DETERMINANTS OF UPTAKE OF MORTGAGE FINANCING FOR HOME OWNERSHIP IN KENYA

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DECLARATION

I declare that this research thesis is my original work and has not been presented in any other university or examination body.

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DEDICATION

This work is dedicated to my family

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ABSTRACT

Since mortgage financing is a valuable method of funding real estate investment, inadequate housing and the proliferation of slums in cities remain a crucial developmental issue that countries continue to contend with in most developing countries. However, little is known about what limits home ownership through this mode of financing in Kenya. This study examined the influence of economic, demographic, social, and technological factors on uptake of mortgage financing for home ownership, and how government policy affected this relationship. The positivist philosophy with descriptive survey design was adopted. Data collection sheets were used for collection of secondary data from published sources. Frequencies, means, standard deviations and inferential statistics were calculated from the collected data. Upon analysis of data collected, findings showed that economic factors did not have a statistically significant effect on uptake of mortgage financing for home ownership in Kenya. The demographic factors, social factors and technological factors had a positive and significant effect on uptake of mortgage financing for home ownership in Kenya. However, results from published secondary data showed that while some economic factors (GDP and population growth rate) had a significant relationship with uptake of mortgage financing for home ownership, some (lending rate and inflation rates) did not. The findings from the regression analysis were that GDP per capita and inflation rate had a statistically significant positive influence on uptake of mortgage financing for home ownership, while lending interest had insignificant effect on uptake of mortgage financing for home ownership; population growth rate had a significant negative effect on uptake of mortgage financing for home ownership. Lastly, government policies had a significant moderating effect on the relationship between the four factors (economic, demographic, social and technological) and uptake of mortgage financing for home ownership. It is therefore recommended that mortgage providers finance ownership of low-income houses which the majority of Kenyans with low incomes can afford. Moreover, the public should formalize their informal incomes as proof of their credit worthiness when they seek mortgages and ability to pay for the mortgage. Further, the stakeholders in the mortgage market including Capital Market Authority, and Nairobi Securities Exchange should develop a secondary mortgage market to improve access. Mortgage liquidity facilities to benefit the entire sector and development of a Mortgage covered bond systems aimed at institutional investors should indeed be embraced by larger lenders. This will necessitate an evaluation of pension scheme and insurance company investment policies in order to able to match them with housing needs.

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ACRONYMS

2SLS	Two Stages Least Square model
ADB	African Development Bank
AI	Artificial intelligence
ARMs	adjustable rate mortgages
CBK	Central Bank of Kenya
FAVAR	Factor-Augmented Vector Auto Regression
FRMs	fixed rate mortgages
GDP	Gross Domestic Product
IoT	The Internet of things
KBA	Kenya Bankers Association
KBRR	Kenya Banks' Reference Rate
KMRC	Kenya Mortgage Refinancing Company
KNBS	Kenya National Bureau of Statistics
NDA	Net Domestic Asset
NFA	Net Foreign Asset
NPL	non-performing loans
SSA	Sub-sahran Africa
TSR	Tawhidi String Relationship
UK	United Kingdom
US	United States
USD	US Dollar

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Financing mortgage is an important investment tool for real estate financing. Segal, and Sullivan (2018) observe that although mortgage financing constitutes an important mode of financing home ownership, inadequate housing and the proliferation of slums in cities remain a crucial developmental issue that countries continue to contend with in most developing countries. According to a study by Central Bank of Kenya (CBK) and the World Bank, investing in real estate involves mobilization of significant capital which investors may be unable to raise on independently (Central Bank of Kenya [CBK] & World Bank, 2018). This necessitates financing the project through lenders who secure their funds by mortgage, which comprises financing that is secured by a specific real estate property obliging a borrower to make repayments in prearranged installments (Laamanen, 2019). Laamanen (2019) defines it as long-term financing avenues for developing housing, infrastructure and drive expansion of capital markets.

Under mortgaging contracts, the mortgaging entity provides credit secured by property thereby earning interest income, and generally borrowing such monies themselves with prices for which such monies are borrowed eventually affecting the cost of borrowing. In some countries, financiers may also sell the mortgage loans to parties interested in receiving the repayments from the borrowers, mostly through securitization (The World

Bank, 2018). This financing strategy further considers the potential risks of the loan, including the creditworthiness of the borrower, possibility to foreclose and recover the original capital or part thereof; and other risks including financial, interest and repayment delays (Stiglitz et al., 2015). These agreements encumber the property acquired through a facility as security for debts taken. During the pendency of the facility, the creditor assumes the role of holder of the property (Asare, 2020) and where the borrower defaults on repayment, the mortgaging entity is entitled to obtaining ownership of such mortgaged property including offering the secured property for sale to third parties.

Global Perspective

Mortgage uptake and homeownership rates in developed countries are high through their approaches to financing homeownership differs with respective countries employing varying systems of governing the market (Selim, 2020). As noted by Ebekozien (2021), in comparison with the United States, the Canadian market is comparatively simple and conservative, with most Canadians executing five-year, fixed-rate mortgages renewed for similar duration until the term of the mortgage is completed, usually twenty-five years. In Denmark and Germany, the regime is underpinned by specialized mortgage bonds, secured by collateral pools as the main mode of financing regulated by government. Sommer and Sullivan (2018) further note that, while the American mortgage regime is interrelated with the secondary markets, where banking institutions

constitute the primary creditors and mortgage facilities are sold to investors in these secondary markets as mortgage-backed securities, the UK, has a depository mode of housing finance structure where banks are mortgage lenders whose sources of funds is predominantly retail deposits also insured by government, with varying rates of mortgage.

FitchRatings (2019) observe that globally, homeownership and mortgage uptake is affected by various factors including household debt, political uncertainty, home prices, mortgage rates and economic risks. For instance, high home prices have negatively influenced homeownership in various cities including in the period 2014 - 2018. However, home prices decreased or stabilized in 2018 in various cities Toronto, Sydney, Melbourne, Vancouver and Stockholm mostly due to policy from the governments concerned to enhance affordability, macro-prudential measures and to decrease foreign purchases. It is expected that in 2010 and 2021, home prices will continue to decrease in Sweden, Australia, Canada, South Korea and China. Other emerging markets are expected to experience a reduction in home prices due to increased regulation in lending regulations and policy.

High household debt has also been a factor in mortgage uptake and homeownership. High household debt-to-GDP ratios increases risks and makes the housing and mortgage market to be susceptible to shocks and borrowers are more exposed to downturns. This is experienced in countries such as Netherlands, Sweden, Denmark, Australia, United

Kingdom, South Korea, Canada, Norway, and New Zealand (Fafard St-Germain, & Tarasuk, 2020). Other key factors affecting mortgage uptake and homeownership include political uncertainty such as Brexit, increase in mortgage rates mostly in South America, and expected global growth outlook.

Regional Perspective

In Nigeria, despite advances in macroeconomic indicators, housing remains a recurrent concern. According to the Nigerian Federal Mortgage Bank's 2020 report, the country's housing shortfall is now estimated at 22 million units, the majority of which are concentrated in urban areas (Ebekozien, 2021). With a predicted population of 263 million by 2038, Nigeria's housing situation demands immediate attention to escape a serious housing crisis. Nigeria now has 34 mortgage banks, 27 commercial banks, and seven microfinance institutions that finance housing demand and supply, but the increased urban migration, expanding population, and the government's disjointed policy orientation are all key elements contributing to Nigeria's housing crisis. Contributing factors, according to Anderson (2019), include high interest rates, high population growth rate, affordability of mortgages for the poor and poor government policy.

In South Africa, Centre for Affordable Housing Finance in Africa (2020) indicates that the residential property market in the country is the biggest component, accounting for the bulk of property assets and providing a significant source of household wealth. In 2020, South Africa's deeds register recorded 6.6 million residential properties worth

around R 5.5 trillion. Over half (55 percent) of all properties were valued at less than R 600,000. Additionally, government-subsidized homes accounted for a large proportion (30 percent or 2 million) of all residential properties, especially at the lower end, demonstrating the influence of the national government housing program's huge investment over the years.

In South Africa, the resale market vastly outpaces the new-build sector – in 2019, three-quarters of all residential related transactions were in the resale market. For the first time home buyers/owners, the resale market is often the initial step on the property ladder. In 2020, 94,157 families became first-time homeowners. Twenty-two thousand two hundred and twenty-three (twenty-one percent) had received housing program that were state subsidized. However, Anderson (2019), only 35.3% of South Africans own homes. Factors that hinder homeownership through mortgage uptake include high mortgage costs, lack of a well-developed secondary mortgage and residential property market, high unemployment, high rural urban migration and high residential building costs.

Awuvafoge (2020) opined that most mortgage markets in Africa are still at infancy. The housing deficits in the Sub Sahara Africa have also been attributed to poor housing institutions, markets, stocks, backlog of housing demand and weak policies. In Ghana, for example, where the annual housing demand is 133,000 units, the housing deficit was found to be two million housing units; yet access to mortgage facilities is still limited with the partial facilities accessible by only about 15% of the Ghanaians. Because of the

housing deficits in SSA, institutions such as, Preferential Trade Area, East Africa Development and Shelter Afrique Banks have entered the fray in an effort to leverage on the shortage of mortgage institutions (Ngacha, 2020).

In Uganda, despite robust economic growth of around 6.1 percent in the past ten years and low inflations rates, mortgage rates continue to be quite expensive (Aguda, 2020). According to the Bank of Uganda, the mean average rate of lending for Ugandan currency mortgage loans was 23.1 percent in 2020, an increase from twenty percent 20% in 2019. The mean rate of lending for residential mortgage loans denominated in foreign currencies was 11.3 percent in 2018, up from 7.2 percent a year before. In 2018, the average lending rate on foreign currency loans for land acquisitions was roughly ten percent, up from nine percent in 2019. It's unsurprising that Uganda's mortgage market remained so limited as a result of these very high interest rates (Lijing et al., 2018). Generally, properties are traded in cash. The mortgage market is small, accounting for just 1.2 percent of GDP, constant over the last three years but up from 0.3 percent in 2002. Delmendo (2021) indicates key factors hindering growth of mortgages to be unsupportive government policy, high mortgage costs, high unemployment, and high costs of residential building.

Local Perspective

The Kenyan mortgage market is mainly dominated by banks comprising forty-three banks and only one Mortgage Finance Company each having a different mortgage

portfolio with some offering mortgage facilities to their employees. The regulator, CBK authorizes two categories of lenders; mortgaging entities and ordinary banks with regulations on mortgage financing applying to both categories. A survey by the Central Bank of Kenya revealed that in 2010, Kenya Commercial Bank was the dominant mortgage financier subsequent to its acquisition of Savings and Loans and followed by Housing Finance Corporation Kenya (Hass Consult, 2018).

Kenya Bankers Association (KBA) observed that albeit the efforts to achieve decent housing for Kenyans, the housing demand is still unsatisfied even though somewhat addressed through investments by private sector, who have been significant suppliers of housing, especially in Nairobi. These attempts to address the housing deficit have however been slowed due to steady decrease in housing expenditure by the Government especially through control of pricing, unsuitable building policies and shortage of planning and service provision (Njuguna, 2020). Moreover, while these have adversely influenced the mortgage market, significant appreciation in property prices and volatility across the Kenya have been reported since 2006. The Hass consult reported that between 2005 and 2009, the prices for high-end residential properties doubled (Kariuki, 2020).

The Kenyan mortgage industry is beset by a number of myriad of problems that have confined the availability and affordability of better living conditions for the majority of Kenyans (Van Noppen, 2018). Among the primary concerns is the large percentage of Kenyans' limited incomes, which has restricted access to financing options to a select

few. Additional issue impeding the sector's growth is the inefficiency with which mortgage loans are issued by providing entities. The discrepancies in demand and supply of housing units in the Kenya have further adversely impacted the progress in the industry particularly characterized by an annual supply of 60,000 housing units against a demand of 300,000 highlighting the increasing deficit over the years. Other issues facing the industry include a poor regulatory framework as well as poor financial awareness of a majority of potential customers (Hass Consult, 2018). Housing provision and mortgage industry growth is a crucial component of the economic development and this is buttressed by its inclusion in various policy papers such as the Kenya Vision 2030 and the National Housing Policy developed in 2004 particularly intentioned to address the housing supply deficits and improve the condition of housing across the country and to address the shortage of housing consequent of the demand outstripping supply especially in urban areas. The Vision 2030 on the other hand identifies 4 main flagships projects for the industry. These are; the metropolitan and investment plans initiative, the housing development initiative aimed to spur annual construction of housing and emphasizing on equitable access (Government of Kenya, [GOK] 2017).

Article 43(1) (b) of the Kenyan constitution makes provision to sufficient and affordable dwellings including reasonable degree of sanitation yet just a paltry 23% of the housing demand is being met with only 20% thereof being affordable to low and moderate-income households (Cytonn, 2019). In Nairobi alone, projections suggest that over the next 20 years, unless the problem is addressed, the shortage of housing for low-income

families is likely to be in the region of 3 million homes. This figure is staggering. If the chronic shortage of housing is not addressed the slums will continue to proliferate.

Home ownership through mortgage financing leading to affordable housing can be that stepping stone (Kenya Bankers Association [KBA] 2018) enabling people to purchase and own homes. Home ownership provides security of tenure, stability, a foundation from which a family can develop, a sense of community, a shared ethic that underlies their attitude towards their community, and a viable and leverage-able asset that can appreciate in value.

The 2017 mortgage report however indicated that more than 60% of Kenyans cannot afford mortgages exceeding Kshs 700,000 revealing that housing needs of this population, mostly urban, are unmet by the mainstream microfinance and financial institutions (Hass Consult, 2018). They are seen as too risky a market to target and sustainability of organizations targeting such markets is put into question. The variables determining home ownership through mortgage financing need to be unearthed and managed.

1.2 Statement of the Problem

The Kenyan government has launched a number of programs to offer inexpensive housing and boost home purchases using mortgages, including the establishment of the Kenya Mortgage Refinancing Company (KMRC) to handle relatively inexpensive

liquidity for mortgage loans. This is stipulated by the government in the Big Four Agenda, 2017 for immediate priorities and actions and in the Kenya Vision, 2030 (GOK 2017). The government has established secondary mortgage finance corporation as well as a national housing fund as a Mortgage Financing Initiative and creating a housing and infrastructure bonds that will be utilized in mortgage financing.

Notwithstanding various government initiatives to increase home ownership in Kenya, the mortgage to GDP ratio is a paltry 2.5%. This compares poorly to other countries such India (6%), Colombia (7%), European Union (50%) and US (70%) (World Bank, 2018). This leaves a huge housing demand versus supply gap where the demand is higher and driven by population growth and urbanization; highlighting the significance of functional mortgage regimes in satisfying the need for housing amongst the population and in strengthening the development of the building, banking and other related sectors. According to Arthanat et al. (2019), 9 out of 10 Kenyans cannot afford to purchase the houses they reside in even with a mortgage facility. This shows that there are serious hindrances towards mortgage uptake for homeownership in Kenya, which motivated this study.

Reports by the CBK and World Bank (2017) show that less than one in every 10 Kenyans can afford a mortgage with mortgage facility records indicating only 20,000 accounts in year 2015, with the total value of mortgage loans in December 2016 being KShs 133.6 billion. According to Cytonn (2019), the local housing deficit of about 5:1 in

demand and supply respectively constitutes a significant challenge within the Kenyan housing market.

There is scarce literature on how the economic, demographic, social and technological factors influence home ownership through mortgage financing in Kenya. Nik Abdul Ghani et al. (2019) assessed the economic factors that influenced mortgage uptake but left some conceptual gaps as the study only focused on inflation, interest rate and money supply leaving other key factors such as social, technological and demographic factors. Another study by Nik Abdul Ghani et al. (2019) investigated the factors that influenced residential mortgage lending but only focused on Mombasa County and thus left some contextual gaps. Thuo (2018) studied determining factor of mortgage uptake amongst institutions in Kenya nevertheless concentrated merely on lender related factors such as capital adequacy, asset quality, liquidity and earnings ability. The study left some methodological and conceptual gaps as it did not include data on the demand side of mortgage uptake and also left out some key variables such as economic, social and demographic factors. Besides, Arthanat et al. (2019) assessed the lender factors affecting residential mortgage uptake in Kenya. The study however, left some conceptual gaps as it did not include demand side factors that could influence mortgage uptake. This study therefore focused on filling these gaps by assessing the determinants of uptake of mortgage financing for home ownership in Kenya.

1.3 Purpose of the Study

This study purposed to establish the determinants of uptake of mortgage financing for home ownership in Kenya.

1.4 Objectives of the Study

Main Objective

The main objective was to assess the determinants of uptake of mortgage financing for home ownership in Kenya

The specific objectives were;

i) To establish the effect of economic factors on the uptake of mortgage financing for home ownership in Kenya.

ii) To determine the effect of demographic factors on the uptake of mortgage financing for home ownership in Kenya.

iii) To examine how social factors, affect the uptake of mortgage financing for home ownership in Kenya.

iv) To evaluate how technology, influence the uptake of mortgage financing for home ownership in Kenya.

v) To assess how government policies, moderate the uptake of mortgage financing for home ownership in Kenya.

1.5 Research Hypotheses

The following research hypotheses were tested:

Ho1 Economic factors have no statistical significant effect on the uptake of mortgage financing for home ownership in Kenya

Ho2 Demographic factors have no statistical significant effect on the uptake of mortgage financing for home ownership in Kenya

Ho3 Social factors have no statistical significant effect on the uptake of mortgage financing for home ownership in Kenya

Ho4 Technology has no statistical significant effect on the on the uptake of mortgage financing for home ownership in Kenya.

Ho5 Government policies have no significant moderating effect on the uptake of mortgage financing for home ownership in Kenya.

1.6 Justification of the Study

Although the Kenyan government has put a lot of effort to increase ownership of homes, the mortgage to GDP ratio is a paltry 2.5%. Compared to other countries with developed mortgage markets, such as India (6%), Colombia (7%), European Union (50%) and US (70%), Kenya's mortgage market is underdeveloped (World Bank, 2018). Since

mortgage uptake is one of the main ways to home ownership, this leaves the country's home ownership to be poor. Home ownership satisfies people's aspirations and is an indicator of human development. Moreover, it enables individuals to accumulate wealth. It was therefore critical to establish the factors that would determine mortgage uptake and home ownership to inform evidence-based interventions that could enhance home ownership through mortgage uptake.

1.7 Significance of the study

The findings deduced will benefit mortgage lenders, the government and even borrowers. Governments and the Central Bank of Kenya will use these findings to implement enabling policies that spur mortgage financing market growth. Policies by the government and central bank of Kenya could target increase in new lending and could include increase in the supply of money and reduction of interest rates.

The CBK can carry out operations including purchase of mortgage loans, bonds and securities and aggressive expansion of the monetary bases. Government can also increase expenditure, especially to boost distressed lending institutions thereby strongly increasing public-sector deficits.

The study findings can be of value also to the mortgage lenders themselves since they will have a view of the major factors inhibiting growth of the mortgage market. These institutions can have strategies and business policy responses to deal with these

challenges and in so doing improve the mortgage uptake. This would improve their revenues and also home ownership.

1.8 Scope of Study

Mortgage-related research studies have largely concentrated on supply or demand side variables. The demand and supply side factors were the main subjects of this investigation specifically on availability of mortgage financing from mortgage institutions, and factors including economic, demographic, social and technological and policy. The study targeted the time series data from World Bank data indicators for the last 30 years in Kenya. The study's unit of analysis was the data from World Bank data indicators, which covered the period from 1999 to 2020. For the 30 years under investigation, this recorded the data on a yearly basis. Secondary data was gathered from publicly available financial accounts of mortgage lenders, the World Bank, CBK, and the Kenya National Bureau of Statistics (KNBS). This was yearly data for at least 30 years (990 – 2020). Data collection sheets were used for collection of economic secondary data from published sources. Frequencies, means, standard deviations and inferential statistics were calculated from the data, to present the findings.

1.9 Limitations of the Study

The descriptive research approach was employed in this study which assumed limitations resultant of subjective and interpretive variances in dynamic, open, human

and active systems, as common in social construct, methodology, or theory where some facets may be underscored at the expense of others. This research was no different as it could have become subjective in some respects as it relays questions to mortgage borrowers and employees in financial institutions and their responses could be relatively subjective.

The method through which the researcher gathers a number of various data samples and arranges these in a systematic way to arrive at their study conclusions is referred to as the research design. The objective of this course of study is to examine and evaluate existing patterns from previous (or a priori) sources and employ them to their own study field. The biggest drawback of using secondary data is that it could not answer the researcher's particular research questions or have the precise facts that the researcher would wish to have. It could be challenging to find the precise information you need for your study from previously published articles as a consequence of using formerly gathered data. You could think it is feasible to incorporate it into your project if the theme of your project is comparable to one that has already published work. You may, however, discover that some of the variables you want are either absent or out of date in the data (e.g., Income, or other characteristics).

1.10 Operational Definition of Terms

Construction technology: The techniques, equipment and methods used in building

of residential homes (Yasmin, & Muhd, 2014).

Demographic factors: Socio-economic characteristics of an individual or population which comprise of religion, occupation, gender, age, education level and marital status (Usman, & Lizam, 2016).

Government policy: Statement of the intention, plan and political activity by the government relating to a given cause in this case home ownership through mortgage financing (Thomas, & Mulder, (2016).

Inflation: An upsurge in prices within an economy and resultant drop in the purchasing value of money (Segal, & Sullivan, 2018).

Interest rate: The amount charged for loans or conversely, the amount paid by lenders, building society, to depositors on funds deposited (Sommer, & Sullivan, 2018).

Life expectancy: A statistical indicator of the expected time in years that a human being is expected to live on average based on their demographic factors such as the birth year, current age

and gender (Stephenson, 2016).

Mortgage: Interest in properties resultant of a facility created as collateral and severed upon repayment of the facility (Pitkin, & Myers, 2017).

Per Capita Income: The average income earned in a given country in a given year. It is calculated by dividing gross national income with the size of the population (Mason, 2016).

Population growth: Rise in people´s number in a certain location in a given period (Garmaise, & Natividad, 2017).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The evaluated literature that is pertinent to this investigation was summarized in this chapter. It clarified the role played by other academics in determining how mortgage finance for house ownership, especially in Kenya, is adopted as well as how the effectiveness of these services is measured. The chapter also highlighted the research gaps that were intended to be filled by this study, offered a conceptual framework, and provided a literature review. The study also provided an adoption model that outlined how various stakeholders adopted innovation.

2.2 Theories Underpinning this Study

This section reviewed literature on theories and concepts about what could determine the mortgage financing variables and hence home ownership. The theories discussed hereunder included liquidity preference theory, information asymmetry theory, the loanable funds theory and prospect theories.

Liquidity Preference Theory

The quantity of money people wishes to maintain for transactional, speculative, or preventative reasons is correlated with interest rates, under Keynes' liquidity preference theory (1934). According to the liquidity preference theory, the cost of borrowing is

represented by the interest rate. This theory hypothesizes that when money is required, it is not because someone wants to borrow money; rather, money is demanded because someone wants to stay liquid (Schuler & Adair, 2020). Cash is the most widely recognized liquid asset, according to the theory, and more liquid assets can be readily turned in for their full worth.

The real variables of saving and investment supply and demand are the drivers of the equilibrium interest rate in the classical model. In a Keynesian liquidity preference approach, however, the ‘monetary' variables are the only drivers of the interest rate (Schiffman, & Kanuk, 2018). The liquidity preference theory of Keynes states that the supply and demand for money determine interest rates. As per Keynes (1934) the rate of interest is only a monetary issue. The expense of borrowed funds is interest. The consequence of the theory to mortgage uptake is that people prefer to retain their cash rather than invest it in assets.

In relation to uptake of residential mortgage, people aim to save a portion of their earnings. However, people like cash because it is the most liquid asset. How much of their resources will be kept in cash and how much will be spent on mortgage uptake depends on what Keynes called liquidity preference. Cash is the most liquid asset, therefore based on various demographic, social and economic risk factors, people would prefer cash over spending the cash in taking a mortgage. When economic factors are conducive, individuals will prefer investment and they can increase their mortgage

uptake. However, when economic factors are not conducive, individuals can seek to hold on to liquid assets which would reduce their mortgage uptake.

The Loanable Funds Theory

This study's theoretical framework is likewise based on Robertson's (1934) loanable funds theory. In accordance with this idea, a variation in a variable besides the interest rate causes the quantity of a financial stability issued to vary at every given interest rate. One of these factors that affects the supply curve of loanable money is the risk of a financial security. When the danger of security reduces, it gets more enticing to fund providers, increasing the supply of funds while holding all other factors constant.

Based on the theory, foreign mortgage holders, government units, customers, and government entities all have a demand for loanable money. According to the loanable funds hypothesis, the flow of loanable funds is sourced through foreign loans, financial system money balances, and domestic savings. Long-term interest rates are influenced by the aforementioned factors, but short-term loan rates are influenced by market financial and monetary conditions. According to Lowies et al. (2020), once all of the aforesaid variables are in harmony separately, the factors that impact loanable money will achieve equilibrium. According to Lowies et al. (2020), consumers in countries with variable mortgage rates are extremely sensitive to fluctuations in borrowing costs.

In contrary, if the threat to financial security has increased, it is less enticing to fund givers, causing a reduction in money supply (Saunders & Marcia, 200). According to this notion, if a mortgage debt is judged risky, the supply of loans would decrease. As per Brueggeman and Fisher (2018), when lending to the mortgage market, financiers weigh the benefits and risks associated. According to Selim (2020), the key determinants of property prices are expected costs and earnings, in addition to rate of interest. Since they are averse to risk, most lenders are slow to respond to monetary policy changes. According to reports, rising interest rates in East Africa have caused many banking firms to vary their investments in order to escape the risks of the money market. As a response, expected returns have reduced as a result of people being discouraged from taking out house loans.

Prospect Theory

This theory indicates that customers are unable to make decisions in complex purchase decisions and this can make a customer shun a product (Kahneman & Tversky, 1981). The theory indicates further that the uniqueness of the product is another factor. Consumer inability to comprehend intrinsic risks in modifiable rate mortgage products is one difficulty consumers encounter when making decisions involving payments over time. Prospect theory assumes that buyers are capable of assigning probabilities to the possibility of future events. The theory of expected utility further assumes customers as possessing abilities to formulate the values expected in form of future income, home

value or other unidentified future events (Benartzi & Thaler, 2015). In addition, whereas there exist defined mathematical approaches to solving such multi-period evaluation problems, current values discounting rarely resemble the manners in which consumers in reality make choices within the markets.

Moreover, consumers rarely possess sufficient capability to gauge the probability of future events. Thus, whereas consumers may be aware of their future plans to find alternative employment or adjust their economic conditions, they have less knowhow on external factors including if the value of a property purchased will either fall or rise over time; whether there will be variations in rates of interest; or if their earnings, employ, setting, or domiciliary size will unexpectedly change. Barberis et al. (2016) posit that uncertainties may dent the abilities of both borrowers and lenders to evaluate the actual price of a mortgage and to decorously approximate the expected returns respectively and hence can affect the decision to take up the mortgage. Where a consumer possesses more knowhow than the mortgagee regarding their personal circumstances, the mortgagee becomes exposed to risks of adverse selections (Benartzi & Thaler, 2015).

Information Asymmetry Theory

The use of information regarding the prices of alternative mortgage products underpins the fundamental assumption within the realm of rational decision-making (Hoppe & Schmitz, 2020). This requires disclosure of mortgage prices by the mortgagees and awareness of the prices by the mortgagors to be used by the latter in making decisions.

Zeckhauser (1986) put forward the information asymmetry theory indicating that consumers are oftentimes incapable of recalling the prices of items recently purchased and their ability to recall such prices significantly vary from product to product.

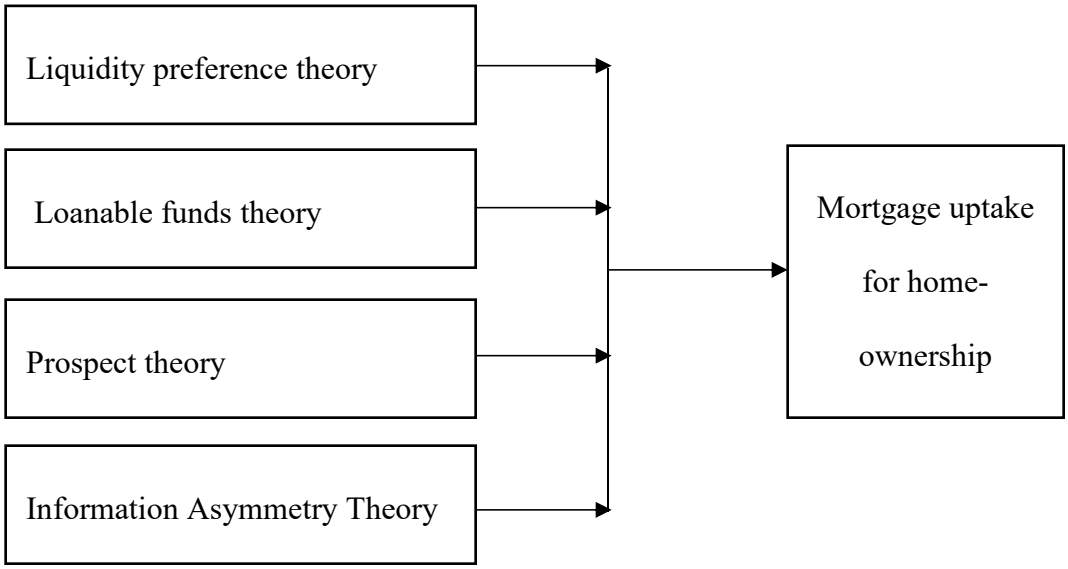
This theory however centers on awareness of the prices of routine consumables including grocery and simple manufactured goods (Hoppe & Schmitz, 2015). Comprehending the prices of mortgage facilities is significantly difficult than understanding those of simpler consumer goods which often have a singular-price component compared to pricing of loans that combines, amongst other factors, interest rates, points, levies, installment and penalties, some of which continually vary due to changing economic circumstances. This is because mortgage prices are affected by various economic factors. These factors make tracking and learning of the relationship between the various price components difficult for consumers (Garmaise & Natividad, 2017). Another inhibition is that such awareness by consumers is limited by the infrequency of mortgaging and high costs of transaction as to enable such consumers make post-purchase adjustments even where they realized that their initial choice was erroneous.

Theoretical Framework

The structure that backs the ideas supporting the study is known as the theoretical framework. By describing the research challenge, this clarifies the hypotheses that have been discussed.

Figure 2. 1

Theoretical Framework



2.3 Empirical Literature

This section reviews the past literature on home ownership, government policy and mortgage uptake. Further, the factors that influence growth and uptake of mortgage are also discussed. The concepts discussed that may have an influence on home ownership through mortgage financing are demographic, social, economic and technological factors.

Brueggeman and Fisher (2018) observed that a party creates mortgages through transactions involving a pledge to another of real property as collateral for obligations owed to the party receiving the security. Mortgages have also been termed as comprising

long-term debt instruments secured by real properties already owned or to be acquired by the debtor (Selim, 2020). They involve borrowing of funds by the debtor from a creditor and then utilizing the facility to acquire property, commercial or residential.

The Kenyan mortgage market is supplied by housing finance entities, microfinance institutions and commercial banks. On average, mortgage facilities are worth KShs 6.6 million, and demand monthly repayments of nearly KShs 90, 000 per month for a duration of 20 years (World Bank, 2018). Most mortgage entities charge variable rates of interest ranging between % and 25% with the average interest rate being 8% (CBK, 2014). In 2014 mortgage facilities on variable interest rate basis stood at around 97.4% compared to 85.6% in 2013 (CBK, 2014). Incidental costs on mortgage facilities include arrangement, legal, valuation, stamp duty and mortgage insurance premiums to cushion lenders for the lending risk. Nevertheless, the CBK (2012) reported a steady growth in the mean mortgage loan size from 2006 noting that in December 2011, the mortgage loan size stood at 6.4 billion while in 2021, it rose to 22.2 billion. Further, the report indicated that the number of mortgage accounts increased from 16,029 in 2011 to 19,177 in 2012 yet lending levels are still low.

Mortgage lenders are businesses such as mortgage banks, finance organizations, savings institutions, and commercial banks and insurance companies that hold mortgage securities in their portfolios (Brischetto & Rosewall, 2017). These organizations play a crucial role in mortgage finance for real estate. They provide funding for construction

projects, financing for building improvements, and lending to non-financial businesses using real estate as collateral (Davis & Zhu, 2014). Mortgage facilities have a beneficial impact on profitability since they give lenders long-term revenue streams (Sharpele, 2019). Lenders within the mortgage markets venture in various income sources where some prefer to retain new mortgage facilities within their portfolio of assets as to be receiving the principal and interest payments from the mortgager while others prefer quick sale of loans instead pursuing securitization, servicing of the loans, and other services that generate income owing to their predictable liquidity needs and reduced capital requirements (Farhi et al., 2018), while each has its own benefits and drawbacks in terms of liquidity risk, susceptibility to default, interest rate, and changes in projected cash flow quantities. According to reports, the Central Bank of Kenya has given approval to two types of lenders: mortgage businesses and regular banks, which include Shelter Afrique, Housing Finance Company of Kenya and commercial banks (CBK, 2014).

The Housing Finance Company (K) was founded in early 1966 through joint effort between the Commonwealth Development Corporation the government and intentioned as a stimulus for the private sector and particularly purposed to promote the culture of saving and avail loans to those wishing desiring to purchase their own homes. In the present day, the Corporation offers integrated financial solutions focused both on residential and commercial properties. It is reported that the quantum of facilities

advanced to the Corporation's customers in quarter one of 2013 was 37.4 Billion (CBK, 2014).

Under the Kenyan Banking Act, Commercial Banks are licensed to carry out mortgage business for purposes including house purchase financing, building and refinance activities. A survey by the Central Bank in 2002 found that 5 institutions, including a medium-sized bank (25.5%) and 4 additional banks from the bigger banks' peer group (44.6%), accounted for around 70% of the lending to the mortgage market. Even though a restriction was put in place prohibiting these businesses from lending more than 25% of their entire deposit liabilities, this cap was raised by 5% and mortgage companies were given permission to run current accounts for their clients. Insurance companies and Pension institutions have also been identified as likely lenders within the mortgage market owing to their significant longer term fund sources, even though, their investment in mortgage financing has predominantly been limited.

Melicher and Norton (2020) defined mortgage markets as those markets wherein real property was used as security for mortgage facilities originated or traded. Fabozzi et al. (2007) define them as comprising markets; both primary and secondary where mortgages traded. Here, the mortgage is originated by mortgage entities in the primary markets and then traded as securities sold in secondary markets. Within Kenya, the market is predominantly primary (World Bank, 2018), which has been observed to limit the funding lender market base funding resultant of constraints in liquidity. In 2011, the

World Bank highlighted the need for Kenya leverage on the secondary markets (predominantly purposed to make capital available by packaging and offering for sale mortgages as assets to investors) in order to buoy expansion, citing the progress in South Africa and Colombia and South Africa.

The financing of mortgages improves operations within property markets as this increases the number of units and further contributes to the development of the economy since it facilitates businesses and improves the environment within which businesses are conducted (Chiquier & Lea, 2016). The sector also contributes to job creation by creating employment opportunities both to the building sector and to other sectors of the economy including through ancillary job opportunities in marketing and insurance (Kibirige, 2006). Goodhart and Hofmann (2017) also highlighted construction as an economic growth driver noting that multipliers of .0 are generated by construction of houses that two dollars are spent in other areas for every dollar invested on housing.

Mortgage financing, especially in the developed economies, constitutes a significant driver that deepens the capital markets that subsequently offer long-term financing sources. The housing and urban infrastructure supply also increase with the deepening of mortgage markets. Where residential mortgages are available, there is a consequent positive impact on infrastructure, urbanization, housing quality and alleviation of poverty (Dolde, 2016). Where governments are limited financially, formalized housing markets characterized by utility charges and property taxes can offer a revenue

generating source (Kibirige, 2016). Aside increasing the asset portfolios of lender, mortgage financing also contributes to overall development within a country by making available avenues critical for the collection of revenue especially through levies such as taxes and surcharges on utilities. In South Africa for example it has been reported that 95% of local government revenue derives from local sources such as property levies and utilities.

An inherent feature of mortgages is mortgage risk; the likelihood of loss or the uncertainties attendant to events in the future. Uncertainties connote the decision maker's inability to gain sufficient insight on the future of variables such as demand, costs and products (Nyandemo, 2019) and most entities effort laboriously to avert potential risks or minimize losses which often occasion significant economic strains to entities. Conversely, the principles on investing posit that the risk laden ventures yield the biggest returns (Trieschmann et al., 2018). And since these entities purpose to maximize returns for shareholders, the risk is usually high. The risks impact both performance and profitability of entities making the management thereof all the more crucial.

Renaud and Jaffe (2016) highlighted certain inhibiting elements hindering the growth of mortgage markets in the developing economies thereby proposing a strategy for expediting their growth. They observed that lenders in these economies are often disinclined to provide mortgage facilities owing to the risks including credit, interest,

liquidity and price risks attendant in such lending and suggested that secondary markets buoyed by adjustments necessary in the primary counterparts could contribute to development of the mortgage markets.

Scanlon and Whitehead (2019) posited that the diversity of customers in mortgage financing exposes both the borrowers and the lenders to risk. Hoppe and Schmitz (2015) observed that the major risks included credit risk; that the mortgagor would renege on their obligations and investment risk; that there would be a decline in value of and equity in the home. Garmaise and Natividad (2017) also highlighted the interest-rate risk; that the rate could adjust to the detriment of either party; lastly, prepayment risk; that a mortgagor would service their facility prior to the expiration of the term. In Kenya, some lenders are liquidity constrained because of mismatches in a market's short-term deposits and long-term mortgage facilities where comprehensive and accurate history of credit on borrowers is not guaranteed and the collateral's value is compromised through inefficiencies in the processes of foreclosure where there is default.

Despite the risks, the dawn of institutional investors has precipitated the development of risk management skills associated with mortgage financing. Mortgage specific securities provide the various avenues, through which mortgagees can access funds, manage and apportion risks (CBK, 2014). Some policy interventions have been imposed locally in an effort to fortify the mortgage market including raising the mortgage lending cap to 40% of total deposit liabilities, allowing mortgage finance entities to operate current accounts

for clients thereby extending the life of their deposits and enabling bond issuance by lenders to inject more capital for mortgage lending (Njuguna, 2020).

Economic Factors

The Economic factors considered include interest rates, per capita income, inflation, population and land. In the purchase of housing, cost will vary especially depending on the price of the houses and the rate of interest. Data on house prices and income amongst households reveal that structural affordability challenges are present both in developed and developing countries in spite of the cynical wide-ranging affordability challenges (Ball, 2016). Research has indeed revealed that the mean percentage rate of increase in the price of houses per annum between 1960 and 2010 was 2.7 percent with a corresponding annual growth in per household real income of 1.9 percent per annum.

The reported weighted mean rate of interest for mortgages in Kenya is 14.07 percent in 2011, comparatively favorable with the mean rate of lending interest of 14.64 percent. These rates are akin to those of the commercial banks because of the high risks associated with mortgages. In 2011, 21.5 percent was reported as the highest interest rate for a mortgage whereas 6.50 percent was the lowest (CBK, 2014).

Kenya has a discretionary variable system of interest rates on mortgages whose advantages include controlled adjustments that somewhat avert arbitrary changes in terms such as interest thereby providing a degree of stability in especially in volatile

periods. Thus, albeit the upsurge of inflation to 20 percent at beginning of 2009, the rate of mortgage interest has stood at 14% during the past half-decade (CBK, 2012). One disadvantage of this system is that banks are often reluctant to lower their interest rates and would oft likely prefer to boost their margins rather than lower their rate where inflation and interest rates fall.

The rigidity in setting of interest rates for mortgages for the macro environments is also discernible from the lack of reduction in these rates despite the drops in money costs as evident from the rates of T-Bill where ideally, the mortgage interest rates ought to have dropped. This lack of stronger links to the funding by capital markets and low elasticity in consumer prices mean that banks may decide to provide interest rates over their cost of funding. Bank margins and risk premiums have been addressed in length in recent times with a survey paper indicating that the banking system in Kenya, in comparison to those of its immediate neighbors, is efficient, charging the net interests margins of 6.6% which is the sub-Saharan mean (World Bank, 2018).

Among the financial organizations that offer mortgages in Kenya, according to Nasir and Abdullah (2019), are commercial banks, insurance firms, pension funds, specialist mortgage businesses, trusts, government parastatals, and other real estate investment. Few Kenyan banks are able to offer loans up to 90% of the value of a property. Mortgage uptake has increased steadily over the years as a result of Kenya's financial sector liberalization and rising middle class. Mortgage availability and affordability in

Kenya expanded as a result of the financial deregulation that brought about a large number of new mortgage providers strong competition in the banking sector resulted in a significant decrease in mortgage interest rates, which increased consumer adoption of mortgages (World Bank Report, 2019). It has been possible to gauge the expansion of the mortgage industry using a variety of metrics. The Central Bank of Kenya has been tracking the expansion of the country's mortgage market by counting the total amount of loans made, the number of accounts held by borrowers, and the proportion of mortgage debt to GDP. The CBK (2011), CBK (2012) and CBK (2020) surveys, among others, capture this.

One challenge of high interest margins for term financing is that that they are surplus to the capital market rates set by the yield curves. Thus, with the current cost of long-term funds being in excess of 2%, the mortgage interest could cost nearly 8 percent more (CBK, 2012). And while the banks and mortgaging institutions could in part use their deposit bases through blending of funds and other sources of funds to relies low cost of funds, long term, the net margins of interest must reduce if access to financing in the mortgage market is to improve.

Where general interest rates rise, a majority of financial entities suffers resultant losses either in value of assets or profit. Thus, when these institutions' capital and future earnings undergo changes in interest rates, the risk resultant is that of interest rate (Dolde, 2016). Soon and Tan (2019) posited that potentially, financial institutions expose

themselves to this risk by mismatching maturity of their liabilities and assets. Thus, lenders would be exposed to such risk where the rate of interest on liabilities and assets are adjusted at different times or subjected to different dates of maturity (Nayyab et al., 2019). The rate of interest is thus a crucial determinant of the net income of lenders with changes thereto also affecting the decisions of borrowers especially to refinance or reinvest.

Globalization has made prominent the challenges of measuring and managing interest rate risks (Saunders & Marcia, 2002). And while the risk resultant of mismatch in maturity may be lower in low interest rate volatility environments, the converse is true where the volatility of rates of interest is higher. Internal and external pressure of inflation exerted increase the vulnerability of markets due to the unpredictable changes in the rates of interest increase with such adjustments in rates affecting the cost of funds and return on assets for lenders. By addressing mismatch, lenders can shield themselves from interest rate risk even though matching is inconsistent with the primary.

Unaffordability includes low-income levels, inflation, volatility and margins charged by the banks which are relatively high (Pozo, 2018). Supply side factors also create price barriers for most, as costs even of the basic houses cannot be afforded by most. Studies have shown that high incomes per person increase housing affordability, potentially impacting mortgage-financing positively. Higher incomes may also boost economic confidence and increase job security which may spur borrowing. Where a household

uses higher income to repay debt, the relationship between mortgage debt and income is negated, for example since debt-free ownership is assumed to raise social status. While empirical studies are dominated by the positive effects, certain exceptions in this area have been reported including in Italy and the US (Crook, 2019).

There exist various mortgage products offered by almost all banks. Ordinary loans are for example offered at a rate of about 4 percent for a Kshs 4 million facility for a term of 5 years (CBK & World Bank, 2018). On the basis of this statistic, only a meagre 2.4% the populace would afford a mortgage for a basic house. Within the urban population, the percentage is slightly higher at 11%. In the rural areas, the market is unviable owing to the low-income levels and the costs of developing distribution networks which are high. The potential Kenyan mortgage market is estimated at about Kshs 800 billion or $9.9 billion which is nearly 3 times the current market.

This very difficult housing shortage was the cause of the birth and expansion of the housing financing industry. When the availability of numerous sorts of mortgage loan products increases, their interest rates are reasonable, mortgage financing becomes the go-to method for businesses and individuals to purchase real estate, housing supply and demand are balanced, and rates are moderated by a number of competitive commercial mortgage providers, mortgage uptake in Kenya has been high.

In Kenya, income level is both unevenly distributed and low constituting a primary barrier to building an effective mortgage market. The characteristics of an ideal

mortgage financing system based on income within a household were proposed thus; first there has to be sufficient absolute level of income (African Development Bank [ADB] 2019) where households earn enough to fulfil the mortgage obligations as due along the recurrent expenses within the household. The ratio proposed is at 40 percent mortgage payment to income. Secondly, the income must be verifiable. Since a vast proportion of the population in SSA subsist on informal income, verification of income poses a significant challenge and involves great effort by the lenders often mirrored in higher cost of loans.

Regularity of income is another factor. Because of the term of the facility, lenders require assurance that income will be earned regularly over the loan term (Abelson, 2018). Albeit the rapid growth of the formal private sector, this only embodies a minor segment of the population with most secure jobs being civil servants whose finances are still restricted. Kenya has been reported as making progress in lowering the level of poverty amongst its population with that below the poverty line of USD .25 daily in PPP at about 20% (ADB, 2019).

Inflation refers to too much money chasing very few goods. The lender's primary risks in mortgaging include loss of principal and interest, cash flow disruptions, and collection costs (Gramlich, 2007). These losses could be partial or complete and may occur based various circumstances. Credit risks can be reduced through qualifying credit checks on potential borrowers, requiring them to take suitable insurance, third party guarantees

among others possible security options. Generally, high risk debtors are charged higher interest rates by lenders for the facilities they take.

The inability of lenders to identify or capture or cognize risks results to the charging of high 'risk premiums' (Brischetto & Rosewall, 2017). This is especially so where ample credit histories are unavailable and the collateral value affected by insufficiencies in the valuation and foreclosure processes including resales.

Borrower default can be compared to exercising an option to exchange the house for the mortgage. Recent ability to collect large amounts of data has shown that other factors, especially credit history, are important indicators on default whose effects, of these factors on default, can be estimated (Pozo, 2018). These factors can be interpreted as proxies for "trigger events" that make giving up a negative equity house an optimal decision. Diversity in geography of mortgage portfolios constitutes an important credit risk management for mortgage facilities. However, recent experience should remind us that when times are bad correlation across regions increases. Asymmetric information, particularly in the form of moral hazard is also an important consideration, especially for riskier loans. Coupled with the rise in subprime securitization, this has been perhaps the most important factor in the recent surge in mortgage defaults in US, and presents important problems for use of credit scoring models that can be reverse-engineered.

In as much as accurate prediction of default at the individual loan level may be impossible, analyzing the potential default risk is possible as is the subsequent

comprehension of the understanding of its elements such that probabilities can be attached and the facility sought priced and to a given extent, controlled. An example would be a lender's ability to decipher how decline in the value of property can contribute to default even if it cannot predict the specific properties that would have a value drop, enabling lenders to assess property value decline probabilities and predict the default likelihood consequent (Gramlich, 2017).

The option-based approach leads to a nexus between default costs and homeowner equity ensuing from two assumptions. First, that mortgagors having equity in the property are less likely to default and would effort as much as possible to mobilize funds to protect their investment, or sell the property and retain the equity as opposed to turning the property to the lenders. Secondly, even where they default with positive equity, the lenders are likely to recover costs subsequent to the sale of selling the properties (Abdulai & Hammond, 2017). In mortgage contracts, lack of credit history data and documented incomes increases the credit risk of the borrower. To cover this risk, the lender has a risk premium that further increases the mortgage costs that can limit subprime mortgage uptake. The factors that were hypothesized in the study to affect mortgage uptake and hence have an effect on home ownership include, government policy, demographic, social, political legal, economic and technological factors. The discussion of these factors follows.

Lee (2017) claim that the collapse of the mortgage market has significantly increased mortgage rates compared to their previous connection to interest rates. They carried out a research to determine how credit markets affect mortgage rates, and therefore home prices, in the US housing market. According to the report, there has been a significant increase in the recent several years in the disparity between the interest rate on the typical 30-year complying mortgage and the 0-year Treasury bond. In actuality, the average rate on complying mortgages decreased by roughly 0.5 percent over the previous two years, despite a nearly.5% decline in the yield on the 0-year Treasury note. The widening of the difference in mortgage rates and government securities was caused by issues with the overall economy as well as the wider credit crunch.

Lee (2017) examined the growth of home values in the United States from 970 to 2008 by using fundamentals model and the asset pricing technique. He employs real disposable income, building costs, unemployment, real mortgage rates, and average household size in the basic model for factors that affect home prices. Real rents and interest rates are linked by Klyuev's asset pricing theory. In this analysis, starting at 2010, both approaches show significant overvaluation in the US home market. Additionally, he discovered that property prices are capable of long-term deviations from their equilibrium values. Walsh (2019) used three-variable SVARs to analyze monetary policy shocks for the medium section of the South African housing market. This outcome highlights the advantage of utilizing a sizable information collection.

In Australia, a study by Mason (2016) was conducted consequent to a political crisis in the country and sought, among others, to assess how population growth was affecting the housing sector and economic development; and assess whether the demand for residential land, housing, and urban infrastructure increased with population growth. Despite using demographic methods especially in assessing the impacts of population growth on the demand for housing, the study findings indicated that high growth in population reduced the demand for housing and reduced home ownership. Though the increase in the population was expected to fuel increase in home ownership, this was not the case.

In a report published in 2000, Palm et al. (2019), examines how China's monetary policy has affected real estate values between the years 1999Q and 2006Q2. After considering the series data attributes of the set of data, a high - dimensional data distributed lag autoregressive (ARDL) template is employed as the appropriate configuration, and the boundaries check is employed to identify the long connection between home prices, rate of interest, supply of money, and bank lending. Real long-term rates of interest and loans, according to the empirical data, have both long-term and short-term causal links with real estate values, implying that these methods could be more beneficial for restraining surging real estate prices.

Jayantha and Oladinrin (2020), conducted research on the reasons of non-performing loans in Kenya. She discovered that the primary causes of NPL were the general

business depression brought on by the national economic downturn, consumers' reduced purchasing power. According to Sunarti et al. (2019) if the house prices appreciate borrower's selection among different fixed and adjustable rates, with higher fluctuating rates the borrower prefer adjustable rates. It has also been established that the pricing terms of loans determine to a significant extent the mortgage choices that borrowers make.

Asal (2019) discovered in their research that the interest rates on fixed rate mortgages (FRMs) impacted the borrowers to choose adjustable rate mortgages (ARMs). This was due to the fact that, in an environment of uncertain interest rates, purchasers preferred ARM financing over FRM but borrowers preferred FRM over ARM when predicted prospective short term interest rates were expected to be lower.

In New Zealand, a study by Stephenson (2016) investigated the implications of a declining and ageing population for home ownership. The study noted that the population of New Zealand will likely grow, but at a decreasing rate. The study established that the population decline means certain local services then become untenable in terms of patronage (for instance retail outlets and schools) and funding (for instance council rates). The decline in population has also dampened the demand for housing.

A study in US by Wyatt (2018) highlighted Brooklyn City's housing market. It revealed that the adult population between 2000 and 2016 grew by % whereas the increase in

number of dwellings was 8%. The effect of more people jostling for smaller supply of apartments was the rise in rents by an average of $300, about double the pace of income growth. The city has also experienced the effects of inadequate housing supply characterized by low vacancy rates, below 4%, and increase in size of households and overcrowding. This study by Jenkins (2017) established that the increase in population in part driven by the city's job growth, 6%, during the period of the study yet construction of adequate housing units for these new workers, albeit logical to ensure continued residency of the workers within the city, has long been a difficult task. The increasing population cannot afford homes and hence the increase in population is not fueling increase in home ownership.

Ngacha (2020) argues that central bank in Kenya, should ensure that mortgage loan institutions and commercial banks lower their rates of interest to encourage higher mortgage uptake or home ownership. Ngacha adds that regulation measures should also be implemented to contain the upsurge in the rates of interest. By so doing, even the lowly paid employees will be able to afford own a home. According to CBK (2014), in Kenya, the setting and determining rates of interest is the work of the Central Bank via the monetary policy committee. Central bank also gives loans to commercial banks and act as a signaling tool for monetary regulations and rules. The rate at which commercial banks are able to loan out cash to consumers is therefore largely determined by Central bank rates (CBR). Kenya Banks' Reference Rate (KBRR) has an effect on the mortgage

market as well since it sets the base rate for loans made by microfinance institutions and commercial banks and determines how much mortgage products cost.

Inflation, according to Mutero (2018), is the overall rise in prices over time for goods and services. Another definition could be the situation in which the levels of aggregate prices permanently increase hence leading to a decreased power of purchase and increased cost of living. According to Awuvafoge (2020), if an inflation is anticipated, nominal interest rates are always affected hence leading to repayments being given a high quotation hence the front-load of payments to cover for losses due to low purchasing power that might result. The uncertainty arises from the obstinate currency instability as a result of unstable inflation, which obscures external long-term mortgage finance access. Barberis et al. (2016) noted that uncertainty resulting from tenacious low inflation is necessary for a success in the mortgage market since it results in stable and low interest rates. High inflation however causes the rates of interest to go up since the lenders will be looking for a way to cover up for loss in purchasing power of their loans. Njiru and Moronge (2020) add that high inflation has the capability to destroy economic practices, hence, an increase in inflation rates can drag the economic growth of any given state.

Manrique and Ojah (2020) conducted a research in Spain to examine the effects of inflation rate on ownership of homes. The discovered that there existed a negative link between mortgage loan uptake and inflation increase. Ngacha (2020) found that there

was a negative influence on uptake of mortgage loans regarding the increase in inflation. Garmaise and Natividad (2017) foresaw a future with an increase of houses mortgage loan following the USA pre-2008, due to stability in house prices. According to Majid et al. (2012), looser underwriting standards and government subsidy leads to an increase in mortgage loan uptake and home ownership. Nevertheless, they were unable to explain the aspect of low mortgage uptake in Africa given that there is low inflation rate that has been persistent over years in countries like Botswana.

As evident from the 2008 debt crisis in the US, it is clear that mortgage loan can have severe repercussions on financial market and the financial state of a household. Due to falling house prices, households usually find themselves with mortgage loans that is higher than the value of the property. Most households are finding it hard to repay mortgage loans as a result of dwindling per capita income. Gan and Hill (2018) found out that borrowers who have high loan values in comparison to their income per capita and the home value, experience difficulties in repaying their mortgage loans. Sommer and Sullivan (2018) demonstrated that US households set aside excess of their household income in order to service their mortgage loans during the period of well performing labor market and also when labor market prices appreciate. Most studies concentrate on income risk in terms of mortgage uptake as a economic variable.

As opined by Chia et al. (2016), wealth risk is a crucial factor in loan uptake. In case of inability to repay loan, the aspect of negative housing equity will result in selling the

house at prices lower than the initial purchasing price. Here, the money acquired from the sell will not be enough to service the outstanding mortgage loan balance. Although, they only investigated on interest only mortgage and did not touch on other mortgages like, amortization, investments, endowments, and many more. Thus, Chia et al.'s study is questionable in when it comes to wealth variables mortgage uptake loan.

Amin (2017) examined the impact of per capita income on mortgage uptake. They noted that moderate- and low-income borrowers take mortgage loans mostly if the loan is characterized by fewer down payments and requires low credit score. These borrowers preferred such types of loans since they could easily service it without too much straining. However, in his research, the authors did not clarify why such loans had big loan to value ratios. The progress in the Chinese real estate market from 2008 has been significant due to an increase in the citizens' per capita income. Another research by Pitkin and Myers (2017) revealed that USA is among the nations whose rapidly growing economy was increasing the demand for mortgage loan via the rise of industrial jobs, which had led to an increase of per capita income.

Taxes are those levies imposed on the citizens to facilitate the provision of public services. Since taxation is a fiscal policy instrument of the treasury department, it imposes a significant economic effect on mortgage loan uptake and home ownership. According to Van Noppen (2018), mortgage loan uptake is higher in nations that have reduced mortgage loans tax hence leading to extensive tax refunds. Van Noppen's

research on Dutch households also revealed that refunds were largely dependent on factors like, marginal tax rate, showing that tax refunds increase with mortgage and income principal.

According to Nayyab et al. (2019), tax has an impact on mortgage uptake. They did research in Norway using information from wealth survey. They also discovered that the Norwegian tax system favored housing more than asset. World Bank (2018), states that favorable taxation on mortgages is one of aspects that lead to a higher demand of house loans. On the contrary, theoretical studies shows that there is need for tax neutrality in the housing market for the sake of fairness and efficiency (Hoppe, & Schmitz, 2020). According to Optimal tax theory, the rule of production efficiency states that taxation should not draw a distinction between input factors, since low housing taxation leads to an upsurge in mortgage loans demand.

Van Noppen (2016) investigated the impact of taxation benefits on mortgage loan uptake and discovered that the effect was insignificant. He opined that the relationship between demand and supply for rental homes, and for owner-occupied homes is what affects the mortgage loan demand. Garmaise and Natividad (2017) also argued that tax policy is not the primary determinant of demand in the mortgage uptake, but financial innovation that enables most people to own homes. Hence, there is limited research supporting the fact that tax changes significantly affect mortgage loan uptake and these calls for further research.

To minimize risks that arise from exchange rates, banks are giving out loans in terms of foreign currencies. It affects those nations that are largely dependent on foreign currency loans to finance economic processes. In case the value of local currency drops, a negative feedback mechanism will be established leading to an increase in loan defaulters, hence a drop in mortgage loan demand. According to Arvantis (2020), the more banks are allowed access foreign currency deposits; more foreign currency loans will be available. As per economics, borrowing rate will largely depend on the differential in interest rate between foreign and local currency. High foreign currency and low rate of exchange volatility leads to more households demanding foreign currency house loans. However, banks are cautious in lending local currencies where there is the credibility of domestic monetary policy is low, more so, if it takes more time for the mortgage loan to mature. However, Stephenson (2016) disputed the argument stating that funding banks with foreign currency as a wholesale, in Eastern Europe is not the primary push factor of foreign currency dominated mortgage loans. However, there is need for the Communist Block (currently Eastern Europe nations) government to advocate for home ownership by placing subsidies and tax incentives on mortgage loans for its citizens.

The CBK, (2014), yearly report established that high interest rates were the primary challenge in mortgage loan uptake. As non-performing loans (NPL) climbed from 6.9 billion Kenyan shillings in 2012 to KES 5 billion by December 2012, it was further claimed that the effects of the high interest rates in 202 were still felt in 2019. The

research by Njuguna (2020) supported the results, which demonstrated a favorable correlation between the rate of loan defaulting and interest rate levels. The annual supervisory report of CBK in 204 revealed that housing prices were the primary factor of mortgage uptake, with interest rates coming in second (Njiru, & Moronge, 2020). Ngacha (2020) also opined that interest rate increase leads to high mortgage cost, hence, lowering mortgage uptake.

The 2014 report also indicated that there was an increase in NPLs ratio as it increases from 5.2% in 2013 to 5.6% in December 2014 (CBK, 2014). The dragging impacts of the 202/2013 high interest tenure partly contributed to the increase in NPLs ratio, together with the down casted economic activities experienced in 2014. Kariuki (2020) undertook a research on impacts of flexible rates of interest on mortgage finance growth between 200- 2007. She found out that there was a significant negative effect of flexible rates of interest to mortgage financing in Kenyan financial firms. Garmaise and Natividad (2017) supported the findings as they also found a strong negative relatedness between mortgage financing growth, and inflation and interest rates. Hoppe and Schmitz (2020) also deduced that lower mortgage products uptake is as a result of upsurge in rates of interest. Jain and Mandot (2012) however, disputed these findings as he found presence of a favorable correlation between interest rates and mortgage take-up.

Kariuki (2020) stated that unreasonably high interest rates in lending firms slows down economic growth and long-term investments. A 20-30 percent interest rate makes home

ownership unaffordable such that private sectors cannot manage to comfortable get loans necessary for investment in the mortgage products. Where they obtain loans at an exorbitantly high interest rates, they tend to exaggerate the prices of these houses to cover up for the interest rates and maintain high profit margins. Due to this fact, the costs of owning a home via mortgage arrangements prevent many households from mortgage uptake (Kusuma, 2017).

An investigation was done by Bourassa (2014) to assess the effect of mortgage finance in Nigeria on home ownership. Their study gave a revelation that mortgage and commercial bank credits, and investments from the private sector would significantly and positively affect home ownership and housing by 2020. He gave a recommendation that current procedures of mortgage loans by private investors, commercial banks and mortgage banks be revisited with a purpose of making accessibility of mortgage loans easier through lowering their interest rates, hence making it affordable. Bourassa suggested a new era of mortgage finance policy that will boost aspiring homeowners' confidence to save and invest in mortgage related tools, more so in the capital market.

Wyatt (2018) in their study gave out an empirical foresight technique concerning mortgage loan consumer behavior and how they react to interest rates changes. They discovered that consumers had a greater reaction on Arm interest rate changes compared to FRM especially those who experienced financial constraints. Monetary policy,

capital demand, inflation and the fiscal policy taxation by the government are some of the factors that affected short term interest rates according to the study.

Credit risk in this case is the risk of the mortgagor failing to service the mortgage loan as expected or defaulting it. According to Ebekozien (2021), credit risk leads to the lender losing interest and principal, cash flow destabilization, and high collection costs. In the banking industry, credit risks arise from hostile selection and moral hazards as a result of inaccurate information. Segal and Sullivan (2018) denote that credit risk resulting from the portfolio of bank loans is the major risk that has a direct impact on the banking department financial stability. According to Wyatt (2018), increase of NPLs in banking sector is a crucial factor regarding loan procedures restrictions imposed on businesses or individuals. Credit risk according to Schuler and Adair (2020) is exacerbated by poor supervision, imposing of compulsory quota lending by the government, ineffective credit guidelines, and capital inadequacy ratios and liquidity.

A research carried out by KBA (2018) showed that risk played a role in home ownership through mortgage loan uptake. They investigated how mortgage market risk affected mortgage uptake and had their main focus on credit, interest rate, liquidity and price risks on mortgage loan uptake in the Kenyan sector. They carried out a research on 27 mortgage lenders from 2008 to 2020. Through regression model analysis, they came out with a conclusion that the risks encountered by mortgage lenders has an impact on uptake of mortgages in that, lenders tend to limit the quantity of mortgages in case the

risk involved is high. The research recommended that proper management of risks could boost house loan uptake.

An investigation done by Kuhn and Grabka (2018) also revealed that risk factors affect mortgage uptake. Their research was done to determine the factors that encourage or discourage mortgage uptake and their findings showed that local economy performance, poor address systems, and inadequate or inaccurate potential client information were listed as some of these hindrance factors. The research also revealed that lending and prime rates, standard identification system, and functional banking systems are some of the indicators of a stable economy and also promoters of mortgage uptake. In their conclusion, they opined that mortgage market success was largely dependent on efficient land title system, attractive mortgage investments, which give an investor a return rate that is positive and risk adjustable.

A baseline survey by the CBK (2020) on Mortgage Finance in Kenya indicated that housing contracts attract payments and expenditures which are imposed on the mortgage and lead to increases in procurement cost. Examples of these costs are: valuation, arrangement, stamp duty, and legal fees as well as mortgage protection policy. All these extra expenditures increase the cost of mortgage making it hard for most households to own a home. All the additional cost increases the cost of mortgage by 0%.

Another CBK (2014) bank supervision report, ranked exaggerated incidental mortgage cost third among the obstacles encountered in mortgage business. Following this costs,

Retirement Benefits mortgage regulations (2018), had to permit members of pension schemes to acquire immovable property under which the home had been constructed. According to Kariuki (2020), this policy applied to members whose scheme policies allowed them to carry out the Act, furnished a guarantee by setting aside part of their scheme benefits for consideration, in favor of the institution, or had been granted favor by the institution to acquire the immovable property. Also, in the Act, the member or their spouse were given the right to ownership of immovable property via the right of occupation.

According to World Bank (2014), rate of interest increment by banks and mortgagors, leads to increase in cost of mortgage facility access, thus, preventing some aspiring home owners from full filing their dream of home ownership. On this light, a rise in interest charges rates affects cost of mortgage repayment and in the end, housing demand drops. Mortgage application decisions are determent by mortgage prices, which act as a measure of collateral value of a mortgage. They also opined that the price of a home together with additional cost is a demand and supply factor in the housing market. Other factors such as the house quality have a slight effect as the housing supply curve will be positively sloped with time. However, the biggest determinant of house prices is the willingness of the consumer to purchase and the willingness of the investor to provide a quality home. The World Bank (2019) has observed that registration of titles is a slow and costly process and also prone to fraud.

Money supply is all the money in existence or in circulation in a given nation. According to Van Noppen (2018), money supply has several standard measures such as monetary base, M (cash and checking deposits) and M2 market mutual funds, deposits from savings and other time deposits). In a situation where money supply goes up, an inflation usually results or is usually anticipated in the economy. Due to inflation or an anticipation of it, discount rates go up and investment market returns drop. Currency value, economy growth and interest rates also go up with increasing circulation as stated by Ullah et al. (2018). In a research conducted by Suaid (2012), it was established that if money supply was to be increased, discount rate will also increase and this might bring about an adverse impact on the economy stimulus resulting from growth of money, which will lead to an increase of cash flow in the economy.

CBK (2020) in their newsletter titled role of the government in money securities stated that, a money supply fluctuation leads to high interest rates. Since the government finances all economy expenditures of public sectors, it is tasked to get a loan from local markets in case of a deficit. This in turn has an effect on money circulation and further affects the pattern of interest rates, making credits unaffordable as a result of crowding market. Mortgage borrower in such an environment is forced to keep off the financial market. Borrowing causes inflation hence raising long term interest rates. Thus, borrowing money to invest on risky assets such a house riskier and costly, and in turn, house loan demands go down. The short-term interest rates theory on mortgage loan demand only applies to markets with volatile interest rates. In this case, it does not give

substantial explanation concerning markets with stability on either long- or short-term interest rates. The notion of short-term interest rates therefore does not apply to housing uptake.

According to CBK (2014), money supply stood at KES 1,272,600 and increased to 2.7% before the year's conclusion. The case was different in 2009 as it only rose by 6% that year. This increase of money supply in 2001 was attributed to foreign assets accumulation and credit expansion to government and private sectors. In December 2011, there was a drop to KES 1,514,200 which is different from 2.7% increase recorded in 2011 (CBK, 2020). This gave a depiction of dragged growth of both Net Domestic Asset (NDA) and Net Foreign Asset (NFA) (NDA) in the banking industry due to reasonably strict monetary policies that were in existence from October 2011. From December 2012 to 2013, there was a decrease in money supply and this resulted in reduced domestic assets in the banking industry and a decreased credit to government due to government deposits accumulation (CBK, 2014).

In 2014, the acceleration was at 6.7% showing that money supply had grown, given that in 2013 acceleration stood at 3.3%. An increase in NFA and NDA were responsible for the 2014 acceleration (World Bank, 2018). By December 2015, a decline had been recorded again (14.1%), due to unresponsive credit uptake by the government from the local market after receiving syndicated loan. With all this fluctuation, mortgage industry was not significantly affected.

A rise in money supply, lowers interest rates and hence money market balance is attained (Swan, 2015). He also added increase in supply of money upsurges but a change in money demand curve declines in terms of equilibrium. Also, in case there is a change in supply of money that is predeceased by the supply of money shift in the short run, interest rates will remain unchanged. Hence, monetary policy might not be the solution to fluctuating house interest rates.

Interest rates can be significantly impacted by consumer and company expectations on inflation. Lenders that anticipate an increase in the cost of goods and services may demand higher interest rates to make up for the possibility that their borrowed money will be refunded with depreciated currency. Potential borrowers are more willing to accept loans with higher interest rates since they anticipate being able to repay them with depreciated currency at the same time as they are anticipating rising inflation rates. The expectation of growing inflation also encourages firms and consumers to make purchases as soon as feasible in order to avoid the anticipated price rises. This increased demand for credit leads to an increase in interest rates. Lower rates of interest will encourage borrowing, which will lead to more investment. By boosting the credit base of commercial banks, this will also enhance their profitability. Conversely, poor completion at commercial banks would result in an increase in interest rates; this sort of increase in interest rates leads to a decline in loan volume, which has an effect on the bank´s profitability and, concurrently, a decline in investment in real estate.

Walsh (2019) uses a Factor-Augmented Vector Auto Regression (FAVAR) to estimate the effect of monetary policy on real home price increase in South Africa. The FAVAR is calculated based on a sizable data set that includes 246 quarterly series over the years 980:0 to 2006:04. The five components of the South African economy are examined in this study to determine the effects of a favorable monetary policy shock on real home price growth. A FAVAR calculated using 246 variables over the years 1980: Q1 to 2006: Q4 is used to make this assessment. Overall, the findings indicate that the framework doesn't really face the home price problem because actual house price increase reacts unfavorably to a favorable monetary policy shock.

Mishkin (2007) asserts that changes in the housing sector might have an impact on lending markets. Rising subprime residential mortgage delinquencies in the US have caused significant losses to investors of mortgage-backed securities as well as substantial increases in credit spreads for those assets. Additionally, issues with the subprime mortgage industry have caused investors to reevaluate pricing and credit risk, which has resulted in wider spreads overall and weakened balance sheets at some financial institutions. Mishkin evaluated the current state of knowledge on housing's function in the transmission of money in this work before examining the consequences of this information for the formulation of monetary policy.

Demographic Factors

Demographic factors to be considered are age, marital status, gender and household size. A study by Wyatt (2018) investigated the consequence of changing demographics on the rate of home ownership by young adult. Wyatt (2018) found that young adult homeowners between the ages of 25 and 34 had changing socio-demographic traits that have an impact on their propensity to own a property. An upsurge in shares of unmarried and minority householders resulted to downward pressure on ownership of homes for this cluster, while contemporaneously; high income levels and education provided a boost. Over the last two or so decades, events in the housing markets have masked these effects, first by making ownership of homes more attainable and attractive prior to the Great Recession, thereby increasing the rates of home ownership, then by lowering them after 2005 as credit constraints and increasing unfavorable economic circumstances subdued purchase of homes by young adults. Disentangling the collective effects of these trends demands analyses that can isolate demographic tendencies including in micro and macro market conditions, to identify the effects resultant of specific characteristic changes on the rate of ownership of homes by young adults over time an analysis described under the study as resultant of socio-demographic factors that estimated expected changes based on econometric methods. The study found that due to growth and decline in housing markets over the last twenty years, the home ownership rate by young adults have decreased by over five percent, much of which bust is resultant of changes in family and marital.

Using the Chi-square Test, Majid et al. (2021) evaluated in Malaysia the impact of buyer demographics on real estate purchases. Questionnaires were administered for collection of primary data in Selangor with particular focus on the housing and demographic attributes of buyers. The results showed that demographic factors including gender, marital status and employment significantly affect property criteria that a potential buyer considers before purchasing a house.

Age is also a significant factor of property criteria Garmaise, and Natividad, (2017) with different diverging inclinations between the old and young adult generation. Retirees may prefer purchases of housing units that are simple in design with some degree of flexibility in movement inside. Hoppe and Schmitz (2020) found age as somewhat key in identification of the current lifecycles of a household including as old couple or young family; cycles that would influence their potentially distinct decisions based on their housing preferences. Other scholars have posited that age could be used as an identifier of housing demand (Swan, 2015). Kusuma (2017) opined that persons over 65 years of age are hesitant to buy a house even where affordability is not an issue. Conversely, younger people are more likely to buy property (Hoppe, & Schmitz, 2015). Nonetheless, those below thirty years of age are less likely to commit into purchasing property as most may still not have attained financial stability (Lutfi, 2015).

The decision making and preferences of a buyer is also affected by their marital status (Lutfi, 2015; Suaid, 2012). These also influence a buyer's basic needs and determine

their budget or capacity to purchase houses. Usually, married people favor having their own houses (Leppel, 2017). Bourassa (2014) however observes the converse for young married people as does (Manrique, & Ojah, 2020) in respect of old married people who he opines, refuse to purchase houses because of the smaller size of their households. Moreover, unmarried people prefer staying with their parents as opposed to moving to other houses (Bourassa, 2014). Divorce incidences however trigger demand for new housing units amongst single parents (Tavakol, & Dennick, 2019). Collectively, these highlight the need for analyzing the marital status of people to offer further insight on their potential house purchasing decisions (Chiu, & Ho, 2016).

Laamanen (2019) observe that increasing the size of the household would result to new demand for residential properties. Households having young children prefer units' simple-designed units also having additional playing (Majid, 2018). The size of the households further determines the space needs in terms of floor area and number of rooms (Suaid, 202). The number of children within households also contributes to the preferences and needs as do other factors such as accessibility, location, accessibility and social facilities including schools (Bienert, & Brunauer, 2018).

A study in Germany and Switzerland by Kuhn and Grabka (2018) established that increased life expectancy in these countries have positively influenced wealth creation and home ownership. The study established that in the two countries, owning a home is considered critical indicator of wealth and financial stability. The study established that

home ownership is linked to life expectancy in two ways. First, people who live longer are expected to have many productive years and hence can save more towards buying a home. Secondly, increasing life expectancy is an indicator of reducing wealth inequality. This makes more households and individuals to be able to afford homes due to the increased and equal distribution of wealth in the population.

A study by Segal and Sullivan (2018) in Chicago, United States investigated the trends in home ownership as explained by factors such as income, demographics and race. The investigation found that life expectancy has a considerable favorable impact. on home ownership. Americans in Chicago view home ownership as a cultural touchstone. It is strongly associated with planning for financial future by Americans. As Americans continue to live longer, they are prioritizing home ownership which is mostly facilitated by mortgages. Further, most Americans of productive age are continually buying homes for their elderly parents. This has increased the home ownership levels within the populace.

Demographic factors are those characteristics in a consumer that act a driving force for them to purchase goods or services. Some of these traits include age of the consumer, gender, marital status, race, and parity, type of job, literacy levels, and household income. These factors also act as determinants in terms of home ownership or mortgage uptake.

According to Njuguna (2020), how much the household earns determines whether they can take a mortgage product or not. He adds that mortgage facilities are investments which are long term and consumes an individual's income for a long time. Annual earnings also determine the amount of mortgage loan one is eligible for. For example, temporary contract bank staff, such as sales personnel are not eligible for house loans as they are only engaged with the bank for a short period. These employees are employed on one- or two-year renewable contractual terms depending on employee performance and bank needs. According to Njiru and Moronge (2020), the time is too short to enable the employee qualify for a mortgage loan. Different types of credit institutions are in existence with cheat rates and simple terms and conditions. However, recklessly borrowing from such facilities may put the person in a fix, denying a chance to borrow meaningful and long-term loans such as house loans. According to Ngacha (2020), misuse of credit institutions hinders someone from attaining financial responsibilities and end up taking shylock loans that are very risky and overly charged. This situation might also lead to financial hardships on bank employees and they may have disciplinary actions taken against them.

There are also circumstances where one needs to satisfy their short-term goals such as education and thus, they take up reasonable amount of money to fund it. These short-term financial needs might also hinder one from obtaining long term loans. Some individuals also start working while still single (unmarried) and in the process they get married. Marriage leads in an increase in household expenses hence, reducing funds

available for investments. Coupled up with other short-term financial needs, the person might turn to credit institution for additional loan to sustain a growing family. Other expensive lifestyle goals also kick in such as cars, and leisure activities such as vacations (Mutero, 2018).

Soon and Tan (2019) noted that affordable housing is a problem to low-income earners and the government. Affordable housing is the type of housing that enables those households with low income to access and pay for suitable dwellings. Affordability entails construction cost, financial terms, rent propensities, and distribution of income. In his investigation, Hass Consult (2019), noted that affordable housing mandate had an impact on the mortgage sector. He also established that housing projects that had low income are situated in cheap lands.

Population growth also affect mortgage uptake and house ownership as it piles pressure on demand for houses causing the prices to hike. In an investigation done by Gambo (2022), population has a significant and strong relationship with house pricing. An increase in household income was also found out to be push factor in the growth of real estates. Employment is also vital in determining possibility of home ownership, although, wages, salaries and the quality of the work were also found to be equally important. Moreover, Yoon and Kim (2016), deduced that there existed a sturdy relationship between income growth and price of mortgages. Any change on demographic factors significantly affects the mortgage market. For example, population growth leads to a

higher mortgage demand, employment growth will also have the same impact since a bigger number of people will be able to afford mortgages.

Manrique and Ojah (2020) states that demographic factors give an incentive on what the customer wants, the reason they want it and the possibility of them buying the stated product. Demographics has an indirect or direct impact on consumer behavior and also affect other features of customers, for example personal attributes and the way they carry out their decisions. According to Ullah et al. (2018), with age one acquires attitude norms and cultural norms and this influences their way of living and self-concept. Age category of the customer also has a significant effect on spending patterns, influences their shopping spots, their way of thinking, perception and action. A good example given by Kuhn and Grabka (2018) of elderly consumers invest more on travelling and medical, and spend less on clothing and home décor compared to the youths. On the other hand, teenagers are more likely to focus on fast foods, drinks and movies.

Age is also more related to lifecycle stage. These stages are single, married with no children, married with children, children got independent, and retirement. As stated by Majid et al. (2012) needs will vary at each given stage. Although some will not marry, their needs will still shift with time. Mason (2016) advices mortgage institution marketers to be observant and considerate of the changing stages and modify their services and products to meet the needs at any given stage. Mason also observed that most mortgage loan lenders do not readily lend mortgage loans to elderly customers

since their income drops on retirement thus, they might not be able to pay monthly mortgages as expected.

This group are anticipated to be the next big thing to be evident in real estate firm. Hass Consult (2019) indicated that close to half of the people in the age bracket 20 to 35 own a land or other land related investments in the housing industry. At the same time, millennials are considered as a group that is more likely to default a house loan even if they have a will to obtain a mortgage to enrich their investment assortment.

Soon and Tan (2019) found that retirees are more likely to buy houses with less furniture for the sake of their flexible movement around the house. He noted that individuals above 65 years of age are less likely to take up the option to buy a house, despite the fact that they can afford. Hence, age factor could be used to determine the quantity of demand in the mortgage sector. Gambo (2022) hypothesized that individuals who are 30 years and below, are unable to purchase a house because they are not yet stable financially.

In an investigation conducted by Bahlous-Boldi (2021), it was noted that a combination of income level of the household and accumulated wealth, can be used to predict purchasing power. Although most purchase are done through credit, the actual ability to purchase via credit is determined by the current as well as the past income of the purchase. Amin (2017) noted that although income enables purchase, it neither initiates nor give a clarity on these purchases. For instance, a lecturer or an advocate may have an

income that equals that of a plumber, however, their consumption choices might not be similar. In this case, literacy levels and job occupation are considered factors that influence product preferences, and income remains to be a tool that enables them purchase these preferences.

As stated by Pitkin and Myers (2017), what is crucial for mortgagees is determining the capability of a mortgager to pay monthly mortgages, and this they can do by reviewing their spending habits and income. Normally, one can obtain a loan of over four times their earnings in case they are purchasing the property alone or up to three times if the property is purchased jointly. Garmaise and Natividad (2017) in their research also found out that education affected home ownership. In their research, they discovered that young adults who went through high school in UK stood a greater chance of owning a home by 2011. The findings were the same for both male and females, married and unmarried. They also noted that secondary qualification had a negative link with home ownership for men and women who were not yet married.

World Bank (2018) noted that the main source of income is education in the current economy. It is therefore, a serious matter given that families of individuals who were paid highly by manufacturing industries despite low education levels are dwindling swiftly. Current job industry needs highly skilled personnel with critical thinking and the ability to read, understand and acquire new skills faster. Those people who lack in the mentioned attributes are left with no choice but to turn to low paying part time jobs,

which makes it hard for them to comfortably sustain their families above the poverty line. Unemployment on the other hand leads to a rise in informal home ownership and slow growth in mortgage investment.

The literacy levels have also been thought to be an indicator of consumer lifestyle. Those individuals who have attained high levels of education are the biggest influencers in the housing sector. Hoppe and Schmitz (2020) also state that education makes individuals more cautious while purchasing a home. Horowitz et al. (2007) found out that highly learned individuals are accustomed to purchasing costly houses. On the contrary, individuals with low literacy levels are less likely to even purchase a house and prefer informal housing. Majid (2018) investigated the effect of education levels on home ownership, and concluded that an increase of educated personnel will lead to a decline in the number of people aspiring to own a home.

Another factor that affects mortgage uptake is the personality of the individual. Jain and Mandot (2012) define personality as the characteristic of an individual to react to stimuli depending on the situation. Kuhn and Grabka (2018) noted that personality comprises of unique behavioral patterns, abilities, qualities, or personal temperaments that differentiate individuals and result to a steady reaction of the stimuli in the environment. Kusuma (2017) reflected on the different ways that personality can be gauged.

The marketing perspective theory is the most convenient as it demystifies the different behavior of people in different situations. The theory holds that individuals possess traits

that are internal and connected to how they act, for instance, more or less of the need to be recognized, materialism or recognition. The theory also postulates that these traits and the individuals are measurable and consistent. They concluded that these traits develop from childhood and remain unchanged throughout the years. However, Amin (2017) disputed the hypothesis and postulated that there is a possibility of the personality changing suddenly in face of the major events in life, or gradually with time.

Since trait theories place personality as individual difference, Majid et al. (2012) suggested that market schemers can fragment consumers as a utility of their personality variance, and this will help them establish STP strategies that are successful. From financial point of view, as stipulated by Manrique and Ojah (2020), personality can be linked with how much risk an investor can take. Mason (2016) add that the short and long-term investment choices of individuals can also be related with their personalities. Given that housing investments have a lengthy lifespan, mortgagors home ownership verdicts will be determined by their personality especially their tendency for postponed gratification.

Soon and Tan (2019) also support that personality has an impact on risk taking and aversion via individual's tolerance or perception. Pitkin and Myers (2017) hypothesize that choosing to channel personal savings towards a mortgage and not home ownership entails a heightened degree of doubt since the mortgager may not be sure of the future of their job, income or the status of the family factor, which will eventually influence the

ability to uphold mortgage obligations. Mortgage incentives are primarily influenced mortgagors, risk perception techniques.

Employment also influences home ownership. An upsurge in employment leas to a decline in unemployed personnel. Majid et al. (2012) categorizes employment as part of what makes up the property cycle. This is usually viewed in terms of what occupation the household head in. a good occupation adds value to the strength of a family in terms of finance, and in turn influence the household purchasing power and thus they are more likely to purchase a home. Losing a home on the other hand, can lead to losing a home in case the house was bought using mortgage loan. Hence, employment influences mortgage uptake and home ownership in both the long- and short-term periods.

Household size as also been postulated as one of the house ownership influencer. It has been defined as a measure of how many people are in a residential house (Mason, 2016). It determines house preferences for example, a household that has young children would go for a home that is spacious and has a simple design for the mobility of the kids around the house. The size of the household also dictates how much space is needed in the house as well as the number of rooms the house should have (Majid et al., 2012). Suaid (2012) concluded that the number of children is the driver of household needs such as location of the home, distance from education and recreational facilities, and the accessibility of the area where the house is situated.

Marital status is a big contributor to home ownership preferences. Gambo (2022) suggest that marital status determines a person's basic needs and hence, their capacity to buy a house. Manrique and Ojah (2020) found out that married couples with kids are the most likely people to own a home whereas the converse holds for old married e and young married people as their household size is small. Individuals who are not married are more likely to stay with their parents and not purchase new housing units. They also found out that divorced people lead to a higher demand of houses as they will opt to get different houses as single parents. Hence, marital status is a big contributor of house decisions of individuals.

Ethnic groups or race is also another aspect that influences home ownership. America is a perfect example of a state with different races. In America, this racial difference in home ownership is mainly brought about by financial difference. The great recession led to a drop of 40% in terms of net worth. The median net worth of the blacks equally dropped by 53% which is higher compared to that of the whites which stood at 7% from 2005 to 2009 (Mutero, 2018). A look into the racial wealth gap by Pitkin and Myers (2017) before and even after the recession it is clear that there has been a consistent gap between the blacks and the whites. The survey carried out by Census Bureau in 2005, showed that black relative stood at 9 cents, dropped to five cents in 2009 and rose to only six cents in the year 2011. This clearly shows that the great recession did not take away the wealth of the blacks but instead destroyed their wealth accumulation. Although the economy is coming back to its feet, and home ownership is going up, graduates who

are black are still lagging behind in home ownership. This black–white gap in home ownership has deepened following after recession recovery. The great recession also promoted the obstacles faced by black degree holders in the mortgage institution. Normally, a bachelor's degree is regarded as a booster in economic security, but current literature disputes the hypothesis. Segal and Sullivan (2018) for instance, deduced from his research findings that households headed by black graduates are less wealthy compared to households headed by a white high school dropout.

Using the Blinder Oaxaca decomposition tool, Sommer and Sullivan (2018), found out that both demographic and socio-economic factors played a crucial role in racial difference in the home ownership in the US. Discrimination by the mortgage loan lenders and initial wealth were also stated as factors that heightened racial unevenness in the home ownership sector between the blacks and the whites.

In their research, Stephenson (2016) established a decline in ownership of homes by youths in the UK. In their work, they drew a contrast with Scotland youth transitions to house ownership between 1990s and 2000s by evaluating socioeconomic role of both parents and the individual in influencing mortgage prices. The findings showed that demographic disparities among the youth, sex, and marital status play a part in shaping their shift into home ownership. Part of the study revelation was also the fact that single women were less likely to purchase a house compared to single men.

Laamanen (2019) conducted a research on the effect of family and individual resources on married and unmarried home ownership rates in Netherlands. The research showed that there also existed a disparity between male and females, whether married or single, both on home ownership and in its drivers. He also gave critical insights although the population carried individuals of up to 65 years of age instead of focusing on youths. Awuvafoge (2020) also did an investigation by drawing a comparison on Netherlands and Germany home ownership on youths in the 25-40 age brackets. He also deduced that there existed a home ownership hierarchy in relation to marital status. A higher likelihood of married people to own a home compared to the unmarried was recorded since married couples became dual earners hence combined efforts to buy a house.

Lacovou (2018), noted that socio economics greatly influenced home gender disparities on ownership among youths. Financial background of the parents also acted as a driver on the same issue (Jenkins, 2017). Although the pathways an individual take when out of parental role might also play a role. According to Lacovou (2018), one of the pathways are income, and is considered to be more crucial in male partnerships than female partnerships. These also suggest that gender roles might influence the disparity. The research by David et al. (2019) shed light on family background plays a bigger role in women home ownership in women than men, in regard to whether the youth left their paternal home to live in their matrimonial home.

Social factors

The social factors to be considered will include education, religion and culture. Education also influences people to purchase houses (Yasmin, & Muhd, 2014). The diverse and distinct educational level of education among people translates to diversity in demands for distinct housing designs (Ahh et al., 2012). High levels of education could encourage purchase of expensive housing units whilst the converse educational level would decrease a person's intent to purchase a housing unit (Majid, 2018). The effect of level of education on purchasing patterns has been studied previously. Morrel (2019) notes, however, that a rise in education would result in fewer purchasers throughout the course of each 10-year period.

In Indonesia, Kusuma (2017) conducted examined variables that affected housing ownership policies necessary to increase ownership of houses in Indonesia. The study used simultaneous equations as the instrument for quantitative analysis and the Tawhidi String Relationship (TSR) approach to use circular causality with the casual relationships analyzed using Two Stages Least Square model (2SLS). The variables projected to affect the house ownership significantly and effectively were religion, culture and education among other factors. Secondary data including from Ministries, Financial Services Authority and Bank Indonesia were used comprising data between January 2005 to December 2016. The results showed that education and culture had significant positive effects on home ownership while culture did not.

In Malaysia, Nepal (2016) interrogated the aspects that influence buying of houses among consumers in Kota Kinabalu. The authors noted that better comprehending of elements that contribute to buyers' decision-making within the housing markets would benefit both the housing industry and buyers. Thus, the study aimed to understand behavior of consumers toward purchase of houses using the theory of buyer behavioral model. The independent variables in the model were social factors such as religion, education among other factors. The findings showed that religion had a significant effect on home ownership. Adults of Muslim faith were more inclined to own a home those adults of Christian faith.

Social factors are those factors in the environment that affect the individual. Religion and acceptability of mortgages is one of the social drivers of home ownership. Religion implies practices and beliefs that are unified in relation to issues considered consecrated. Hoyer et al. (2012) define religion as a subculture element, which equips individuals with an organized set of believes that as code of conduct and a behavior guide. Religion also binds individuals together and brings about the uniqueness of a particular group from the other. Usman and Lizam (2016) argue that religion is a major determinant of the actions people take over time as it is interlinked with culture and sheds light on individual's life.

Religion and tradition guide the purchase patterns of customers. According to Schiffman and Kanuk (2018), religious identity influences the purchasing decisions of individuals

depending on their religious group. Hoyer et al. (2012) note that religion can also be a hindrance tool towards the consumption of particular goods or services. For example, Muslims are prohibited from consume pork or drinking alcohol whereas Christians refrain from consuming meat on Sundays during the month of Lent. Amin et al. (2014) also support the hypothesis that religiosity controls consumer purchase behaviour and decisions. Religiosity when referring to a specific product means the tolerability of the particular element in absence of impermissible rudiments.

Most studies have depicted that religion influences people's willingness to act in a certain manner. Usman and Lizam (2016) believe that pious insights on a certain product are essential in determining the acceptance level of a product. An investigation done by Hoyer et al. (2012) revealed that religious doctrines are vital factors reflected in mortgage financing decisions of an Islamic home. Amin et al. (2014) note that mortgage industry is marked by risks and interests making them unacceptable from the Islamic pious point of view. Islam religion disregards interest earning dealings, but Christianity on the contrary is permissive. Hence, religious beliefs control aspiring homeowners' decisions to take up mortgage loans. Alam et al. (2012) conclude that the degree of favorability of religious tenets on the issue of mortgage determines their willingness to take up a loan for financing their ownership of homes with the opposite is also true.

It is therefore, wise for mortgage marketers to put religious codes of their potential customers. Religions techniques showcased by these marketers should be based on their

understanding of their target audience and in respect of their customs and beliefs. By doing so they will be successful in their line of duty as their word of mouth would give positive results. They can also partition their market by aiming at religious affiliation, passing on intended information and offers or their media preferences.

Another social factor that influences home ownership or mortgage uptake is family influence. As defined by Hoyer et al. (2012), family comprises people living together and related via adoption, blood or marriage. There are several family types. One is the nuclear family and is made up of parents (father and mother) and children. This is the most common family type. The extended family on the other hand consists of a nuclear family and other relatives (grandparents, aunts, uncles and cousins or even in-laws). Family is essential to mortgage industry marketers since it makes up a household: that is considered as the typical consumption and purchase entity.

Family unit determines purchasing power as most purchases are made as a collective responsibility in a family. For instance, each family member plays a specific role in decision-making while purchasing a house. Individuals may assume roles such as consumer, buyer, decision maker, influencer, or data collector; depending on the involved individuals and the purchase. Usman and Lizam (2016) substantiated these findings stating that families with double income, has the wife taking charge on decisions concerning home ownership, consumption decisions on tours, automobiles and other luxuries. Therefore, marketers should convince both the wife and the husband.

Usman and Lizam (2016) also postulated that those families with minors (children) are more likely to pay their mortgage loans as intended as they would not want an incident where their house is repossessed in presence of the children. Families faced with foreclosure of the house encounter financial distress, and emotional stress brought about by the situation that threatens to break a family (Aguko, 2012).

Several studies on family decision making have depicted that partnership is common in family making decisions. Father and daughters precisely teenagers are more likely to support the father whereas, sons always form a coalition with the mother. Studies have shown that the force is even stronger when the son is the first-born child. Following this fact, marketers should investigate and find out who plays a major role on family decisions at a given decision making stage of home purchase, for them to have an insight of whom they should approach (Hollensen, 2014).

Another social factor is the reference group. According to Lancaster and Massingham (2018), reference groups are those groups that people look up to for attitudes and behavior. They are more of role models. Kotler and Keller (2016) contextualized it as individuals whose norms and principles has an impact on the actions of a consumer. Any consumer has someone who they live up to, depend on and are nurtured by them. Most people are influenced by people close to them such as allies, workmates, and relatives. Social media personnel can also influence their fans indirectly. Reference groups influence individuals in three ways: they shape attitudes and personality, they give

individuals new exposure, and they conform them through pressure. Peer pressure can also influence personal aspirations and this can be channeled by mortgage marketers to advertisements, to instill desire for the product, by presenting their (family) icons in their dream houses, and bringing out a sense of stability.

Hollensen (2014) states that when a customer gathers information on popular products, they mostly follow a particular hierarchy of effects. Exposing an individual to a new product or advert grabs their attention, gets them thinking and finally retain the information. Nevertheless, information gathered from a word of mouth has a greater impact on a consumer's decision-making process. Following the insight, mortgage marketers must identify chief inciters for their products to sell.

As stated by Amin et al. (2014), mortgage acquisition process is usually tiresome and frustrating, due to inadequate or imprecise information. In such incidences, advice from close associates who are experienced would encourage or discourage a house purchase decision. Therefore, marketers should strive to make a good implication on their customers for them to pass on positive information and influence home ownership or mortgage loan uptake.

Another social aspect is motivation for mortgage acquisition. Hollensen (2015) note that motivation pushes individuals into action. Motivation is brought about by discomfort from an unsatisfied need. Schiffman and Kanuk (2018) define motivation as inner condition of provocation that leads a customer into taking part in behaviors that add

value to their goals, action-based decision making, and comprehensive decision making. Another definition by Usman and Lizam (2016) is the push factor in an individual that stimulates them to respond in a certain way towards a particular issue. In simple terms, motive is an explanation of why people act the way they do.

Hollensen (2015) found that motivation is vital in processing of information, decision making and stimuli perception on consumers. Kotler and Keller (2016) opined that a need is transformed into a motive if aroused to a certain intensity, hence pushing the customer to act. Both scholars agree that motivation can act as a direction as well as intensity in reference consumer goal preferences, of pursuing a given goal with more or less commitment. Goals which consumers consider vital to their way of living, are pursued with greater motivation, if they are in line with their needs, principles, gals and self-concept. Pursuing with motive entails reasonable risk, or goal consistency with prior attitude. Hollensen (2015) also noted that motivation brings out a psychological state in customers as per their rational indulgence and experience. In most cases, they are indulged in an enduring manner if they show a persisting interest in a product over a long period time, such as purchasing a house and the involvement only stops when they have obtained the product.

In Kenya as stated by KBA (2015), motivation for home ownership is more dependent on social factors than commercial factors. This is because its main objective is to provide the family with a shelter more than it being an investment. The core objective of

owning a home is to get privacy and be secure as a family. Status elevation is also another motive for buying a house. Hence, motive act as a driver of home ownership and should be used as a tool to lure potential home owners into purchasing a home.

How the mortgage process is perceived also affects home ownership and mortgage uptake Lancaster and Massingham (2018) defined perception as the process where information is selected, organized, and interpreted. It also includes how a person views and interprets an organization and its products. Kotler and Keller (2016) stated that action comes after motivation; however, the action is usually influenced by how they perceived the matter. A message gets modified by the individual's perception. People unknowingly chose what they get exposed to, give their attention, and how they chose to understand and retain the stimuli: they then organize the information they have retained for easy understanding. As stated by Hollensen (2015), when a customer gathers information concerning a high involvement product, they follow a step-by-step procedure, the information is exposed leading to attention, the information is then comprehended and finally retained, by doing so understanding becomes easier.

Full perception of the information by the customer, they analyze for alternative brands. Perception is more crucial than the reality in marketing as perception impacts the actual behavior of the consumer. As noted by KBA (2015), people perceive mortgage as costlier than constructing a home using personal savings. However, construction is also perceived as time consuming and in the end, it turns out to be more expensive. Mortgage

terms are also perceived to consume too much time before one assumes ownership of a home, and also needs another asset or heavy collateral for it to be secured.

Mwitari (2019), opines that beliefs and perception concerning mortgages has contributed to the slow uptake of mortgages in Kenya. According to his research, the perception about mortgage is that it is meant for the wealthy and those with a stable job, and that the loans are long term and repayment is hard to track. Agreeing with the findings, Ngigi (2015) found out that the perception concerning Kenyan mortgages is that it is meant for earners with high income, and that it is less costly to obtain a mortgage with stable income. Hence, marketers should take note of such perceptions and also find out how they perceive them or any other stimuli related to marketing.

The resources of parents also play a great deal on home ownership. Both married and single youths do not depend solely depend on their earnings or what they look forward to in the future. Ahh et al. (2012) observed that youths from well off families are more likely to overstay in their parent's homes as they deal with employment uncertainties. This gives them a chance to accumulate sufficient finances and purchase a house with it. Barberis et al. (2016) also noted that well off parents can give loans or gifts to their children that will help towards housing budget, for them to gain a grip on the mortgage journey. Bienert and Brunauer (200) state that home owning parents tend to possess greater available resources as housing equity or savings towards a household.

On the other hand, as stated by Schiffman and Kanuk (2018), youths from poor backgrounds whose parents are not well off, are unlucky as they are forced to go for rentals. Parents influence on youths is seen on housing outcomes. The influence originates from both direct and indirect socialization mechanism of parents with their children. These parent child interactions influence the aspirations, knowledge, inclinations, and habitual behaviors. Hence, youths who have been brought up in a family that owned a home view this as something normal and always strive to have a home of their own.

Housing environment is also vital in explaining homeownership. Environment is what catches the eye of the consumer, for example neighborhood condition, appeal of the area, types of houses in the neighborhood, number of houses, house quality of the neighborhood, geographical features, literacy levels of the people around, occupation of the neighbors, schools, religious institutions and so many other things. Security around the area and infrastructure is also another important factor people consider when sourcing for housing units (Usman, & Lizam, 2016). Many studies have proved that environmental factors are core drivers of home ownership decisions. Nepal (2016), for instance confirmed that environment greatly influences customer decisions concerning mortgage in Malaysia.

Quality of the community improvement usually leads to improved housing (Arvantis, 2020). This is evident in quality neighborhoods as they are always clustered. However,

as noted by Chiu and Ho (2016), neighborhood improvement does not entail improving the quality of a house or rental right hence proving that the relationship with the neighborhood in itself is a family motivating factor. Wyatt (2018) also found a positive association between neighborhood factors and housing decisions. Safety and friendliness of the environment is thus a key factor in urban settlements.

Culture also influences decisions on mortgage uptake and ownership of homes. Hollensen (2015) confirmed the hypothesis in a research conducted in Taiwan on Qi and Feng shui societies. They concluded that mystical beliefs have a significant effect on behavior of consumers in Taiwan. Their findings also showed that the taken by mystical believes of Eastern China habitants in 990s, was important for the construction of western mystical belief regarding prediction of eastern consumer behavior. They found out that people put into consideration house address number, as they believed that lucky numbers can be a lucky charm in their lives. Most Chinese even those who are not Fengshui believers take the address number of the house so seriously. They believed that houses with unlucky numbers are more prone to foreclosure. From the study, Hollensen (2015) concluded that there existed superstition numbers and superstition ghosts.

Location is another mortgage consideration. Lancaster and Massingham (2018) argued that location is usually represented by a particular criterion for it to be significant and functional. Usman and Lizam (2016) disagreed and stated that location had no influence on purchasing decision in the mortgage industry. Other studies reveal that location

affects significantly and positively property purchase decisions, and crucial for investment of property (Awuvafoge, 2020). According to Jenkins (2017), some individuals have a preference towards near the city or town as this will give them easy access to services and facilities the desire for daily in their lives. Thus, the location factor affects urban settlement patterns.

Brand also has an impact on mortgage uptake or home ownership. Brand can connote names, icons, designs or any other product distinguishing characteristic. It also entails the feelings of the consumer and consumer perception towards a given product. It can also be said a promise to a consumer. As put by Kotler and Keller (2016), a good brand can be trusted and able to hang on even when everything changes. A brand should also come with a story, mottos, and trait of a consumer. Kiff (2018) adds that a brand image that is in line with the personality of the customer can be presented in a product.

The choice of a brand tells more about the consumer's true self. The perception of the consumer towards a product largely depends on the brand image. Thus, advertisements, promotions, and packaging can determine if the product will sell or not. Consumers not only purchase a product but they purchase it with the brand image. The image needs to be one of a kind and positive too. Hence, mortgagors with quality brand sell out than those with low quality brands (Kiff, 2018).

According to Hass Consult (2019), road construction has greatly impacted the value of the property. It can either be positive or positive. Hence, Road construction is an

important factor to consider on home ownership decisions. Highways for instance, have a big impact on settlement as they come with benefits. Living near a highway reduces travel time, it also enhances the ease of access to personal needs and cuts down travel costs. Property owners benefit more from the highway aspect as the property value goes up (Kiff, 2018). Hence, most investors choose to construct houses or real estates on areas where roads are good to attract customers.

On the other hand, Hass Consult (2019) found that road construction also has degrading effect on property value. Some family residences do not like the traffic noise and the environmental pollution cause by cars and other automobiles. As the traffic increase, environmental pollution also does. Thus, most families choose to stay away from roads with heavy traffic. For this case homeowners mostly settle in the quite serene outskirts environment of the town. However, Rentals (multifamily residential) and commercial properties have a preference for places near the roads, due to the benefits that come with it.

Technological factors

In considering technological factors, the issues to be looked into will include among others access to internet, construction costs, and construction technology.

In regard to construction technology and costs, In India, a study by Jain and Mandot (2012) examined how technology influenced investment choices in Rajasthan. The study

established that the intervention of technology in construction such as prefab technology has addressed the gap between funding, time and efficiency for projects of mass housing forming part of the Smart Cities Initiative in India. Another study by Wyatt (2018) noted that the influx of smart phones, affordable and faster bandwidth has made the internet a utility available to most homeowners. Prospective homeowners can interact with family and friends, conduct research and engage in buying property.

Access to internet: Yasmin and Muhd (2014) also note the critical influence that technology has had in home ownership. Today, contacting estate agents is not necessarily the first step into home hunting as buyers now commence the process by inline shopping to get information on potential purchases based on their respective preferences before contacting the agents. The advent of the internet has armed sellers and buyers alike with information on products within the market offering vast opportunities to obtain and compare offerings based on factors such rates and costs. The technological boom has necessitated the adoption of new business models by property agents. They now employ advanced systems and platforms to showcase the residential properties they have which has influence their sales positively.

According to Chiquier and Lea (2016), non-bank systems such as Quicken loan offer e access to house credit through digital platforms. This platform was rolled out in 2015 with Rocket Mortgage. One key highlight is that it expedited the loan application process by nearly ten times. Another such platform was the loan depot, 2017, which

launched applications allowing consumers to remotely and conveniently apply for facilities. In the United States, Better.com was launched in 2016 and by 2019; it had offered loans worth $4 billion. Nearly twenty thousand customers utilized these loans for both funding and purchase of homes.

A report on online mortgage financing revealed that traditional banking mortgage facilities could soon be replaced by non-bank mortgage services. Their findings also revealed that over 40% of consumers had less faith in traditional bank mortgage than non-bank lenders. Competition by non-bank lenders has triggered digitization in traditional banks that now aim to leverage on the internet to improve and offer services online (Chiquier, & Lea, 2016).

Analysis of data within the mortgage industry is crucial and big data technology is key for easy and fast analysis of data. Mathew et al. (2015) define big data as vast data which is difficult to process via outdated software. Krause (2016) defined it to encompass big databases with compatibilities including crucial information from digital data streams with most definitions comprising the feature: huge data sets, expeditious processing of data processing and data coverage.

Krause (2016) observes that the housing industry involves usage of wide data sets that require big data since they are complicated and consume time. Hence technology simplifies the work of housing agents affording them time to focus on other roles. Real estate companies can use big data for consumer surveys, marketing, and e-commerce

among others to fulfill business objectives and enhance performance. Other value additions of big data include efficiency, and access to consumers which help in better decision making.

Tharian and Tharakan (2016) observed that consumers could access important information on property trends and other social factors including locality perceptions, sale patterns, price of houses, ancillary costs and crime rate from big data websites that may minimize regrets subsequent to purchase that may arise because of insufficiency of information per-purchase. The potential unease resultant of settling into a new locality is also lessened by insights accessed via big data consequently used by buyers in decision making.

Artificial intelligence (AI) and AI robotics have also impacted the mortgage industry. David et al. (2019) define AI as the process of executing multifaceted and intelligent tasks, akin to those undertaken by human brains, albeit, the former, through computers furnished with intelligent programs which require minimal supervision by humans. Robotics on the other hand comprise of robots equipped with Artificial Intelligence to execute multifarious functions with high precision. Today, and the real estate and construction industry has embraced robotics to assist in complex tasks. Thomas and Mulder (2016) found that the growth of AI has been exponential and is now used in most industries. By 2025, the AI revenue is projected to grow to more than $36.8 billion

according to a study by Ullah et al. (2018). Its adoption within the construction sector was projected at 75% in mortgage industry services or applications.

Ullah et al. (2018) in their study on the construction sector found that technology continues to be adopted within the industry constituting essential elements such as construction materials and finishing products. Within the mortgaging sector, robotics and AI can be used for delivery of building material through driverless automobiles which can also be used to transport potential buyers to their dream houses. They can also be used in the production of 3D images of interior spaces and in the maintenance of hard to access.

Moreover, salespeople can solicit potential buyers using Artificial Intelligence. Ahh et al. (2012) stated that marketing strategies can also be improved by availing information to potential buyers through online media thereby saving on costs associated with traditional advertising. Artificial intelligence could also be used to journey with potential home buyers from the very first step. Web filters can also be used by customers to highlight and memorize their preferences and enhance efficiency and consumer experience online. Through features such as voice recognition, also improve customer experience, optimize searching and give them useful information.

The Internet of things (IoT) has also revolutionized ownership of homes. David et al. (2012) opined that because of increase in connected devices, the value of IoT would rise to $7 trillion by 2020. In the housing industry, IoT devices are utilized in management of

property including monitoring of buildings, control of atmospheric conditions such as humidity, temperature, lighting and air quality through systems designed to improve homeowner experience (Zhilong et al., 2015). It can also be used to predict consumer behavior and respond appropriately including through notifications and reminders (Zhilong et al., 2015).

Amin (2017) found that there exist a range of data collection tools including VR and BIM integration designed to improve real estate processes and service delivery. In the housing industry, drones have been used in data collection including aerial 3D photographs and images (Garmaise, & Natividad, 2017). These images can then be sent to the potential house buyers without the need for physical meeting with real estate agents. This saves on time and improves sales (St-Germain, & Tarasuk, 2020). In the mortgage industry nearly 49% are utilized. Wyatt (2018) found that in the United States drone usage stood at 72%, 52% in France 48% in Britain while Germany stood at 24%.

Wu et al. (2018) observed that drones are equipped with high resolution cameras and aerial features that are important for property marketing. Moreover, they are less costly in comparison to helicopters and planes. Their climbing capabilities enable customers view desired properties and the environment surrounding. Through wall-climbing drones, photographs of the interior can be captured for subsequent sharing prospective buyers (Segal, & Sullivan, 2018). 3D scanning is another information gathering technique which can be utilized in the property sector to revise drawings, schedule repairs and for

maintenance purposes. These scanners are cheaper and could potentially cut costs by half and assist in efficient updating of data and revision of drawings. Moreover, Ebekozien (2021) found that 3D scanners enabled efficient communication between mortgagors and potential mortgagees, affording them the opportunity to tour the properties virtually.

Ullah et al. (2018) established that 3D modelling media afford customers more credible information regarding properties in a process that also benefit investors, agents and customers. These scanners also conserve heritage making renovation and refurbishment possible including for archeological establishments. They also afford aspiring home owners deeper and more realistic images without requiring their physical presence in the exact location of the property. Information received can also be used in suggestion of possible repairs to fit customer preferences. O'Callaghan and Quigley (2020) found that 3D scanned building models and properties could be integrated to avail information to customers, thereby enhancing sales.

Wearable technologies have also been used for real time communication between investors and customers (Turner, & Lue, 2014). As stated by Stephenson (2016), these devices include spectacles, bracelets, jewelry, hats and body kits among others that are connected to buildings with capabilities for real time notifications including on utilities and emergency. Such interconnection creates stronger bonds between houses and their owners resulting in a near-affectionate connectedness.

Zhilong et al. (2015) found that crucial data can be documented absent unnecessary intrusions and channeled as information on the properties to potential home buyers' s or renters. Through wearable technologies, property managers can identify action areas through alerts. Moreover, construction management systems and devices can also be used for detection of faults during construction and empower consumers with the knowledge necessary for making informed decisions.

Government Policy

Sommer and Sullivan (2018) investigated the implications of US Taxation Policies for Price of Houses, Rents, and Home ownership interrogating the effect of deducting interest tax on mortgages on equilibrium price of houses, rents, ownership of homes and welfare employing dynamic models of markets featuring realistic progressive tax systems where owner-occupied home services are exempted from taxes and payment of interest on mortgage is tax-deductible. Further, the study simulated the effects of tax reforms on housing markets and found that the elimination of deduction of mortgage interest triggered decline in price of houses, increased home ownership, decreased mortgage debts, and improved welfare. The findings from this study challenged the common notion that abolishing the preferential mortgage tax treatment would adversely affect home ownership.

Kenya has over the years adopted policies and programs intended for providing house units for low-income groups to ease the current poor housing supply in Kenya including

through the National Housing Policy of 2004 (World Bank, 2018). Review of literature indicates that Kenya has a growing mortgage market, which among other projects are key in the provision of part investment in housing needed in years to come as the population continually grows and the country's economic epicenter shifts towards its urban areas highlighting the need to focus on continued growth since the level of mortgage uptake and real estate is still very low at 2.5% of GDP as compared to developed countries like US with 70% and European countries with 60%.

Kenya has a large housing gap currently estimated at an annual housing deficit of 56,000 units rising annually and particularly dominant in urban setting with existing deficits predominantly met by increased slum living and ongoing, low-quality, self-construction of conventional housing, with the gap only partially filled by mortgages, need the use of additional options for lower income groups, like rental housing and housing micro-finance. As the Kenyan housing demand continues to grow due to a growing population and urbanization, the demand for bigger and better-quality housing has also grown yet supply shortage including of new construction aggravates the unmet demand. The contributory factors therefore need to be studied and analyzed so as to comprehensively deal with the situation.

The macroeconomic, legal, and regulatory environment must be favorable for the growth of real estate, according to the literature. The justification for economic regulation is the existence of a sizable market failure brought on by manufacturing scale and scope

economies. It also results from externalities, incomplete markets, and information inadequacies in market transactions, as well as from the impacts on distribution of wealth and income that follow. While Amin (2017) hint that government regulations influence the allocation of housing finance across a sample of countries, Tan and Lee (018) argue that government regulates all corporate activities in a nation by recommending the regulations and using its authority to induce equity and fairness in business operations. There are enormous amounts of money being funneled from large financial institutions for housing development, necessitating the implementation of an effective physical planning system to lower the risk associated with building and land acquisition. They also contend that an effective legal system protects the registration of property rights and has favorable impacts on residential real estate, although these benefits differ between nations. Tan and Lee (018) provides more support for the idea that Sub-Saharan Africa's unfavorable macroeconomic, legal, institutional, and regulatory environments have an impact on the availability of long-term financing for housing.

According to Tan and Lee (2018), residential mortgage finance methods have a significant impact on real estate enterprises' success. Government laws may help to enhance this relationship. More specifically, the regulatory framework that the government has established will affect how mortgage finance practices affect real estate performance. Only a few studies that focused on residential mortgage finance methods and governmental restrictions have been published in the literature. The majority of

studies looked at the relationship between public-private partnerships and government agencies; real estate performance and government regulations (Appiah, 2007); firm performance and government financial incentives; policy and fixed-rate mortgages and land use regulations and sustainable urban housing.

Mortgage financing is supplied to real estate companies through networks called mortgage distribution channels. Distribution of mortgage financing, which is crucial to real estate enterprises' performance, is significantly impacted by the government's taxes, subsidy, and monetary policies at the time. The government may also participate in the mortgage intermediation market through organizations subject to special regulation and tax breaks provided they limit their lending to mortgages. The distribution of mortgage financing is influenced by the macroeconomic, legal, institutional, and regulatory climate that currently governs the housing market. This shows how heavily governmental laws influence the availability of mortgage financing. Government rules permit mortgage lending institutions to sign contracts with real estate companies stipulating the right to encumber collateral with liens. By providing borrowers with a guarantee of protection through the openness of mortgage contract conditions, these rules help establish the safety and soundness of mortgage lending standards.

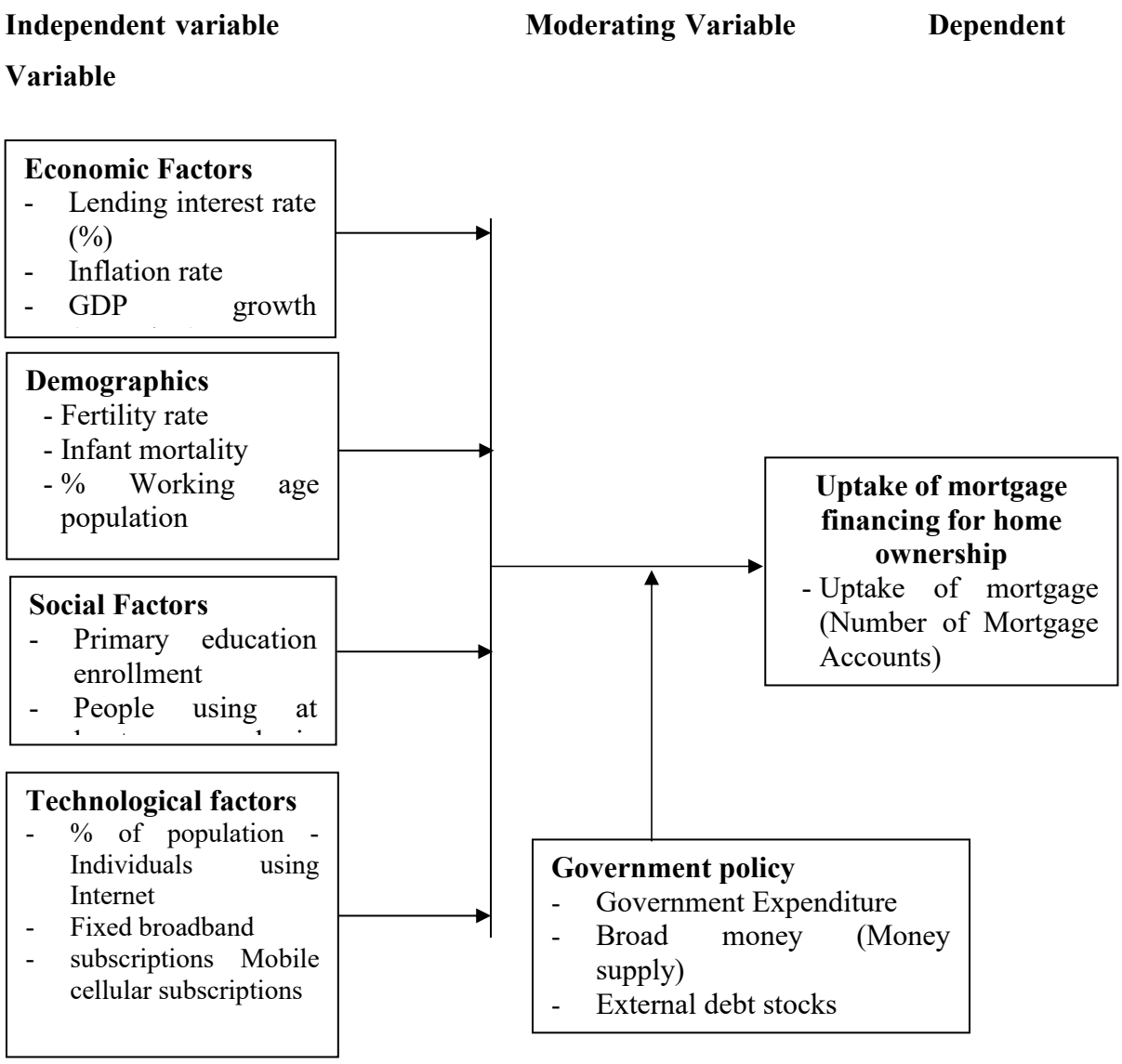
2.4 Conceptual Framework

The conceptualization of this study is presented in Figure 2.1 – Conceptual Framework. The economic, demographic, social and technological factors are hypothesized to have

an influence on growth of home ownership. Government policy is depicted to have a moderating effect.

Figure 2. 2

Conceptual Framework



Source: Author (2022)

Economic Factors

Housing availability continues to be a significant problem in metropolitan areas even though the Kenyan government has acknowledged the right to accessible, appropriate housing with adequate sanitation under the constitution. Economic concerns, such as rising and rigid interest rates, rising inflation rates, difficult and drawn-out processes for acquiring land, and exploding land prices, have a negative impact on the acceptance of mortgages in the Housing Finance Corporation.

Demographic factors

We almost subconsciously acquire from our demographic context a worldview that establishes how we relate to one another, organizations, groups of people, nature, society, and the cosmos. Culture is the environment that humans have created and consists of the information, values, norms, traditions, laws, and other things that people have learned via social interaction. The demographic environment comprises all of the skills that people learn as members of society, including information, beliefs, the arts, legislation, morals, and conventions.

Social Factors

Social environmental elements are those that have an impact on the individual. One of the societal factors influencing house ownership is the acceptance of mortgages and religion. In respect to anything regarded as sanctified, religion means behaviors and ideas that are cohesive. Housing finance frequently stays underdeveloped in developing nations despite its acknowledged social and economic relevance, mostly as a result of the absence of social-economic stability.

Technological factors

The study established that technological factors influence on the growth of homeownership through mortgage financing. Technology simplifies the work of housing agents affording them time to focus on other roles. Consumers can access important information on property trends and other social factors including locality perceptions, sale patterns, price of houses, ancillary costs and crime rate from big data.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The methodology for the research is described in this chapter, including the research paradigm, design, population, sampling strategies, data gathering strategies, and analysis.

3.2 Research Philosophy

A philosophy of research is a perspective on the best approach to gather, evaluate, and best available evidence on an area. It is a more straightforward method to study and understanding. According to Kuhn (2016) who also developed the idea of the paradigm as the broad range of assumptions a social scientist has, the research paradigm is the overall approach to research philosophy.

A paradigm is the philosophical position that guides the approach, giving it context, underpinning its logic, and establishing its standards (Teye, 2017). Regarding the amount of paradigms that are now available, there has been continuous discussion in the literature. The positivist (quantitative) and interpretative paradigms are considered as two major broad research paradigms or ideologies (qualitative). Researchers that use qualitative techniques have underlined the importance of comprehending organizational processes and have claimed that survey-based approaches fall short of adequately probing these processes. In addition, Iovino and Tsitsianis (2020) outline four paradigms:

advocacy/participatory, post-positivism, social constructivism, pragmatism. The empiricist worldview has an impact on quantitative research, which means it is concerned with the circumstances and outcomes of social wonders and employs data that rely on precise observation and their fundamental explanation.

The study adopted a positivist research philosophy that was partially inspired by the ideas of the French philosopher August Comte (1848), who placed an emphasis on observation and reason as ways to understand human behavior and noted that true knowledge is based on sensory experience that can be gained through experimentation and observation. Positivists have chosen this approach as a technique of generating information that is comprehended within the parameters of scientific principles and presumptions. Additionally, the positivist paradigm of investigating social reality is predicated on the notion that reason and observation are the greatest ways to comprehend human behavior. The study on the adoption of mortgage finance for property ownership in Kenya was therefore appropriate for the positive paradigm. Secondary data were gathered using a data sheet from publically accessible published sources.

3.3 Research Design

The study used a time series technique lasting 30 years, from the year 1991 to 2020, using a descriptive survey design. The research parameters and the dependent variable are connected through the use of time series methodology (in a cause-effect approach).

A reasonably easy and direct method for studying values, attitudes, beliefs, and motivations is provided by descriptive design. The factors and the responders were both outside the researcher's control. This approach is preferable because it provides a report of the situation as it is (Matitz, 2018).

3.4 Target Population

The study focused on the 30-year time series data from World Bank data indicators in Kenya. The study's unit of analysis was the data from World Bank data indicators, which covered the period from 1991 to 2020. For the 30 years under investigation, this recorded the data on a yearly basis.

3.5 Sampling Design and Sample Size

The study's unit of analysis was the yearly time series data from World Bank data indicators, which covered the period from 1991 to 2020. As a result, there was no sampling done, and a census survey was used to evaluate all the data being seen.

3.6 Diagnostic Tests

Diagnostics aims to locate any potential sources of bias in research. These tests are: the unit root test, the Hausman test, the normality test, the linearity test, the multi-collinearity test, the test for heteroscedasticity, the test of autocorrelation, and the test of heteroscedasticity.

Test of Normality

To determine if the data given by the dependent variable is regularly distributed, normalization is necessary. The normalcy tests are an addition to the graphical normality examination (Kan & Zhou, 2017). The Jarque-Bera (JB) statistic and a histogram of regression scaled residuals are two tools used to determine the normality of time series data. The Jarque-Bera (JB) statistic and the histogram were the primary tests for determining the degree of normalcy for the current secondary data.

Linearity Test

Before beginning the regression analysis, the study employed the graphical approach to assess for data linearity and graphically show if there is a linear or curvilinear connection between two continuous variables. Only when the connection is linear can the regression models adequately capture the interaction between the dependent and predictor variables (Kan & Zhou, 2017).

Test of Multicollinearity

The multicollinearity test is useful in assessing how strongly two variables are correlated. The two variables are positively correlated in a perfect positive correlation, whereas a value of - denotes a perfect negative correlation in which as one variable's value rises, the value of the other variable falls. Correlation coefficient (r) values between -1 and + 1indicate weaker negative or positive relationships, whilst a value of 0 indicates

complete independence between the variables. Because multicollinearity is a concern when there is a significant degree of correlation across variables, independent variables shouldn't be heavily correlated with one another. Values for the correlation coefficient (r) are considered acceptable if they fall between 0.3 and 0.7. The tolerance value with a tolerance level of higher than 0 was used to examine the multicollinearity of the variables in this study. with a tolerance threshold of less than 0 for the variance inflation factor (VIF) (Adams & Metwally, 2021).

Heteroscedasticity Test

The error term is considered to be homoscedastic in the time series regression model, which means it has a constant variance. There is heteroscedasticity in the data if the error variance is not constant. When a regression model is run without taking heteroscedasticity into account, parameter estimates will be skewed. The Breauch-Pagan Test and the robust test were employed in the study to detect and correct heteroscedasticity.

Test of Autocorrelation

Autocorrelation frequently occurs when time series data are being analyzed. In the literature, a number of tests for the existence of serial error correlation in a time series data model with fixed effects have been suggested. The Durbin-Watson statistic is extended to the fixed effects time series model by Matitz (2018). An LM statistic that

checks for first order serial correlation is created by Adams and Metwally (2021). Based on the residuals of the first-differenced model's time series regression model, Matitz (2018) suggests a simple test for serial correlation.

Unit Root Test

When analyzing time series data, it is assumed that the underlying series is stable, meaning that it's mean, variance, and auto covariance (at different lags) stay constant regardless of the measurement point. According to Hariri (2022), stationarity tests are carried out to prevent changes in estimates over time for the research variables, which might result in erroneous estimations. The general rule is that the findings are erroneous and the regression cannot be utilized for predicting when the R squared is higher than the Durbin Watson value. The ability to examine a time series' behavior just during the time period under examination makes it impossible to generalize it to other time periods, hence it is crucial to test each unique time series for stationarity.

3.7 Data Collection

Secondary data was gathered from publicly available financial accounts of mortgage lenders, the World Bank, CBK, and the Kenya National Bureau of Statistics (KNBS). This information was yearly for at least 30 years (1991 – 2020). Using a secondary data template, the secondary data was gathered (see Appendix I). This information was used

to adjust the model and determine how the independent variables and moderating factor affected the dependent variable.

3.8 Operationalization of the Study Variables

The operationalization of the study's variables is depicted in Table 3.1 Economic, demographic, social, and technical elements made up the independent variables. Government regulations served as a moderating factor, and Kenya's adoption of mortgage finance for home ownership served as a dependent variable.

Table 3. 1

Operationalization of the Study Variables

Objectives	Variable	Variable Type	Parameters/Indicators
1. To establish the effect of economic factors on the uptake of mortgage financing for home ownership in Kenya	Economic factors	Independent	- Lending interest rate (%) - Inflation rate - GDP growth (annual %)
2. To determine the effect of demographic factors on the uptake of mortgage financing for home ownership in Kenya	Demographic factors	Independent	- Fertility Rate - Infant Mortality - % of working-age population
To examine how social factors affect the uptake of mortgage	Social factors	Independent	- Primary education

financing for home ownership in Kenya			enrolment - People using at least basic sanitation services - Current health expenditure per capita
3. To determine how technology, influence the uptake of mortgage financing for home ownership in Kenya	Technological factors	Independent	- % of population - Individuals using Internet - Fixed broadband subscriptions (per 100 people) - Mobile cellular subscriptions (per 100 people)
4. To determine how government policies, moderate the uptake of mortgage financing for home ownership in Kenya	Government policies	Moderating	- Government expenditure - Broad money (% of GDP) - External debt stocks
	Uptake of mortgage financing	Dependent	- Uptake of mortgage (Number of Mortgage Accounts)

The study has used Lending interest rate (%), Inflation rate and GDP growth (annual %) as the proxy measures of economic factors. The measures have previously been used and proposed by Adams and Metwally (2021). Hariri (2022) used Fertility, Children Schooling and Child Mortality in their assessment of demographic factors relationship with inflation in the economy. The study adopted the working age population and Population Size as their indicators in the study. The current study has used Fertility Rate, Infant Mortality and % of working-age population as the proxy measures of demographic factors.

Tan and Lee (2018) assessed the social factors and health related issues and used Sanitation (People using at least basic sanitation services), Clean Water and Education levels (enrollment in school) as their proxy variables. World Health Organization (2018) assessed Current health expenditure per capita as a social factor indicator. The current study has used Sanitation (People using at least basic sanitation services), Primary education enrollment and Current health expenditure.

Bahlous-Boldi (2021) assessed the technological factors and used Expenditure on R&D and Mobile cellular subscriptions as the measures of technology. Further, Tan and Lee (2018) used the proxies of Broad band Internet Connections and Individuals using Internet in the model as measures of technology. The current study has used % of population - Individuals using Internet, Fixed broadband subscriptions (per 100 people) and Mobile cellular subscriptions (per 100 people).

The current study has used Government expenditure, Broad money (11% of GDP) and External debt stocks as the proxy measures of government policies. The measures have previously been used and proposed by Tan and Lee (2018). Further, the current study has used Uptake of mortgage (Number of Mortgage Accounts) as the proxy measure of Uptake of mortgage financing for home ownership.

3.9 Data Analysis

Quantitative information was gathered, and both descriptive and inferential statistics were used to examine it. Time series analysis was used to examine the secondary data. This information was yearly for at least 30 years (1991 – 2020). The predictive capability of the research models was established using a number of linear regressions.

Model 1: Direct Effects model

The first model was used to establish the effect of economic factors, demographic factors, social factors and technological factors on home ownership without the moderator;

$$Y = \beta_0 + \beta X + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots \text{ Equation 1}$$

Where Y = Uptake of mortgage financing for home ownership

X= Macro economic factors

X_2 = Demographic factors

X_3 = Social factors

X_4 = Technological factors

β_0 = constant

β, β_2, β_3, and β_4= Coefficients associated with X, X_2, X_3, and X_4 respectively

ε = Error Term

Model 2: Moderating effect

The second model examined how government policy (Z) affected the association between factors affecting mortgage finance and house ownership. A composite variable for the predictor variables was computed using the following model;

$$X_5 = (X + X_2 + X_3 + X_4)/4$$

The moderating effect model was of the form;

$$Y = \beta_0 + \beta X_5 + \beta_2 Z + \beta_3 X_5 Z + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots \text{ Equation 2}$$

Where, Z = Government policy (moderating variable)

The regression model including the independent variables and the moderator was of the form;

$$Y = \beta_0 + \beta XM + \beta_2 X_2 M + \beta_3 X_3 M + \beta_4 X_4 M + \varepsilon \ldots\ldots\ldots \text{ Equation 3}$$

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This Chapter contains the results of the study and the ensuing discussions. First, the descriptive results on the study variables, which were economic factors, demographic factors, social factors, technological factors, government policy and home ownership were discussed. Further, both correlation and regression analysis were presented followed by hypothesis tests.

4.2 Descriptive statistics

Descriptive Statistics for Mortgage Financing

The section provides illustrative data on the use of mortgage finance. The quantity of mortgage accounts served as a proxy for mortgage financing uptake. The outcomes were displayed in Table 4.1.

Table 4. 1

Descriptive Statistics for Uptake of Mortgage Financing

	Minimum	Maximum	Mean	Std. Deviation
Uptake of mortgage (Number of Mortgage Accounts)	38.2	224.094	05.848	72.0984

The results in Table 4.1 shows that the uptake of mortgage (Number of Mortgage Accounts) recorded from 1991 to 2020 had the least rate at 38.2 and the maximum rate at 224.09. The mean value of the Uptake of mortgage (Number of Mortgage Accounts) across the years is 05.84 with the standard deviation being 72.09. The high standard deviation implies that there have been major fluctuations in the Uptake of mortgage (Number of Mortgage Accounts) in the course of the years studied.

Descriptive statistics for Economic factors

The section presents the descriptive statistics for Economic factors. Economic factors were represented by the Lending interest rate, Inflation rate and GDP growth. The results are shown in Table 4.2.

Table 4. 2

Descriptive Statistics for Economic Factors

	N	Minimum	Maximum	Mean	Std. Deviation
Lending interest rate (%)	30	.996	36.24	9.2006	6.949748
Inflation rate	30	.554	45.979	.395	9.55579
GDP growth (annual %)	30	-0.799	8.406	3.7358	2.48842

The results in Table 4.2 reveals that the Lending interest rate (%) recorded from 1991 to 2020 had the least rate at .996% and the maximum rate at 36.24%. the mean value of the Lending interest rate (%) across the years is 9.2% with the standard deviation being 6.949%. The high standard deviation implies that there have been major fluctuations in the Lending interest rate in the course of the years studied.

Further, results in Table 4.2 reveals that the Inflation rate (%) recorded from 1991 to 2020 had the least rate at .554% and the maximum rate at 45.979%. the mean value of the Inflation rate (%) across the years is .39% with the standard deviation being 9.555%. The large standard deviation indicates that the Inflation rate (%) has fluctuated significantly during the years analyzed.

The GDP growth (annual %) recorded from 1991 to 2020 had the lowest rate of -0.799% and the highest rate of 8.406%, according to the figures in Table 4.5. The standard deviation of the GDP growth (annual %) across the years is 2.488%, with a mean of 3.735. The high standard deviation indicates that the GDP growth (annual %) has also fluctuated significantly during the years analyzed.

Descriptive statistics for Demographic factors

The section presents the descriptive statistics for Demographic factors. Demographic factors were represented by the Fertility Rate, Infant Mortality and percentage of working-age population. The findings were shown in Table 4.3.

Table 4. 3

Descriptive Statistics for Demographic Factors

	N	Minimum	Maximum	Mean	Std. Deviation
Fertility Rate	30	3.423	5.90	4.67277	.755039
Infant Mortality	30	3.900	68.000	49.36557	3.245682
% of working-age population	30	69.776	05.029	86.37647	9.404333
Valid N (listwise)	30				

The results in Table 4.3 reveals that the Fertility Rate (%) recorded from 1991 to 2020 had the least rate at 3.423% and the maximum rate at 5.90%. The mean value of the Fertility Rate (%) across the years is 4.672% with the standard deviation being 0.755%. The low standard deviation implies that there have been minimal fluctuations in the Fertility Rate in the course of the years studied.

Further, results in Table 4.3 reveals that the Infant Mortality (%) recorded from 1991 to 2020 had the least rate at 3.9% and the maximum rate at 68%. The mean value of the Infant Mortality (%) across the years is 49.365% with the standard deviation being 3.245%. The large standard deviation indicates that the Infant Mortality (%) has changed significantly during the years analyzed.

The percentage of working-age population recorded from 1991 to 2020 had the lowest rate of -69.776% and the highest rate of 105.029%, according to the figures in Table 4.3. The mean of the percentage of working-age population across the years was 86.376%, with a 9.404 standard deviation. The little standard deviation suggests that the percentage of working-age population is also gradually varying significantly during the years analyzed.

Descriptive statistics for Social factors

The section presents the descriptive statistics for Social factors. Social factors was represented by the primary education enrollment, individuals who use at least basic sanitation services and current per capita health spending. The findings were shown in Table 4.4.

Table 4. 4

Descriptive Statistics for Social Factors

	N	Minimum	Maximum	Mean	Std. Deviation
Primary education enrollment	30	4437893.	8344274.	64882.	575683.
People using at least basic sanitation services	30	30.559	32.699	3.45983	.72345
Current health expenditure per capita	30	86.67	79.80	22.30047	3.095694
Valid N (listwise)	30				

The results in Table 4.4 reveals that the primary education enrollment recorded from 1991 to 2020 had the least number at 4437893 students and the maximum number at 8344274 students. The mean value of the primary education enrollment across the years

is 64882.83 students with the standard deviation being 575683.204. The high standard deviation implies that there have been major changes of numbers in the Primary education enrollment in the course of the years studied.

Further, results in Table 4.4 reveals that the people using at least basic sanitation services (%) recorded from 1991 to 2020 had the least rate at 30.559% and the maximum rate at 32.699%. The mean of persons that use at least basic sanitation services across the years is 3.459% with the standard deviation being 0.723%. The low standard deviation indicates that the people using at least basic sanitation services has varied insignificantly during the years analyzed.

The current health expenditure per capita recorded from 1991 to 2020 had the lowest rate of -86.67% and the highest rate of 79.8%, according to the figures in Table 4.4. The mean of the current health expenditure per capita across the years was 22.3%, with a 3.095 standard deviation. The high SD indicates that the current health expenditure per capita has also varied significantly during the years analyzed.

Descriptive statistics for Technological factors

The section presents the descriptive statistics for Technological factors. Technological factors were represented by the percentage population of Individuals using Internet, Fixed broadband and mobile cellular subscriptions (per 100 persons) (per 100 people). The findings were shown in Table 4.5.

Table 4. 5

Descriptive Statistics for Technological Factors

	N	Minimum	Maximum	Mean	Std. Deviation
% of population - Individuals using Internet	30	.000	22.565	6.65887	7.504098
Fixed broadband subscriptions(per 100 people)	30	.008	.254	.7603	.30205
Mobile cellular subscriptions (per 100 people)	30	.000	4.204	35.36250	38.68895
Valid N (listwise)	30				

The results in Table 4.5 reveals that the percentage population of Individuals using Internet recorded from 1991 to 2020 had the least rate at 0.000% and the maximum rate at 22.565%. The mean value of the percentage population of Individuals using Internet across the years is 6.658% with the standard deviation being 7.504%. The high standard deviation implies that there have been major changes of numbers in the percentage population of Individuals using Internet in the course of the years studied.

Further, results in Table 4.5 reveals that the fixed broadband subscriptions (per 100 people) recorded from 1991 to 2020 had the least rate at 0.008% and the maximum rate at .254%. The mean value of the fixed broadband subscriptions (per 100 people) across the years is 0.76% with the standard deviation being 0.302%. The high standard deviation indicates that Fixed broadband subscriptions (per 100 people) has varied significantly during the years analyzed.

The mobile cellular subscriptions (per 100 people) recorded from 1991 to 2020 had the lowest rate of 0.000% and the highest rate of 4.204%, according to the figures in Table 4.5. The mean of the mobile cellular subscriptions (per 100 people) across the years was 35.36%, with a 38.688 standard deviation. The high SD indicates that the mobile cellular subscriptions (per 100 people) has also varied significantly during the years analyzed.

Descriptive statistics for Government policies

The section presents the descriptive statistics for Government policies. Government policies was represented by the Government expenditure, Broad money (% of GDP) and External debt stocks. The results were presented in Table 4.6.

Table 4. 6

Descriptive Statistics for Government Policies

	N	Minimum	Maximum	Mean	Std. Deviation
Government expenditure	30	3.864	27.469	20.740	3.63700
Broad money (% of GDP)	30	30.982	47.008	38.85703	3.595740
External debt stocks	30	22.427	24.366	23.0260	.58659
Valid N (listwise)	30				

The results in Table 4.6 reveals that the Government expenditure from 1991 to 2020 had the least rate at 3.86% and the maximum rate at 27.469%. The mean value of the Government expenditure across the years is 20.74% with the standard deviation being 3.637%. The high standard deviation implies that there have been major changes of numbers in the Government expenditure in the course of the years studied.

Further, results in Table 4.6 reveals that the Broad money (% of GDP) recorded from 1991 to 2020 had the least rate at 30.982% and the maximum rate at 47.008%. The mean value of the Broad money (% of GDP) across the years is 38.857% with the standard deviation being 3.595%. The high standard deviation indicates that the Broad money (% of GDP) has varied significantly during the years analyzed.

The External debt stocks recorded from 1991 to 2020 had the lowest rate of 22.427% and the highest rate of 24.366%, according to the figures in Table 4.6. The mean of the External debt stocks across the years was 23.02%, with a standard deviation of 0.586.

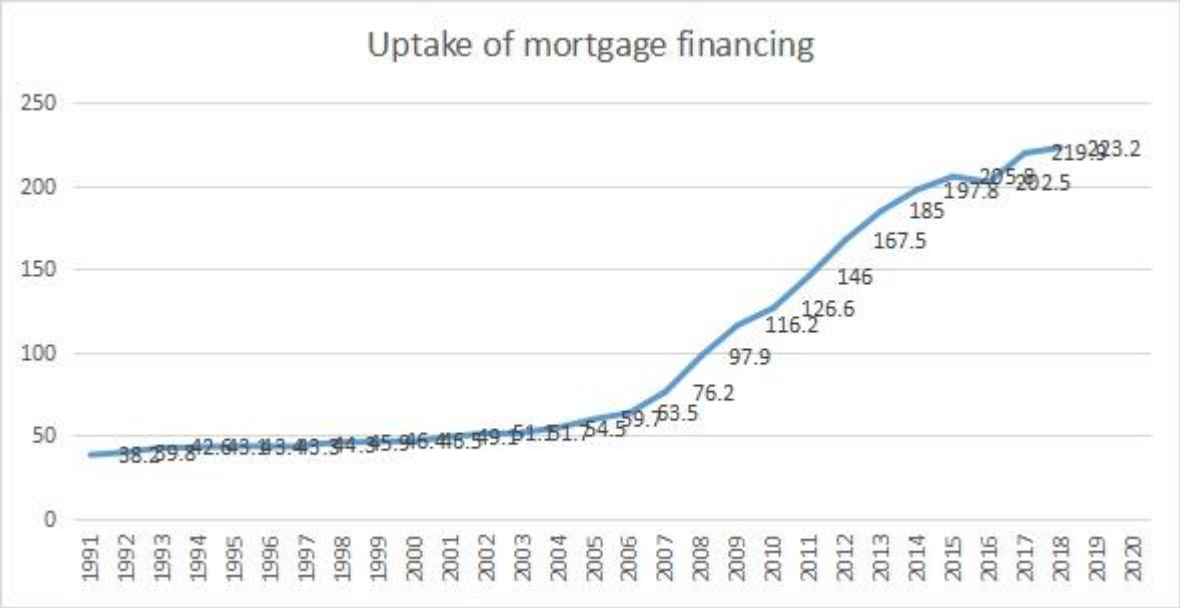
4.3 Trend analysis

Trend Analysis for Mortgage Financing

The graphical trend of uptake of mortgage financing was presented so as to get a better understanding of the variation across time that were identified when conducting descriptive statistics. The trend was presented as follows.

Figure 4. 1

Trend of Uptake of Mortgage Financing (1991– 2020)



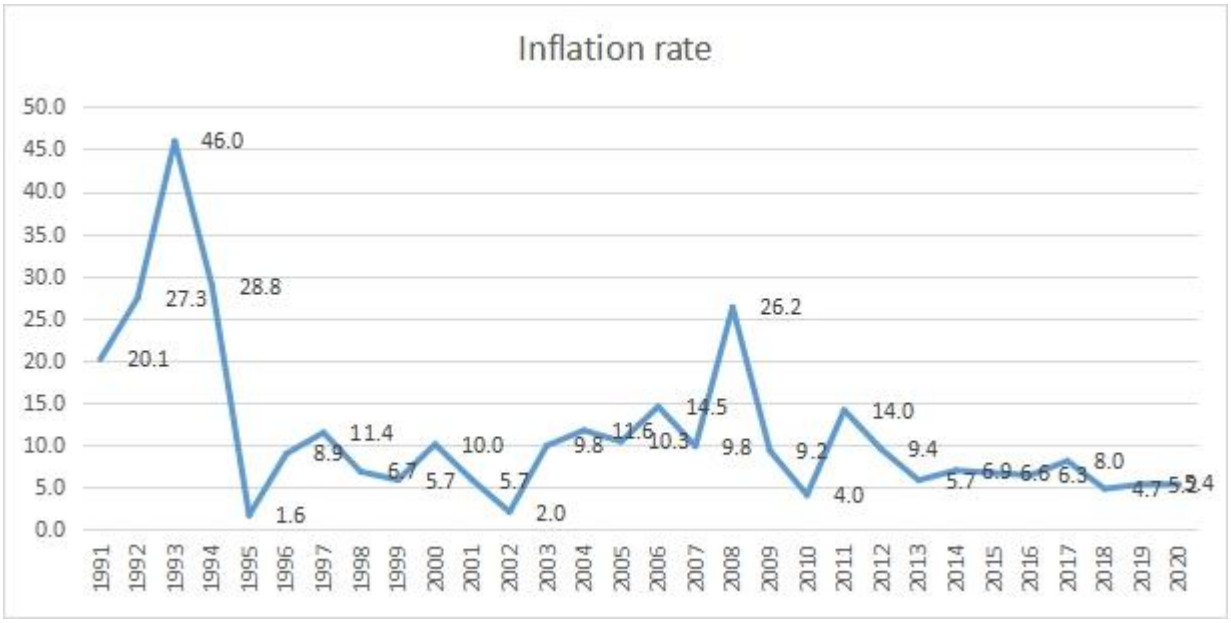
The trend analysis of Uptake of mortgage financing presented shows that the amount/value of debt stock have been rising since 1991. The highest expenditure was recorded in 2020, with sharp rise in Uptake of mortgage financing between 2013 and 2020. The lowest Uptake of mortgage financing was recorded in 1991. The trend shows that Uptake of mortgage financing have been rising with time.

Trend analysis for Economic factors

The trends provided in this section also include a trend line that shows the general movement of the factor under consideration. These trends are provided for 30 years (1991– 2020).

Figure 4. 2

Trend of Inflation Rate (1991 – 2020)

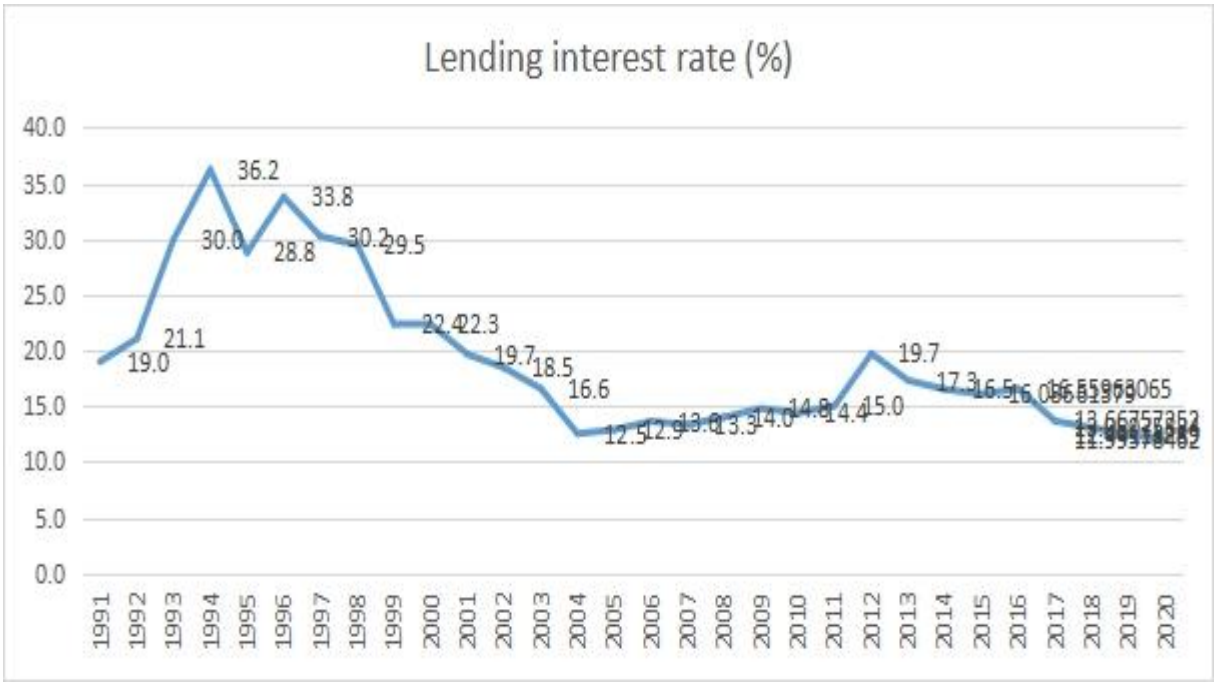


The trend analysis of Inflation rate presented shows that the rates have been fluctuating in a decreasing manner since 2005. This shows that Inflation rate have been decreasing gradually in the economy of Kenya. The highest Inflation rates period is recorded

between year 1991 and 1993. The highest Inflation rate is in 1993. The lowest Inflation rate is in 1995.

Figure 4. 3

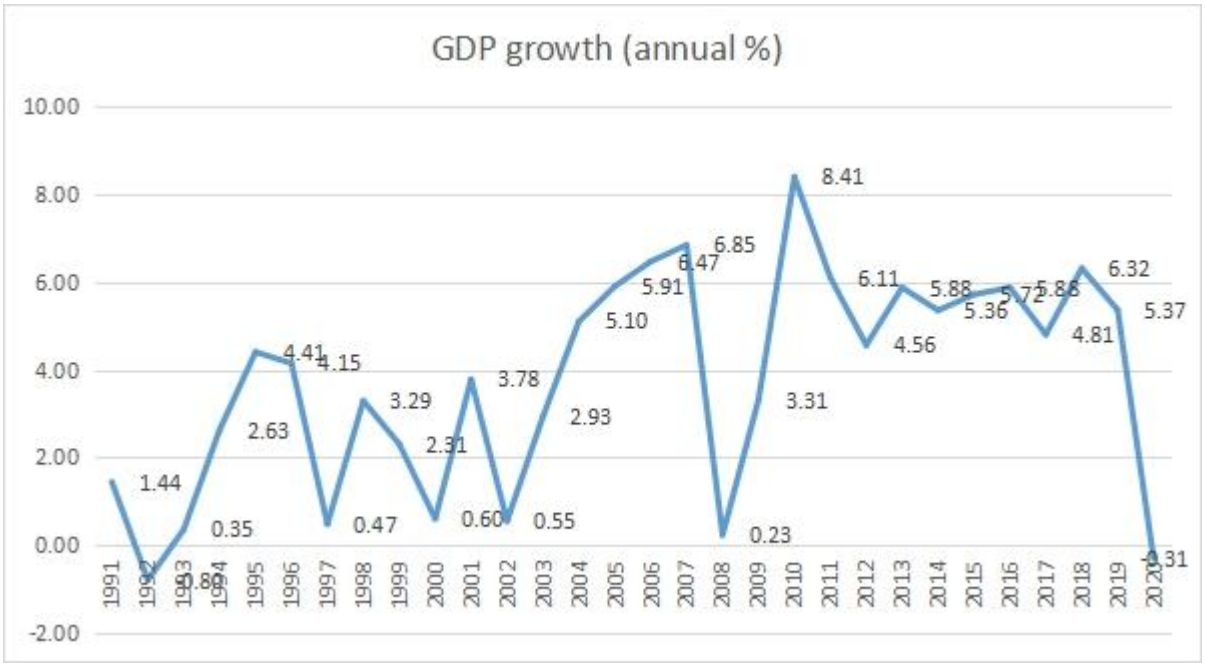
Trend of Lending Interest Rate (1991 – 2020)



The trend analysis of Lending interest rate (%) presented shows that the rates have been fluctuating in a decreasing manner since 1994. This shows that Lending interest rate (%) have been decreasing gradually in the economy of Kenya. The highest Lending interest rates (%) period is recorded between year 1991 and 1994. The highest Lending interest rate (%) is in 1994. The lowest Lending interest rate (%) is in 2020.

Figure 4. 4

Trend of GDP Growth (1991 – 2020)



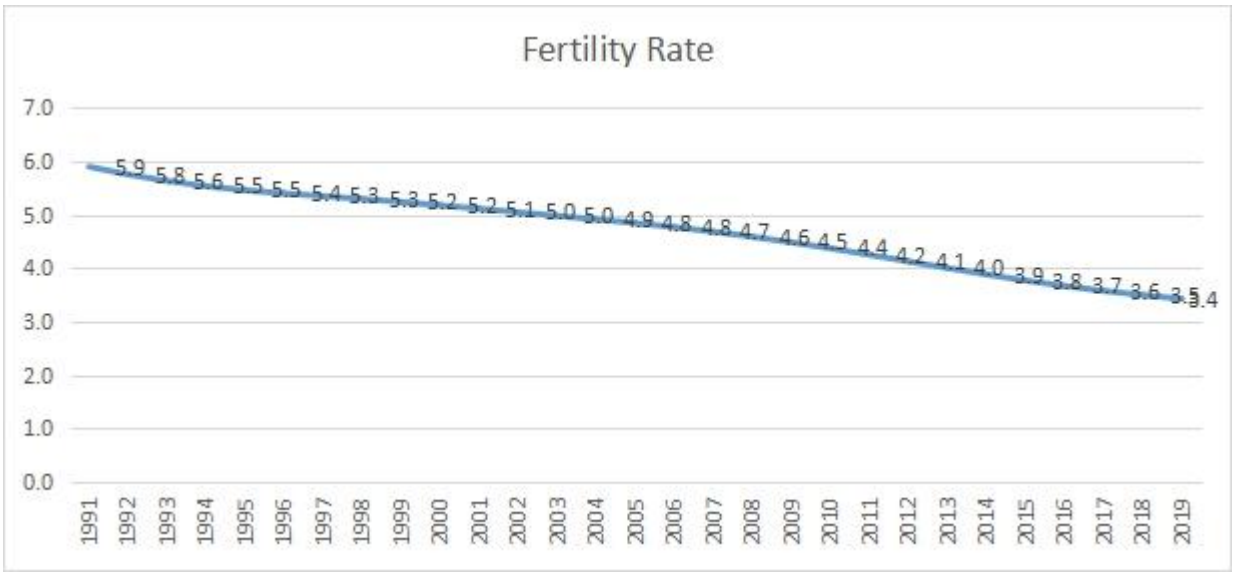
The trend analysis of GDP growth (annual %) presented shows that the rates have been fluctuating in an increasing manner since 1991. This shows that GDP growth (annual %) have been increasing gradually in the economy of Kenya. The highest GDP growth (annual %) period is recorded between year 2008 and 2010. The highest GDP growth (annual %) is in 2010. The lowest GDP growth (annual %) is in 1992.

Trend analysis for Demographic factors

The graphical trend of Fertility Rate, Infant Mortality Rate and Percentage of working-age population was presented so as to get a better understanding of the variation across time that were identified when conducting descriptive statistics. The trend was presented in Figure 4.5

Figure 4. 5

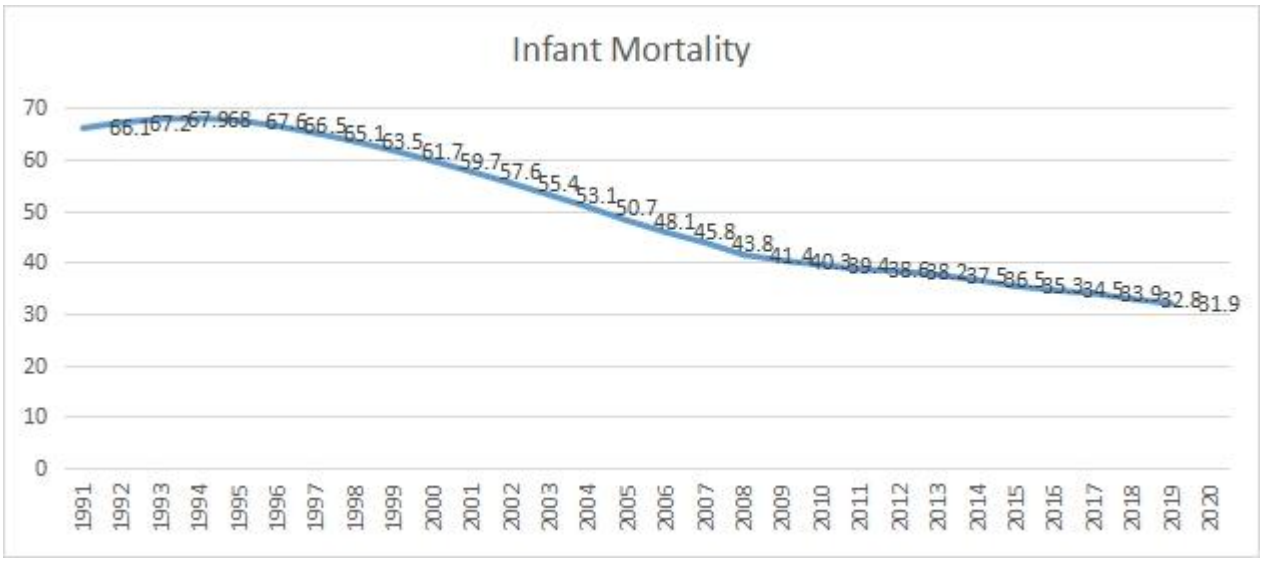
Trend of Fertility Rate (1991 – 2020)



The trend analysis of Fertility Rate presented shows that the rates have been decreasing in a gradual manner since 1991. This implies that the rate of fertility in the population is naturally decreasing.

Figure 4. 6

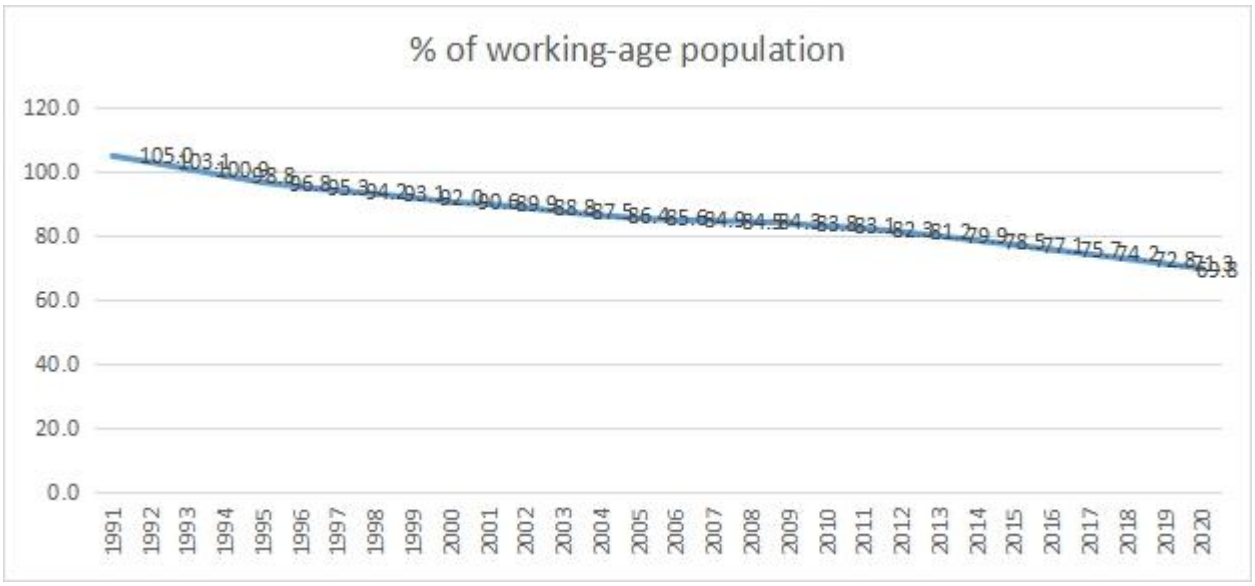
Trend of Infant Mortality Rate (1991 – 2020)



The trend analysis of Infant Mortality Rate presented shows that the rates have been decreasing in a gradual manner since 1991. This implies that the rate of Infant Mortality in the population is naturally decreasing.

Figure 4. 7

Trend of Percentage of Working-Age Population (1991 – 2020)



The trend analysis of Percentage of working-age population presented shows that the rates have been decreasing in a gradual manner since 1991. This implies that the Percentage of working-age population in the population is decreasing as the population grows in the Kenyan economy.

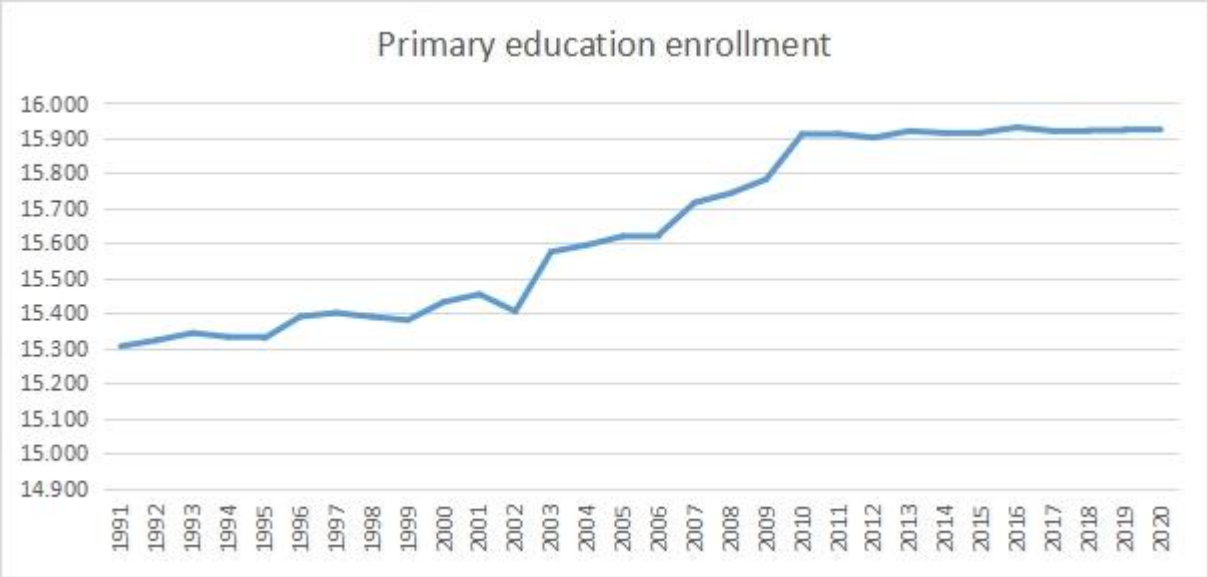
Trend analysis for Social factors

The graphical trend of Primary education enrollment, People using at least basic sanitation services and Current health expenditure per capita was presented so as to get a

better understanding of the variation across time that were identified when conducting descriptive statistics. The trend was presented in Figure 4.8

Figure 4. 8

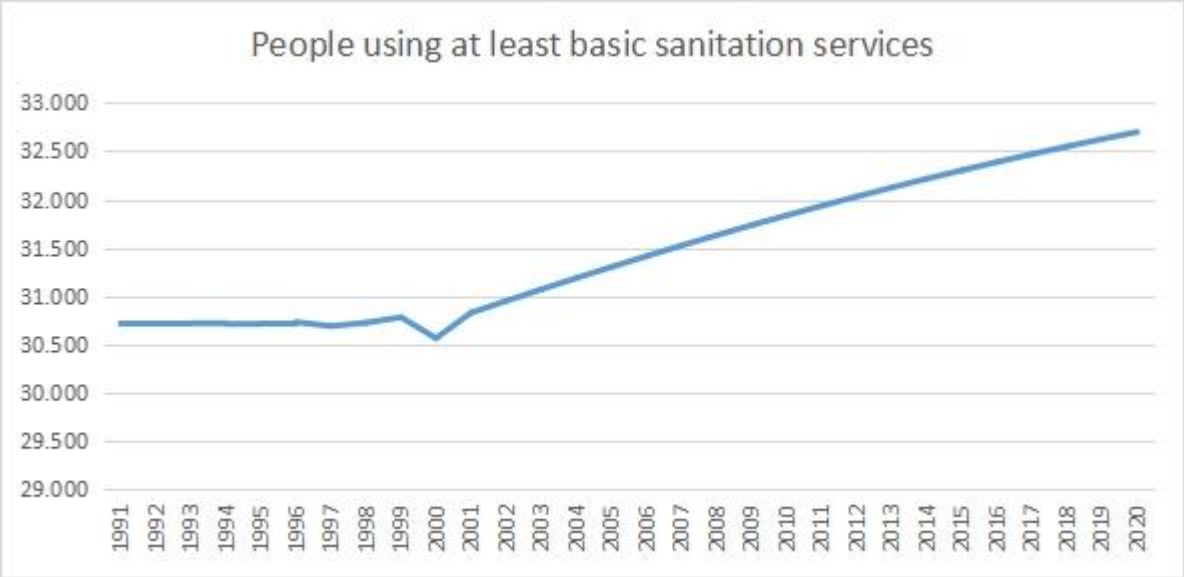
Trend of Primary Education Enrollment (1991 – 2020)



The trend analysis of Primary education enrollment presented shows that the number of individuals in Primary education enrollment have been rising since 99. The rise has been recorded in 3 exponential rise between 1991 and 2002, 2003 and 2010 & 2011 and 2020. This shows that Primary education enrollment for students have been rising in the population.

Figure 4. 9

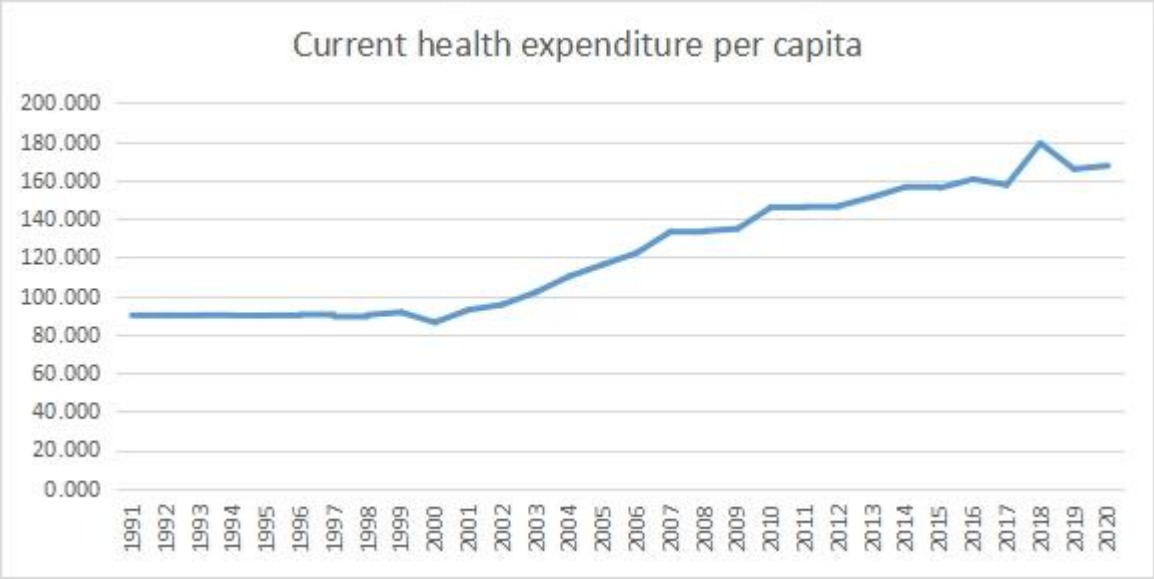
Trend of People Using at Least Basic Sanitation Services (1991 – 2020)



The trend analysis on people utilizing at least basic sanitation services demonstrates that there are many people using these services and have been rising since 1991. The rise has been recorded in 2 exponential rise periods between 1991 and 2000, & 2010 and 2020. This shows that number of individuals utilizing at least basic services have been rising in the population.

Figure 4. 10

Trend of Current Health Expenditure Per Capita (1991 – 2020)



The trend analysis of Current health expenditure per capita presented shows that the amount in expenditures have been rising since 1991. The rise has been recorded in 2 exponential rise periods between 1991 and 2000, & 2010 and 2020. This shows that the amounts invested in health expenditure per capita have been rising in the population.

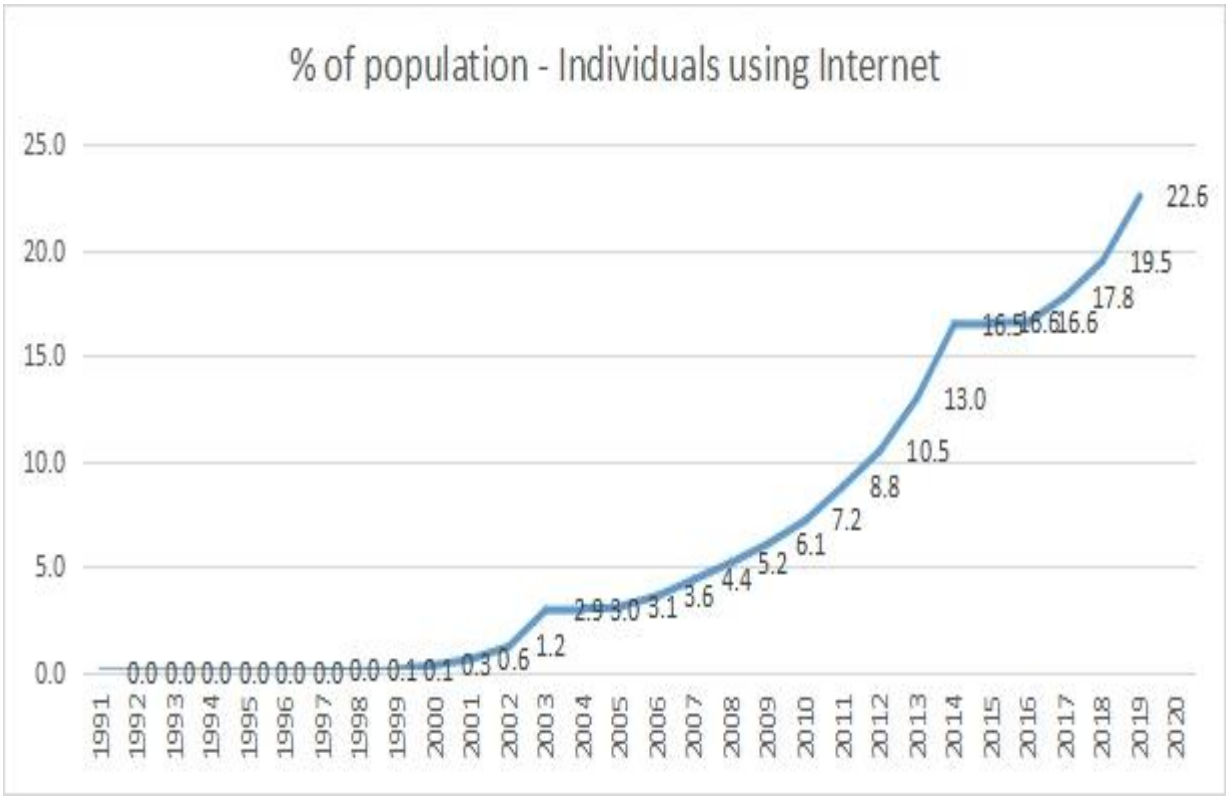
Trend Analysis for Technological Factors

The graphical trend of percentage population of Internet users, fixed broadband subscribers, and mobile cellular subscribers (per 100 persons) (per 100 people) was

presented so as to get a better understanding of the variation across time that were identified when conducting descriptive statistics. The trend was presented in Figure 4.

Figure 4. 11

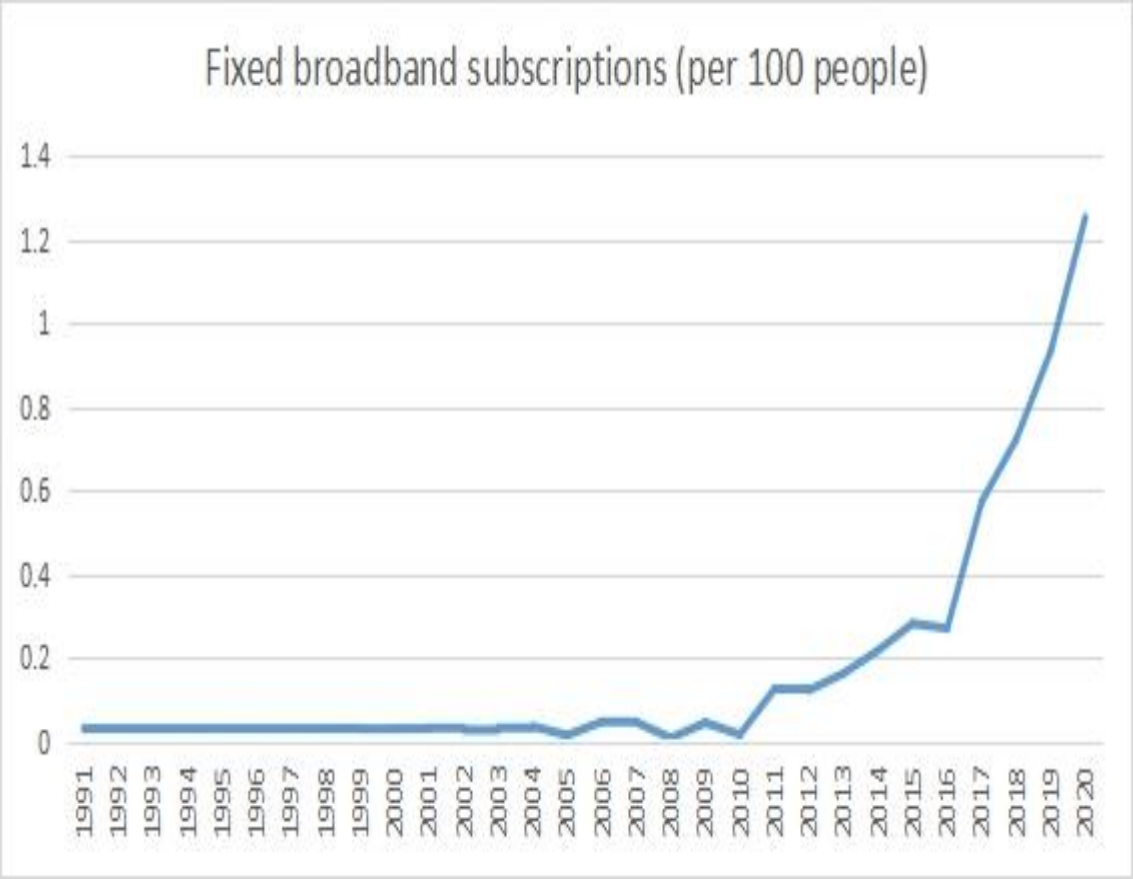
Trend of Percentage Population of Individuals Using Internet (1991 – 2020)



The trend analysis of percentage population of Individuals using Internet presented shows that the number of individuals have been rising since 1997. The rise has been recorded in 3 exponential rise between 1997 and 2003, 2004 and 2014 & 2015 and 2020. This shows that internet usage has been rising in popularity in the population.

Figure 4. 12

Trend of Fixed broadband subscriptions (1991 – 2020)

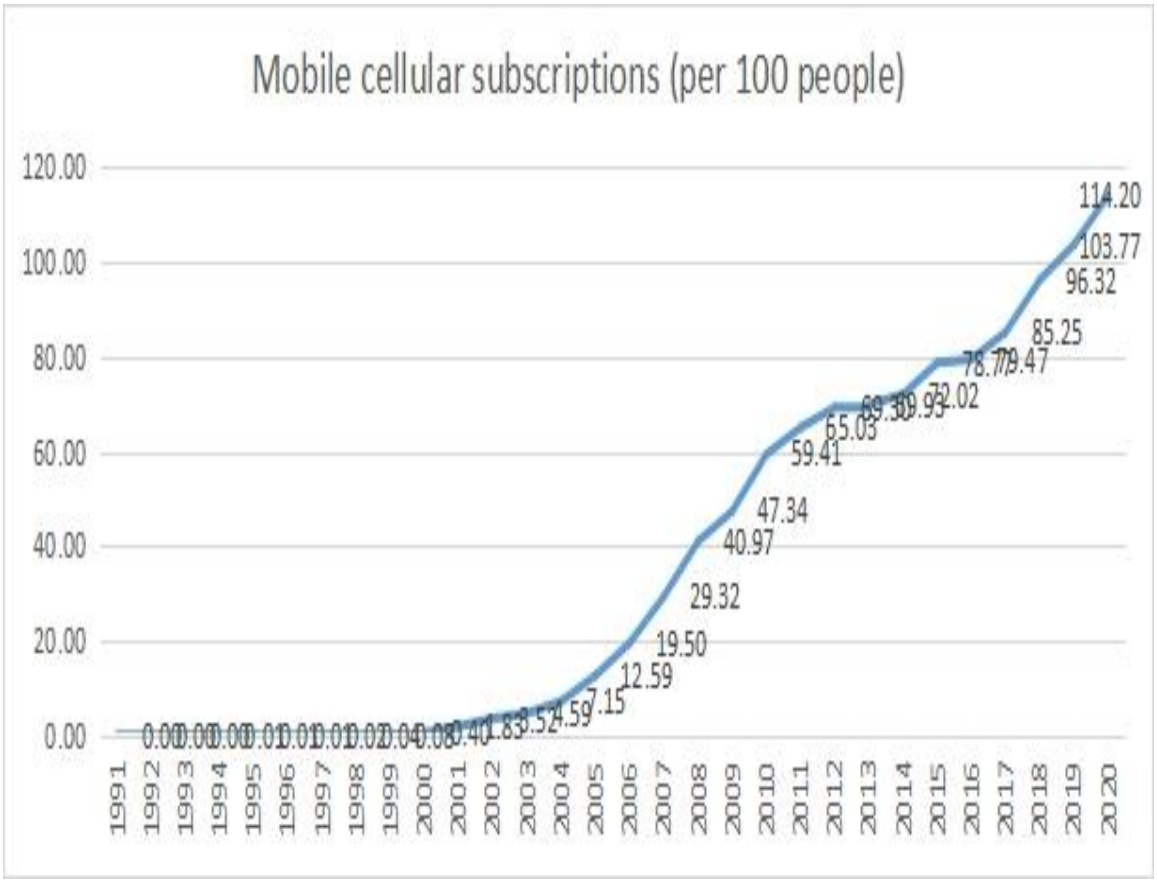


The trend analysis of fixed broadband subscriptions (per 100 people) presented shows that the number of individuals in broadband subscriptions have been rising since 2005. The rise has been recorded in 3 exponential rise between 2005 and 2011, 2011 and 2016 & 2016 and 2020. This shows that broadband subscriptions have been rising in

popularity in the population. The highest growth rate in broadband subscriptions is recorded between year 2016 and 2020.

Figure 4. 13

Trend of Mobile Cellular Subscriptions (1991 – 2020)



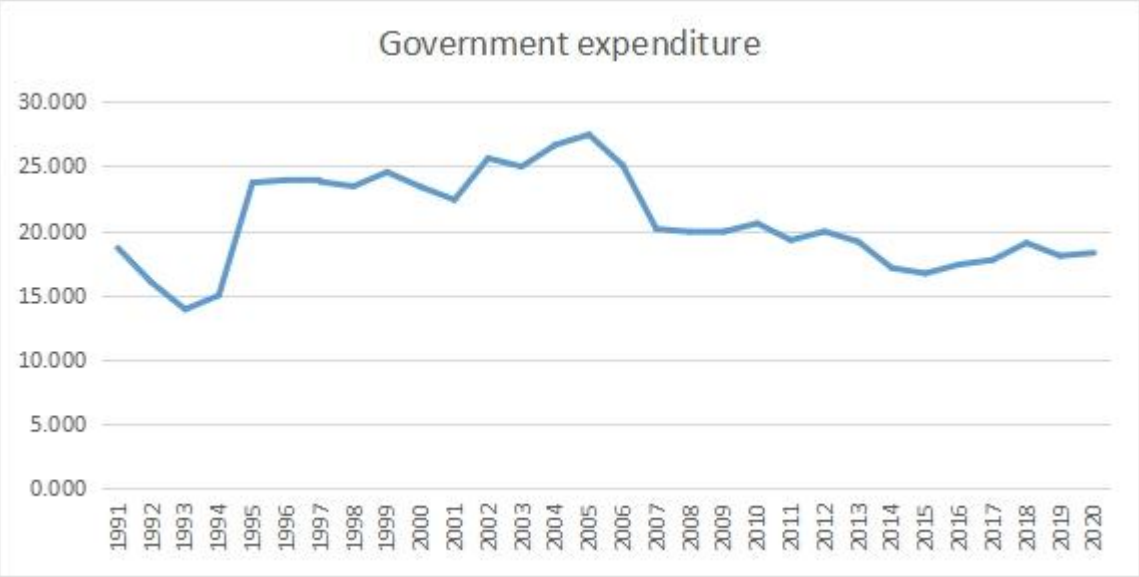
The trend analysis of Mobile cellular subscriptions (per 100 people) presented shows that the number of individuals in Mobile cellular subscriptions have been rising since

2005. The rise has been recorded in 3 exponential rise between 1991 and 2003, 2004 and 2011 & 2012 and 2020. This shows that Mobile cellular subscriptions have been rising in popularity in the population. The highest growth rate in Mobile cellular subscriptions is recorded between year 2017 and 2020.

Trend Analysis for Government Policies

Figure 4. 14

Trend of Government expenditure (1991 – 2020)

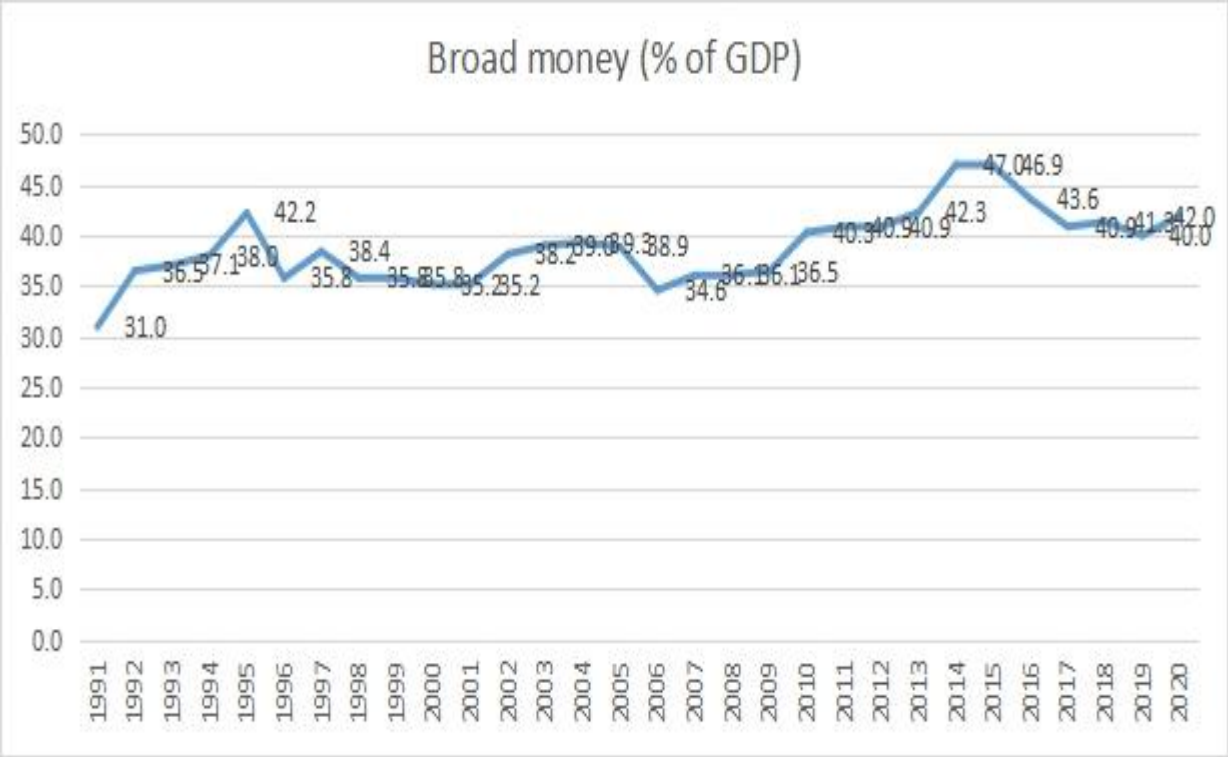


The trend analysis of Government expenditure presented shows that the amounts in expenditure have been fluctuating since 1991. The highest expenditure was recorded in 2005, with high expenditures between 1995 and 2005. The lowest expenditure was

recorded in 1993. This shows that Government expenditure have been fluctuating in the population.

Figure 4. 15

Trend of Broad Money (1991 – 2020)

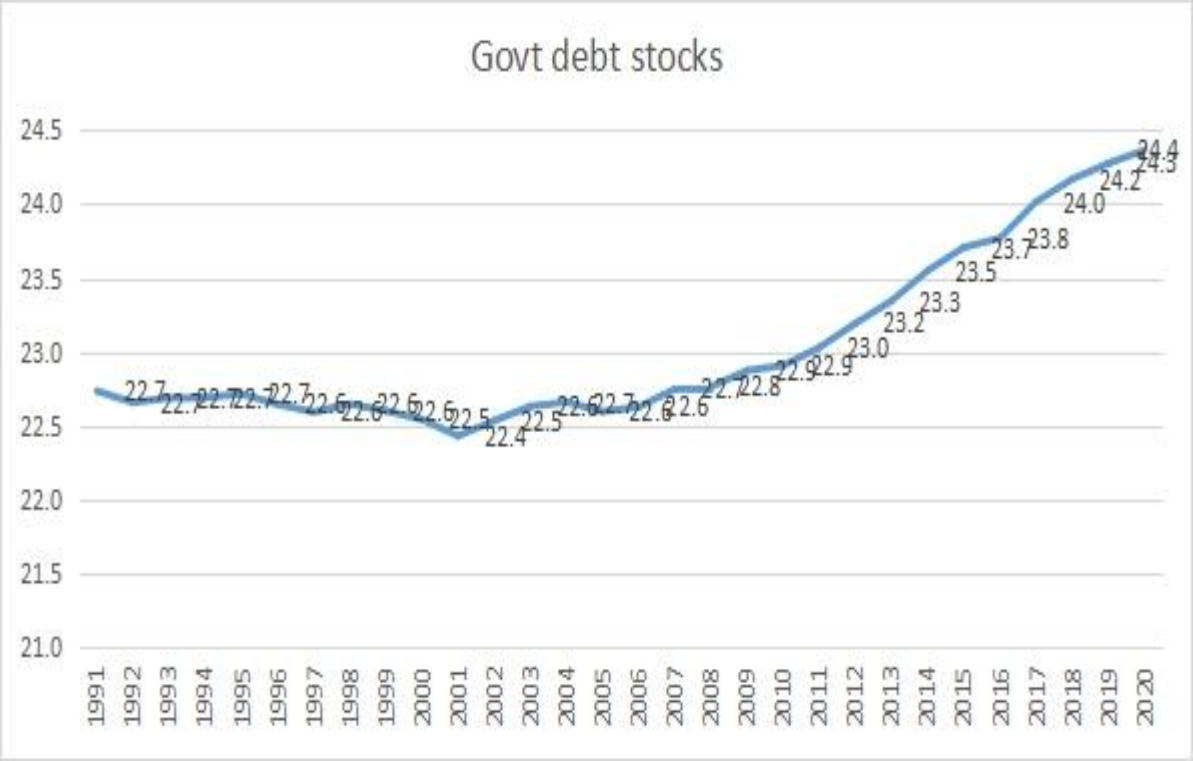


The trend analysis of Broad money (% of GDP) presented shows that the amount/value of Broad money (% of GDP) have been fluctuating since 1991. The highest expenditure was recorded in 2014 and 2015, with high expenditures between 2013 and 2015. The

lowest expenditure was recorded in 1991. This shows that Broad money (% of GDP) have been fluctuating within the mean value in Broad money (% of GDP).

Figure 4. 16

Trend of Government Debt Stocks (1991 – 2020)



The trend analysis of Percentage of Government debt stocks presented shows that the amount/value of debt stock have been fluctuating between 1991 and 2005. However, a gradual rise in Percentage of Government debt stocks have been gradually rising from 2006 to 2020. The highest expenditure was recorded in 2014 and 2015, with high

expenditures between 2013 and 2020. The lowest expenditure was recorded in 2010. This shows that Percentage of Government debt stocks have been rising with time.

4.4 Normality test

Various assumptions of regression model were done on the research study. Normality test was done to test whether the data is normally distributed.

Normality test for Mortgage financing

Knowing the distribution form and being able to anticipate the dependable variables depend on normality (Bahlous-Boldi (2021)). A crucial component of parametric experiments is normality. According to the normality assumption, residuals have a normal distribution with a mean of zero. The Kolmogorov-Smirnov and Shapiro-Wilk tests determine if a variable in a population is regularly distributed. The hypothesis (null) for the two trials listed above says that the data are collected from a normally distributed population.

Table 4. 7

Normality Test for Mortgage Financing

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	**Df**	**Sig.**	**Statistic**	**Df**	
Uptake of mortgage (Number of Mortgage Accounts)	0.255	30	0.000	0.79	30	0.000

The significant value for the variable of Uptake of mortgage (Number of Mortgage Accounts) is lower than 0.05 which imply that the data is not normally distributed. The lack of normality is attributed to the presence of a trend and outliers as shown in the descriptive results and graphical trend. The remedy for the lack of normality is to subject the data to unit root testing where trends and outliers are cancelled out through differencing. The resultant data becomes stationary after differencing, implying that shocks that make the data to have trends and outliers no longer affect the mean, and hence normality is restored.

Normality test for Economic factors

Knowing the distribution form and being able to anticipate the dependable variables depend on normality Bahlous-Boldi (2021). A crucial component of parametric experiments is normality. According to the normality assumption, residuals have a normal distribution with a mean of zero. The normal distribution of the residuals will be validated if the residual points displayed on the normal probability curve are pretty near

to a straight line drawn from the lower left to the upper right of the graph (Lind, Marchal & Wathen, 2012).

Table 4. 8

Normality Test for Economic Factors

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	**Df**	**Sig.**	**Statistic**	**Df**	**Sig.**
Lending interest rate (%)	0.8	30	0.04	0.849	30	0.00
Inflation rate	0.257	30	0.000	0.757	30	0.000
GDP growth (annual %)	0.3	30	.200*	0.945	30	0.22

The lack of normality is attributed to the presence of a trend and outliers as shown in the descriptive results and graphical trend. The remedy for the lack of normality is to subject the data to unit root testing where trends and outliers are cancelled out through differencing. The resultant data becomes stationary after differencing, implying that shocks that make the data to have trends and outliers no longer affect the mean, and hence normality is restored.

Normality test for Demographic factors

Knowing the distribution form and being able to anticipate the dependable variables depend on normality Bahlous-Boldi (2021). A crucial component of parametric experiments is normality. According to the normality assumption, residuals have a normal distribution with a mean of zero.

Table 4. 9

Normality Test for Demographic Factors

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	**Df**	**Sig.**	**Statistic**	**Df**	**Sig.**
Fertility Rate	.09	30	.200*	.944	30	.17
Infant Mortality	.60	30	.050	.879	30	.003
% of working-age population	.068	30	.200*	.982	30	.878

The findings in Table 4.9 indicated that the variable Infant Mortality has a significant value that is less than 0.05, indicating that the data are not regularly distributed. The variables Fertility Rate and Percentage of Population in Working Age have significant values larger than 0.05, indicating that the data is regularly distributed. The lack of normality is attributed to the presence of a trend and outliers as shown in the descriptive results and graphical trend. The remedy for the lack of normality is to subject the data to unit root testing where trends and outliers are cancelled out through differencing. The resultant data becomes stationary after differencing, implying that shocks that make the data to have trends and outliers no longer affect the mean, and hence normality is restored.

Normality test for Social factors

Knowing the distribution form and being able to anticipate the dependable variables depend on normality (Gel et al., 2018). A crucial component of parametric experiments is normality. According to the normality assumption, residuals have a normal distribution with a mean of zero. The Kolmogorov-Smirnov and Shapiro-Wilk tests determine if a variable in a population is regularly distributed.

Table 4. 10

Normality test for Social Factors

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	**Df**	**Sig.**	**Statistic**	**Df**	**Sig.**
Primary education enrollment	.22	30	.00	.83	30	.000
People using at least basic sanitation services	.77	30	.07	.884	30	.003
Current health expenditure per capita	.207	30	.002	.864	30	.00

The data for the variables Primary education enrolment, People utilizing at least basic sanitation services, and Current health spending per capita have p-values that are lower than 0.05, indicating that the data is not regularly distributed. The lack of normality is attributed to the presence of a trend and outliers as shown in the descriptive results and graphical trend. The remedy for the lack of normality is to subject the data to unit root testing where trends and outliers are cancelled out through differencing. The resultant

data becomes stationary after differencing, implying that shocks that make the data to have trends and outliers no longer affect the mean, and hence normality is restored.

Normality Test for Technological Factors

Knowing the distribution form and being able to anticipate the dependable variables depend on normality (Gel et al., 2018). A crucial component of parametric experiments is normality. According to the normality assumption, residuals have a normal distribution with a mean of zero. The Kolmogorov-Smirnov and Shapiro-Wilk tests determine if a variable in a population is regularly distributed.

Table 4. 11

Normality test for Technological Factors

	Kolmogorov-Smirnova			**Shapiro-Wilk**		
	Statistic	**Df**	**Sig.**	**Statistic**	**Df**	**Sig.**
% of population - Individuals using Internet	.192	30	.006	.821	30	.000
Fixed broadband subscriptions (per 100 people)	.332	30	.000	.582	30	.000
Mobile cellular subscriptions (per 100 people)	.234	30	.000	.826	30	.000

The findings in Table 4.11 indicated that the p-values for the variables of the percentage of the population using the internet, fixed broadband subscriptions (per 100 people), and Mobile cellular subscriptions (per 100 people) are lower than 0.05, which suggests that

the data for the variables is not normally distributed. The lack of normality is attributed to the presence of a trend and outliers as shown in the descriptive results and graphical trend. The remedy for the lack of normality is to subject the data to unit root testing where trends and outliers are cancelled out through differencing. The resultant data becomes stationary after differencing, implying that shocks that make the data to have trends and outliers no longer affect the mean, and hence normality is restored.

Normality test for Government Policies

Knowing the distribution form and being able to anticipate the dependable variables depend on normality (Gel et al., 2018). A crucial component of parametric experiments is normality. According to the normality assumption, residuals have a normal distribution with a mean of zero. The Kolmogorov-Smirnov and Shapiro-Wilk tests determine if a variable in a population is regularly distributed. The hypothesis (null) for the two trials listed above says that the data are collected from a normally distributed population.

Table 4. 12

Normality Test for Government Policies

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	**Df**	**Sig.**	**Statistic**	**Df**	**Sig.**
Government expenditure	.136	30	.162	.964	30	.395
Broad money (% of GDP)	.109	30	.200*	.964	30	.393
External debt stocks	.272	30	.000	.786	30	.000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The findings in Table 4.12 indicated that the variables for government spending and broad money (% of GDP) had p-values larger than 0.05, which suggests that the data is normally distributed. External debt stocks' p-value is less than 0.05, indicating that the data is not regularly distributed. The lack of normality is attributed to the presence of a trend and outliers as shown in the descriptive results and graphical trend. The remedy for the lack of normality is to subject the data to unit root testing where trends and outliers are cancelled out through differencing. The resultant data becomes stationary after differencing, implying that shocks that make the data to have trends and outliers no longer affect the mean, and hence normality is restored.

4.5 Heteroscedasticity

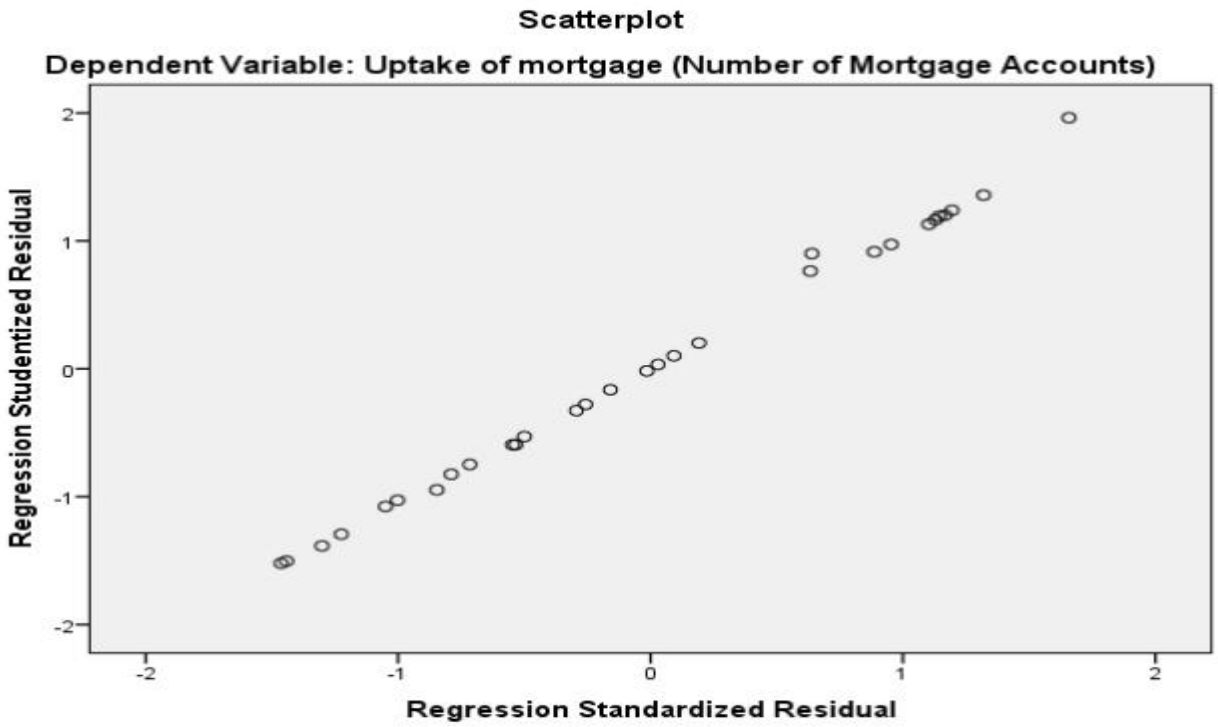
Various assumptions of regression model were done on the research study. Heteroscedasticity test was done to test whether the error term differs (error variance) in the variable.

Heteroscedasticity for Economic factors

When the magnitude of the error term varies across values of an independent variable, heteroscedasticity is typically present (Iovino & Tsitsianis, 2020). When the residuals do not cover the line in an evenly distributed pattern, heteroscedasticity is present. More rigorous tests for heteroscedasticity should be run when the plot of residuals appears to stray significantly from the average (Gambo, 2022). A scatter plot was made to determine group-wise heteroscedasticity in the residuals for the purpose of assessing heteroscedasticity in this study.

Figure 4. 17

Scatter plot for Economic Factors



We infer that there is no heteroscedasticity because the residuals are uniformly distributed along the line. Therefore, the population used in the regression contains equal variance, the analysis results are valid.

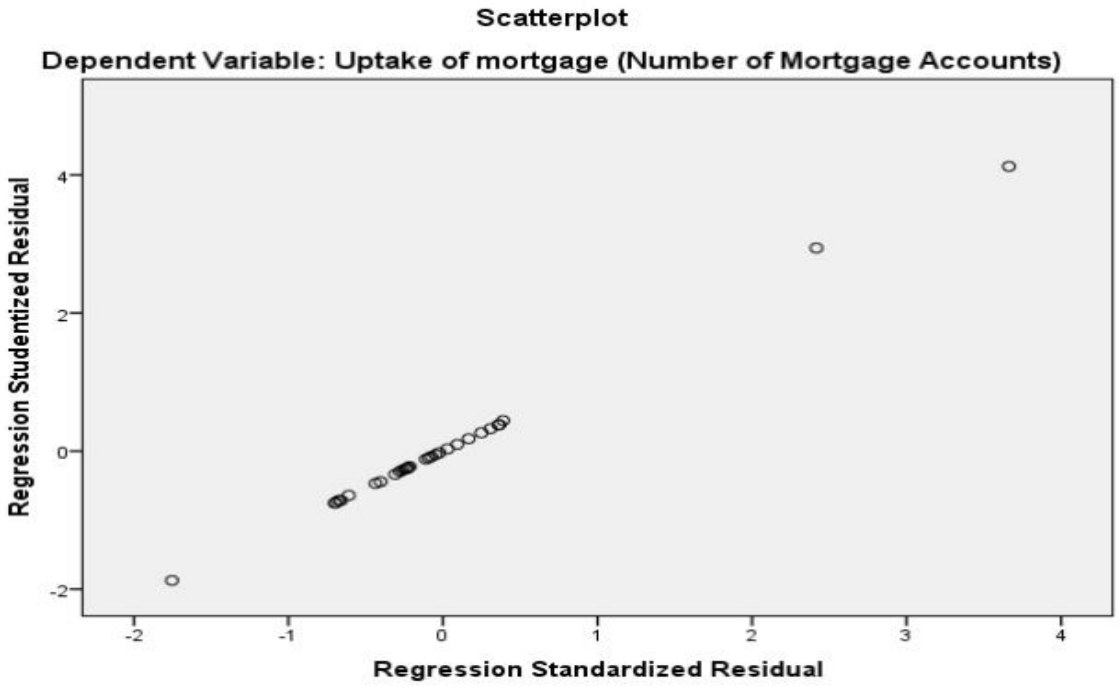
Heteroscedasticity for Demographic factors

Once the amount of the error term changes with the values of the predictor variables, heteroscedasticity is frequently present (Iovino & Tsitsianis, 2020). When the residuals

are not distributed equally across the line, heteroscedasticity is present. More official tests for heteroscedasticity should be run when the plot of residuals appears to stray significantly from the average (Gambo, 2022). In order to determine group-wise heteroscedasticity in the residuals for the current investigation, a scatter plot was produced.

Figure 4. 18

Scatter Plot for Demographic Factors



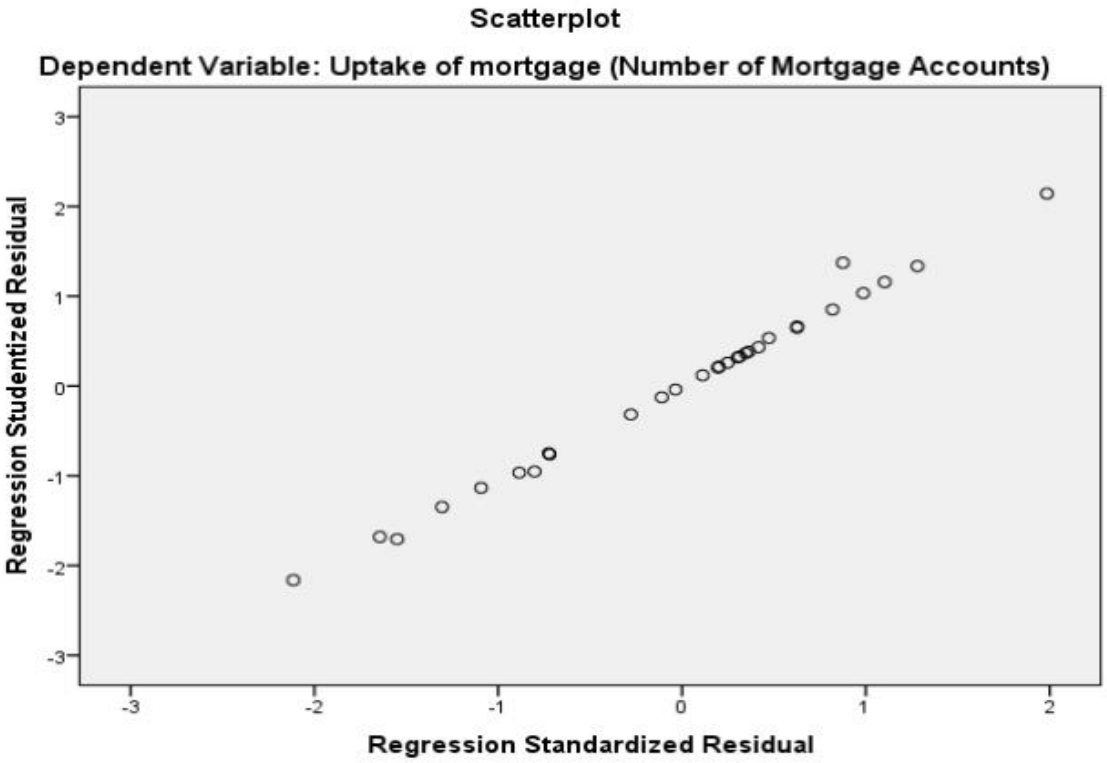
We infer that there is no heteroscedasticity because the residuals are uniformly distributed along the line. Therefore, the population used in the regression contains equal variance, the analysis results are valid.

Heteroscedasticity for Social factors

Once the amount of the error term changes with the values of the predictor variables,, heteroscedasticity is typically present (Fletcher, et al., 202). When the residuals are not equally dispersed over the line, heteroscedasticity is present. More rigorous tests for heteroscedasticity should be run when the residuals plot appears to differ significantly from the average (Gambo, 2022). A scatter plot was made to calculate the group-wise heteroscedasticity in the residuals for this study's test of heteroscedasticity.

Figure 4. 19

Scatter plot for Social Factors



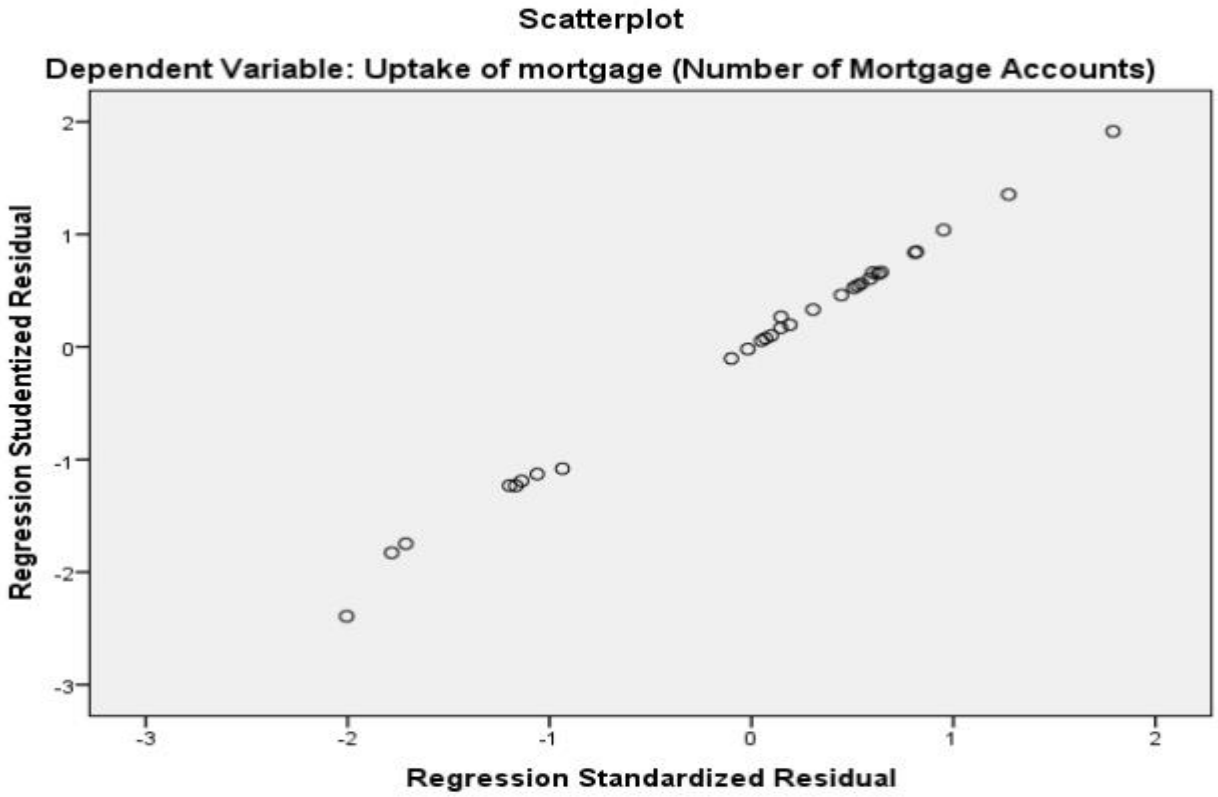
We infer that there is no heteroscedasticity because the residuals are uniformly distributed along the line. Therefore, the population used in the regression contains equal variance, the analysis results are valid.

Heteroscedasticity for Technological factors

When the magnitude of the error term varies across independent variable values, heteroscedasticity is typically present (Fletcher, et al., 2022). When the residuals are not distributed equally across the line, heteroscedasticity is present. More rigorous tests for heteroscedasticity should be run when the plot of residuals appears to vary significantly from the mean (Gambo, 2022). In order to determine group-wise heteroscedasticity in the residuals for this investigation, a scatter plot was made.

Figure 4. 20

Scatter plot for Technological Factors



Since the residuals are evenly scattered around the line, we conclude that there is absence of Heteroscedasticity. Therefore, the population used in the regression contains equal variance, the analysis results are valid.

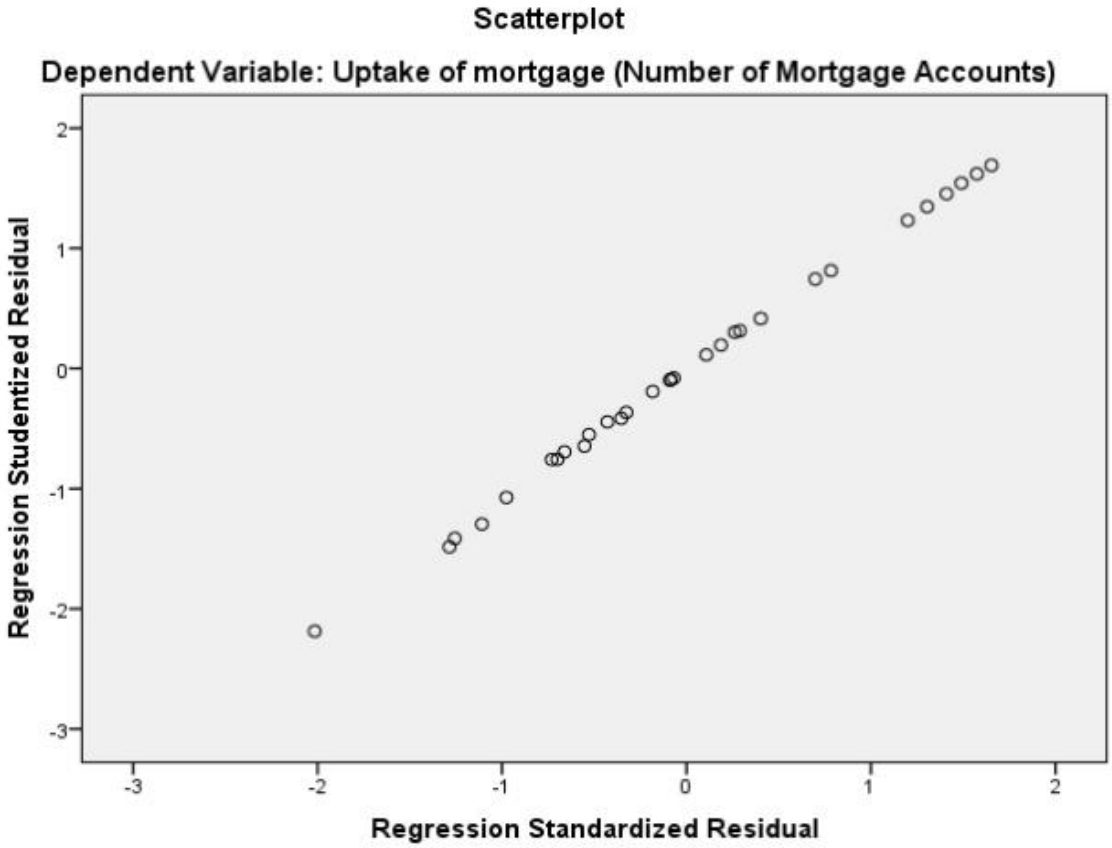
Heteroscedasticity for Government Policies

When the magnitude of the error term varies across values of an independent variable, heteroscedasticity is typically present (Iovino & Tsitsianis, 2020). When the residuals do not cover the line in an evenly distributed pattern, heteroscedasticity is present. More rigorous tests for heteroscedasticity should be run when the plot of residuals appears to

stray significantly from the average (Gambo, 2022). A scatter plot was made to determine group-wise heteroscedasticity in the residuals for the purpose of assessing heteroscedasticity in this study.

Figure 4. 21

Scatter Plot for Government Policies



Since the residuals are evenly scattered around the line, we conclude that there is absence of Heteroscedasticity. Therefore, the population used in the regression contains equal variance, the analysis results are valid.

4.6 Autocorrelation

Various assumptions of regression model were done on the research study. Autocorrelation is a statistical measure of how similar a time series is to a lagged version of itself over consecutive time intervals.

Autocorrelation for Economic factors

Autocorrelation is when influence of one predictor variable on another predictor variables travels across different intervals; it influences the future amounts of the other predictor variables. Matitz (2018) use the Durbin-Watson assessment to the fixed effects board model (Durbin and Watson, 1971). Baltagi and Li (1991, 1995) devise an LM measure for testing first inquiry sequential connections. Wooldridge (2002) presents an easily implementable criterion for serial connection based on the first-difference model's Ordinary least square residuals. The null hypothesis proposes that no first-order correlation exists (Matitz, 2018)). The research implemented the Durbin-Watson test to examine for auto-correlation. The Durbin-Watson value should be around 1.5 and 2.5 to indicate that there is no association between residual items (Adams & Metwally, 2021).

Table 4. 13

Autocorrelation for Economic Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.508[a]	.258	.231	63.142412	.249

a. Predictors: (Constant), Economic factors

b. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Given that the Durbin Watson statistic was 0.249 and outside the permissible range of 1.5 and 2.5, Table 4.13 may be used to reject the null hypothesis that there is no serial correlation between residual terms. As a result, there was a requirement for first-order correlation between the residual components, and to address this, delays were added to the final model to get rid of autocorrelation.

Autocorrelation for Demographic factors

Autocorrelation is when the influence of one predictor variable on another predictor variables travels across different intervals; it influences the future amounts of the other predictor variables. Matitz (2018) use the Durbin-Watson assessment to the fixed effects board model (Durbin & Watson, 1971). Baltagi and Li (1991, 1995) devise an LM measure for testing first inquiry sequential connections. Wooldridge (2002) presents an easily implementable criterion for serial connection based on the first-difference model's Ordinary least square residuals. The null hypothesis proposes that no first-order correlation exists (Matitz, 2018)). The research implemented the Durbin-Watson test to

examine for auto-correlation. The Durbin-Watson value should be around 1.5 and 2.5 to indicate that there is no association between residual items (Adams & Metwally, 2021).

Table 4. 14

Autocorrelation for Demographic Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.905a	.819	.813	31.146427	.075

a. Predictors: (Constant), Demographic factors

b. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Given that the Durbin Watson statistic was 0.075 and was outside the permitted range of 1.5 and 2.5, it may be concluded from Table 4.14 that there is no serial correlation between the residual terms. As a result, there was a requirement for first-order correlation between the residual components, and to address this, delays were added to the final model to get rid of autocorrelation.

Autocorrelation for Social factors

Autocorrelation is when the influence of one predictor variable on another predictor variables travels across different intervals; it influences the future amounts of the other predictor variables. Matitz (2018) use the Durbin-Watson assessment to the fixed effects board model (Durbin & Watson, 1971). Baltagi and Li (1991, 1995) devise an LM measure for testing first inquiry sequential connections. Wooldridge (2002) presents an

easily implementable criterion for serial connection based on the first-difference model's Ordinary least square residuals. The null hypothesis proposes that no first-order correlation exists (Matitz, 2018)). The research implemented the Durbin-Watson test to examine for auto-correlation. The Durbin-Watson value should be around 1.5 and 2.5 to indicate that there is no association between residual items (Adams & Metwally, 2021).

Table 4. 15

Autocorrelation for Social Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.954[a]	.910	.907	22.003516	0.460

a. Predictors: (Constant), Social factors

b. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Given that the Durbin Watson statistic was 0.46 and was outside of the permitted range between 1.5 and 2.5, it may be concluded from Table 4.15 that there is no serial correlation between the residual components. As a result, there was a requirement for first-order correlation between the residual components, and to address this, delays were added to the final model to get rid of autocorrelation.

Autocorrelation for Technological factors

Autocorrelation is when influence of one predictor variable on another predictor variables travels across different intervals; it influences the future amounts of the other

predictor variables. Matitz (2018) use the Durbin-Watson assessment to the fixed effects board model (Durbin & Watson, 1971). Baltagi and Li (1991, 1995) devise an LM measure for testing first inquiry sequential connections. Wooldridge (2002) presents an easily implementable criterion for serial connection based on the first-difference model's Ordinary least square residuals. The null hypothesis proposes that no first-order correlation exists (Matitz, 2018)). The research implemented the Durbin-Watson test to examine for auto-correlation. The Durbin-Watson value should be around 1.5 and 2.5 to indicate that there is no association between residual items (Adams & Metwally, 2021).

Table 4. 16

Autocorrelation for Technological Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.988[a]	.976	.975	11.339218	.390

a. Predictors: (Constant), Technological factors

b. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Given that the Durbin Watson statistic was 0.39 and was outside the permitted range of 1.5 and 2.5, it may be concluded from Table 4.16 that there is no serial correlation between the residual components. As a result, there was a requirement for first-order correlation between the residual components, and to address this, delays were added to the final model to get rid of autocorrelation.

Autocorrelation for Government policies

Autocorrelation is when influence of one predictor variable on another predictor variables travels across different intervals; it influences the future amounts of the other predictor variables. Matitz (2018) use the Durbin-Watson assessment to the fixed effects board model (Durbin & Watson, 1971). Baltagi and Li (1991, 1995) devise an LM measure for testing first inquiry sequential connections. Wooldridge (2002) presents an easily implementable criterion for serial connection based on the first-difference model's Ordinary least square residuals. The null hypothesis proposes that no first-order correlation exists (Matitz, 2018)). The research implemented the Durbin-Watson test to examine for auto-correlation. The Durbin-Watson value should be around 1.5 and 2.5 to indicate that there is no association between residual items (Adams & Metwally, 2021).

Table 4. 17

Autocorrelation for Government Policies

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.318[a]	.101	.069	69.484855	.099

a. Predictors: (Constant), Government policies

b. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Given that the Durbin Watson statistic was 0.099 and outside the permissible range of 1.5 and 2.5, Table 4.17 null hypothesis that denotes that there is no serial correlation

between residual terms is rejected. As a result, there was a requirement for first-order correlation between the residual components, and to address this, delays were added to the final model to get rid of autocorrelation.

4.7 Multicollinearity

Various assumptions of regression model were done on the research study. Multi-collinearity test was done to test whether there is correlation of numerous independent factors in a framework.

Multicollinearity for Economic factors

The tolerance and variance inflation factor were used to test multicollinearity in this study (VIF). According to Adams and Metwally (2021), a very tiny tolerance value (0.0 or less) or a significant VIF value (0 or above) indicates strong collinearity (Multicollinearity). Adams and Metwally (2021) define multicollinearity as a state in which more than two elaborating variables are strongly linearly connected. Multicollinearity testing must be performed before performing data analysis since extremely collinear explanatory variables result in estimators that are not the best linear unbiased estimators (BLUE). This is due to the fact that when multicollinearity grows, so does the standard error of coefficients, rendering them less dependable.

Table 4. 18

Multicollinearity for Economic Factors

Model	Collinearity Statistics	
	Tolerance	**VIF**
Lending interest rate (%)	.818	1.223
Inflation rate	.758	1.320
GDP growth (annual %)	.729	1.372

VIF values greater than 0 indicate the presence of multicollinearity (Field 2018). The results show that there is no multicollinearity because the variance inflation factor was determined to be between 1.223 and 1.372. The remedy for presence of multicollinearity is either to drop the offending variable or ignore the presence of multicollinearity. The study chose to ignore the presence of multicollinearity since it was not severe.

Multicollinearity for Demographic factors

The tolerance and variance inflation factor were used to test multicollinearity in this study (VIF). According to Adams and Metwally (2021), a very tiny tolerance value (0.0 or less) or a significant VIF value (0 or above) indicates strong collinearity (Multicollinearity). Adams and Metwally (2021) define multicollinearity as a state in which more than two elaborating variables are strongly linearly connected. Multicollinearity testing must be performed before performing data analysis since extremely collinear explanatory variables result in estimators that are not the best linear

unbiased estimators (BLUE). This is due to the fact that when multicollinearity grows, so does the standard error of coefficients, rendering them less dependable.

Table 4. 19

Multicollinearity for Demographic Factors

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Fertility Rate	.034	29.695
Infant Mortality	.072	3.80
% of working-age population	.042	24.007

VIF values greater than 0 indicate the presence of multicollinearity (Field 2018). The variance inflation factor was found to range between 3.80 and 29.695 in the data, indicating the presence of multicollinearity. The remedy for presence of multicollinearity is either to drop the offending variable or ignore the presence of multicollinearity. The study chose to ignore the presence of multicollinearity since it was not severe.

Multicollinearity for Social factors

The tolerance and variance inflation factor were used to test multicollinearity in this study (VIF). According to Adams and Metwally (2021), a very tiny tolerance value (0.0 or less) or a significant VIF value (0 or above) indicates strong collinearity (Multicollinearity). Adams and Metwally (2021) define multicollinearity as a state in which more than two elaborating variables are strongly linearly connected.

Multicollinearity testing must be performed before performing data analysis since extremely collinear explanatory variables result in estimators that are not the best linear unbiased estimators (BLUE). This is due to the fact that when multicollinearity grows, so does the standard error of coefficients, rendering them less dependable.

Table 4. 20

Multicollinearity for Social Factors

Model	**Collinearity Statistics**	
	Tolerance	**VIF**
(Constant)		
Primary education enrollment	.056	7.705
People using at least basic sanitation services	.08	56.284
Current health expenditure per capita	.03	75.027

VIF values greater than 0 indicate the presence of multicollinearity (Field 2018). The variance inflation factor was discovered to range between 7.705 and 75.027, indicating the presence of multicollinearity, according to the findings. The remedy for presence of multicollinearity is either to drop the offending variable or ignore the presence of multicollinearity. The study chose to ignore the presence of multicollinearity since it was not severe.

Multicollinearity for Technological factors

The tolerance and variance inflation factor were used to test multicollinearity in this study (VIF). According to Adams and Metwally (2021), a very tiny tolerance value (0.0 or less) or a significant VIF value (0 or above) indicates strong collinearity (Multicollinearity). Adams and Metwally (2021) define multicollinearity as a state in which more than two elaborating variables are strongly linearly connected. Multicollinearity testing must be performed before performing data analysis since extremely collinear explanatory variables result in estimators that are not the best linear unbiased estimators (BLUE). This is due to the fact that when multicollinearity grows, so does the standard error of coefficients, rendering them less dependable.

Table 4. 21

Multicollinearity for Technological Factors

Model	**Collinearity Statistics**	
	Tolerance	**VIF**
(Constant)		
% of population - Individuals using Internet	.047	2.330
Fixed broadband subscriptions (per 100 people)	.33	3.07
Mobile cellular subscriptions (per 100 people)	.054	8.476

VIF values greater than 0 indicate the presence of multicollinearity (Field 2018). The variance inflation factor was observed to range from 3.07 to 2.33 in the data, indicating

the presence of multicollinearity. The remedy for presence of multicollinearity is either to drop the offending variable or ignore the presence of multicollinearity. The study chose to ignore the presence of multicollinearity since it was not severe.

Multicollinearity for Government policies

The tolerance and variance inflation factor were used to test multicollinearity in this study (VIF). According to Adams and Metwally (2021), a very tiny tolerance value (0.0 or less) or a significant VIF value (0 or above) indicates strong collinearity (Multicollinearity). Adams and Metwally (2021) define multicollinearity as a state in which more than two elaborating variables are strongly linearly connected. Multicollinearity testing must be performed before performing data analysis since extremely collinear explanatory variables result in estimators that are not the best linear unbiased estimators (BLUE). This is due to the fact that when multicollinearity grows, so does the standard error of coefficients, rendering them less dependable.

Table 4. 22

Multicollinearity for Government Policies

Model	**Collinearity Statistics**	
	Tolerance	**VIF**
(Constant)		
Government expenditure	.736	1.359
Broad money (% of GDP)	.58	1.722

External debt stocks	.47	2.22

VIF values greater than 0 indicate the presence of multicollinearity (Field 2018). The variance inflation factor was observed to range from 1.359 to 2.22 in the data, indicating the presence of multicollinearity. The remedy for presence of multicollinearity is either to drop the offending variable or ignore the presence of multicollinearity. The study chose to ignore the presence of multicollinearity since it was not severe.

4.8 Unit roots test

Various assumptions of regression model were done on the research study. A unit root test is used to determine whether a time series parameter is non-stationary and has a unit root.

Unit roots test for Mortgage financing

The unit root test with the Augmented Dickey-Fuller (ADF) approach was used to determine the conditions of stationarity for the data series in this study, with the null hypothesis being that the series under examination is non-stationary or has a unit root. As a result, stationarity testing was done as follows:

Table 4. 23

Unit Roots Test for Mortgage Financing

Variable	Test Statistic	% Critical	5% Critical	0% Critical	P value - z(t)

		Value	Value	Value		
Uptake of mortgage (Number of Mortgage Accounts)	-0.6982	-4.4407	-3.6329	-3.2547	0.9895	Stationary

Table 4.23 findings showed that the variable Uptake of mortgage (Number of Mortgage Accounts) had an Augmented Dickey-Fuller probability statistic greater than 0.05 ($p = 0.9895 > 0.05$). Hence, the null hypothesis of presence of a unit root (non-stationarity) could not be rejected. Thus, the variable Uptake of mortgage (Number of Mortgage Accounts) was found Non-stationary, necessitating the first difference.

Table 4. 24

First difference Unit Roots Test for Mortgage Financing

Variable	Test Statistic	% Critical Value	5% Critical Value	0% Critical Value	*P value -z(t)*	
Uptake of mortgage (Number of Mortgage Accounts)	-4.78398	-4.44074	-3.6329	-3.25467	0.0049	Stationary

Table 4.24 shows that Uptake of mortgage (Number of Mortgage Accounts) were stationary at first difference (since *p-value = 0.0049<0.05)*. The implication for inducing stationarity in Uptake of mortgage accounts is so that the resultant series will be mean reverting and will not lead to spurious relationships when regressed with other variables. Spurious relationships mostly arise due to presence of common trends across variables.

Unit roots test for Economic factors

The Augmented Dickey-Fuller (ADF) approach was utilized in the research to determine the stationarity criteria of the series data and the test of unit root. The null hypothesis is that the dataset being studied is non-stationary or has a unit root. As a result, stationarity testing was carried out as follows:

Table 4. 25

Unit Roots Test for Economic Factors

Variable	**Test Statistic**	**% Critical Value**	**5% Critical Value**	**0% Critical Value**	***P value -z(t)***	***Comment***
Lending interest rate (%)	-2.5397	-4.30982	-3.57424	-3.2273	0.395	Non-stationary
Inflation rate	-3.3363	-4.30982	-3.57424	-3.2273	0.084	Non-stationary
GDP growth (annual %)	-6.00223	-4.33933	-3.58753	-3.22923	0.0002	Stationary

Table 4.25's results showed that, with the exception of GDP growth (annual%) ($p = 0.0002 < 0.05$), all the variables under consideration had an Augmented Dickey-Fuller probability statistic of more than 0.05. Thus, the variables (Lending interest rate (%) and Inflation rate) were found Non-stationary except for GDP growth (annual %) which was stationary necessitating the first difference.

Table 4. 26

First Difference Unit Roots Test for Economic Factors

Variable	Test Statistic	% Critical Value	5% Critical Value	0% Critical Value	*P value -z(t)*	*Comment*
Lending interest rate (%)	-5.3757	-4.32398	-3.58062	-3.22533	0.00	Stationary
Inflation rate	-8.086	-4.33933	-3.58753	-3.22923	0.000	Stationary

Table 4.26 shows that Lending interest rate (%) and Inflation rate were stationary at first difference (since *p-value (Lending interest rate (%)) = 0.00>0.05; p-value (Inflation rate) = 0.000>0.05)*. The implication for inducing stationarity in Lending interest rate (%) and Inflation rate is so that the resultant series will be mean reverting and will not lead to spurious relationships when regressed with other variables. Spurious relationships mostly arise due to presence of common trends across variables.

Unit roots test for Demographic factors

The null hypothesis of the study was that the series under investigation is non-stationary or has a unit root, and it was tested using the Augmented Dickey-Fuller (ADF) approach and unit root test as indicated below:

Table 4. 27

Unit Roots Test for Demographic Factors

Variable	Test Statistic	% Critical Value	5% Critical Value	0% Critical Value	P value - z(t)	Comment
Fertility Rate	-6.00223	-4.33933	-3.58753	-3.22923	0.0002	Stationary
Infant Mortality	-0.4608	-4.32398	-3.58062	-3.22533	0.9796	Non-stationary
% of working-age population	-2.86087	-4.32398	-3.58062	-3.22533	0.893	Non-stationary

Table 4.27's findings showed that all of the study's variables had Augmented Dickey-Fuller probability statistics greater than 0.05, with the exception of Fertility Rate (p = 0.0002 0.05). Thus, the variables (Infant Mortality and percentage of working-age population) were found Non-stationary except for Fertility Rate which was stationary necessitating the first difference.

Table 4. 28

First Difference Unit Roots Test for Demographic Factors

Variable	Test Statistic	% Critical Value	5% Critical Value	0% Critical Value	P value - z(t)	Comment
Infant Mortality	-.499	-4.32398	-3.58062	-3.22533	0.8057	Non-stationary
% of working-Age population	-.42844	-4.32398	-3.58062	-3.22533	0.8297	Non-stationary

Table 4.28 shows that Infant Mortality and percentage of working-age population were not stationary at first difference (since *p-value (Infant Mortality) = 0.8057>0.05; p-value (percentage of working-age population) = 0.8297>0.05)*. Since the variables (Infant Mortality and percentage of working-age population) were found Non-stationary, it is necessary to analyse the second difference

Table 4. 29

Second difference Unit Roots Test for Demographic Factors

Variable	**Test Statistic**	**% Critical Value**	**5% Critical Value**	**0% Critical Value**	***P value - z(t)***	***Comment***
Infant Mortality	-3.88206	-4.33933	-3.58753	-3.22923	0.0272	Stationary
% of working-Age population	-5.765	-4.33933	-3.58753	-3.22923	0.004	Stationary

Table 4.29 shows that Infant Mortality and percentage of working-age population were stationary at second difference (since *p-value (Infant Mortality) = 0.0272>0.05; p-value (percentage of working-age population) = 0.004>0.05)*. The implication for inducing stationarity in Infant Mortality and percentage of working-age population is so that the resultant series will be mean reverting and will not lead to spurious relationships when regressed with other variables. Spurious relationships mostly arise due to presence of common trends across variables.

Unit roots test for Social factors

The Augmented Dickey-Fuller (ADF) approach was utilized in the research to determine the stationarity criteria of the series data and the test of unit root. The null hypothesis is

that the dataset being studied is non-stationary or has a unit root. As a result, stationarity testing was carried out as follows:

Table 4. 30

Unit Roots Test for Social Factors

Variable	**Test Statistic**	**% Critical Value**	**5% Critical Value**	**0% Critical Value**	***P value - z(t)***	***Comment***
Primary education enrollment	-.535	-4.30982	-3.57424	-3.2273	0.8022	Non-stationary
People using at least basic sanitation services	-2.5348	-4.30982	-3.57424	-3.2273	0.307	Non-stationary
Current health expenditure per capita	-3.53506	-4.3943	-3.622	-3.24308	0.058	Non-stationary

Table 4.30's findings showed that all of the variables (including enrollment in primary school, use of at least basic sanitation facilities, and current health spending per capita) had an Augmented Dickey-Fuller probability statistic of more than 0.05. The variables were therefore discovered to be non-stationary, requiring the first difference.

Table 4. 31

First Difference Unit Roots Test for Social Factors

Variable	**Test Statistic**	**% Critical Value**	**5% Critical Value**	**0% Critical Value**	***P value -z(t)***	***Comment***
Primary education enrollment	-5.88688	-4.32398	-3.58062	-3.22533	0.0002	Stationary
People using at least basic sanitation services	-5.67073	-4.32398	-3.58062	-3.22533	0.0004	Stationary
Current health expenditure per capita	-7.3607	-4.32398	-3.58062	-3.22533	0.000	Stationary

Table 4.31 demonstrates that the first difference was stationary for Primary education enrollment, People using at least basic sanitation services, and Current health expenditure per capita (since the p-values for these variables are 0.0002>0.05 for Primary education enrollment, 0.0004>0.05 for People using at least basic sanitation services, and 0.000>0.05 for Current health expenditure per capita).The implication for inducing stationarity in Primary education enrolment, People using at least basic sanitation services, and Current health expenditure per capita is so that the resultant series will be mean reverting and will not lead to spurious relationships when regressed with other variables. Spurious relationships mostly arise due to presence of common trends across variables.

Unit roots test for Technological factors

Through the use of the unit root test and the Augmented Dickey-Fuller (ADF) approach, the study determined the stationarity conditions of the data series. The stationarity testing results are as follows:

Table 4. 32

Unit Roots Test for Technological Factors

Variable	Test Statistic	% Critical Value	5% Critical Value	0% Critical Value	P value - z(t)	Comment
% of population - Individuals using Internet	-.777	-4.30982	-3.57424	-3.2273	0.6897	Non-stationary
Fixed broadband subscriptions (per 100 people)	4.97276	-4.3943	-3.622	-3.24308	.000	Non-stationary
Mobile cellular subscriptions (per 100 people)	-.90533	-4.33933	-3.58753	-3.22923	0.624	Non-stationary

All of the variables (% of population - Individuals utilizing the internet, fixed broadband subscribers (per 100 people), and Mobile cellular subscriptions (per 100 people)) under consideration had an Augmented Dickey-Fuller probability statistic of higher than 0.05, according to the data in Table 4.32. The variables were therefore discovered to be non-stationary, requiring the first difference.

Table 4. 33

First Difference Unit Roots Test for Technological Factors

Variable	Test Statistic	% Critical Value	5% Critical Value	0% Critical Value	P value - z(t)	Comment
% of population - Individuals using Internet	-3.8362	-4.324	-3.5806	-3.2253	0.0294	Stationary
Fixed broadband subscriptions (per 100 people)	4.06096	-4.4679	-3.645	-3.2645	0	Non-stationary
Mobile cellular subscriptions (per 100 people)	-2.893	-4.324	-3.5806	-3.2253	0.795	Non-stationary

Table 4.33 shows that Current health expenditure per capita were stationary at second difference (since *p-value (Current health expenditure per capita) = 0.0294>0.05).* Fixed broadband and mobile cellular subscriptions (per 100 persons) (per 100 people) were not stationary at first difference (since *p-value (Fixed broadband subscriptions) = .000>0.05; p-value (Mobile cellular subscriptions) = 0.795>0.05)*. Since the variables (Fixed broadband subscriptions and Mobile cellular subscriptions) were found Non-stationary, it is necessary to analyze the second difference

Table 4. 34

Second Difference Unit Roots Test for Technological Factors

Variable	Test Statistic	% Critical Value	5% Critical Value	0% Critical Value	P value -z(t)	Comment
Fixed broadband subscriptions (per 100 people)	-7.557	-4.3561	-3.595	-3.2335	0	Stationary
Mobile cellular subscriptions (per 100 people)	-7.442	-4.3393	-3.5875	-3.2292	0	Stationary

Table 4.34 shows that Fixed broadband and mobile cellular subscriptions (per 100 persons) (per 100 people) were stationary at second difference (since *p-value (Fixed broadband subscriptions) = 0.000>0.05; p-value (Mobile cellular subscriptions) = 0.000>0.05)*. The implication for inducing stationarity in Fixed broadband subscriptions and Mobile cellular subscriptions is so that the resultant series will be mean reverting and will not lead to spurious relationships when regressed with other variables. Spurious relationships mostly arise due to presence of common trends across variables.

Unit roots test for Government policies

Through the use of the unit root test and the Augmented Dickey-Fuller (ADF) approach, the study determined the stationarity conditions of the data series. The stationarity testing results are as follows:

Table 4. 35

Unit Roots Test for Government Policies

Variable	Test Statistic	% Critical Value	5% Critical Value	0% Critical Value	P value -z(t)	Comment
Government expenditure	-0.8722	-4.3098	-3.5742	-3.2273	0.6428	Non-stationary
Broad money (% of GDP)	-2.3747	-4.324	-3.5806	-3.2253	0.3839	Non-stationary
External debt stocks	-0.369	-4.3098	-3.5742	-3.2273	0.984	Non-stationary

All of the variables under consideration (Government expenditure, Broad money (% of GDP), and External debt stocks) had an Augmented Dickey-Fuller probability statistic of more than 0.05, according to the data in Table 4.35. The variables were therefore discovered to be non-stationary, requiring the first difference.

Table 4. 36

First Difference Unit Roots Test for Government Policies

Variable	Test Statistic	% Critical Value	5% Critical Value	0% Critical Value	P value -z(t)	Comment
Government expenditure	-4.6858	-4.324	-3.5806	-3.2253	0.0043	Stationary
Broad money (% of GDP)	-6.2934	-4.324	-3.5806	-3.2253	0	Stationary
External debt stocks	-4.739	-4.324	-3.5806	-3.2253	0.004	Stationary

Table 4.36 shows that Government expenditure, Broad money (% of GDP) and External debt stocks were stationary at first difference (since *p-value (Government expenditure) = 0.0043>0.05; p-value (Broad money (% of GDP)) = 0.000>0.05; p-value (External debt stocks) = 0.004>0.05)*. The implication for inducing stationarity in Government expenditure, Broad money (% of GDP) and External debt stocks is so that the resultant series will be mean reverting and will not lead to spurious relationships when regressed with other variables. Spurious relationships mostly arise due to presence of common trends across variables.

4.9 Linear Regression test

Linear Regression test for Economic factors

Regression analysis was employed to examine the connection between the predictors' variables and the criterion variable. It was measured how closely the independent and dependent variables related to one another. To determine how strong the association between the different parameters related to economic (GDP growth (annual %), Lending interest rate (%), and Inflation rate) and the dependent variable, the T-test statistic and the R2 Test statistic were computed (Uptake of mortgage).

Using regression analysis, assess how Economic factors influenced the uptake of mortgage.

Table 4. 37

Model Summary for Economic Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
	.819[a]	.672	.654	60.526046	.264

a. Predictors: (Constant), GDP growth (annual %) , Lending interest rate (%), Inflation rate
b. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

The findings in Table 4.37 showed how well the regression model suited the phenomena under examination. It was determined that economic variables adequately influenced the

uptake of mortgage finance. The R2 of 0.672, provided support for this. This demonstrates that economic variables account for 67.2% of mortgage loan uptake. This suggests that additional factors that were not included in the model explained 32.8 percent of the change in the dependent variable.

Table 4. 38

ANOVA for Economic Factors

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	5570.43	3	8390.38	5.020	.007b
	Residual	95248.458	26	3663.402		
	Total	5048.87	29			

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)
b. Predictors: (Constant), GDP growth (annual %) , Lending interest rate (%), Inflation rate

The outcomes of the analysis of the variance were presented in Table 4.38. (ANOVA). The model's statistical significance was demonstrated by the findings. An F statistic of 5.020 and the computed sig value (0.007), which was below the usual probability of 0.05 significant level, corroborated this. The findings suggested that economic considerations are a reliable determinant of mortgage loan uptake.

Table 4. 39

Regression Coefficients for Economic Factors

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	185.456	48.192		3.848	.001
Lending interest rate (%)	-4.551	1.789	-.439	-2.544	.017
Inflation rate	-1.020	1.35	-.135	-.755	.457
GDP growth (annual %)	5.190	5.290	.179	.981	.336

Uptake of mortgage accounts = 85.456 - 4.55 Lending Interest rate - 1.02 Inflation rate + 5.190 GDP Growth.

Table 4.39's regression of coefficient findings showed a significant inverse relationship between lending interest rate (%) and uptake of mortgage finance (B = -4.55, p=0.07). Mortgage finance uptake and inflation rate have an inverse but negligible relationship (r = -1.020, p=0.457). The relationship between GDP growth (annual %) and mortgage financing uptake is positive but not statistically significant (r = 5.90, p=0.336). According to Nasir and Abdullah (2019), Kenya's financial sector liberalization and rising middle class have contributed to steady expansion in mortgage uptake throughout

the years. Further Soon and Tan (2019) posited that high interest margins for term financing is leads to the surplus to the capital market rates set by the yield curves.

Linear Regression test for Demographic factors

To evaluate the impact of demographic characteristics on mortgage uptake, regression analysis was used. It was measured how closely the independent and dependent variables related to one another. To assess the strength of the association between the major demographic indicators (% of the working-age population, infant mortality, fertility rate), the T-test statistic and the R2 Test statistic were produced (Uptake of mortgage).

Table 4. 40

Model Summary for Demographic Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
	.83[a]	.691	.680	7.166778	1.110

a. Predictors: (Constant), % of working-age population, Infant Mortality, Fertility Rate
b. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

The findings in Table 4.40 showed how well the regression model suited the phenomena under examination. It was determined that demographic considerations contributed to the uptake of mortgage finance in a suitable manner. The coefficient of determination, or R square, of 0.691, corroborated this. This demonstrates that demographic

considerations account for 69.1% of mortgage financing uptake. This suggests that additional factors outside the scope of the model account for 30.9% of the variation in the dependent variable.

Table 4. 41

ANOVA for Demographic Factors

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	49083.441	3	49694.480	967.521	.000[b]
Residual	335.430	26	5.363		
Total	150418.871	29			

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)
b. Predictors: (Constant), % of working-age population, Infant Mortality, Fertility Rate

The findings from the study of the variance are presented in Table 4.41. (ANOVA). The model's statistical significance was demonstrated by the findings. An F statistic of 967.521 and a reported p value (0.000), which was lower than the usual significance level of 0.05, corroborated this. The findings suggested that demographic characteristics are a reliable indicator of mortgage finance uptake. Similarly, Laamanen (2019) observed that increasing the size of the household would result to new demand for residential properties. A study in Germany and Switzerland by Kuhn and Grabka (2018) established that increased life expectancy in these countries have positively influenced wealth creation and home ownership. Segal and Sullivan's (2018) concordant findings in

Chicago revealed that life expectancy significantly increases the likelihood of property ownership.

Table 4. 42

Regression Coefficients for Demographic Factors

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	310.668	26.450		11.746	.000
Fertility Rate	-218.96	9.605	-2.288	-22.717	.000
Infant Mortality	1.167	.373	.215	3.127	.004
% of working-age population	8.766	.693	1.145	12.642	.000

Uptake of mortgage accounts = 310.668 - 218.196 Fertility Rate + 1.167 Infant Mortality + 8.766% of working-age population.

According to the regression of coefficient values in Table 4.42, there is a substantial and inverse relationship between the fertility rate and the uptake of mortgage finance (β = -218.196, p=0.000). Infant Mortality and Mortgage Financing Uptake are strongly and positively correlated (β = 1.167, p=0.004). Intake of mortgage finance and the percentage of the population who are of working age are positively and strongly correlated (r = 8.766, p=0.000).

Wyatt (2018) found that young adult homeowners between the ages of 25 and 34 had changing socio-demographic traits that have an impact on their propensity to own a property Majid et al. (2012) evaluated the impact of Buyers' Demography on Property in Malaysia Purchasing and showed that demographic factors including gender, marital status and employment significantly affect property criteria that a potential buyer considers before purchasing a house. Garmaise, and Natividad, (2017) noted that age is also a significant factor of property criteria. He noted that retirees may prefer purchases of housing units that are simple in design with some degree of flexibility in movement inside. Soon and Tan (2019) noted that affordable housing mandate had an impact on the mortgage sector. He also established that housing projects that had low income are situated in cheap lands.

Linear Regression test for Social factors

To investigate the impact of social determinants on mortgage uptake, regression analysis was used. It was measured how closely the independent and dependent variables related to one another. To assess the strength of the association between the major social determinants (current health spending per capita, enrolment in primary education, and people utilizing at least basic sanitation services), the T-test statistic and the R2 Test statistic were computed (Uptake of mortgage).

Table 4. 43

Model Summary for Social Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.974[a]	.949	.943	17.166533	.464

a. Predictors: (Constant), Current health expenditure per capita, Primary education enrollment, People using at least basic sanitation services
b. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

The findings in Table 4.43 showed how well the regression model suited the phenomena under examination. Social variables were shown to contribute to the uptake of mortgage finance in an acceptable manner. The R square of 0.949, or the coefficient of determination, provided support for this. This demonstrates that social considerations account for 94.9% of mortgage loan uptake. Additionally, it suggests that additional factors outside the scope of the model account for 5.0% of the variance in the dependent variable.

Table 4. 44

ANOVA for Social Factors

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	142756.935	3	47585.645	161.477	.000[b]
Residual	7661.936	26	294.690		
Total	**150418.871**	**29**			

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

b. Predictors: (Constant), Current health expenditure per capita, Primary education

enrollment, People using at least basic sanitation services

The outcomes of the analysis of the variance are shown in Table 4.44. (ANOVA). The model's statistical significance was demonstrated by the findings. An F statistic of 161.477 and the reported p value (0.000), which was below the usual probability of 0.05 significant level, corroborated this. The findings suggested that social variables are a reliable predictor of mortgage finance uptake.

Table 4. 45

Regression Coefficients for Social Factors

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-3490.745	1259.050		-2.773	.010
Primary education enrollment	-55.324	54.340	-.190	-1.018	.318
People using at least basic sanitation services	144.543	33.057	1.452	4.373	.000
Current health expenditure per capita	-.698	.888	-.301	-.786	.439

Uptake of mortgage accounts = -3490.745 - 55.324 Primary education enrollment + 144.543 People using at least basic sanitation services + 0.698 Current health expenditure per capita.

Primary school enrolment and mortgage finance uptake are inversely and insignificantly connected, according to the regression of coefficients findings in Table 4.45 (β = -55.324, p= 0.318). Use of mortgage finance and people utilizing at least basic sanitation services are positively and strongly correlated (β = 44.543, p = 0.000). Mortgage finance uptake and current per-person health spending have a negative but negligible relationship (β = -0.698, p=0.439). Education influences people to purchase houses (Yasmin, & Muhd, 2014). The diverse and distinct educational level of education among people translates to diversity in demands for distinct housing designs. The number of potential customers would decline as education levels rose, according to Morrel (20), within each 0-year period. Further, Kusuma (2017) conducted examined variables that affected housing ownership policies necessary to increase ownership of houses in Indonesia. The variables projected to affect the house ownership significantly and effectively were religion, culture and education among other factors. Moreover, Nepal (2016) interrogated the aspects that influence buying of houses among consumers in Kota Kinabalu. Better comprehending of elements that contribute to buyers' decision-making within the housing markets would benefit both the housing industry and buyers.

Linear Regression Test for Technological Factors

To ascertain the impact of technological elements on mortgage uptake, regression analysis was used. It was measured how closely the independent and dependent variables related to one another. To assess the strength of the connection between the

various technological factors (mobile cellular subscriptions (per 100 people), fixed broadband subscriptions (per 100 people), and the percentage of people using the Internet) and the dependent variable, the T-test statistic and the R2 Test statistic were computed (Uptake of mortgage).

Table 4. 46

Model Summary for Government Policies

Model	R	R2	Adj. R2	Std. Error of the Estimate	Durbin-Watson
1	.994[a]	.989	.987	8.067760	.913

a. Predictors: (Constant), Mobile cellular subscriptions (per 100 people) , Fixed broadband subscriptions (per 100 people), % of population - Individuals using Internet
b. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

The findings in Table 4.46 showed how well the regression model suited the phenomena under examination. It was determined that technological elements contributed to the uptake of mortgage finance in an acceptable manner. The coefficient of determination, or R square, of 0.989, corroborated this. This demonstrates that technological considerations account for 98.9% of mortgage finance uptake. Additionally, it suggests that extraneous factors outside the scope of the model account for 1.1% of the variation in the dependent variable.

Table 4. 47

ANOVA for Government Policies

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	148726.563	3	49575.521	761.660	.000[b]
Residual	1692.308	26	65.089		
Total	**150418.871**	**29**			

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)
b. Predictors: (Constant), Mobile cellular subscriptions (per 100 people) , Fixed broadband subscriptions (per 100 people), % of population - Individuals using Internet

The outcomes of the analysis of the variance are shown in Table 4.47. (ANOVA). The model's statistical significance was demonstrated by the findings. An F statistic of 761.660 and the reported p value (0.000), which was below the usual probability of 0.05 significant level, corroborated this. The findings suggested that technological characteristics are a reliable predictor of mortgage financing uptake.

Table 4. 48

Regression Coefficients for Government Policies

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	39.927	2.041		19.566	.000
% of population - Individuals using Internet	6.223	.922	.648	6.749	.000
Fixed broadband subscriptions (per 100 people)	-29.635	8.616	-.124	-3.440	.002
Mobile cellular subscriptions (per 100 people)	.840	.166	.451	5.046	.000

Uptake of mortgage accounts = 39.927 + 6.223 % of population - Individuals using Internet - 29.635 Fixed broadband subscriptions + 0.84 Mobile cellular subscriptions.

The proportion of people who use the Internet and the uptake of mortgage finance are positively and substantially associated, according to the regression of coefficient findings in Table 4.48 (β = 6.223, p=0.000). Mortgage finance uptake and fixed broadband subscriptions (per 100 persons) have a negative and significant relationship (β = -29.635, p=0.002). Mortgage finance uptake and mobile cellular subscriptions (per 100 persons) have a favorable and substantial relationship (β = 0.84, p=0.000). Yasmin and Muhd (2014) also note the critical influence that technology has had in home ownership. The advent of the internet has armed sellers and buyers alike with

information on products within the market offering vast opportunities to obtain and compare offerings based on factors such rates and costs. The technological boom has necessitated the adoption of new business models by property agents.

Krause (2016) observes that the housing industry involves usage of wide data sets that require big data since they are complicated and consume time. Hence technology simplifies the work of housing agents affording them time to focus on other roles. Furthermore, Tharian and Tharakan (2016) observed that consumers could access important information on property trends and other social factors including locality perceptions, sale patterns, price of houses, ancillary costs and crime rate from big data websites that may minimize regrets subsequent to purchase that may arise because of insufficiency of information per-purchase.

Linear Regression test for Government policies

To examine the impact of government initiatives on mortgage uptake, regression analysis was used. It was measured how closely the independent and dependent variables related to one another. To assess the strength of the association between the different government policies (External debt stocks, Government expenditures, and Broad Money (% of GDP)) and the dependent variable, the T-test statistic and the R2 Test statistic were produced (Uptake of mortgage).

Table 4. 49

Model Summary for Government Policies

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
	.784[a]	.616	.606	22.063621	.380

a. Predictors: (Constant), External debt stocks, Government expenditure, Broad money (% of GDP)
b. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

The findings in Table 4.49 showed how well the regression model suited the phenomena under examination. It was determined that government measures contributed satisfactorily to the uptake of mortgage lending. The R square of 0.616, or the coefficient of determination, provided support for this. This demonstrates that 6.16% of mortgage financing uptake may be attributed to government policy. This suggests that other factors that were not included in the model account for 38.4% of the variance in the dependent variable.

Table 4. 50

ANOVA for Government Policies

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	13776.984	3	45920.661	94.331	.000[b]
Residual	12656.887	26	486.803		
Total	150418.871	29			

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

b. Predictors: (Constant), External debt stocks, Government expenditure, Broad money (% of GDP)

The outcomes of the analysis of the variance were presented in Table 4.50. (ANOVA). The model's statistical significance was demonstrated by the findings. An F statistic of 94.33 and a reported p value (0.000), which was lower than the usual probability of 0.05 significant threshold, corroborated this. The findings suggested that government policies are a reliable predictor of mortgage finance uptake.

Table 4. 51

Regression Coefficients for Government Policies

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	-2330.323	29.46		-0.621	.000
Government expenditure	-.269	1.313	-0.14	-.205	.839
Broad money (% of GDP)	4.08	.495	.201	2.687	.012
External debt stocks	99.282	0.83	.808	9.750	.000

Uptake of mortgage accounts = -2330.323 – 0.269 Government expenditure + 4.018 Broad money (% of GDP) + 99.282 External debt stocks.

Government spending and the uptake of mortgage finance are inversely and negligibly associated, according to the regression of coefficient findings in Table 4.51 (β = -0.269,

p=0.839). Mortgage finance uptake and broad money (% of GDP) are positively and strongly correlated (β = 4.018, p = 0.02). Mortgage finance uptake and external debt stocks have a positive and substantial relationship (β = 99.282, p=0.000).

The necessity of a supportive macroeconomic, regulatory and legal environment for the growth of real estate is emphasized by Sommer and Sullivan (2018). Tan and Lee (208) provides more support for the idea that Sub-Saharan Africa's unfavorable macro related economic factors, institutional, legaland regulatory environments have an impact on the availability of financing for housing in the long run. The state administration might also participate in the mortgage intermediation market through organizations subject to special regulation and tax breaks provided they limit their lending to mortgages (Chiquier & Lea, 2016).

4.10 Hypothesis Testing

Hypothesis testing for the association between Economic Factors and Uptake of Mortgage financing

Through the use of linear regression, the hypothesis was examined. If the p value is larger than 0.05, the hypothesis is not rejected; however, if it is less than 0.05, the hypothesis is not accepted. The underlying null hypothesis was that Economic factors have no statistical significant effect on the uptake of mortgage financing for home ownership in Kenya.

Table 4. 52

Hypothesis Testing for Economic Factors

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	206.441	34.251		6.027	.000
Economic factors	-8.791	2.819	-.508	-3.119	.004

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Uptake of mortgage financing = 206.44 - 8.79 (Economic factors)

Results show that the p-value was 0.004<0.05. The beta coefficient is negative which implies that an increase in Lending interest rate, Inflation rate and GDP growth will inversely affect Uptake of mortgage financing. The calculated t-value was t_{cal} (-3.119)> $t_{critical}$ (1.96). This indicated that the null hypothesis was rejected. Therefore, economic factors have a statistical significant effect on the uptake of mortgage financing for home ownership in Kenya. Therefore, the study concluded that economic factors influence uptake of mortgage financing.

H_0: Economic factors have a statistical significant effect on the uptake of mortgage financing for home ownership in Kenya

4.10.2 Hypothesis Testing for the relationship between Demographic factors and Uptake of Mortgage financing

Utilizing linear regression, the hypothesis was evaluated. The p value had to be larger than 0.05 in order for the Ho to be accepted, whereas it had to be less than 0.05 for the Ho to be rejected.

Table 4. 53

Hypothesis Testing for Demographic Factors

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	50.699	35.576		14.102	.000
Demographic factors	-8.457	.750	-.905	-11.272	.000

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Uptake of mortgage financing = 501.699 - 8.457 (Demographic factors)

Demographic characteristics did not statistically significantly affect Kenya's use of mortgage finance for home ownership, according to the null hypothesis. According to the findings, the p-value was 0.0000.05. The t-value was determined as tcal (-11.272)> tcritical (1.96). This demonstrated the rejection of the null hypothesis. Therefore, Demographic factors have a statistical significant effect on the uptake of mortgage financing for home ownership in Kenya. Therefore, the study concluded that Demographic factors influence uptake of mortgage financing.

H_{02}: Demographic factors have a statistical significant effect on the uptake of mortgage financing for home ownership in Kenya.

Hypothesis Testing for the association between Social factors and Uptake of Mortgage financing

Through the use of linear regression, the hypothesis was examined. If the p value is larger than 0.05, the Ho is not rejected, but if it is less than 0.05, the Ho is not accepted, according to the acceptance/rejection criterion. Social variables had no statistically significant impact on Kenya's adoption of mortgage finance for house ownership, according to the null hypothesis.

Table 4. 54

Hypothesis Testing for Social Factors

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	-257.227	21.965		-11.711	.000
Social factors	6.430	.382	.954	16.813	.000

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Uptake of mortgage financing = -257.227 + 6.43 (Social factors)

According to the findings, the p-value was 0.0000.05. Tcal (16.813)>tcritical was the computed t-value (1.96). This demonstrated the rejection of the null hypothesis.

Therefore, Social factors have a statistical significant effect on the uptake of mortgage financing for home ownership in Kenya. Therefore, the study concluded that Social factors influence uptake of mortgage financing.

H_{03}: Social factors have a statistical significant effect on the uptake of mortgage financing for home ownership in Kenya

Hypothesis Testing for the relationship between Technological factors and Uptake of Mortgage financing

Through the use of linear regression, the hypothesis was examined. If the p value is larger than 0.05, the Ho is not rejected, but if it is less than 0.05, the Ho is not accepted, according to the acceptance/rejection criterion. The null hypothesis stated that there is no statistically significant relationship between technological characteristics and Kenya's use of mortgage finance for home ownership.

Table 4. 55

Hypothesis Testing for Technological Factors

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	40.942	2.824		14.498	.000
Technological factors	4.614	.137	.988	33.792	.000

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Uptake of mortgage financing = 40.942+ 4.614 (Technological factors)

According to the findings, the p-value was 0.000<0.05. The t-value was determined as tcal (33.792)>tcritical (1.96). This demonstrated the rejection of the null hypothesis. Therefore, there is no statistically significant impact of technological elements on the uptake of mortgage financing for home ownership in Kenya. Therefore, the study concluded that Technological factors influence uptake of mortgage financing.

H_{04}: Technological factors has no statistical significant effect on the uptake of mortgage financing for home ownership in Kenya.

Hypothesis Testing for the relationship between Government policies and Uptake of Mortgage financing

Through the use of linear regression, the hypothesis was examined. If the p value is larger than 0.05, the Ho is not rejected, but if it is less than 0.05, the Ho is not accepted,

according to the acceptance/rejection criterion. The null hypothesis stated that there is no statistically significant relationship between government actions and Kenya's use of mortgage finance for home ownership.

Table 4. 56

Hypothesis Testing for Government Policies

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-326.554	243.784		-1.340	.191
Government policies	15.706	8.843	.318	1.776	.087

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Uptake of mortgage financing = -326.554 + 15.706 (Government policies)

According to the findings, the p-value was 0.087>0.05. Tcal (1.776) Tcritical was used to determine the t-value (1.96). It was clear from this that the null hypothesis was accepted. Consequently, there is no statistically significant impact of government policies on the uptake of mortgage financing for home ownership in Kenya. Therefore, the study concluded that Government policies does not influence uptake of mortgage financing.

H_{05}: Government policies have no significant moderating effect on the uptake of mortgage financing for home ownership in Kenya.

4.11 Relationship between economic, demographic, social, technological and government policy with uptake of mortgage financing

In order to determine how closely two variables co-vary, a correlation is utilized. It ranges from -, which is referred to as a perfect negative correlation, through 0 or no correlation to +, which is referred to as a perfect positive correlation (Asal, 2018)). The correlation coefficient, which measures correlation, gauges the strength of the seeming linear relationship between the two variables under consideration (Asal, 2018).

In contrast to a correlation coefficient of -1 or +1, which denotes a perfectly linear relationship, a correlation coefficient of zero shows the absence of any linear relationship between two continuous variables. The correlation coefficient approaches one as the strength of the connection between the variables increases (Gambo, 2022). The variables are directly associated if the coefficient is positive, which means that if the value of one variable rises, the value of the other variable likewise tends to rise. The variables, however, are inversely connected if the coefficient is negative, which means that if the value of one variable rises, the value of the other variable falls (Asal, 2018).

Table 4. 57

Strength of Relationship between Study Variables

		UP	EF	DF	SF	TF	GP
UP	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	30					
EF	Pearson Correlation	-.508**	1				
	Sig. (2-tailed)	.004					
	N	30	30				
DF	Pearson Correlation	-.905**	.684**	1			
	Sig. (2-tailed)	.000	.000				
	N	30	30	30			
SF	Pearson Correlation	.954**	-.549**	-.959**	1		
	Sig. (2-tailed)	.000	.002	.000			
	N	30	30	30	30		
TF	Pearson Correlation	.988**	-.526**	-.924**	.971**	1	
	Sig. (2-tailed)	.000	.003	.000	.000		
	N	30	30	30	30	30	
GP	Pearson Correlation	.318	-.633**	-.455*	.327	.289	1
	Sig. (2-tailed)	.087	.000	.012	.077	.122	
	N	30	30	30	30	30	30

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

KEY: UP = Uptake of mortgage (Number of Mortgage Accounts); **TF** = Technological Factors **DF** = Demographic Factors; **EF** = Economic Factors; **SF** = Social Factors; and **GP** = Government Policies

The findings of this study demonstrate a substantial correlation between economic considerations and property ownership (r = -0.508, p = 0.004). According to further findings, property ownership was significantly positively correlated with demographic

characteristics (r = -0.905, p 0.00). Home ownership and social characteristics were significantly positively correlated (r = 0.954, p 0.001). Additionally, according to the study's findings, technical aspects were positively and significantly associated with house ownership (r = 0.988, p 0.00). The study's findings, however, showed that there was no correlation between government policy and property ownership (r = 0.38, p = 0.087).

Consistent with Wyatt (2018) these results suggest that changing socio-demographic characteristics had an impact on their propensities for home ownership as seen from the significant correlation between demographic and home ownership and between social factors and home ownership. It was also found that the more the adoption of technology the more would be home ownership (r = 0.456, p < 0.00).

Further, in Indonesia, Kusuma (2017) conducted an analysis of factors affecting house ownership. The results showed that education and culture had significant positive effects on home ownership while culture did not have a significant effect. The findings of this study provided support to this previous finding because social factors were found to be significantly correlated with home ownership.

Lastly, as already noted Asal (2018), technological advancement enables prospective homeowners to communicate with friends and families abroad locally, conduct research, and engage in buying property. Data in his study suggests a positive significant interrelation between technological factors and home ownership hence the need to

promote technology particularly the ICTs and technologies associated with the housing construction. It is thus important that big data technology be leveraged by mortgage financiers to reach more customers because through big data websites as stated by Mathew et al. (2015), customers can get important market information.

Findings reveal that economic factors had a significant relationship with home ownership ($r = -0.508$, $p = 0.004$). The cost of purchasing a home will vary based on a number of factors, the most significant of which are the price of the home and the interest rate. The data on home prices and household income suggest that structural affordability difficulties face the housing market. A majority of financial companies' experience losses as a result of an increase in general interest rates, whether in terms of the value of their assets or profits. As a result, when the interest rates on these institutions' capital and future profits fluctuate, the interest rate risk that results is that of interest rate fluctuation (Dolde, 2016). Consequently, lenders would be exposed to this risk if the rate of interest on obligations and assets were modified at separate periods or if the liabilities and assets were subject to differing maturity dates (Nayyab et al., 2019). In this way, the rate of interest plays an important role in determining the net revenue of lenders, with changes in the rate having an impact on the actions of borrowers, particularly those who are looking to refinance or reinvest. It has been demonstrated in studies that higher salaries per person boost home affordability, which may have a favourable influence on mortgage financing. Increased salaries may also help to promote economic confidence and job stability, which may in turn encourage further borrowing.

When a household utilizes increased income to repay debt, the association between mortgage debt and income is nullified, for example, since debt-free ownership is thought to elevate social standing, the relationship between mortgage debt and income is eliminated. In Kenya, income levels are both unequally distributed and low, posing a significant hurdle to the development of a viable mortgage market in the country. It has been proposed that the following characteristics of an ideal mortgage financing system for a household based on income should be present: first, there must be a sufficient absolute level of income (ADB, 2019), where households earn enough to meet their mortgage obligations on time while also meeting their recurrent expenses within the household.

A favorable tax environment for mortgages, according to the World Bank (2018), is one of the factors that contribute to a higher demand for home loans. On the contrary, theoretical studies have demonstrated that tax impartiality in the housing market is necessary for the sake of equality and effectiveness in the market (Hoppe, & Schmitz, 2020).

Van Noppen (2016) conducted an investigation into the implications of taxation advantages on mortgage loan adoption and realized that the consequence was statistically insignificant. Specifically, he believes that the connection between demand and supply in the rental housing market, as well as in the owner-occupied housing market, is what influences mortgage loan demand. Furthermore, according to Garmaise

and Natividad (2017), financial innovation, rather than tax policy, is the primary factor in the determination for mortgages, as most people are able to purchase a home as a result of this innovation. As a result, there is limited information to support the claim that tax changes have a significant impact on mortgage loan uptake, and this necessitates further investigation.

Further results show that demographic factors had a significant positive relationship with home ownership ($r = -0.905$, $p < 0.00$). Majid et al. (2012) assessed, in Malaysia, the effect of Buyers' Demography on Property Purchasing. The results showed that demographic factors including gender, marital status and employment significantly affect property criteria that a potential buyer considers before purchasing a house. A study in Germany and Switzerland by Kuhn and Grabka (2018) established that the two countries, owning a home is considered critical indicator of wealth and financial stability. The study established that home ownership is linked to life expectancy in two ways. First, people who live longer are expected to have many productive years and hence can save more towards buying a home.

A study by Segal and Sullivan (2018) in Chicago, United States investigated the trends in home ownership and is strongly associated with planning for financial future by Americans. Different types of credit institutions are in existence with cheat rates and simple terms and conditions. However, recklessly borrowing from such facilities may put the person in a fix, denying a chance to borrow meaningful and long-term loans such

as house loans. According to Ngacha (2020), misuse of credit institutions hinders someone from attaining financial responsibilities and end up taking shylock loans that are very risky and overly charged.

Social factors had a significant positive association with home ownership ($r = 0.954$, $p < 0.00$). People's decision to purchase a home is influenced by their education (Yasmin, & Muhd, 2014). People's educational levels are diverse and distinct, which translates into a diversity of demands for a variety of housing designs that are distinct from one another. High levels of education may encourage the purchase of expensive housing units, whereas a low level of education may discourage a person's desire to purchase a housing unit. Indonesian researchers, led by Kusuma (2017), investigated variables that affected housing ownership policies, which are necessary to increase home ownership. They discovered that education and culture had statistically significant positive effects on home ownership.

The study results show that technological factors had a positive and significant association with home ownership ($r = 0.988$, $p < 0.00$). In India, a research by Jain and Mandot (2012) examined the influence of technology on the choices of investors in the state of Rajasthan. According to the findings of the research, the use of technology in building, such as prefab technology, has helped bridge the gap between money, time, and efficiency for projects of mass housing that are part of India's Smart Cities Initiative. Another research by Wyatt (2018) found that the proliferation of smart phones, as well

as the availability of inexpensive and faster bandwidth, has transformed the internet into a utility that is accessible to the majority of householders. Individuals who want to become homeowners may communicate with family and friends, do research, and participate in the process of purchasing real estate.

Yasmin and Muhd (2014) also point out that technology has had a significant impact on the process of house ownership. Today, calling real estate brokers is not always the initial step in the home-buying process, as purchasers are increasingly beginning the process by internet browsing to gather information on prospective purchases based on their own tastes before contacting the agents themselves. With the introduction of the internet, suppliers and consumers alike now have access to a wealth of information about items available on the market, providing extensive chances to receive and evaluate offers based on characteristics such as rates and prices. As a result of the technology revolution, real estate brokers have been forced to embrace new business models. They are now using technologies and platforms to exhibit the residential homes they have available, which has had a great impact on their sales.

4.12 Moderating effect of government policy on the relationship between factors and uptake of mortgage financing

The relationship's moderating impact of government policy between factors that affect mortgage financing and its actual uptake was assessed in two steps as follows.

Before Moderation

The factors influencing the use of mortgage finance were identified by regression analysis. It was measured how closely the independent and dependent variables related to one another. To assess the strength of the association between the main variables of mortgage finance uptake (technological factors, economic factors, demographic factors, and social factors), the T-test statistic and the R2 Test statistic were computed (Uptake of mortgage).

Table 4. 58

Overall Model Summary before Moderation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.988[a]	.977	.973	11.844633

a. Predictors: (Constant), Technological factors , Economic factors, Demographic factors, Social factors

The findings in Table 4.58 showed how well the regression model suited the phenomena under examination. The factors that affect the adoption of mortgage finance have been shown to be satisfactorily significant. The R square of 0.977, or the coefficient of determination, provided support for this. This demonstrates that factors influencing the uptake of mortgage finance account for 97.7% of that uptake. This suggests that additional factors that were not included in the model account for 2.3% of the variance in the dependent variable.

Table 4. 59

ANOVA before Moderation

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	146911.488	4	36727.872	261.790	.000b
Residual	3507.383	25	140.295		
Total	150418.871	29			

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

b. Predictors: (Constant), Technological factors , Economic factors, Demographic factors, Social factors

The outcomes of the analysis of the variance were presented in Table 4.59. (ANOVA). The model's statistical significance was demonstrated by the findings. An F statistic of 261.790 and the reported p value (0.000), which was below the usual probability of 0.05 significant level, confirmed this.

Table 4. 60

Regression Coefficients before Moderation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	70.730	116.954		.605	.551
Economic factors	.224	.851	.013	.263	.795
Demographic factors	-.058	1.365	-.006	-.043	.966
Social factors	-.632	1.273	-.094	-.496	.624
Technological factors	5.045	.601	1.080	8.387	.000

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Economic determinants and the uptake of mortgage finance are favorably and insignificantly associated, according to the regression of coefficients found in Table 4.60 (β = 0.224, p= 0.795). The relationship between demographic characteristics and mortgage financing uptake is inverse and not statistically significant (β= -0.058, p=0.966). The relationship between social characteristics and mortgage financing uptake is inverse and negligible (r = -0.632, p=0.624). The use of mortgage finance and technological elements are favourably and strongly correlated (r = 5.045, p 0.000).

After Moderation

Regression analysis was used to identify the factors that influence the use of mortgage financing and how governmental regulations affect the use of mortgage financing for house ownership. It was measured how closely the independent and dependent variables

related to one another. The T-test statistic and the R2 Test statistic were computed to determine the relationship strength between the different factors that influence mortgage financing uptake (technological, economic, demographic, and social factors) and the criterion variable (mortgage uptake), as well as the moderating impact of governmental policies on the relationship.

Table 4. 61

Overall Model Summary after Moderation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.990[a]	.980	.976	11.217512

a. Predictors: (Constant), Government policies, Technological factors , Economic factors, Demographic factors, Social factors

The outcome in Table 4.61 demonstrated the suitability of the regression model utilized to describe the study phenomena. The contribution of the factors influencing the adoption of mortgage finance was found to be adequate, with the moderating influence of governmental policies. The coefficient of determination, or R square, of 0.980, corroborated this. The value of r-squared after moderation is higher than the value of r-squared before moderation (R square of 0.977).

Table 4. 62

ANOVA after Moderation

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	147398.889	5	29479.778	234.278	.000[b]
Residual	3019.982	24	125.833		
Total	**15048.871**	**29**			

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)
b. Predictors: (Constant), Government policies, Technological factors , Economic factors, Demographic factors, Social factors

The findings from the study of the variance are shown in Table 4.62. (ANOVA). The model was statistically significant, according to the data. An F statistic of 234.278 and a reported p value (0.000), which was lower than the usual significance level of 0.05, corroborated this.

Table 4. 63

Regression Coefficients after Moderation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-79.327	134.467		-.590	.561
Economic factors	.831	.863	.048	.963	.345
Demographic factors	.523	1.326	.056	.394	.697
Social factors	-.442	1.209	-.066	-.366	.718
Technological factors	5.168	.573	1.107	9.018	.000
Government policies	3.758	1.910	.076	1.968	.061

a. Dependent Variable: Uptake of mortgage (Number of Mortgage Accounts)

Regression of coefficients results in Table 4.63 revealed that Economic factors and Uptake of mortgage financing are positively and insignificantly related (t=.963, p= .345 >.05). Demographic factors and Uptake of mortgage financing are positively and insignificantly related (t= .394, p=.697>.05). Social factors and Uptake of mortgage financing are inversely and insignificantly related (t=-.366, p=0.718). Technological factors and Uptake of mortgage financing are positively and significantly related (t=1.968, p<0.00<.05). Government policies and Uptake of mortgage financing are positively and insignificantly related (t = .968, p=.06>.05).

4.13 Summary of Hypothesis

Table 4. 64

Summary of Hypotheses

Null Hypothesis	t-Calculated	t-critical	P value	Conclusion
H_0: Economic factors have no statistical significant effect on the uptake of mortgage financing for home ownership in Kenya	-3.9	0.96	0.004	The null hypothesis was rejected indicating there is significant relationship between Economic factors and uptake of mortgage financing for home ownership. Due to the computed t value being higher than the crucial t value and the accompanying p value being lower than 0.05, this occurred.
H02: Demographic factors have no statistical significant effect on the uptake of mortgage financing for home ownership in Kenya	-0.272	0.96	0	The null hypothesis was rejected indicating there is significant relationship between Demographic factors and uptake of mortgage financing for home ownership. Due to the computed t value being higher than the crucial t value and the accompanying p value being lower than 0.05, this occurred.
H_{03}: Social factors have no statistical significant effect on the uptake of mortgage financing for home ownership in Kenya	6.83	0.96	0	The null hypothesis was rejected indicating there is significant relationship between Social factors and uptake of mortgage financing for home ownership. Due to the computed t value being higher than the crucial t value and the accompanying p value being lower than 0.05, this occurred.
H_{04}: Technological factors have no statistical significant effect on the on the uptake of mortgage financing for home ownership in Kenya	33.792	0.96	0	The null hypothesis was rejected indicating there is significant relationship between Technological factors and uptake of mortgage financing for home ownership. Due to the computed t value being higher than the crucial t value and the accompanying p value being lower than

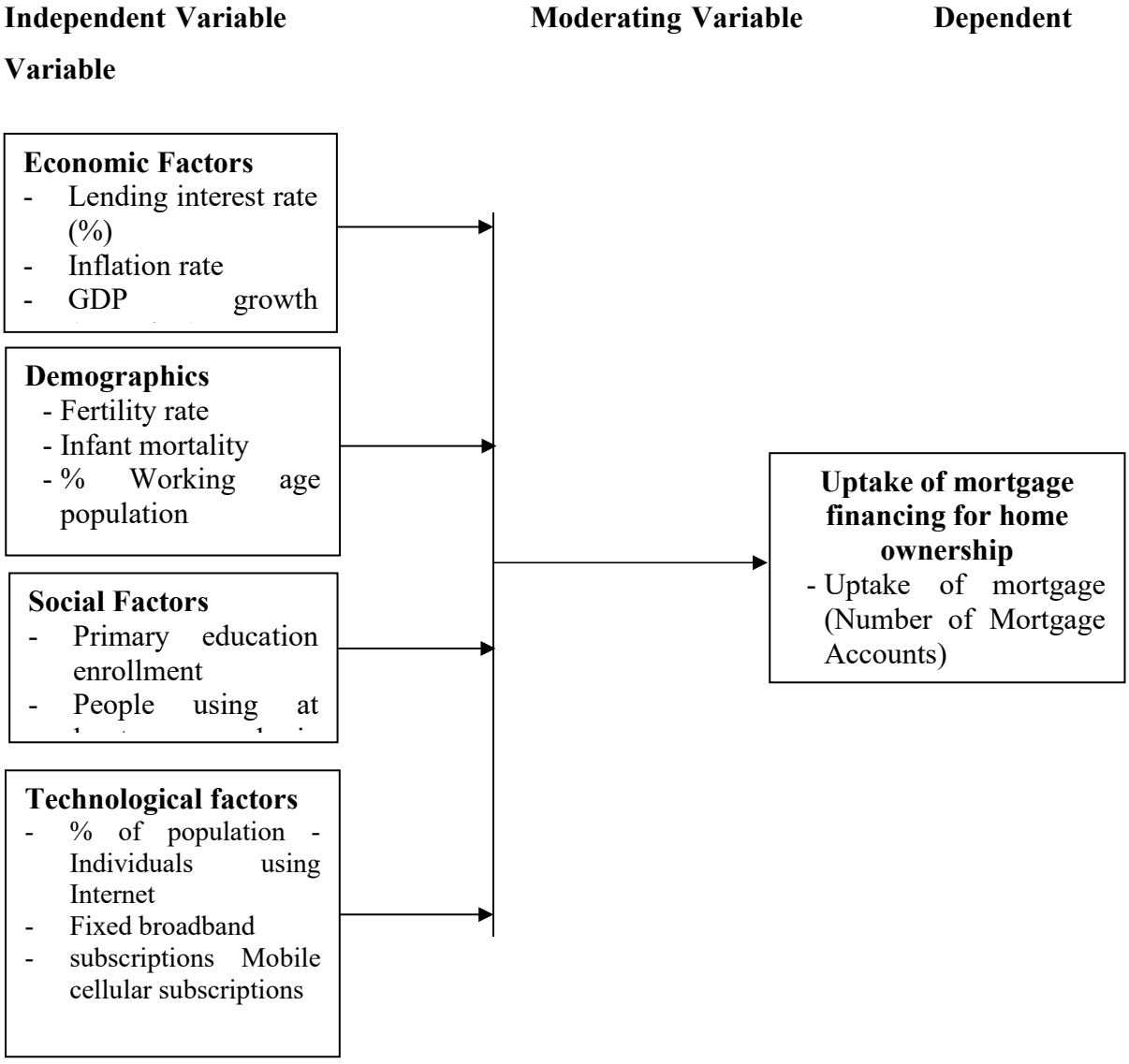
				0.05, this occurred.
H05: Government initiatives have no appreciable moderating impact on Kenya's use of mortgage finance for home ownership.	0.776	0.96	0.087	There is no substantial correlation between government policies and the use of mortgage finance for house ownership, since the null hypothesis was not rejected. Due to the computed t value being higher than the crucial t value and the accompanying p value being lower than 0.05, this occurred.

4.14 Revised Conceptual Framework- Empirical Model

From the overall regression model it was clear that the factors that had effect on the uptake of mortgage financing for home ownership were four and Technological factors had more effect on the uptake of mortgage financing for home ownership followed by Social factors, Demographic factors and Economic factors. Government policies had an insignificant effect on the uptake of mortgage financing for home ownership. Figure 4.22 illustrates the revised conceptual framework.

Figure 4. 22

Revised Conceptual Framework



Source: Author (2022)

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter provided a summary of findings, on objectives and associated hypothesis. This was followed by conclusions that were arrived after consideration of the study finding. The recommendations for theory, policy and practice were made while also providing its contributions to the existing knowledge. Lastly, the study provided the suggestions for further research.

5.2 Summary

The following is a summary of the findings of this study with regard to the objectives of the study.

Economic Factors and Uptake of Mortgage Financing for Home Ownership

The mean value of the Lending interest rate (%) across the years is 9.2% with the standard deviation being 6.949%. The high standard deviation implies that there have been major fluctuations in the Lending interest rate. The mean value of the Inflation rate (%) across the years is .39% with the standard deviation being 9.555%. The large standard deviation indicates that the Inflation rate (%) has fluctuated significantly during

the years. The standard deviation of the GDP growth (annual %) across the years is 2.488%, with a mean of 3.735. Interest rates had a huge impact on capital intensive industries and this increased the risk of investing in those industries. This therefore has a huge impact on the mortgage industry knowing that it is a capital intensive industry.

Economic factors were found to be satisfactory in contribution as a factor to Uptake of mortgage financing. Lending interest rate (%) and Uptake of mortgage financing are inversely and significantly related (β = -4.55, p=0.07). Inflation rate and Uptake of mortgage financing are inversely and insignificantly related (β = -.020, p=0.457). GDP growth (annual %) and Uptake of mortgage financing are positively and insignificantly related (β = 5.90, p=0.336). further, economic factors did not have a significant relationship with home ownership (r = -0.508, p = 0.004). Therefore, economic factors have a statistical significant effect on the uptake of mortgage financing for home ownership in Kenya.

Mortgages is an industry that is very intertwined with the monetary markets, due high cost investment required in mortgages, developers and home owners turn to banks to source for funding. Thus growth in real estate very dependent on availability of funds and the cost of funds from the banks. The cost of funds is determined by the interest rates set by the central bank which is transmitted to the borrowers by commercial banks after adding a spread to cover the commercial banks operation cost.

Many variables influence the price of a property, but the most important are the purchase price and the interest rate. Structural affordability issues in the housing market are based on statistics on property prices and family income. Borrowers, especially those wishing to refinance or reinvest, are influenced by changes in the interest rate, which is a key factor in determining the net income of lenders. Increased income per person has been shown in research, which may have a positive impact on mortgage finance. Economic confidence and job security may be boosted by raising pay, which may lead to more borrowing. As a result of wealth inequality and a lack of a sustainable mortgage market in Kenya, the nation faces substantial challenges in developing a mortgage market. An income-based mortgage financing system would have the following qualities, according to certain theories: If there isn't already enough money, then it's not worth it.

The low-yielding government notes have been replaced by the enormously lucrative real estate sector, which has led to the mortgage boom in Kenya. Banks have introduced and actively marketed a variety of mortgage packages to match this. The relatively cheap property prices in Kenya point to a high potential for capital growth and competitive rental returns.

The study's conclusions showed that financial organizations can recognize the various risks involved in lending money to borrowers, which may be used to assist them calculate interest rates. Due to the high interest rates for mortgage financing, interest rate spreading has a significant impact on mortgage financing among commercial banks. The

study found that it is important to know a client's income status because it influences how financial institutions provide mortgage financing. It also found that a client's monthly income should be accurately determined when deciding how financial institutions provide mortgage financing. According to the study, cost of capital and return on equity have a significant impact on commercial banks' ability to finance mortgages, and as a result, the pricing of mortgage amounts theoretically depends on these factors as well as transaction costs, investment income, and markups between financial institutions.

Demographic Factors and Uptake of Mortgage Financing for Home Ownership

The second objective concerned the relationship between demographic factors and uptake of mortgage financing for home ownership. The Fertility Rate (%) recorded from 1991 to 2020 had the least rate at 3.423% and the maximum rate at 5.90%. The mean value of the Fertility Rate (%) across the years is 4.672% with the standard deviation being 0.755%.

The Infant Mortality (%) recorded from 1991 to 2020 had the least rate at 3.9% and the maximum rate at 68%. The mean value of the Infant Mortality (%) across the years is 49.365% with the standard deviation being 3.245%. The large standard deviation indicates that the Infant Mortality (%) has changed significantly during the years analyzed.

The percentage of working-age population recorded from 1991 to 2020 had the lowest rate of -69.776% and the highest rate of 05.029%, according to the figures in Table. The mean of the percentage of working-age population across the years was 86.376%, with a standard deviation of 9.404.

Demographic factors were found to be satisfactory in contribution as a factor to Uptake of mortgage financing. Demographic characteristics did not statistically significantly affect Kenya's use of mortgage finance for home ownership, according to the null hypothesis. The p-value for the regression indicates that it was 0.0000.05. The t-value was determined as tcal (-.272)> tcritical (.96). According to further findings, property ownership was significantly positively correlated with demographic characteristics (r = -0.905, p 0.00). This demonstrated the rejection of the null hypothesis. The study came to the conclusion that demographic characteristics have an impact on the use of mortgage loans.

The capacity to take use of a mortgage facility depends on one's income and employment status. Mortgage facilities are long-term investments that deplete an individual's income significantly over an extended period of time. The quantity of money one may qualify for in terms of mortgage facilities is also determined by their income levels. Due to their brief engagement periods with the bank, contract employees of banks including the sales team and some operations personnel are ineligible for mortgage facilities. Depending on the employee's performance and the bank's demands

at that time, contracts can be renewed for one or two years. Employees on a contract basis do not have enough time to apply for home financing. Various financing options are widely accessible at reasonably affordable and simple terms and conditions. These credit facilities include personal unsecured loans of up to one million shillings as well as credit cards. However, reckless use of these credit options might result in unneeded over-borrowing and overcommitting, which would prevent the use of significant long-term credit options like mortgage facilities. Overextending one's personal credit lines can result in instances when one is unable to pay their debts, which may force them to use riskier financial credit options like Shylock facilities.

There are times when making certain short-term financial obligations requires a significant sum of money. These short-term financial obligations include possibilities for education, such as pursuing postgraduate degrees. These short-term financial obligations can make it more difficult to sign up for long-term facilities. The majority of employees in the banking sector join the company while single and later get married while still working. The result of this is that costs go up and discretionary income goes down. If such workers had other ongoing short-term financial obligations, especially with a developing young family, they could discover that their capacity to obtain more credit facilities was severely limited. As they fund short-term lifestyle-related costs, wealthy living may also result in a situation where the staff is unable to take out long-term mortgage facilities. Auto mobiles and entertainment venues are two examples of such high-end living costs.

Mortgage rates rise as a result of expectations that house demand will rise. It has also been demonstrated that the decision low income borrowers choose between fixed rate mortgages and adjustable rate mortgages is influenced by the increase in home prices.

Mortgage rates are not set, in contrast to purchases made at physical locations. When a buyer looks for a new house, he or she does so aware of the possibility of making a lower offer to the seller than the asking price. A mortgage acquisition is negotiable in all respects. Real estate value is the subject of mortgage pricing, and all the usual techniques for calculating the cost of fixed assets are applicable. Prices are constrained by a number of variables, including the ability to build new housing, the cost, and the income levels of prospective purchasers. Major factors influencing how high prices may grow before meeting resistance include the capacity to make payments, the cost of borrowing money, and the cost of borrowing money. When prices reach certain levels, potential borrowers are no longer eligible.

Social Factors and Uptake of Mortgage Financing for Home Ownership

Primary education enrolment recorded from 1991 to 2020 had the least number at 4437893 students and the maximum number at 8344274 students. The mean value of the Primary education enrolment across the years is 64882.83 students with the standard deviation being 575683.2014.

The People using at least basic sanitation services (%) recorded from 1991 to 2020 had the least rate at 30.559% and the maximum rate at 32.699%. The mean value of the People using at least basic sanitation services across the years is 3.459% with the standard deviation being 0.723%.

The Current health expenditure per capita recorded from 990 to 2020 had the lowest rate of -86.67% and the highest rate of 79.8%, according to the figures in Table. The mean of the Current health expenditure per capita across the years was 22.3%, with a standard deviation of 3.095.

Social variables were shown to contribute to the uptake of mortgage finance in an acceptable manner. An F statistic of 6.477 and the reported p value (0.000), which was below the usual probability of 0.05 significant level, corroborated this. The findings suggested that social variables are a reliable predictor of mortgage finance uptake. The relationship between primary school enrolment and the use of mortgage finance is inverse and negligible ($r = -55.324$, $p=0.38$). People using at least basic sanitation services and Uptake of mortgage financing are positively and significantly related ($\beta = 44.543$, $p=0.000$). Current health expenditure per capita and Uptake of mortgage financing are inversely and insignificantly related ($\beta = -0.698$, $p=0.439$).

The null hypothesis was that Social factors have no statistical significant effect on the uptake of mortgage financing for home ownership in Kenya. The calculated t-value was t_{cal} (6.83)> $t_{critical}$ (.96). Social factors had a significant positive association with home

ownership ($r = 0.954$, $p < 0.00$). This indicated that the null hypothesis was rejected. Therefore, Social factors have a statistical significant effect on the uptake of mortgage financing for home ownership in Kenya.

Technological Factors and Uptake of Mortgage Financing for Home Ownership

The percentage population of Individuals using Internet recorded from 1991 to 2020 had the least rate at 0.000% and the maximum rate at 22.565%. The mean value of the percentage population of Individuals using Internet across the years is 6.658% with the standard deviation being 7.504%. The fixed broadband subscriptions (per 100 people) recorded from 1991 to 2020 had the least rate at 0.008% and the maximum rate at .254%. The mean value of the fixed broadband subscriptions (per 100 people) across the years is 0.76% with the standard deviation being 0.302%.

The mobile cellular subscriptions (per 100 people) recorded from 1991 to 2020 had the lowest rate of 0.000% and the highest rate of 4.204%, according to the figures in Table. The mean of the mobile cellular subscriptions (per 100 people) across the years was 35.36%, with a standard deviation of 38.688.

It was determined that technological elements contributed to the uptake of mortgage finance in an acceptable manner. The model's statistical significance was demonstrated by the findings. An F statistic of 76.660 and the reported p value (0.000), which was

below the usual probability of 0.05 significant level, corroborated this. The proportion of people who use the internet and the uptake of mortgage finance are positively and substantially associated, according to the findings of the regression of coefficients (β = 6.223, p=0.000). Mortgage finance uptake and fixed broadband subscriptions (per 100 persons) have a negative and significant relationship (r = -29.635, p=0.002). Mortgage finance uptake and mobile cellular subscriptions (per 100 persons) have a favorable and substantial relationship (β = 0.84, p=0.000).

The null hypothesis stated that there is no statistically significant relationship between technological characteristics and Kenya's use of mortgage finance for home ownership. According to the findings, the p-value was 0.000<0.05. The t-value was determined as tcal (33.792)>tcritical (.96). The findings of the study indicate that technical elements significantly and positively correlated with property ownership (r = 0.988, p =0.00). Therefore, Technological factors have no statistical significant effect on the uptake of mortgage financing for home ownership in Kenya.

Government Policy and Uptake of Mortgage Financing for Home Ownership

The Government expenditure from 1991 to 2020 had the least rate at 3.86% and the maximum rate at 27.469%. The mean value of the Government expenditure across the years is 20.74% with the standard deviation being 3.637%. the Broad money (% of GDP) recorded from 99 to 2020 had the least rate at 30.982% and the maximum rate at 47.008%. The mean value of the Broad money (% of GDP) across the years is 38.857%

with the standard deviation being 3.595%. The high standard deviation indicates that the Broad money (% of GDP) has varied significantly during the years analyzed. The External debt stocks recorded from 1991 to 2020 had the lowest rate of 22.427% and the highest rate of 24.366%. The mean of the External debt stocks across the years was 23.02%, with a standard deviation of 0.586.

Regression of coefficients results revealed that Government expenditure and Uptake of mortgage financing are inversely and insignificantly related (β = -0.269, p= 0.839). Broad money (% of GDP) and Uptake of mortgage financing are positively and significantly related (β = 4.08, p=0.02). External debt stocks and Uptake of mortgage financing are positively and significantly related (β = 99.282, p=0.000).

The null hypothesis stated that there is no statistically significant relationship between government actions and Kenya's use of mortgage finance for home ownership. According to the findings, the p-value was 0.087>0.05. Tcal (.776) Tcritical was used to determine the t-value (1.96). The study's findings demonstrated that there was no significant association between government policy and property ownership (β = 0.38, p = 0.087). It was clear from this that the null hypothesis was accepted. Therefore, there is no statistically significant impact of government policy on Kenya's use of mortgage finance for home ownership.

In developing nations, the enormous financial burden of house manufacturing, finance in housing distribution is crucial. The cooperative housing system has to be strengthened,

according to studies by Fasakin (1998), Onibokun (1985), and Ebie (2003), who also claimed that rent in Nigeria's main cities accounted for nearly 60% of the average worker's disposable income. This is a lot higher than the United Nations' recommended range of 20–30%. Omirin (1998) explores the availability of land and the construction of affordable housing in urban emerging nations. According to her findings, land accessibility is now prioritized above a lack of funding and rising costs. According to Williams (2002), the urban poor continue to lack access to housing created by governmental agencies because they are unable to gather the necessary financial means to buy these housing units. The appropriateness and socioeconomic effects of providing affordable housing via a supporting strategy as opposed to a provider approach were investigated by Jaiyeoba and Amole in 2002. They said that figuring out how much help the different income categories need is necessary. Lack of commercial bank short-term mortgages was cited by Olusola, Aina, and Ata (2002) as one of the main barriers to the development of rural and urban housing in developing nations like Kenya. However, they come to the conclusion that inflation and central bank rates have a large beneficial impact in Kenya, which they believe are important predictors of mortgage uptake. Mburu and Owiti (2003) found that central bank rates has an inverse link on mortgage.

5.3 Conclusion

The following conclusions were based on key findings of the study. Accessible housing is a form of housing that allows families with limited financial resources to get and pay

for adequate accommodation. The affordability of a project is determined by the building cost, financing conditions, rent propensities, and income distribution. The Affordable Housing Mandate had an influence on the mortgage industry, among other things. The study also discovered that low-income housing complexes are often built on property that is inexpensive to purchase.

Homeownership and mortgage uptake are influenced by a variety of variables throughout the world, including consumer debt, political instability, housing prices, mortgage interest rates, and economic concerns, among others. High levels of household debt have also been linked to lower rates of mortgage take-up and lower rates of homeownership. As a result of high household debt-to-GDP ratios, risks are increased, the housing and mortgage markets are more vulnerable to shocks, and debtors are more vulnerable to downturns.

Regarding economic factors, it was concluded that economic factors have a varied and mixed effects on uptake of mortgage financing for home ownership. This meant that different economic conditions affected the use of mortgage finance for house ownership differently. Some had a good impact, some had a negative one, and some had no real impact at all. In particular, the adoption of mortgage finance for home ownership was significantly positively impacted by the GDP per capita and inflation rate, but the influence of lending interest rates was negligible. Additionally, mortgage finance adoption for house ownership was significantly negatively impacted by the population

growth rate. Due to rising interest rates paid by mortgage lending organizations, the quantity of mortgage loans has stayed lower as a result of inflation rates. Where general interest rates rise, a majority of financial entities suffers resultant losses either in value of assets or profit. Thus, when these institutions' capital and future earnings undergo changes in interest rates, the risk resultant is that of interest rate. The rate of interest is thus a crucial determinant of the net income of lenders with changes thereto also affecting the decisions of borrowers especially to refinance or reinvest. Borrowing causes inflation hence raising long term interest rates. Thus, borrowing money to invest on risky assets such a house riskier and costly, and in turn, house loan demands go down. The short-term interest rates theory on mortgage loan demand only applies to markets with volatile interest rates. In this case, it does not give substantial explanation concerning markets with stability on either long- or short-term rates of interest rates. Therefore, short term interest rates theory is not applicable in house uptake.

Demographic factors had a significant positive effect on uptake of mortgage financing for home ownership. These factors, which included marriage, age, significantly influenced the decision of customers to take a mortgage or possess a home. Specifically, high Fertility Rate factor was noted to be a factor leading to taking mortgages and buying houses in the national population. An upsurge in shares of unmarried and minority householders resulted to downward pressure on ownership of homes for this cluster, while contemporaneously; high income levels and education provided a boost. due to growth and decline in housing markets over the last twenty years, the home

ownership rate by young adults have been decreasing, much of which bust is resultant of changes in family and marital. Age could be used as an identifier of housing demand. Persons over 65 years of age are hesitant to buy a house even where affordability is not an issue. Conversely, younger people are more likely to buy property. Since property is a major source of wealth for most families and one of the primary factors affecting the cost of raising children, housing prices are a crucial variable of interest.

Based on the findings, it was also deduced that social factors had a significant positive consequence on uptake of mortgage financing for home ownership. Social factors such as Primary education enrollment, People using at least basic sanitation services and Current health expenditure in the community influenced potential home owners' decisions regarding uptake of mortgage financing for home ownership. Level of education is a significant factor towards uptake of mortgage financing for home ownership. Mortgagees usually ascertain a mortgagor's ability to afford their monthly mortgage payments, which they do by closely auditing their income and spending habits. Households may not find sanitary investments (such those in latrines) to be sufficiently alluring as investments. So, the concept of funding sanitation projects through bigger programs like "housing microfinance" goods is encouraged. The second argument is that microfinance institutions may be more familiar or more comfortable with housing microfinance as the market is steadily growing in the developing world, and in East Africa in particular.

On technology, which included the internet and the building technologies, the findings revealed that technological factors had a significant positive effect on uptake of mortgage financing for home ownership. Technological advancements especially internet technology had increased access to information thus increasing home ownership due to the availability of relevant information on mortgages to potential home owners. Moreover, internet technology has made it easier and efficient for information on residential housing to reach customers in a timely manner. Additionally, advancements in technology such as prefab technology of building have enabled many people to afford homes.

Finally, government policy had a significant moderating effect on the relationship between economic, social, demographic and technological factors, and uptake of mortgage financing for home ownership. The housing policies determine the mortgage products to be offered my financial institutions. The rules, regulations and policies that are devised by government influence the type of mortgage products provided by mortgage institutions. Additionally, provision of basic amenities such as roads, electricity, water and sewerage systems by the government in a certain location determines the residential housing developments in that location. Kenya has generally failed to satisfy the housing demands of its population, despite efforts to provide appropriate homes for Kenyans. The endeavour is typically dragged down by actions related to price limits, incorrect construction standards and codes, a lack of fundamental planning and service supply, and a steady drop in government spending on housing. This

ultimately upsets mortgage brokers, which undermines the purpose of providing good housing.

5.4 Recommendations

Housing provision and mortgage industry growth is an important aspect of the economic development of the country and this is indicated by its inclusion in various policy papers such as the Kenya Vision 2030. The following are the policy implications of economic factors for uptake of mortgage financing for home ownership. First, the mortgage market should be expanded with appropriate housing policies that promote investment in the sector and affordability of houses. This is because the growth of size and reach of the mortgage market constitutes part solution for the growing urban populations that need housing solution. By implementing favorable housing policies to the population, the housing coverage for the residents will be enhanced.

The level of inflation level does not favor the economic growth in a nation. Inflation economic aspect should therefore be regulated to promote mortgage growth and sustainability. In order to lower the cost of purchasing the necessary raw materials for home building, the researcher advises policy-makers to control the amount of inflation that is now present in the nation. Policies to lower the interest rates that financial institutions charge on mortgage loans should be put in place by the government through the Central Bank of Kenya and mortgage lending organizations.

In comparison to other industrialized nations like the USA, which charges 5% on mortgages, Kenya now has one of the highest interest rates for borrowing, particularly on mortgages, which deters borrowers from taking out loans. Therefore, lowering interest rates will encourage more borrowers to take out loans, which will boost the housing sector's growth.

In a population, there are different levels of income. The disparity of incomes makes the affordability of housing to be skewed to several people with the capacity to borrow. The financiers should consider the low-income earners. The study recommends to mortgage providers to finance ownership of low-income houses which the majority of Kenyans with low incomes can afford. This is because low-income levels were a major factor that affected uptake of mortgages for home ownership. It is also recommended that the public formalizes their informal incomes which can then be used as bases for mortgage credit worthiness. This is because the study results indicate that informality of incomes of many prospective mortgagors turn away most mortgage providers since they cannot see proof of income and ability to pay back.

The study recommends that the mortgage industry players need to consider the technological factors in the policy making process which can enhance the mortgage uptake in Kenya. The report also advises lenders to invest in technology that will enable them to meet the demands of home buyers on their terms, adapt engagement with each individual consumer, and help them move into their ideal houses more quickly.

In light of the results of this investigation, it was also advised that the mortgage providers should also widen the pool of the assets that can be eligible for mortgages and that can be taken as collateral. They should further expand their reach and accept to finance properties outside the major urban areas because most of the mortgages are in urban areas. This is necessary since, according to this study findings, absence of credit risk data was a major factor that made many lenders to have a small pool of eligible mortgagors according to their assessments. The study findings also indicated that limit in acceptable collateral by prospective borrowers had greatly contributed to low mortgage uptake. In other words, diversification of collateral is recommended.

It is further recommended that the relevant stakeholders such as the Capital Market Authority (CMA) and Nairobi Securities Exchange (NSE) develop a secondary mortgage market to improve access to these facilities.

5.5 Contribution of the Study to Theory/ Existing Body of knowledge

Firstly, the study has been able to focus on the association between social factors, economic factors, demographic factors, technological factors and uptake of mortgage financing for home ownership by establishing the relationship between some components of uptake of mortgage financing for home ownership. Secondly, there is no study in Kenya focusing on mortgage financing for home ownership sector.

5.6 Recommendations for Further Research

The study solely took into account the use of mortgage finance for home ownership. The financial institutions in the nation that are also making loans for the development of the housing industry should be the subject of further study. Second, the acceptance of mortgage loans is influenced by prospective home-owners' attitudes on mortgage finance. To determine this link and how it may be improved, more research is advised.

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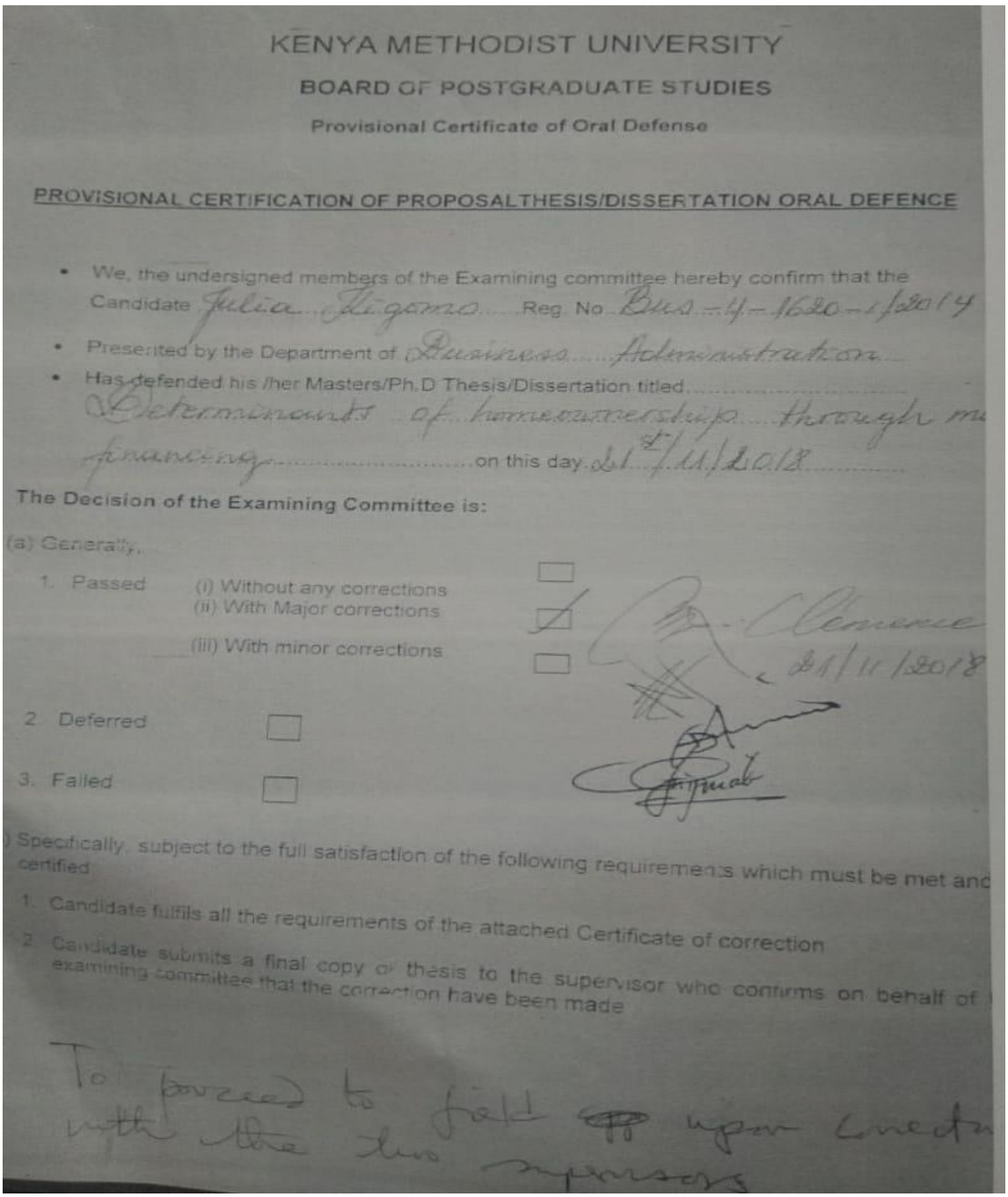
APPENDICES

Appendix I: Secondary Data

Year	Uptake of mortgage (Number of Mortgage Accounts)	Lending interest rate (%)	Inflation rate	GDP growth (annual %)	Economic factors	Fertility Rate	Infant Mortality	% of working-age population	Demographic factors	Primary education enrollment	People using at least basic sanitation services	Current health expenditure per capita	Social factors
1991	38.200	18.998	20.084	1.438	13.507	5.901	66.100	105.029	59.010	15.306	30.711	89.840	45.2
1992	39.800	21.068	27.332	-0.799	15.867	5.755	67.200	103.088	58.681	15.323	30.711	89.837	45.2
1993	42.600	29.989	45.979	0.353	25.440	5.633	67.900	100.926	58.153	15.344	30.715	89.932	45.3
1994	43.100	36.240	28.814	2.633	22.562	5.535	68.000	98.772	57.436	15.332	30.707	89.750	45.2
1995	43.400	28.796	1.554	4.406	11.585	5.459	67.600	96.752	56.604	15.328	30.710	89.829	45.2
1996	43.300	33.787	8.864	4.147	15.599	5.400	66.500	95.289	55.730	15.391	30.727	90.218	45.4
1997	44.300	30.245	11.362	0.475	14.027	5.348	65.100	94.158	54.869	15.401	30.685	89.205	45.0
1998	45.900	29.490	6.722	3.290	13.168	5.296	63.500	93.145	53.980	15.390	30.719	90.063	45.3
1999	46.400	22.380	5.742	2.305	10.142	5.239	61.700	91.971	52.970	15.380	30.776	91.386	45.8
2000	46.500	22.339	9.980	0.600	10.973	5.178	59.700	90.555	51.811	15.432	30.559	86.167	44.0
2001	49.100	19.666	5.739	3.780	9.728	5.112	57.600	89.916	50.876	15.454	30.823	92.637	46.3
2002	51.100	18.453	1.961	0.547	6.987	5.045	55.400	88.808	49.751	15.405	30.946	95.353	47.2
2003	51.700	16.573	9.816	2.932	9.774	4.979	53.100	87.511	48.530	15.575	31.066	101.793	49.4
2004	54.500	12.532	11.624	5.104	9.753	4.913	50.700	86.381	47.331	15.595	31.183	110.105	52.2
2005	59.700	12.883	10.313	5.907	9.701	4.843	48.100	85.556	46.166	15.620	31.298	116.165	54.3
2006	63.500	13.636	14.454	6.472	11.521	4.767	45.800	84.906	45.158	15.624	31.411	122.236	56.4
2007	76.200	13.340	9.759	6.851	9.983	4.682	43.800	84.531	44.338	15.716	31.520	133.202	60.1
2008	97.900	14.017	26.240	0.232	13.496	4.587	41.400	84.259	43.415	15.743	31.628	133.559	60.3

2009	116.200	14.805	9.234	3.307	9.115	4.482	40.300	83.812	42.865	15.783	31.732	134.762	60.7
2010	126.600	14.372	3.961	8.406	8.913	4.369	39.400	83.062	42.277	15.911	31.834	145.944	64.5
2011	146.000	15.047	14.022	6.108	11.726	4.248	38.600	82.315	41.721	15.912	31.933	146.218	64.6
2012	167.500	19.723	9.378	4.563	11.221	4.123	38.200	81.230	41.184	15.902	32.029	146.559	64.8
2013	185.000	17.313	5.717	5.879	9.637	3.999	37.500	79.916	40.472	15.920	32.123	151.233	66.4
2014	197.800	16.514	6.878	5.357	9.583	3.879	36.500	78.527	39.635	15.915	32.214	156.525	68.2
2015	205.800	16.087	6.582	5.719	9.462	3.765	35.300	77.130	38.732	15.916	32.302	155.959	68.0
2016	202.500	16.560	6.297	5.879	9.579	3.663	34.500	75.680	37.948	15.931	32.388	160.491	69.6
2017	219.900	13.668	8.006	4.806	8.826	3.572	33.900	74.235	37.236	15.920	32.470	157.598	68.6
2018	223.200	13.061	4.690	6.318	8.023	3.492	32.800	72.775	36.356	15.922	32.550	179.180	75.8
2019	223.646	12.441	5.236	5.366	7.681	3.423	31.900	71.283	35.535	15.924	32.626	165.756	71.4
2020	224.094	11.996	5.405	-0.307	5.698	3.496	32.867	69.776	35.379	15.922	32.699	167.512	72.0

Appendix II: Research Authorization Letter by KeMU



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Provisional Certificate of Oral Defense

PROVISIONAL CERTIFICATION OF PROPOSALTHESIS/DISSERTATION ORAL DEFENCE

- We, the undersigned members of the Examining committee hereby confirm that the Candidate Julia Ligamo Reg. No Bus-4-1620-1/2014
- Presented by the Department of Business Administration
- Has defended his /her Masters/Ph.D Thesis/Dissertation titled Determinants of homeownership through mo financing on this day 21st/11/2018

The Decision of the Examining Committee is:

(a) Generally,

1. Passed
   - (i) Without any corrections ☐
   - (ii) With Major corrections ☑
   - (iii) With minor corrections ☐
2. Deferred ☐
3. Failed ☐

21/11/2018

) Specifically, subject to the full satisfaction of the following requirements which must be met and certified

1. Candidate fulfils all the requirements of the attached Certificate of correction
2. Candidate submits a final copy of thesis to the supervisor who confirms on behalf of examining committee that the correction have been made

To proceed to fail upon Corrections with the two supervisors

KENYA METHODIST UNIVERSITY

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Fax: 254-64-30162
Email: info@kemu.ac.ke

Our ref: NAC/PHD/1/2019/2

1st MARCH 2019

Commission Secretary,
National Commission for Science, Technology and Innovations,
P.O. Box 30623-00100,
NAIROBI.

Dear Sir/ Madam,

RE: JULIA RUGURU KIGOMO (BUS- 4- 1620-1/2014)

This is to confirm that the above named is a bona fide student of Kenya Methodist University undertaking a **PhD in BUSINESS ADMINISTRATION**. She is conducting a research titled **DETERMINANTS OF HOMEOWNERSHIP THROUGH MORTGAGE FINANCING.**

We confirm that her thesis proposal has been defended and approved by the university.

In this regard, we are requesting your office to issue a permit to enable her collect data for her Ph.D. dissertation.

Any assistance accorded to her will be appreciated.

Yours faithfully,

KENYA METHODIST UNIVERSITY
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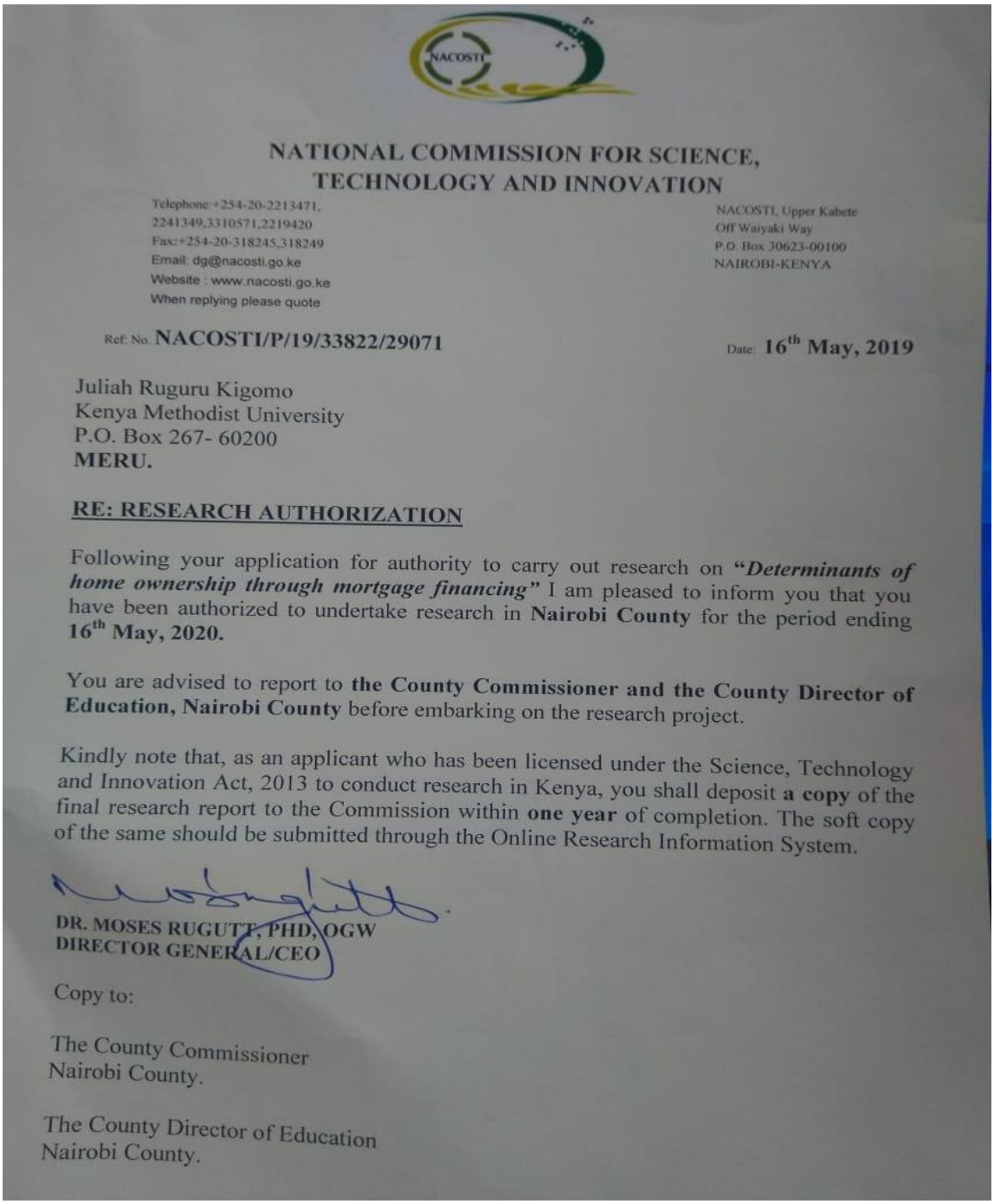
DR. Evangeline Gichunge PhD.
ASS DIRECTOR POSTGRADUATE STUDIES

Encl.

Appendix III: Research Authorization Letter by NACOSTI



NATIONAL COMMISSION FOR SCIENCE,
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Ref: No. **NACOSTI/P/19/33822/29071**

Date: **16th May, 2019**

Juliah Ruguru Kigomo
Kenya Methodist University
P.O. Box 267- 60200
MERU.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Determinants of home ownership through mortgage financing"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **16th May, 2020.**

You are advised to report to **the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

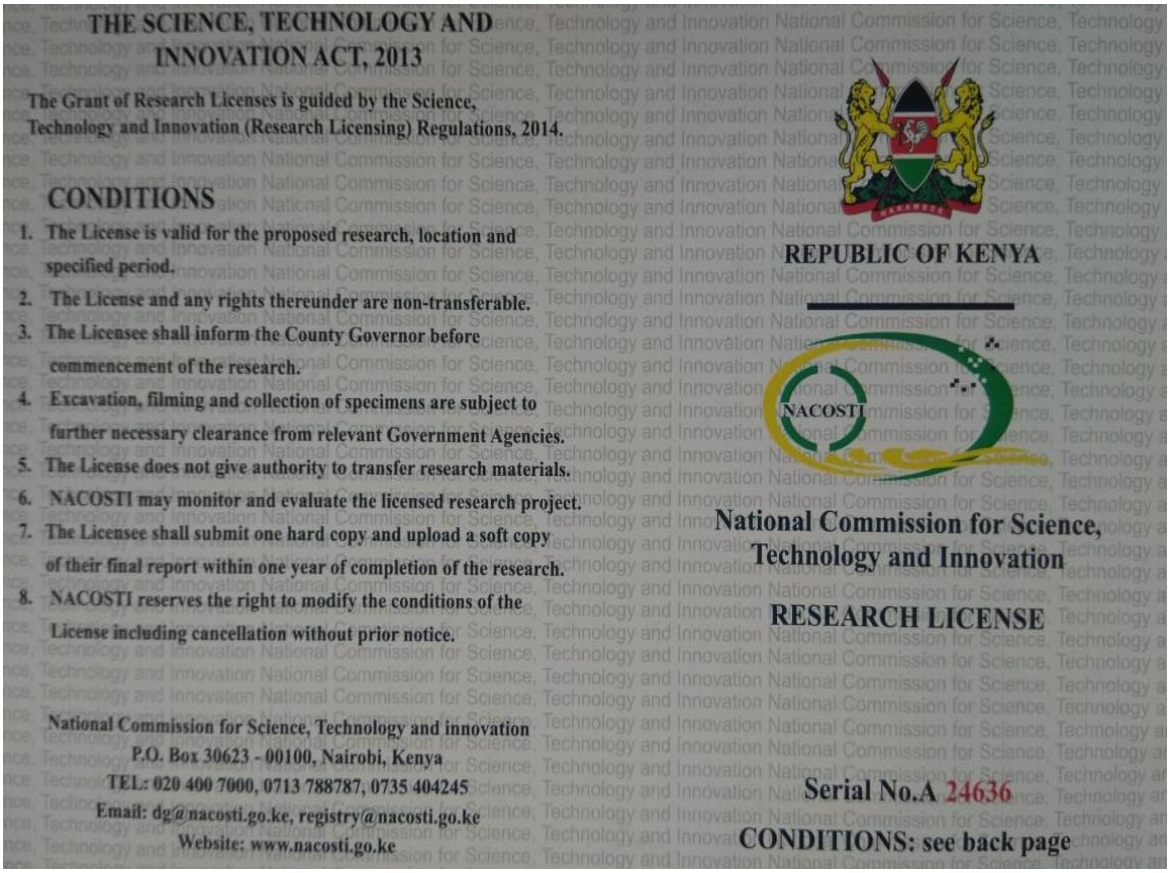
DR. MOSES RUGUTT, PHD, OGW
DIRECTOR GENERAL/CEO

Copy to:

The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.

Appendix IV: NACOSTI Research Permit



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National Commission for Science, Technology and Innovation

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CONDITIONS: see back page

THIS IS TO CERTIFY THAT:
MS. JULIAH RUGURU KIGOMO
of KENYA METHODIST UNIVERSITY,
0-100 Nairobi,has been permitted to
conduct research in *Nairobi County*

on the topic: *DETERMINANTS OF HOME OWNERSHIP THROUGH MORTGAGE FINANCING*

for the period ending:
16th May,2020

.....
Applicant's Signature

Permit No : NACOSTI/P/19/33822/29071
Date Of Issue : 16th May,2019
Fee Recieved :Ksh 2000

.....
Director General
National Commission for Science, Technology & Innovation