in 67 low-income and middle-income countries. *The Lancet Global Health*, 5(9), 875-887.

Sugiharti, L., Esquivias, M. A., & Setyorani, B. (2020). The impact of exchange rate volatility on Indonesia's top exports to the five main export markets. *Heliyon*, 6(1), 03141.

Sumer, L., & ÖZorhon, B. (2018). The exchange rate effect on housing price index and REIT index return rates. *Finansal Araştırmalar ve Çalışmalar Dergisi*, 12(22), 249-266.

Sykes, C., & Piper, S. P. (2015). Conceptual frameworks and terminology in doctoral nursing research. *The Journal of Nurse Researcher*, 23(2), 8–12.

Tabak, B. M., Gomes, G. M., & da Silva Medeiros Jr, M. (2015). The impact of market power at bank level in risk-taking: The Brazilian case. *International Review of Financial Analysis*, 40, 154-165.

Tabash, M. I., Yahya, A. T., & Akhtar, A. (2017, December). Financial performance comparison of islamic and conventional banks in the United Arab Emirates (UAE). In *International Conference on Advances in Business and Law (ICABL)* (Vol. 1, No. 1, pp. 477-494).

Tamura, R., Kobayashi, K., Takano, Y., Miyashiro, R., Nakata, K., & Matsui, T. (2017). Best subset selection for eliminating multicollinearity. *Journal of the Operations Research Society of Japan*, 60(3), 321-336.

Taner. M. Y. (2016). *Effects of Inflation Uncertainty on Credit Markets:* A Disequilibrium Approach.

Tanui, S. J. (2019). *Investigating The Management Of Construction Wastes In Nairobi County* (Doctoral dissertation, University of Nairobi).

Taylor, R. (2015). Interpretation of the correlation coefficient: a basic review. *Journal of diagnostic medical sonography*, 6(1), 35-39.

Tecles, P. L., Tabak, B. M. (2015). *Estimating the credit – GDP elasticity: the case of Brazil.* The Banco Central D Brasil Working, No. 229

Theuns, V. (2012). The economic variables that influence the residential property market in South Africa. *South African Journal of Economics*, 76(2), 291-297.

Toporowski, J. (2020). Anwar Shaikh and the classical theory of interest: a critical note. *Cambridge Journal of Economics,* 44(2), 465-474.

Tsatsaronis, K. & Zhu, R. (2014). Residential property price statistics across the globe. *BIS Quarterly Review September*. 1(1), 2-8

Tse, R. Y. (2016). Relationship between Hong Kong house prices and mortgage flows under deposit-rate ceiling and linked exchange rate. *Journal of Property Finance*, 7(4), 54-63.

Tsiang, S. C. (1989). Keynes"“Finance” Demand for Liquidity, Robertson's Loanable Funds Theory, and Friedman's Monetarism. In *Finance Constraints and the Theory of Money* (pp. 303-330). Academic Press.

Ugwuanyi, U. B., & Ugwunta, O. D. (2017). Fiscal policy and economic growth: An Examination of selected countries in Sub-Saharan Africa. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *7*(1), 117-130.

Uppal, J. (2021). Developing housing finance in Pakistan-challenges and opportunities. *The Lahore Journal of Economics*, *26*(1), 31-56.

Van den Berg, H. (2016). *Economic growth and development*. World Scientific Publishing Company.

Vinokurova, N. (2018). How mortgage-backed securities became bonds: the emergence, evolution, and acceptance of mortgage-backed securities in the United States, 1960–1987. *Enterprise & Society*, *19*(3), 610-660.

Walley, S. B. (2013). *Housing Finance across Countries: New Data and Analysis.*

Wang, X. Q., Hao, L. N., Tao, R., & Su, C. W. (2020). Does money supply growth drive housing boom in China? A wavelet-based analysis. *Journal of Housing and the Built Environment*, 35, 125-141.

Warnock, F. E., & Warnock, V. C. (2018). Currency matters: Analyzing international bond portfolios. *Journal of International Economics*, *114*, 376-388.

Warnock, V. C., & Warnock, F. E. (2008). Markets and housing finance. *Journal of Housing economics*, *17*(3), 239-251.

Wilson, V. (2014). Research methods: sampling. *Evidence based library and information practice*, 9(2), 45-47.

World Bank report. (2011). *Housing Finance Policy in Emerging Market*. ISBN: 978-0-82137750-5.

World Bank. (2017). *World development report 2018: Learning to realize education's promise*. The World Bank.

Yakub, J. O., Bello, H. T., Adenuga, I. A., & Ogundeji, M. O. (2020). The cashless policy in Nigeria: prospects and challenges. *International Journal of Humanities and Social Science*, *3*(3), 200-212.

Yang, L. I. U., & Zhiqiang, H. U. (2017). On correlation between RMB exchange rate and real estate price based on financial engineering. *Systems Engineering Procedia*, *3*, 146-152.

Yigermal, M. E. (2017). History of Treasury Bills Market in Ethiopia: T-bills Yield and other Interest Rates. *History*, *39*.

Yinger, J. (2018). Discrimination in mortgage lending: A literature review. *Mortgage lending, racial discrimination, and federal policy*, 29-73.

Yusuf, M., Ichsan, R. N., & Suparmin, S. (2021). Influence Of BI Rate, FED Rate, And Inflation on Composite Stock Price Index (JCI). *Journal of Management and Business Innovations*, 3(01), 8-16.

Zandi, M. M., & Deritis, C. (2016). Putting mortgage insurers on solid ground.

Zhu, B., Betzinger, M., & Sebastian, S. (2017). Housing market stability, mortgage market structure, and monetary policy: Evidence from the euro area. *Journal of Housing Economics*, 37, 1-21.

APPENDICES

Appendix I: Secondary Data Collection Sheet (CBK)

Financial Year	Interest rate	Economic growth GDP	Money Supply (M3)	Inflation rate (CPI)	Foreign exchange rate (USD/Ksh)	Treasury Bill rate
2014						
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						

Appendix II: Secondary Data Collection Sheet (Commercial Banks)

Bank	Year	Growth of mortgage financing (Amount of Outstanding mortgage)
	2014	
	2015	
	2016	
	2017	
	2018	
	2019	
	2020	
	2021	
	2022	
	2023	

Appendix III: Commercial Banks in Kenya

1. KCB Bank Ltd
2. Standard Chartered Bank (K) Ltd
3. Barclays Bank of Kenya Ltd
4. Bank of India
5. Bank of Baroda (K) Ltd
6. Commercial Bank of Africa Ltd
7. Prime Bank Ltd
8. Co - operative Bank of Kenya Ltd
9. National Bank of Kenya Ltd
10. M-Oriental Commercial Bank Ltd
11. Citibank N.A. Kenya
12. Habib Bank A.G. Zurich
13. Middle East Bank (K) Ltd
14. Bank of Africa (K) Ltd
15. Consolidated Bank of Kenya Ltd
16. Credit Bank Ltd
17. Transnational Bank Ltd
18. Chase Bank Ltd
19. Stanbic Bank (K) Ltd
20. African Banking Corporation Ltd
21. Imperial Bank Ltd
22. NIC Bank PLC
23. Ecobank Kenya Ltd
24. Spire Bank Ltd
25. Paramount Bank Ltd
26. Jamii Bora Bank Ltd
27. Guaranty Trust Bank (Kenya) Ltd
28. Victoria Commercial Bank Ltd
29. Guardian Bank Ltd
30. I&M Bank Ltd
31. Development Bank of Kenya Ltd
32. SBM Bank (Kenya) Ltd
33. Diamond Trust Bank (K) Ltd
34. Charterhouse Bank Ltd
35. Mayfair Bank Ltd
36. Sidian Bank Ltd
37. Equity Bank Kenya Ltd
38. Family Bank Ltd
39. Gulf African Bank Ltd
40. First Community Bank Ltd
41. DIB Bank Kenya Ltd
42. UBA Kenya Bank Ltd

43. HFC Ltd

Source, CBK, (2023)