AFFORDABLE HOUSING AND REAL ESTATE INVESTMENT IN RESIDENTIAL HOUSING SECTOR IN KENYA

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DECLARATION

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

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DEDICATION

This research thesis is dedicated to all those that have contributed in the success of my research. To my parents- this will not have been probable without your financial support and guidance. To my friends, namely Linus, Hassan, Ben and Jacky- thank you for your moral support and various contributions towards this research proposal.

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ABBREVIATIONS AND ACRONYMS

CBK	Central Bank of Kenya
CFPS	China Family Panel Studies
CPI	Consumer Price Index
GDP	Gross Domestic Product
HFCK	Housing Finance Company of Kenya
LTV	Loan-to-value (LTV) ratio
REITs	Real Estate Investment Trusts
ROD	Return on deposits
ROE	Return of Equity
SPSS	Statistical Package for Social Sciences
WPI	Wholesale Price Index

OPERATIONAL DEFINITION OF TERMS

Affordable Housing: Refers to a house that a family can acquire via purchase, rent or any other mean using utmost thirty percent of the income in the household.

Capitalization Rate: The ratio of the operating income and current market value of a property.

Consumer Price Index: The mean change in price for goods and services that consumers pay.

Cost of Mortgage: Refers to a fee for real estate property that the borrower is obliged to pay back with a predetermined set of payments.

Household Income: A measure of the combined incomes of all people household residence consisting of all receipts whether monetary or in kind that are received by the household or by individual members of the household at annual or more frequent intervals.

Housing Price Index: An indicator that measures changes in single-family home prices across a designated market.

Housing Prices: The sum of money for which residential houses may be bought or sold.

Housing Sector: The development, construction, and sale of houses, which include individual residential houses (mansions) and high-rise multi-family residential buildings. The development of housing sector indicates the household formation

Income Per Capita: The measure of the amount of money earned per person in a given region over a specific year.

Inflation:	General increase in prices and fall in the purchasing value of money.
Lending Rate:	The rate of interest charged by a financial institution for lending money.
Low Income Earners:	Individuals whose income is below the average income for all households.
Real Estate Investment:	The property that produces rental income and is producing a profit.
Residential Sector	**Housing**: Consists of housing for individuals, families, or groups of people.

ABSTRACT

Affordable housing and determinants of real estate investments have received significant scholarly attention; however, there remains limited scholarship and consensus on the relationship between affordable housing and real estate investment growth in Kenya. Provision of affordable housing has remained a challenge in many developing nations including Kenya. Kenyan real estate investment especially the residential housing sector is facing poor growth rate due to its unbalanced focus. Residential real estate investment mostly focuses on the elite, high income earners while giving little focus to the majority who belong to the low and middle class households. The study aimed at determining the effect of affordable housing on real estate investment capitalization in the Kenya. It focused on identifying key indices of affordable housing in Kenya and recommended ways of increasing residential housing affordability to promote the growth of real estate investment through increased capitalization. Evidence indicates that majority of the houses constructed targets the elite and wealthy individuals hence majority of the housing units constructed remain unaffordable to the low-income earners, which affects residential real estate investment. The real estate market in Kenya has been on the decline owing to many factors, such as oversupply of high-end residential property and constrained access to credit facilities. The specific objectives were to: determine the effect of housing prices, household income, cost of mortgage, and moderating effect of inflation on real estate investment in the housing sector in Kenya. The study was anchored on permanent income theory, liquidity preference theory, anticipated income theory, rational choice theory, and decision theory. Positivism research philosophy and explanatory research design were adopted for the study. The study population comprised of real estate firms registered in Kenya. Using Census technique, a document review guide was applied to collect data from Real Estate firms registered by Estate Agents and Valuers Registration Board under Ministry of Land, Housing and Urban Development (N=80). The study adopted a 10-year period ranging from years 2010 to 2019. Data sources were: annual reports and financial statements from real estate companies. Data was analyzed using: Descriptive statistics, correlation analysis, and time series analysis. Data were presented in form of figures and tables. Diagnostic tests such as normality, multicollinearity, heteroscedasticity, stationarity and autocorrelation tests were conducted. Ethical considerations were observed to maintain integrity in the research process. The study found that housing prices, household income, and cost of mortgage all had a statistically significant effect on real estate investment in residential housing sector in Kenya. The study further determined that inflation had a significant effect on the relationship between affordable housing and real estate investment in residential housing sector in Kenya. The study recommends government's cushioning prospective home owners from economic shocks and inflation, reduction of excessive taxes on construction materials, encouraging alternative income sources for households, the need for innovative financing in addition to provision of government tax incentives and exceptions/grants for private developers to build affordable residential units. The research effort further recommends that investors should find alternative sources of building materials.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Owning a house is a human need to be met for people to lead healthy and productive lives. To meet this need, policymakers and scholars on the housing sector have delved into how the housing deficit can be reduced so that more people own homes. Towards this end, affordable housing continues to receive tremendous attention from governments worldwide, and Kenya has been no exception. Nevertheless, first, this study conceptualizes real estate investment, given that residential real estate investment is a panacea for the construction of affordable housing. Ireri (2010) offered an accentuated definition of real estate by asserting that it comprises of purchasing, managing, renting, and selling houses.

Kieti (2020) confirms that building more houses and increasing focus on real estate investment would lower housing prices in Kenyan urban centers. The article also affirms that the government of Kenya was committed to providing affordable housing, which remained a problem in the country, targeting the construction of 500,000 affordable houses by 2022. However, the completed units need to be more uptake since most applicants cannot raise the 12.5% of home value required to participate in the lottery (Kieti, 2020). Affordability is a great concern in the accessibility and growth of investment in residential housing.

At the global level, evidence shows that several factors influence the supply of affordable housing. For instance, Bujang *et al.* (2011) delved into the interplay between housing affordability and demographic factors in Malaysia, where the authors established that socioeconomic attributes of the household, such as the number of people who have incomes, monthly income, education level and marital status influence the ability of the household to purchase a residential home. However, this study did not link housing affordability to real estate investment. The current study will address how

housing prices, cost of mortgage, household income and inflation influence residential real estate investment in Kenya's housing sector.

According to Masika (2010), real estate controls a significant chunk of investors' and people's wealth in Kenya since it plays a critical role in creating job opportunities, fighting against poverty alleviation, income distribution and provision of shelter for households. However, real estate investment in Kenya has yet to be efficacious since most housing projects remain unaffordable for most individuals at the bottom or closer to the bottom of the income pyramid (Karoki, 2013). Despite notable investments in real estate, few houses target low-income households, who are the majority. Thus, people demanding affordable housing are greater than the units supplied, given that the existing supply targets opulent customers. To circumvent this challenge, governments all over the globe have underscored the need to stimulate investors to supply affordable housing so that people with lower incomes can own homes, which will bring down the housing deficit on a considerable scale. Far from the truth, this has yet to be achieved, given that many Kenyan countries still experience a deficit of affordable residential housing.

Studies conducted in developed countries have shown the key factors that affect the building and purchase of housing properties. For instance, in the United States, Agarwal (2022) argues that investment in real estate requires huge funds to the extent that property buyers resort to mortgages. Un-habitat Agenda (2012) have provided a more nuanced description of home ownership by including the need for homeowners to have adequate space and privacy. Thus, it appears that the amount of living spaces and accompanying privacy are central to determining the prices of houses. Bentley *et al.* (2016) contend that the shelter indicator is significant in an attempt to invigorate the economic fortunes of any given country.

The challenge of housing affordability is hyped by the inability of savings to cater for housing construction and purchase costs fully. Ahalik and Mallick (2011) state that savings are insufficient for many people in India to purchase houses, signifying that funding must come from other sources, such as banks or micro-lending financial

institutions. Financing the construction or purchase of real estate properties through banks and micro-lending financial institutions increases the costs due to the high-interest charges on the finance. The landlords translate the high costs on the housing prices. Barua, Mridha, and Khan (2010) observe that overcrowding has increased the prices of renting living spaces since most people living in Bangladesh slums cannot purchase houses in cash or access funding to buy habitable places. This evidence from the global perspective on home ownership has reaffirmed that high prices for renting or purchasing homes continue to affect the capacity of people to acquire safe living spaces. More fundamentally, most of the efforts made by various public and private players have not yielded much outcomes since major urban places, towns, and cities continue to grapple with the challenge of ballooning slums.

Research has examined the interrelationships between affordable housing and real estate investment in Tanzania, Rwanda, and Uganda. For instance, Buckley (2014) argues that the complexity surrounding housing affordability in Rwanda needs to be more tactic measures and indicators to evaluate the extent to which affordable housing challenges exist. Similarly, Adabre (2019) confirms the existence of the challenge and provides possible solution by asserting that the problem of non-existent structures for housing affordability can be addressed by identifying policy needs to highlight the existing challenge in terms of form and scale. Once the scale and form of affordable housing have been established, there is a need to assess the housing market trends, which will inform the best practices for designing guidelines and policies for the housing sector. However, there needs to be policy evidence at the regional level to document how this approach of problem identification has led to solving of affordable housing deficit.

In Tanzania, it has been documented that the country's scheme for affordable housing is affected by inadequate financial housing access, the high cost of construction materials, and poor analytical capacity and planning skills (Kavishe et al., 2019). Though African nations strive to fight the problem of affordable housing, their efforts fall on various obstacles. The challenge of the unavailability of affordable houses is common across major towns and cities in East Africa. Mayer (2011) contends that the unpredictable

housing sector in Uganda's capital distorted the market to the extent that it destabilized the social fabric that holds the society together. Moreover, the weakened housing sector can potentially reverse the economic success witnessed in Uganda. Furthermore, evidence shows that most of the housing projects in Kampala, Uganda, target the elites and wealthy people with extensive connections. Many people residing in Kampala earn low incomes, which forces them to seek housing in slum areas. Other factors that affect affordable housing in major cities include but are not limited to inaccessibility to affordable financing options, exorbitant costs of infrastructure, and inflation of values of the land. This evidence from Tanzania, Uganda and Rwanda suggests that affordable housing could have been more efficacious in East Africa.

Affordable housing in Kenya depends on the mortgage cost, given that as the interest rates rise, so do the housing costs. The Kenyan constitution has express provisions on reasonable sanitation standards and access to adequate housing (Republic of Kenya, 2010). Despite this constitutional provision, the majority, if not all, of urban places in Kenya continue to experience the challenge of adequate housing, as evidenced by the rising number of informal settlements and slum dwellings (Un-habitat, 2008). Major urban centres and cities, such as Nairobi, will continue to face the challenge of housing until affordable houses are constructed since the current picture of housing is spontaneous and unplanned (World Bank, 2003). Nabutola (2004), among other scholars who have done studies in Kenya on the real estate industry, believes that an unstable political environment, such as the 2008 poll violence, greatly affected the mortgage industry since the stagnation of the economy-adjusted interest rates in the upward trend, thus pushing up the price of houses.

The centrality of real estate investment is its ability to offer returns on investment, given that investors can realize benefits in terms of income. Real estate investments in Kenya have been on the rise for various reasons, including but not limited to the need to own homes, diaspora remittance, rural-urban migration, and increased infrastructure development (Creswel, 2012). Despite the expanding real estate development, several attempts by the national and county governments coupled with real estate firms have yet

to yield adequate and decent housing to the extent that this has affected the housing needs of the people (Ireri, 2010). The private sector has invested substantial resources in real estate, intending to construct more houses (Hassanali, 2009). Statistics provided by the Hass property index (2009) indicated a double increase in the prices of high-end residential properties.

Various metrics have been proposed to measure housing prices, cost of mortgage, and household income, which are the predictors of real estate investment and, by large, determinants of affordable housing. Lee *et al*. (2021) stated that Housing Price Index is used to measure the variations in the prices of houses. Household income denotes the collective income from all individuals living in a house, including money or kind donations (Krulicky & Horak, 2019). Per capita income is the proxy measure for household income, which refers to money an individual earns in a given area over a specific year (Piao *et al.,* 2019). The cost of a mortgage as a predictor of residential real estate investment refers to a fee that emanates from borrowing money to purchase property in real estate (Chong, 2020). The lending rate is the proxy measure for the cost of a mortgage, which includes the interest levied when an organization or an individual borrows money from a bank or a firm that offers credit (Demary & Voigtländer, 2018). Proxy measures made measuring the unobserved quantity of the variables under investigation possible.

1.1.1 Affordable Housing

Affordable housing refers to the availability of the housing units that are inexpensive for people whose income is below the median household income. According to Kenya National Bureau of statistics 2017 economic survey, the lower income group are those earning ksh 23, 670 per month, while middle income group are those earning between ksh 23,671 and ksh 119,999. Brooks (2022) defines affordable housing as the price at which households can purchase or rent a house in a place of their choice using utmost thirty percent of the household income. Thus, affordable housing in kenya can be well understood to mean the price at which households earning around Ksh 23,670 can purchase or rent a house using utmost thirty percent of the income. Other scholars, such as Fields (2015) defined affordable housing as the extent to which households have

discretionary income to meet the on-going costs as an acceptable living standard. Bujang *et al.* (2010), points out that the concept of affordable housing is subjective given that there is no benchmark established to indicate what is affordable or what is not. This appears to suggest that the ability of an individual to pay for their housing delineates affordable housing from unaffordable housing.

According to Claussen (2013) the value of a house depends on the number of people demanding houses and the number of houses available in the market. The prices hikes when fewer houses are available compared to the number of people needing them and it falls when available houses exceed demand. A phenomenon called tenure-neutral term takes place when the value of homes inconsistently rises relative to rise in income therefore making the houses unaffordable. Consequently, the ability to afford ownership of a house is influenced by income and prevailing values of houses Brooks (2022). Low income earners are commonly used as the yardstick in measuring affordability of houses. There have been little to no efforts to reverse the situation, such as providing incentives to the non-governmental investors to build houses for people with low income. For instance, Njaramba, Gachanja and Mugendi (2018) argue that there are no efforts directed to boost investment in property targeting low-income bracket, such as provision of tax discounts so that developers can deliver modest and elegant housing estates for families from low incomes. Mulli and Kaplelach (2017) states that there is inadequate motivation for developers, such as monetary incentive for private developers to leverage efficiencies into the market and facilitate improvement of housing sector. Due to lack of incentives, prospective homeowners must bear the cost of the units.

The challenge of housing affordability is increased by the little attention granted to low income earners by the real estate investors. According to the UN-Habitat (2018), a paltry two percent of houses built are meant for people with low income. This signifies that there is little attention on affordable housing. Word Bank Report (2017), of the 28% urbanized population, 61% of them live in informal settlements. The report further stated that there is an agent need for 2 million more low-income homes to bridge the

existing gaps. Owing to inability of many households to afford houses, less than twenty five thousand mortgages, where the debt on mmortgages stands at 3.15 percent of Gross Domestic Product. Gardner *et al*. (2019) stated that most (70%) of the urban dwellers rent compared to those in rural areas (12%). Furthermore, more than 90% of dwellers in Nairobi rent. This points to the possibility of inadequate affordable housing so that more people can own residential units.

The current body of literature has delved into components and/or determinants of affordable housing and real estate investment. However, consensus among scholars has not been realized on how and extent to which household/personal income and housing prices influence investment in real estate (Rogers, Wong, & Nelson, 2017; Fields, 2015). In Kazakhstan, owning a home is predicted by the size of household since this strongly determines the likelihood of individuals owning homes (Seitz, 2018). In Korea, home ownership is influenced by current income and consumption as a measure of Price per Unit of Housing Services and permanent income (Lim, Follain, & Renaud, 2018), while in Malaysia real estate investment is determined by the housing characteristics (property types and type of house), socio-cultural and demographic attributes, and trends of income and employment (Tan, 2008). In Denmark, social status and civil rank of the breadwinner and an array of characteristics of the household including but not limited to income predicates house ownership (Lauridsen, & Skak, 2017), whereas in Nairobi County accessibility to credit and loan, land prices, and interest determine how affordable houses are (Ndungu, 2014).

Scholars have proposed various determinants of affordable housing given the subjective nature of concept. To offer a comprehensive understanding of affordable housing and its predictors, Stone (2006) stated that the acceptable minimum standard housing that individuals occupy, which leaves adequate income to meet other expenditures that are not related to housing. Christopher (2014) argues that the prices of houses and cost of mortgage as dictated by the prevailing interest rates and the amount of deposit required before servicing the remainder of the funds. This suggests that the interest rates in the

market influence affordability of the residential housing given that interest rates affect the cost of lending.

Evidence shows that most houses are purchased through loans, where the mortgage lending rate is influenced by the prevailing market interest rates, which determines the ability of the people to pay (Han & Lu, 2017). Towards this end, questions may arise on the interplay between mortgage interest rate and affordable housing. This paper portends that the prices of houses emblem the prevailing interest rates in the money market (Riazi & Emami, 2018). Income at the household level has been cited as a better indicator to measure housing affordability given that the entire household has the responsibility to meet the housing costs (Robinson *et al.*, 2006). Consequently, houses are more affordable when persons in a house pool their income together.

1.1.2 Real Estate Investment

Real estate investment refers to purchasing, managing and selling real estate property for profit. It involves investment in residential homes, townhouses, commercial property or office premises. Several scholars have provided various definitions to describe what entails real estate and what does not. Okumu (2017) stated that real estate investment encompasses rental, management, purchase, sale, and real estate ownership to make a profit. Brueggeman (2011) believed that investment in real estate pertains to interest charged on a property in the real estate market, housing or building. Towards this end, the variable of real estate investment has gathered much attention, given that it has been equated with the housing sector in Kenya. To support this assertion, Masika (2010) opined that real estate property in Kenya encompasses multi-family residential houses, shopping complexes, agricultural and commercial land, warehouses, go-downs, office space, and renting outlets. According to Hass Consult (2009), real estate property has increased since 2000 owing to the rising demand for real estate for various activities.

Various measurements have been proposed to establish the performance of real estate investment. This paper adopts Capitalization, the most accepted measure of properties in real estate. Capitalization is an easy way of assessing real estate investment growth. Capitalization rate has been proposed by various scholars, such as Wu, Gyourko, and

Deng (2015), who stated that real estate property's current market value is taken as the denominator while the net operating income is taken as the nominator. Wu *et al.* (2015) stated that the capitalization rate has been accepted globally since it provided a nuanced metric in the valuation of commercial properties. To this end, this study adopts the capitalization rate to determine the growth in the investment towards affordable houses in Kenya. In establishing real estate in Kenya, the researcher recognizes that investment in Kenyan real estate continues to grow in momentous proportions to the extent that it is cited among the key predictors of the economy's performance adduced from the ROI (Mbuguah, 2017).

1.1.3 Inflation

Inflation refers to the increase in the prices of goods and services. It has received attention from scholars, given that it greatly affects the money and property market. In trying to understand the influence of inflation on real estate investment, Basu (2011) defines inflation as the continuous rise of prices of items and delivered services compared to perceived price changes of products and services. This suggests that prices of goods and services can change because of macroeconomic factors that are not necessarily caused by the interplay between supply and demand. Accordingly, inflation affects growth in the average proceed of products and services over a given period, where inflation increases the general attraction of real estate property owing to the increased value of the properties. One (2020) argues that inflation reduces profits and general earnings. This suggests that inflation favors those with the property while depriving prospective property owners.

Various approaches and methodologies have been proposed to measure inflation depending on the context. The various approaches to measuring inflation include the Wholesale Price Index (WPI) and the Consumer Price Index (CPI), which this study adopts as the primary indicator for the level of inflation. The rationale for adopting CPI stems from the need to establish how far the variations in real estate property prices affect households' ability to afford housing (Gardner et al, 2019). Given the nature of inflation trends and lack of adequate information to measure inflation in Kenya, CPI is

adopted since it provides more accentuated practical ways of establishing the changes in prices and their effect on purchasing power of the consumers. Groshen (2017) suggested that the CPI has weaknesses and biases that affect inflation measurement, given that the indicator does not consider new services and products entering the market and the quality of goods. In addition, CPI does not consider that relative prices change at distinct rates.

The Central Bank of Kenya started documenting the CPI trends in 2005, where the statistics indicate that the inflation rate has been averaging 5% in 2020. This reveals that the general price increase in the face of the pandemic has remained relatively unchanged (CBK, 2020). Between 2013 and 2018, the CPI averaged 6.0% to 7.0%, indicating that the general prices of goods and services were relatively stable despite fluctuations showing +-1 deviations from the mean point. On the other hand, 2005 to 2012 witnessed some of the highest inflation rates, where the country experienced a 19.5% inflation in November 2008. The changes were caused by crises in the financial sectors experienced between 2008-2009. Towards this end, it appears that the general increase or fall in item prices predicts the same affordability.

1.1.4 Residential Housing sector in Kenya

There have been several attempts from real estate and property experts to document the general profitability of Kenyan real estate, where there is a seeming consensus that Kenya's real estate market has undergone drastic changes in terms of investment opportunities. For instance, Masika (2010) stated that the real estate sector in Kenya has become lucrative, given that its size and value have increased. Various reasons have been given against the backdrop of increased real estate investment in Kenya, where Okumu (2017) underscored that rural-urban migration coupled with the growing influence of the middle class has accelerated real estate expansion. According to Battersby (2017), Kenyan property development has been supported by formalizing retail trading and opening and expanding commercial malls in various cities and urban places. This suggests that as people's incomes increase, so do their consumption patterns and preferences in basic needs.

Cytonn's (2017) report is replete with information on how real estate pricing has changed over time. For instance, in 2016, the real estate sector witnessed a price appreciation of 7.4%, while in 2017, it was at 3.8%. The drop in 2017 price appreciation was attributed to the elections, where investors postponed their investment activities owing to market uncertainties. Regarding rental yields, statistics showed that in 2016 were at 5.2%, while in 2017, the yields stood at 5.6%. Regarding housing demand in Nairobi, there was a housing deficit of 1.9 million units in 2017, where more than 70% of this deficit stems from the segment of the lower-middle income. To bridge the existing gap, the government of Kenya continues to provide incentives, such as eliminating the 15% tax so that more housing units can be built. The government has also rolled out an affordable housing scheme to reduce the deficit since most people live in rented housing.

Evidence indicates Kenyan property market has been declining due to an oversupply of high-end residential property and constrained access to credit facilities. According to Hass Consult (2019), the asking price for residential property, also known as the Hass Composite Property Sales Index, fell by 3.4% compared to a rise of 8.1% in 2018. This indicates that the asking price has been increasing at an average of 8% up to 2018, and there was a 3.4% reduction, suggesting that the affordable housing units in the market are beyond the capability of many people and households. Furthermore, statistics indicate that several housing units in various neighbourhoods in Nairobi City have indicated a rise in the nominal prices, signifying that affordability remains an alien term in Kenya. In the present mortgage market, the size of the mortgage stands at three percent of GDP, yet fewer than twenty-five thousand mortgages exist (Delmendo, 2019). This evidence suggests that access to financing remains a big challenge to most households searching for housing.

Karoki (2013) demonstrates that low-cost housing projects in Nairobi are typified by a rising demand mostly because of urbanization. However, the selection of building materials must match the requirements of the local setting to improve the quality of life by constructing more houses or improving the existing structures. Moreover,

sustainability concerning urban housing requires innovation and new approaches to constructing houses to manage human settlements and incorporate energy and ecological matters (Kiriko, 2013).

Evidence indicates that ownership of homes is low in Kenya, specifically in Nairobi, where 87.9% of the households rent compared to 7.6% who own residential homes (Economic Survey, 2014). This suggests that home ownership in Kenya is a herculean task since affordability challenges are currently insurmountable. Kenya faces low availability of affordable houses, suggesting that many houses constructed by investors target the high-end market (World Bank report (2011). This evidence demystifies that housing shortage, household income, accessibility, and housing credit cost can give insights on how to increase access to affordable housing. Therefore, this research looked at the influence of affordable housing on real estate investment in the Kenyan residential housing sector.

1.2 Statement of the Problem

The government of Kenya considers building affordable houses for low-income citizens as a key development agenda that has been receiving scholarly and policy attention; where there seems to be a consensus that real estate investment has been on the rise despite housing affordability being low. Mbatha (2017) states, Despite the recognition of housing, the low/middle-level income earners who comprise over 90% cannot access quality housing because of affordability challenges. Though low-income and middle-income earners form the largest population in Kenya, there is very little attention on building low-mortgage houses that attract low rents. Mayer (2011) states that most city houses only target the elite and wealthy. This means that most of the houses constructed remain unaffordable to low-income citizens.

High housing costs have been attributed to reasonably priced home finance schemes, inflated infrastructure costs, and bloating land values (Kibunyi *et al.*, 2017). Furthermore, many private and government property developers are offering units affordable to a minority of wealthy individuals (Marx et al., 2019). Despite this initiative, real estate investment has yet to be on the upsurge as expected; this remains

an issue for empirical investigation. Low-income individuals always need help to access good housing due to the high costs of residential houses, especially in urban sectors.

The affordability of houses relies on housing prices, household income, mortgage costs, and inflation rates. The problem of affordable housing is predominant in Kenyan urban areas compared to rural areas. Gardner et al. (2019) claim that the predominant form of housing in Kenyan urban areas is bungalows comprising 41%, medium and high-rise flats at 21%, swahilis10 at 21%, and shanties at 13%. Over 90% of Kenyan urban households rent, thus indicating a lack of affordable accommodation. Average household incomes in Kenya are low, and the majorities are in the informal working sectors placing more pressure on housing affordability. There is a dire need for more information about Kenyan households who can afford formally constructed homes, especially with mortgage financing. Despite being an important element of the growth of the housing sector in Kenya, there needs to be more research on the relationship between affordable housing and real estate investment growth.

Due to the increased concern about the affordability of housing, especially in Kenyan urban areas there is a need for current research to focus on the various determinants of affordable housing as predictors of investment in real estate. Gardner et al. (2019) assert that sixty-six percent of people living in Kenyan urban slums dwell in slums, signifying that affordable housing has a deficit. Kenya Bureau of Statistics (2019) recorded 4.8% real estate growth during the three quarters of 2019. This growth was higher by 0.3% compared to the year 2018. Furthermore, people in the middle and the low segments of the economy experience shortfall of houses, where only 20% of the new housing units cover this group in urban places. This suggests that most housing units are constructed in high-end target markets, thus negating the critical market for low and middle incomes. More policies and resources should be directed toward filling the housing gap. HFCK (2012) puts this into perspective by stating that the total demand for affordable housing from low- and middle-income households is 48%, given that 80% of the new units target individuals with high incomes.

Limited information is available on housing prices, household incomes, mortgage costs, and inflation rates on the residential estate growth in Kenya. Previous researchers provided some insightful information on these variables' influence on residential real estate growth using true housing affordability indicators that are yet to be documented. For example, Karoki (2013) identified GDP and the rates of inflation and interest as predictors of the prices of real estate properties. On the other hand, Muthaura (2012) revealed that the rate of that interest predicted the price of houses. Nzalu (2013) suggests that population growth; inflation rate, interest rate, and GDP are critical factors that influence real estate investment growth. These studies focused on the investment in real estate without regard for housing affordability variables and residential real estate investment. Therefore, this study set out to fill the gap by delving into residential real estate investment using affordable housing variables: cost of mortgage, housing prices, and household income. The study further sought to determine the moderating effect of inflation on the link between affordable housing and investment in residential real estate.

1.3 Objectives of the Study

1.3.1 General Objective

To determine the effect of affordable housing on real estate investment in the residential housing sector in Kenya.

1.3.2 Specific Objectives

The specific objectives of the study were:

i. To determine the effect of housing prices on real estate investment in the residential housing sector in Kenya.
ii. To establish the effect of household income on real estate in the residential housing sector in Kenya.
iii. To assess the effect of cost of mortgage on real estate investment in the residential housing sector in Kenya.

iv. To investigate the moderating effect of inflation rate on the relationship between affordable housing and real estate investment in the residential housing sector in Kenya.

1.4 Research Hypotheses

The study sought to test the following null hypotheses:

H_{01}**:** Housing prices do not significantly affect real estate investment in the residential housing sector in Kenya.

H_{02}**:** Household income does not significantly affect real estate investment in the residential housing sector in Kenya.

H_{03}**:** Cost of mortgage does not significantly affect real estate investment in the residential housing sector in Kenya.

H_{04}**:** Inflation does not significantly moderate the relationship between affordable housing and real estate investment in the residential housing sector in Kenya.

1.5 Significance of the Study

This research provides informative insights to help people or organizations interested in the property market make appropriate decisions, particularly in building and purchasing houses. Knowing factors contributing to the affordability of houses helps investors and buyers avoid making losses in their investments. The decision-making organs in banks, governments, and other organizations can use the outcome of this research to streamline their policies toward improving affordability by focusing on the key areas highlighted in the research. Besides the contribution to the affordable housing literature, the results of this study improves the levels of awareness among real estate developers regarding the areas of leverage aimed at making houses affordable to people in lower cadres of the economy. Improved awareness is projected to augment the existing relationships among and between estate agents and property owners.

The information generated in this research builds on the available knowledge on residential real estate investment, where policymakers are better positioned to draft well-thought policies to grow the property market. Results emanating from this research provide more insights into how property owners engage with estate agents. This

suggests that both the real estate agents and the property owners have nuanced knowledge of affordable housing and how it can be profitable, given that most prospective homeowners cannot afford high-end real estate properties. The outcome of this research will be of great help to people managing projects in real estate and other professionals interested in studying the dimensions of affordable housing and real estate investment, as the results will also provide important insights vis-à-vis factors that affect affordable housing and real estate investment.

1.6 Scope of the Study

The key area of focus in this research was the interaction between affordable housing and real estate investment in residential houses in Kenya. The period was confined to ten years, from 2010 to 2019. The focus on the ten years was informed by the development in the residential housing sector owing to political goodwill and implementation of critical housing sector legislations. The ten years up to 2019 were chosen considering the onset of Covid 19 pandemic in 2020 that slowed down social and economic activities worldwide. Moreover, it was during this period that interest rates were capped, and the section was repealed later. The population comprised Kenyan real estate firms registered by the government. Thus, the unit of interest was narrowed down to residential housing of firms registered by Real Estate Agents. The study focused on Kenya's residential housing sector since the available data sets have not been disaggregated nationally. Thus, concentrating on Kenya's residential housing sector provided more realistic secondary data. Moreover, the study concentrated on affordable housing and how the pull and push factors affect residential housing's eventual real estate investment.

1.7 Organization of the Study

This thesis comprises of five chapters. The first chapter introduces the study and lays the conceptual and contextual foundations for the research. The first chapter also outlines the problem this research seeks a solution to and the relevant objectives and questions to address. The importance of the research outcomes is also stated in this chapter. The second chapter reviews the theories that inform the research and the

relevant empirical literature. The third chapter outlines the methods and tools for collecting the required information and statistical analysis. The fourth chapter presents the outcome of the analysis and interpretations and discussions drawn from the results. The last chapter (five) summarizes the findings and states the conclusions and recommendations drawn from the results. Limitations are also highlighted at the end of the chapter.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This study segment looks into the theories forming the foundation of the research. The segment then examines the empirical review of housing affordability and real estate investment. The theoretical review illustrates the applicable theories for this study that guide the housing affordability phenomena. The empirical reviews cover local and international contexts on ownership of affordable houses and investment in real estate. A conceptual framework was applied to show and/or describe the relationship between predictor variables (housing prices, household income, cost of mortgage), moderating variable (inflation rate), and the outcome variable (real estate investment).

2.2. Theoretical Review

Theories are important in guiding comprehension, forecasting, and description of an occurrence (Ngulube *et al*., 2015). Theories also lay out the assumptions made in the area of study that a scholar is interested in (Steggell *et al*., 2013). Furthermore, reviewing theories in research studies is essential since it enables researchers to draw blueprints that guide the choice of topic, variables/objectives, the questions the researcher intends to answer, and the design for gathering and analyzing information. The researcher's theories are permanent income, liquidity preference, anticipated income, rational choice, and decision theory.

2.2.1 Permanent Income Theory Milton Friedman is credited with propounding permanent income theory in 1957 to explain the consumers' spending capacity (Friedman, 1957). The theory underscores that consumption patterns for individuals at a particular time are determined by their prevailing incomes and anticipated future income (Meghir, 2004). This suggests that future and current income are the key tenets of permanent income theory. Importantly, Milton (1957) suggests that changes in incomes do not necessarily alter consumption patterns; rather, permanent income

changes are central to predicting the consumption capacity of individuals. In the simplest form, the permanent income theory demarcates the ratio between income deemed permanent and permanent consumption. Heylen and Haffner (2013) developed the theory further, stating that permanent income and permanent consumption ratio hinge on the interest rate, the centrality or meaningfulness of income from non-property and property assets, and the interest rates individuals can lend and borrow. In addition, the consumer's addictions to wealth versus their tastes and preferences (Galvez, 2011). Despite the importance of permanent income theory in explaining consumer patterns of spending, the theory has been critiqued because it negates the aspect of fluctuations in short-term incomes, given that consumers spend their resources when their incomes change (Aguiar & Hurst, 2016; Zhang, 2018). This suggests that permanent income theory assumes the changes in the incomes that people receive in the short term, which enormously impacts people's consumption capacity.

Permanent income theory is relevant in this study since it provides insights into understanding affordability and household investment patterns by exploring the role of future income on planned investment and spending. The theory explains the role of future income in motivating individuals to invest in real estate. It applies to housing prices because it elucidates the rationale under which people acquire houses through mortgages depending on the permanent income they earn to service the loans. In addition, some consumers will buy houses to circumvent the challenges they might face in servicing the mortgage in the unforeseen future. This suggests that individuals purchase houses for two reasons; to secure their future when they can no longer work/receive income, while others purchase houses depending on their ability to meet mortgage rates in the imminent future. Over and above, the theory underscores the centrality of present income and the anticipated permanent incomes in predicting the capability of individuals to purchase residential houses.

2.2.2 Liquidity Preference Theory

John Keynes is credited for propounding the theory of liquidity preference, where the prevailing interest rates are the key predictor of individuals' preference to hold their

assets in liquid assets or assets that readily yield liquidity (Keynes, 1937). This appears to imply that incomes individuals receive to determine their motivation to hold their assets, where capital value changes of the assets and actual incomes from these assets are central to predicting the holding of assets (Kregel, 1998). For Keynes, the key motivation for people to hold their assets is determined by the changes in interest rates. In other words, the extent to which interest rates affect the capital value of assets in terms of the returns predicts people's preferences.

The theory asserts that people need money for various reasons. To meet speculative needs for money, individuals may hold money and avoid investing them in real estate. Elgar (1999) proposed various reasons why individuals need money since there are many factors to this. For instance, individuals need money to finance expenditure plans, while others require money for speculative purposes to benefit from interest rates. On the other hand, individuals require money as a way of holding their fortunes in pure purchasing power so that they can circumvent unforeseen future happenings. All these motives are categorized as either precautionary or transactions-speculative to demand money. These precautionary or speculative motives explain why banks prefer higher liquidity since active balance sheets define their business compared to passive accommodation of credit demand. The theory asserts that people may be motivated to hold money rather than invest in real estate and other investment forms.

As far as this research is concerned, the strength and importance of liquid preference theory are clear since it describes how people balance holding money as a store of wealth or value money for transaction purposes for their prevailing business needs. It explains the motivation and demotivation behind people getting involved in real estate investments (Bibow, 2005). Consequently, people spend money for their current monetary demands, thus preceding interest they have earned if they could have speculated the funds through interest rates. In contrast, others will hold the money since they are unsure about the future (precautionary motives). Elsewhere, an interest rate increase motivates individuals to borrow less money to derive profits. To this end, this theory is relatable to the cost of a mortgage since it describes how individuals will store their wealth in terms of the mortgage. This is more precautionary than paying rent,

devoid of futuristic economic outputs like home ownership. Moreover, liquidity preference theory offers a nuanced framework that describes why real estate investors demand higher premium interests since real estate is a long-term investment with greater risks, thus the need for higher liquid holdings.

2.2.3 Anticipated Income Theory

Prochanow (1944) is credited with developing the theoretical framework of anticipated income to explain the totality of motivation by commercial banks to offer loans to individuals and liability entities. The cardinal postulation of this theory is the borrower's capability to repay the loans, thus, commercial authenticates the expected revenue made by the borrower as a scorecard that gauges the individual to serve the term loan extended to her. It is instructive to note that a term loan refers to a period not exceeding five years but more than one year. Bronfenbrenner (2017) states that the anticipated income framework offers an accentuated approach to examining how lenders, such as financial institutions, estimate loan repayments. Thus, it appears that the ability of an individual to serve a term loan is central to predicting the loan amount extended to them.

Lenders rely on the borrower's expected income to plan the mortgage's liquidation. Ngwu (2006) underscored the centrality of individuals being their loan compared to reliance on collateral. In real estate terms, an individual can be loaned a mortgage depending on the investment portfolio and the patterns of maturity of the loans. Baker and Yannelis (2017) underline that the ability of customers to meet the loan installments is important in determining their general capability to service the mortgage. Scholars such as Bronfenbrenner (2017) and Oner (2010) agree that the borrower's ability from their anticipated income to repay their mortgage is more important than the collateral they hold from the borrower. This can mean that people with better income projections are well placed to receive loans from lending entities since they show how and when to repay loans.

Despite being critiqued on the basis that arrangements to pay back the money borrowed in installments weakens a bank's ability to honor emergency cash requests from other clients, the anticipated income theory is important in explaining the ability of borrowers to repay a loan. In this research, the theory provides a framework that analyzes the ability of prospective house owners to repay their loans. The ability of prospective house owners to repay loans determines accessibility to mortgages, increasing the

construction of residential houses. Moreover, anticipated income theory borders on the creditworthiness of individuals since lenders are determined to establish whether borrowers will meet their financial obligations based on the agreed terms and conditions. To this end, the anticipated income theory explains inflation since it offers a more accentuated description of how price changes affect interest rates, which influences the cost of mortgage and housing prices.

2.2.4 Rational Choice Theory

Adam Smith is credited with expounding the rational choice theory to explain the motivation behind given activities (Smith, 1776). Later, the rational choice theoretical framework was developed into a neoclassical economic theory to describe the choice by individuals to invest in light of the expected utility they derive from the investment (Becker, 1988). In other words, the rewards emanating from an investment must be seen to outweigh the risks for an investment to make meaning. From the economic perspective, Paternoster, Jaynes, and Wilson (2017) provided a nuanced justification for rationality in investment, given that human actions are designed to make decisions based on reason and the possible outcomes of the investment decisions.

Dugato, Favarin, and Giommoni (2015) furthered the application of the rationality framework in the study of investments by underlining the criticality of weighing the real estate investment risks and rewards. Several variations have been pointed out in the application of the theory of rational choice in real estate investment; however, for Lux *et al.* (2017), three elements are common in the study and application of rationality in real estate investment: Rationality defines the reason to invest since there is a deliberate effort to gauge the rewards and risks of the investment, investment specificity of the rational choice models, and immediate contextual attributes define the investment decision. These elements of rational choice infer that investment decisions are not made in a vacuum; rather, they should appear to be supported by returns on the investment.

The theory fits this research because it speaks to the role of expected returns in the decision of a person to invest. Thus, it may be applied in this research to explain why real estate investors target high-income earners and avoid constructing cheap and

affordable houses. Real estate investors are motivated to construct housing by the expectation of future returns. Most low-income households have unpredictable incomes and may need help to meet periodic demands to pay for housing, creating losses for the homeowners. Investors in housing properties make decisions informed by the estimated costs, benefits, and availability of the investment opportunity versus the availability of a comparable opportunity's costs, availability, and potential returns. Rationality is equated with personal preferences, time discounting, and attitudes toward the possible risks of an individual investor. The rational choice theory applies to household income variables since individuals make investment decisions based on reason/rational outcomes (Sugden, 1991). This means that investment resolve is based on tangible and persuasive information available to the household members.

2.2.5 Decision Theory

Leonard Savage propounded the decision theory. It provides models for judgment that lead to rational decision-making (Savage, 1954). The decision framework relies on mathematical models to make judgments based on statistical representations, loss functions, and probability. Before decisions are made, the theory proposes the need for modeling the possible outcomes and whether assumptions will hold for achieving the projected outcome. Researchers who have applied the decision theory, such as French (2011), believed that the decision framework draws from many disciplines and/or fields, such as social sciences, statistics, mathematics, economics, and psychology. Thus, deciding to invest in real estate depends on mathematical modeling, which will show whether the investment will be profitable. In real estate investment, the decision theory has been applied to establish the allocation and pricing of assets. In other words, the decision theory offers a critical foundation that predicts the allocation of assets and their pricing in a manner that strikes a balance between risk and performance.

Scholars suggest that the study of real estate investment was initially based on portfolio theory developed by Harry Markowitz (1952), which stated that portfolio optimization is a major area in real estate investment. The centrality of optimizing an organizational portfolio is to minimize risks by maximizing the returns/income from the

portfolio/asset. Markowitz (1952) contended that asset diversification in the form of different securities is important to realize the set organizational goals. French (2011) argues that the optimization of real estate investment follows the path of decision theory, where the objectives of the investor form one of the criteria applied in the selection of real estate. This suggests that the marginal contribution of investment in properties to a multi-asset portfolio is essential in decision-making, that is, whether to invest or not.

Thus, the decision theory is relevant in explaining the challenges surrounding affordable housing. It attributes the inability to meet the affordable housing demands to the rational decisions of investors based on current expectations and prevailing business constraints. Guarini, Battisti, and Chiovitti (2018) state that real estate decisions' sanction depends on the relativity of the prevailing business constraints and current expectations. French (2011) suggests that decisions to invest in real estate do not end in the mathematical modeling state; rather, decisions also consider the exposure levels that must be minimum. Thus, factors outside the mathematical model are considered. To this end, the decision theory is relevant to real estate investment since it offers rationale/justification that backs up investment in properties (Takemura, 2021). It is instructive to note that factors outside the limitations of the mathematical model are considered before a decision is made to undertake real estate investment.

2.3 Empirical Review

This segment delves into past empirical research on affordable housing and real estate investment. Specifically, the study will focus on the influence of housing prices, household income, mortgage cost, and inflation rate on real estate investment and its growth.

2.3.1 Housing Prices and Real Estate Investment

Housing prices significantly influence the affordability of houses. Zainon, Mohd-Rahim, Sulaiman, Abd-Karim, and Hamzah (2017) noted that constructing new houses predicts housing costs. In other words, higher construction costs will attract a high cost

of housing in the long term. The high construction costs translate to high house prices, reducing affordability. Research underscored the idea that the fluctuation of the cost of the house is a key predictor of home ownership and demand for housing. The study focused on the Malaysian housing sector from the demand side. In contrast, the current study will concentrate on Kenya's residential housing sector and the factors associated with affordable housing besides prices.

Using firm-level data from 2001-2007, Han and Lu (2017) studied housing prices and investment, particularly how far land policy changes had influenced housing prices and real estate investment. The secondary data analysis indicated that land-use quotas are critical determinants of housing prices since the reduction or increase of land-use quotas increases and decreases prices, respectively. In other words, increased quotas on land use mean less growth of housing prices, and the reverse holds (Rottke, 2001). In addition, the study noted that increased housing prices encouraged more investments owing to higher profitability to the extent that this crowds out fixed capital investment. It is instructive to note that the net outcome of housing prices on investment limits economic growth; thus, it is termed negative to the economy. The study adopted firm-level data, while this study adopted the use of secondary panel data for analysis.

The construction cost of residential houses is one of the significant factors determining housing affordability and the growth of real estate investment. Glaeser, Huang, Ma, and Shleifer (2017) affirmed the existence of a connection between houses construction costs, affordability, and real estate investment growth, asserting that the funds needed for building houses continue to influence their retail prices, where the cost of housing is higher by 2-10% of the construction cost. The authors noted that China continues to construct more residential houses to the extent that many are vacant, leading to a housing bubble. To ameliorate the state of affairs, the study noted the need for the Chinese real estate market to curtail housing supply so that the existing vacant units can be sold and/or occupied (Almirall, 2013). Thus, the need for the Chinese authorities to strike a balance between progress and gains in the development of property and its

sustainability. This research sought to delineate how much housing prices have influenced real estate investment, specifically in affordable housing.

The Kenyan real estate market is not an exemption. Karoki (2018) delved into the house price predictors in Kenya, where he underscored the centrality of macroeconomic factors, like rates of interest, GDP, and money supply, in determining housing price outcomes. Furthermore, Karoki (2018) uncovered that the order of influence from the highest to the least was the rate of interest rates, GDP, and then the supply of money to the market. Consequently, macroeconomic factors remain important in setting up the prices of real estate properties. The author makes bold steps to evaluate the predictors of residential house prices. In contrast, this research delved into the effect of housing prices on house investment and how market conditions, such as inflation and lending rates, moderate this. Thus, the authors agree that housing affordability in Kenya is determined by several macroeconomic factors influencing housing prices.

The need for more affordable houses continues to be a concern in the Kenyan real estate industry. Mbuguah (2017) researched factors contributing to the availability of houses that people with small incomes in Nairobi County can afford. Mbuguah (2017) gathered information from property managers, agents, and valuers. The target population comprised all the real estate agents, valuers, and property managers with headquarters in Nairobi. Mbuguah (2017) determined that the availability of inexpensive houses depended on legal factors, the cost of housing, and financial and socioeconomic factors that influenced real estate investment.

2.3.2 Household Income and Real Estate Investment

Household disposable income determines the affordability of residential homes. Linneman and Megbolugbe (2017) studied housing affordability in Boston, USA, focusing on the connection between household income and the ability to afford housing, noting that households with low education and income levels take long periods to purchase homes. With low education levels, the authors underlined that the incomes of such a group of individuals stagnate for a protracted period hindering their ability to

own homes is compromised. The study postulated that household income directly predicts home ownership, where education levels play a significant role in determining income levels. The author delved into education and how it predicts an eventual ability to afford housing. At the same time, the current study provided empirical insights on how household income is moderated by inflation, among other factors, to influence investment in building affordable houses.

Household income can never be separated from the ability to own homes. Through longitudinal data from the Chinese Family Panel Studies Survey, Chen, Hardin III, and Hu (2020) document the relationship between household income and home ownership. Analysis of the extracted data from the survey indicated that wealth at the household level in China is higher than in some developed economies. The authors applied this information to state that the totality of household income is essential in predicting the capability of a given household to purchase a home. This suggests that residential ownership significantly differs from purchasing an office space or complex since household members do not use the same office for income. In addition, household consumption is more likely to exploit economies of scale, thus leaving more disposable income for home purchases. Thus, it is argued that the propensity to consume increases as household wealth an increase, suggesting that joint property ownership attracts increased spending compared to sole proprietorship (Rogers, 2017). The study focused on household wealth and how it predicts residential real estate investment. In contrast, the current study offered a more nuanced description of how household income affects residential real estate. This research concentrated on the Kenyan case study to compare the results with China.

The low uptake of residential housing is attributed to unaffordability caused by low household incomes. Nurick *et al.* (2018) found that household income is a determinant of low uptake of residential housing in South Africa. The study revealed several predictors of low uptake of residential housing: REIT maturity, residential real estate nature, and household income. This suggested that apart from the maturity of trusts and the nature of the real estate, household wealth appears to predict the uptake of

residential spaces in South Africa. The study applied a qualitative approach, deemed more biased, while the current study used quantitative data to make inferences. In addition, the study used primary data, while this research opted for secondary information.

Though other factors like marital status and family structures can be considered significant in home ownership, they don't significantly influence affordability. Rattanaprichavej and Teeramungcalanon (2020) claimed that demographic factors do not influence home affordability, but active or passive income does. By testing the attitudes of 334 real estate investors on the anticipated investment returns when they make passive, direct, or indirect incomes from real estate investment, the study established that marital status, education, and gender do not affect investment decisions. This was reinforced by the fact that individuals' incomes from investments are normally lower than the expected yields. Importantly, the study established that real estate yields big returns. This signified that household income (active or passive) is a key predictor of home ownership. The study disaggregated household demographics to establish their influence on real estate investment, while the current study concentrated on the aggregated household level characteristics to determine their influence on investment.

2.3.3 Cost of Mortgage and Investment in Real Estate

Most real estate investment construction and purchases are funded using loans. Cost of Mortgages affects investors' ability to fund real estate projects. High mortgage costs limit the investor's ability to provide affordable houses since they have to cope with the high cost of the funds. A study by Klimczak (2016) on the predictors of real estate investment found that capital markets have a cardinal in determining the availability of funds to invest. Thus, the source of funds is a critical investment decision that should be investigated to unearth facilitators and hindrances to investment. Towards this end, it becomes apparent that capital markets are central to determining the cost of a mortgage, which in turn determines real estate investment decisions. For investors to attract financiers, the capital market must be attractive so that the returns attract entities financing the investment. The study concentrated on the factors that affect access to mortgage financing and how this influences real estate investment. In contrast, the

current study offered a more accentuated approach to how the mortgage/lending rate cost affects investment in real estate investment in Kenya.

The house prices in Nairobi have also been a study focus for several authors. Kibunyi *et al.* (2017) studied the indicators of housing prices in Nairobi and found that Gross Domestic Product, cost of construction, loans extended to the real estate sector, lending rate, and diaspora remittances as important in the determination of house prices in Nairobi, Kenya. Furthermore, research showed that inflation has an inverse relationship with housing prices. In contrast, GDP has a strong relationship with the pricing of houses, while the cost of construction and diaspora remittances has a very fragile relationship with housing prices. Notably, the study indicated that diaspora remittance has no significant relationship with house prices. This negates the existence of a house price bubble. The study focused on how housing prices affect the cost of a mortgage. In contrast, the current study concentrated on the interplay between the mortgage cost measured by the lending rate and residential real estate investment.

Further interest rate volatility is a key factor influencing housing prices and affordability in Kenya. Waithera (2017) indicates that the interest rate is positively associated with real estate housing prices. This suggests that as the interest rates increase, so does the price of purchasing residential houses. Importantly, Waithera (2017) noted that the demand for houses in Kenya has been increasing since 2005, but the mortgage cost has majorly predicted the uptake. The study concentrated on real estate prices in Kenya and how interest rates determine this. In contrast, the current study delved into how lending rates affect residential real estate investment, which is central to bridging the unfilled rising demand for affordable housing.

Additionally, Mutisya (2015) also found that mortgage is most affected by the interest rates charged on the same mortgage, which affects the homes' affordability. Other significant factors noted by the author include GDP, household sizes, inflation rate, construction costs, household constitution, and routine employment incomes. The study underscored the centrality of policy developments as a panacea for ameliorating the

affordability of residential houses. The study was interested in ranking factors that affect affordable residential home ownership, while the current study concentrated on the aggregated level of the mortgage cost and how it influences residential real estate investment.

2.3.4 Influence of Inflation Rate

The increasing rate of inflation increases household financial burdens and reduces affordability. Nabutola (2014) found that inflation rates are significantly connected with housing affordability in Kenya. Notably, the study underlined that inflation continues to increase the cost of housing coupled with government policies that are not effective. Furthermore, the study noted the centrality of the availability of houses to align with individuals' savings which are also affected by inflation. Inflation reduces the amount of savings (Batayneh, 2021). A reduced saving indicates low affordability and an inability to foster investment projects. Further, inflation rates affect the supply of houses as they may serve as a demotivating factor for investors and reduces the investors' qualification for mortgages. The moderating effect of inflation is evidenced by its role in decreasing the purchasing power of both the landlords and the tenants (Lersch, 2018). Inflation results in high asset prices and increases mortgage rates, hence creating downward pressure on demand for real estate products.

Further, inflation increases the amount of income households devote to housing. Lersch, 2018 asserted that inflation increases the rent burdens for poor households. Inflation rates affect both housing affordability and the growth of real estate investment. Kidundi (2020) found that most financial institutions do not fund low-cost housing for fear of defaults caused by the unbearable costs of life. The government needs to be more effective in regulating the financial market where firms advancing credit for inexpensive houses can operate, thus forcing them only to finance middle and upper-class individuals. However, the author seems to negate the concept of inflation and how it affects the ability of buyers to meet their end of the bargain in terms of loan repayments. Thus, the current study was interested in the role of the inflator as a moderator in the housing industry.

Access to mortgages is generally low in Kenya for fear of the financial burdens caused by several factors, including inflation. Kipkirui (2015) suggests that Kenya's mortgage access is still low, partly blamed on inflation. It is instructive to note that inflation affects the cost of housing, meaning that many prospective homeowners cannot afford it. In terms of demand and supply, the study noted that the supply of affordable housing is still low. The author directly attributes low real estate development to inflation, meaning other factors were negated.

The current study portended that inflation moderates interaction involving housing uptake and investment in housing. Kimani and Memba (2017) state that debt financing largely supports real estate investment. Towards this end, the study underpinned the need for real estate stakeholders to control inflation to ensure that the general cost of mortgage does not rise to unaffordable levels. In general terms, higher inflation makes individuals keep their savings in terms of assets, suggesting that some people can keep their savings during inflation times in real estate investment. The inflation rate has a direct influence on real estate prices (Beguy, 2010). Though the author provided a sound explanation of the impact of inflation on development in real estate, the moderation effect of inflation as measured by the CPI was negated, which the current study sought to establish.

2.4 Summary of Literature and Research Gaps

Experimental research on the effect of affordable housing on the developments in the housing sector is limited. Only some attempts have led to inconclusive findings attributed to limited literature and a lack of real estate strategies and investment to alleviate the shortage of houses in Kenya. Documented information on the effect of affordable houses on investment in the housing sector needs to be more researched and comprehensive.

Methodologically, available information leans towards the performance of real estate. While past research examined investment in real estate, the predictors were varied – the first one had invested in commercial real estate as the independent variable, while the others had determinants of home ownership as the independent variable. To this end,

this research determined the impact of affordable housing on investment in the residential housing sector in Kenya. Arising from the synopsis of various studies outlined in Table 2.1, it is evident that affordable housing is influenced by an array of moderating, intervening, and explanatory/predictor variables. Therefore, more experimental research is needed to bridge the gaps identified in the review.

Table 2.1 summarizes the past research reviewed in this study.

Table 2.1: Empirical Evidence and Research Gaps

Author	**Objectives/ Purpose**	**Key Findings**	**Research gaps**	**Focus of this study**
Karoki (2017) -Kenya	To investigate the determinants of residential real estate prices in Kenya**.**	The study found that interest rates have the most significant effect on house prices followed by GDP and thus affecting affordability of housing.	This study focused on relationships between residential real estate prices and cost of mortgage, GDP, and income of the households and less on the affordability of the housing	The study was more focused on the relationship between the affordable housing and real estate investment. Besides pricing, the current study seeks to establish the effect other housing affordability, such as interest rates and household income.
Nabutola (2016) -Kenya	To investigate housing affordability and challenges.	The study established that while savings and loan programmes have been successful in attracting substantial deposits, they often create potential difficulties.	This study focused on supply of houses to the Kenyan citizens to measuring affordability, however the study does not divulge into the variables that influence growth of the real estate sector.	The study focused on affordability of housing with a view to establish its influence on the real estate investment.
Zainon et al. (2017) - Malaysia	The objective of the study was to find out the general scenario of affordable	Their study established that price factor is the key determinant of affordable housing in Malaysia.	This study focused into the determinants of affordable housing, but negated the aspect of real estate investment	The study detailed the various determinants of affordable housing while observing the influence of macroeconomic factors such as inflation.

	housing in Malaysia			
Linneman &Megbolugbe's (2017) -Boston, USA	The objective was to explore the impacts of public policy interventions on urban housing markets	Their study found that level of education really affects the income of individuals and in turn, affects their possibility of affordability of housing.	This study focused on housing affordability problems for middle- and low-class households and negated the aspect of real estate investment	The study focused on affordable housing for the middle-income households. In addition, the current study delves into how variables of housing affordability influence residential real estate investment.
Mutisya (2015) -Kenya	The objectives of the study were to: identify significant factors that affect housing affordability, determine the influence of the significant factors and rank them with respect to contribution to housing affordability	The author established factors that affect housing affordability which include: number of family members with income, construction costs, size of the household, loan to land value, GDP and inflation rate.	The study focused on factors that influence affordability of houses while the current study seeks to investigate the effect of affordable housing on real estate investment.	The study applied macro-economic factors such as interest and inflation rates as moderating variables to test the influence of affordable housing on real estate investment.
Kidundi (2018) -Kenya	The objective was to determine the profitability of financing in the low-income housing sector in the Kenyan	The findings were that, financial institutes do not fund low-cost housing for fear of defaults. And the government has not been effective in regulating the financial market.	The focus of the study was on profitability of the real estate sector, while the current study focuses on affordability of housing and growth of real estate sector.	The study focused on mortgage and inflation rates in moderating the relationship between affordable housing and real estate investment.

	mortgage industry by investigating the main business activities of the finance institutions.			
Mbugua h (2017)	Assessment of factors affecting the supply of affordable residential housing units in Nairobi city and its environs	Findings from the study indicated that legal factors, cost of housing, financial, and socio-economic factors influenced real estate investment	The study adopted variables/factors that are distinct from the present study.	The study adopted inflation as a moderating factor and how it influences the relationship between housing prices, cost of mortgage, household income and rea real estate investment.
Chen, Hardin III, and Hu (2020)	Conducted a study on household income and home ownership using longitudinal data from the China Family Panel Studies (CFPS) survey	Findings suggest that the housing wealth effect on household consumption in China is much larger than has been shown for developed economies	The study focused on household income using longitudinal and panel data	The study included the variable of inflation using an exploratory design to establish its influence of affordable housing and real estate investment
Nurick *et al.* (2018)	Determined the factors that had attributed to low uptake of residential stock	The findings indicated several factors that have influenced the low uptake of residential stock. These have been identified as the financial performance of residential real estate in South Africa, such household income, the nature of residential real estate, and the	The study concentrated in South Africa and used a qualitative approach, which relies on primary data.	The study focused on Kenya's housing sector secondary data using a quantitative approach. Besides, the current study focused on residential real estate investment from the affordability perspective.

		maturity of the REITs sector		
Rattanaprichavej and Teeramungcalanon (2020)	Analysed the demographic characteristics of real estate investors and their attitude towards expected and earned yields when making direct, indirect, and non-real estate passive income investments	Results reveal that general investor characteristics such as gender, education, and marital status tend not to affect investment decisions.	The study did not establish whether demographic factors are moderates by other factors.	The study contextualized the influence of inflation on the relationship between factors associated affordable housing and real estate investment

Source: Literature Reviewed by Researcher (2023)

2.5 Conceptual Framework

The conceptual framework below visually illustrates how the variables are linked. It entails three predictor variables: affordable housing as determined by housing prices, cost of mortgage, and household income. The investment in real estate is the dependent variable while inflation moderates the association among variables in the study.

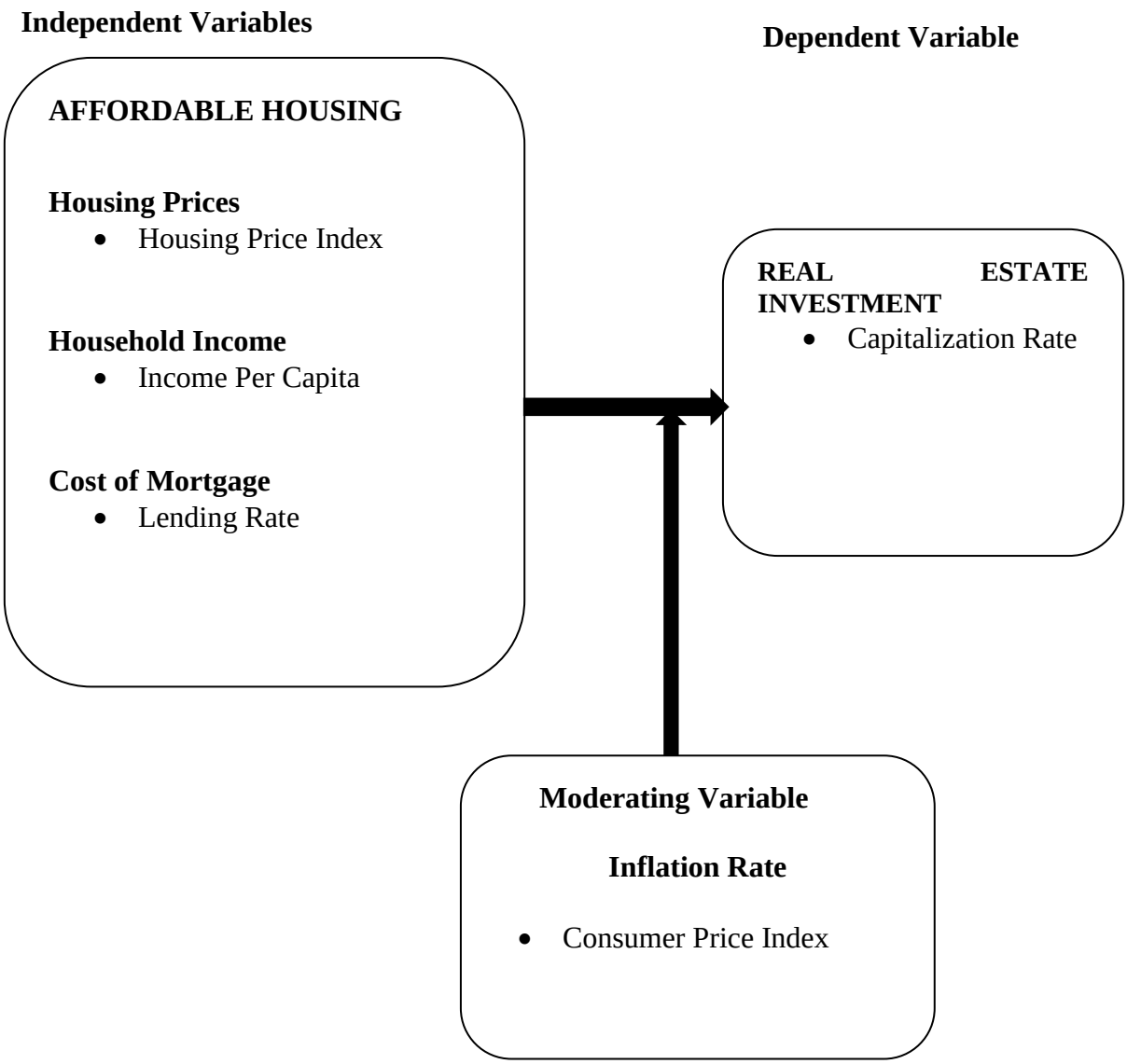

Figure 2.1: Conceptual Framework

Source: Researcher, (2023)

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This third chapter covers the methods employed by the researcher in conducting the research, from the targeted population to the techniques used to come up with the sample and procedures for arriving at the sample size. Thus, the methodology offered a roadmap that guided the study in answering the research questions. Given that the study applied secondary data, many methodological approaches are quantitative. The specific sub-sections in this chapter include; research philosophy, research design, empirical and test of moderation models, how the variables were operationalized and measured, the population targeted by the research, how the sample was arrived at, tools and procedure for data collection, analysis of data and presentation, the validity of the instruments, tests used to diagnose the statistical method, and ethical issues considered in the research.

3.2. Research Philosophy

The study follows many pathways before conclusions and generalizations are drawn, suggesting that the research is philosophical since the blueprint predicted the study's outcomes. De Langhe and Schliesser (2017) state that research philosophies define the way data are collected, analyzed, and applied to solve a given phenomenon, while Saunders, Lewis, and Thornhill (2015) underscore that the philosophy on which the research is anchored narrates the basis of information upon which the key dispositions and constructs of research are grounded. Galleries (2011) states that research philosophies are either interpretive or based on positivism, whereas the positivist approach is based on scientific methods that enhance the production of new knowledge. It is instructive to note that positivism is associated with quantitative data and experiments. The study was based on the positivist research philosophy since the research objectives have been formulated to enable hypothesis testing. Biesta (2010) supports this viewpoint by stating that positivism enables researchers to test hypotheses and answer research questions.

3.3 Research Design

Any research activity must have a roadmap that defines the boundaries of the data collected and how it is analyzed. Khajeheian (2019) stated that qualitative researches have different research designs than quantitative ones. The research design is adopted as a mechanism to answer the questions posed in the study (Mellenbergh & Hand, 2008). This research employed an explanatory research design since affordable housing and real estate investment are current themes that need to be properly researched and documented. The explanatory design approach was considered appropriate, especially when a detailed contextual analysis of the selected population is required, as it provides information on the various variables' perceptions, attitudes, and motives.

Since this research aimed at increasing understanding of the connection between affordable housing and real estate investment, explanatory research design became more relevant. The explanatory research design was justified because there is a dearth of literature on the interplay between affordable houses and investment in Kenyan real estate. Baştug and Yercan (2021) explained that the explanatory approach provided detailed information on the phenomenon under investigation. The design promoted the exploration of the role of affordable housing in real estate capitalization and its growth. It illuminated the available information about the connection between real estate investment and affordable housing.

The subsequent combination of quantitative and qualitative approaches generates in-depth information for establishing the causality among the study variables (Thornhill, 2009; Mugenda, 2003; Cooper & Schindler, 2008; Kothari, 2004). Explanatory research design explains why a given phenomenon under investigation is the way it is when there is limited information (Liu *et al.,* 2021). Similarly, an explanatory research design describes a topic or issue that has yet to be comprehensively explained (Dolce *et al.,* 2020). To offer an accentuated understanding of the study, the information gathered was put through rigorous appraisals and evaluation to establish the patterns and trends of the relationship between affordable housing and residential affordable housing while considering the moderating effect of the inflation rate.

3.4 Empirical Model

The study employed time series analysis to test direct relationships and an alternative model to test for moderator effects. Time series analysis enabled the determination of causality among the study variables, while the moderating model described how the inflation rate moderates the interaction between the independent and the outcome variables.

The study applied time series analysis model as captured below:

$$\mathbf{Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + ẹ \ldots\ldots\ldots i}$$

Where:

Y_t = Real estate investment at time t

β_0 = Constant Term

$\beta_1 - \beta_3$= Regression coefficients

X_{1t}= Housing prices at time t

X_{2t}=Household income at time t

X_{3t}= Cost of mortgage at time t

ẹ= error term

3.5 Testing of Moderation Effects

The moderation effect is tested differently from direct relationships involving predictor and outcome variables, suggesting that simple bivariate relationships are handled differently from relations between variables that involve a third variable, otherwise known as a moderator. Preacher, Zhang, and Zyphur (2016) underline adding a third variable and modifying the relation between variables, which should be handled differently from simple bivariate relations between variables. In statistical analysis, the predictor variable is normally represented with capital letter X, the outcome variable with capital letter Y, and the third variable with Z. According to Fassott, Henseler, and Coelho (2016) states that the moderation model is applied to test whether the influence of the predictor X on outcome Y differs when the third variable Z is added. Towards this end, it is instructive to note that the introduction of the moderator variable has the potential to alter how strong and the direction was taken in the interaction among

variables. Hayes (2017) argues that the moderator variable can change, reduce, or enhance the influence of the explanatory variable.

The model for testing for moderation was presented below:

$$\mathbf{Y_t = \beta_0 + \beta_1 A_t + \beta_2 I_t + \beta_3 A_t * I_t + ę \ldots\ldots ii}$$

Where:

Yt = Real estate investment at time t,

β_0 = Constant Term,

β_0= Constant,

$\beta_1 - \beta_3$= Regression coefficients,

A_t = Affordable Housing (housing prices, cost of mortgage, and household income) at time t

I_t= Inflation at time t

$A*I_t$ = Interaction term

ę= error term

3.6 Operationalization and Measurement of Variables

Table 3 below illustrated how the study has operationalized the association between variables in the research.

Table 3.1: Operationalization and Measurement of Variables

Category	**Variable**	**Operationalization**	**Measurement**	**Measurement scale**
Independent variables	Housing Prices	Measurement of price movements for housing units.	Housing Price Index (Mean and the median of real estate prices)	Ratio
	Household Income	Average income earned per an individual in a single year.	Income Per Capita (GDP/Population)	Ratio
	Cost of Mortgage	Monthly payment of mortgage	Lending Rate $LR = P(+i)n - P$	Ratio
Moderating Variable	Inflation	Steady and sustained increase in the price of housing units.	Consumer Price Index $(CPI_t - CPI_{t-1}/CPI_{t-1}) * 100$	Ratio
Dependent Variable	Real Estate Investment	Rate of return for real estate investment based on the net operating	Capitalization Rate Cap rate=Net Operating income/Current market value	Ratio

		income	of the asset (NOI/CMVA)*100	

Source: Researcher, 2023

3.7 Target Population

The target population is the group of persons or organizations from which the researcher intends to seek research data. Dahabre and Hernan (2019) define a population as a cluster of persons or organizational unit(s) that the researcher will obtain data that the analysis will be based. A study needs to describe the target population properly. The population targeted in this research constituted of 80 firms registered by the Estate Agents and Valuers Registration Board, which is found in the Ministry of Land, Housing, and Urban Development. The researcher considered Kenya's housing sector as the unit of analysis. The sources of information are considered as the unit of observation, which was made up of the real estate firms in Kenya.

3.8 Sampling Design

Kothari (2004) underscores that sampling design provides a guide that lays out how the study selects a section of a portion of the population targeted that will comprise the participants who will provide the data required. Etikan, Musa, and Alkassim (2016) define sampling design as the criteria that guide the selection of a small portion of the population that gives the information required. Kalton (2020) underscores the importance of sampling in determining the strength of the chosen statistical method in coming up with the correct inferences and presenting the true characteristics of the population. A census approach was employed to obtain data from all organizations that collect and analyze data concerning real estate investment in Kenya (N=80). Census was chosen because the researcher could access the whole population. The census is suitable when the people or organizations targeted are not large (<200), can be accessed with ease, and when it is varied enough to enable the researcher to obtain varying information (Saunder *et al.*, 2003).

3.9 Data Collection Instrument

Data collection refers to the means and the activities involved in information from the sampled subjects. Research data was gathered through a guide on document review (Appendix I). Data on the outcome and predictor variables were obtained from secondary data sources, largely from financial statements and annual reports between 2010-2019 of individual real estate firms in Kenya under the study (see Appendix IV). In order to ensure efficiency in the process of data collection, a guide on document review assisted the researcher in gathering secondary from publications on real estate firms listed in Nairobi Stock Exchange (NSE). According to Johnson (2012), document review refers to a data collection technique through a review of existing data.

3.10 Data Collection Procedure

The study utilized secondary data to examine affordable housing and real estate investment. The researcher obtained secondary data from the published yearly reports and statements on financial status to solicit data, such as Housing prices through HPI. Similarly, secondary data was collected from institutions that have relevant data on real estate investment, such as Kenya National Bureau of Statistics (KNBS), Central Bank of Kenya (CBK), National Construction Authority (NCA), Ministry of Infrastructure and Housing, World Bank website, and Kenya Revenue Authority (KRA) website. Data for independent variables (housing price, household income, and cost of mortgage) and moderating variable (inflation) was time series as it was aggregate data, meaning that it represented macro-economic variables of the entire country. To calculate real estate investment, the proxy measure (cap rate) was used, where data on the net operating income and current market value of assets was computed to yield a single data for each year of the 10-year period. The researcher obtained authorization for data collection from the National Commission for Science, Technology, and Innovation (NACOSTI) and Kenyatta University (KU). NACOSTI is the government agency mandated to authorize students and organizations to conduct research in Kenya legally. All research ethics and protocols were observed throughout the research process.

3.11 Data Analysis and Presentation

In order to evaluate the patterns and trends of the information collected, data was cleaned, and efforts were made to ensure the completeness and consistency of the collected data. Analyzing data enables the researcher to derive meaningful conclusions from the information gathered (Saunders et al., 2009). Proceeding with data collection, the collected information was edited, checked for completeness, categorized, coded, and entered into Stata software version 20 for analysis. After that, the researcher generated descriptive statistics (including frequencies, percentages, mean, and standard deviation). Further, the Pearson's correlation analysis and time series analysis were used in determining whether the variables were significantly associated. The collected data was further subjected to time series analysis which was applied to analyze the sequence of data collected at various intervals (Jiang *et al.,* 2029; Siami-Namini & Namin, 2018). It was used to measure the marginal and relative contribution of housing prices, cost of mortgage, and household income on real estate investment. The outcome was presented in tables to ensure that patterns and trends of analyzed data were presented clearly.

Time series analysis also encompassed the testing of the hypothesis and it was applied to statistical methods for analyzing and modeling sequence of observations. This modeling resulted in a stochastic process model for the system which generated the data. Analyzing time series data enhanced extraction of meaningful trends, forecasts, and patterns of data based on previously observed values of data, where this facilitated the prediction of values that the variables took at different times (Durbin & Koopman, 2012; Tanaka, 2017; Li et al., 2019; Adèr, 2008). The dependent variable (real estate investment) was transformed to yield 'time series' equivalent data by computing aggregate/mean investment to yield a single observation/data for each year. Transforming capitalization rate data to give a single observation for each of the 10-year periods meant that time series analysis was the most probable data analysis technique.

3.12 Instrument Validity

Validity denotes the extent that the outcome generated from the data analyzed represents the issue under examination (Mendenhall *et al.,* 2017). It shows whether the information collected is truly representative of the research variables. The researcher looked into content and construct validity. The research assured content validity via the use of census, which guaranteed that the data and the outcome were a representative of the population. On the other hand, construct validity was ascertained via consultations with experts who included two supervisors intending to find out whether the guide to document review obtained the appropriate information.

3.13 Diagnostic Tests

The researcher carried out several tests that precede carrying out of regressions.

3.13.1 Multicollinearity

Multicollinearity examines the existence of linear correlation among the independent variables. Multiple ways of determining multicollinearity exist, including Pearson Correlation and the Variance Inflation Factor (VIF). The study opted to use the variance inflation factor to investigate multicollinearity. A VIF bigger than 10 indicates that data has multicollinearity, which is problematic (Oguntunji & Makram, 2019). In other words, greater VIF and the presence of multicollinearity show a bigger standard error and low precision of the data to test the hypothesis put forth in the study (Vatcheva et al., 2016). The study preferred a regression model that does not have a multicollinearity problem.

3.13.2 Normality test

The normality test examines the presence or absence of outliers in the data. It determines if the distribution of the data assumes a bell curve. A normally distributed data lies around a common mean or the line of best fit (Mishra *et al.,* 2019). The observation of the distribution of data in a scatter plot helps determine if the distribution is normal. Besides, normality can be determined using the Jarque-Bera test and the

researcher chose to perform the Jarque-Bera test. Therefore, the Jarque-Bera test examined the null hypothesis that data is normally distributed (the test was set at a 95% confidence level or *p-value* of 0.05).

3.13.3 Heteroscedasticity test

The regression model assumes that the error term has a constant variance, and the lack of constant variance shows that the data is heteroscedastic (Cattaneo *et al.,* 2018). Data with heteroscedasticity results in an incorrect standard error in the regression model, which is undesirable. Therefore, the study used the Breusch Pagan test to evaluate the presence of heteroscedasticity. A probability value higher than 0.05 resulted in the acceptance of the null hypothesis for constant error variance. Instead, the study found out that the data were homoscedastic.

3.13.4 Autocorrelation test

The autocorrelation test examined if there was a serial correlation among the independent variables. The researcher preferred a regression where the independent variables have no serial correlation. Autocorrelation results in an idiosyncratic error term which blurs the measurement of the estimates (Gencay & Signori, 2015). In this regard, Durbin Watson's was used to examine autocorrelation in the data collected.

3.13.5 Test for Stationarity

Stationarity was conducted using a unit root test to determine variable stationarity. It measured the variability of the statistical properties over time. The stationary test thus provided significant information about the applicability of the study findings to different periods in time. Riman and Eyo (2008) state that no stationary time series data has the potential to produce spurious results, where significant relationships can be produced even though they do not exist. The study applied Augmented Dickey-Fuller (ADF) to establish variable stationarity. It is instructive to note that ADF and DF are standard procedures to determine whether a unit root is present in time series data. However, the DF has low power to test compared to ADF, which is necessary for eliminating the low power on the unit root of the series. Towards this end, ADF is

considered a superior test owing to the capability to establish a distinction between series that indicate stationarity and series that appear to have a unit root (Gujarati, 2003). The tests measured the variability of the statistical properties like the mean and variance over time, hence a reason to rely on the figures.

3.14 Ethical Considerations

The study relied on secondary data from sampled real estate firms and registered agents, denoting that firms' privacy laws and rights must be accorded optimum confidentiality. The guide used to review the documents was formulated in a way that enabled easy gathering of the data. Before data collection, clearance was sought from NACOSTI and the ethical review board of KU. During the data collection phase, the researcher clarified to the participating firms that the information was solely intended for academic use. It was made clear to the sampled real estate firms that the provision of data is voluntary, and they can withdraw from the exercise if they feel uncomfortable. To ensure the anonymity of the firms, codes were used in the document review, signifying that indication of any emblems or pseudonyms that can be used to establish their identity was eliminated. To ascertain that the data was complete and consistent, the researcher built a rapport with the respondents to enhance their willingness and confidence to provide information. Appropriate appointments to the real estate were made throughout the data collection phase, and explanations were given for clarity.

CHAPTER FOUR
DATA ANALYSIS AND PRESENTATION

4.1 Introduction

In this chapter, the researcher presents the outcomes obtained from the data and the interpretation of the findings. The secondary data gathered in the study was analyzed using Stata version 15. The chapter answers the question whether affordable housing affects real estate investment within the residential housing sector in Kenya. This chapter first shows the outcome of the descriptive statistics. Thereafter, the diagnostics tests results are presented followed by time series analysis and the testing of the postulated hypotheses.

4.2 Descriptive Statistics

In this segment, the researcher lays out the outcome of the descriptive analysis which covered a number of observations (frequency), minimum and maximum values of each of the variable, the mean values and the corresponding standard deviations. The study evaluated the effect of predictor variables (housing prices, household income and the cost of mortgage) on residential real estate investment along with the moderating effect of inflation. The descriptive statistics are illustrated in Table 4.1

Table 4.1: Descriptive Statistics

Variable	**Observations**	**Min.**	**Max.**	**Mean**	**Std. Dev.**
Housing Price	10	98.02	121.87	109.95	8.19
Household income	10	95200	181700	134320	29181.00
Cost of mortgage	10	12.44	19.65	15.48	2.20
Inflation	10	3.2	18.93	7.06	4.40
Capitalization rate	10	1.50	10.17	5.31	2.00

Source: Researcher (2023)

4.2.1 Housing Price

The housing price for the period 2010-2019 was determined using Housing Price Index (HPI). HPI is an indirect housing price indicator that is used to evaluate real estate investment. The research found out that the minimum HPI was 98.02 and the maximum was 121.87 with a mean of 109.95 (standard deviation of 8.19). The outcome is attributed to reportedly unoccupied housing units leading to the dipping of the prices. Furthermore, with the low expenditure on consumption as a result of poor state of the economy, prospective home-owners faced the uncertainty in terms of income leading to an adverse effect on the housing markets. The weak demand in the low-end housing prices, which are projected to have more demand, dipped the housing index even though the prices for high end housing units, such as bungalows and maisonettes increased.

4.2.2 Household Income

One of the aims of the research was to analyse the influence of the household income on investment in residential housing sector. Housing income was estimated in terms of income per capita and trends and patterns for household income were developed to establish how the level of income at the household compared with real estate investment in residential housing sector in Kenya for the period 2010-2019. Table 4.1 illustrates the household income for the 2010-2019 periods. The mean household income was 134320 (standard deviation of 29181.00). The least household income was 95200 and a maximum of 181700. Data shows that the average income per capita has been on the increase since the year 2010. The rise in income per capita was attributed to the GDP growth in Kenya, suggesting that the value of goods and services significantly increased leading to a greater income per capita. Notably, the households with higher income per capita as represented by more working family members easily afford housing units. Households with low income are unable to pay for mortgage, thus they opt to stay away from home ownership.

4.2.3 Cost of Mortgage

Lending rate as proxy for measuring the cost of mortgage was applied to the influence that cost of mortgage had on the investment in residential affordable housing units. The cost of mortgage determines the number of prospective owners who are willing to take mortgage as an option of owning residential units. Table 4.1 illustrates the trends on the cost of mortgage for the period under consideration (2010-2019). The mean of the cost of mortgage as measured by lending rate was 15.48 (standard deviation of 2.20), while the minimum lending rate for the period under review was 12.44 and a maximum of 19.65. The lending rate for the period under review decreased as a result of interest rate capping, suggesting that mortgage institutions were unable to increase the lending rate beyond the capping rates as offered by the Central Bank of Kenya (CBK). Furthermore, drop seen in the cost of mortgage was attributed to the higher supply of the residential units, thus the need for the investors to provide incentives to the prospective customer

4.2.4 Inflation

Consumer price index as proxy of inflation was applied as moderating variable in the examination of the influence that the variations in residential housing prices on the eventual real estate investment. This suggested that inflation in the economy would translate into an increase in the prices of the assets, cost of mortgage, devaluing of the long-terms debt, among others. Table 4.1 visualizes the trends of the analyzed secondary data as provided by Kenya National Bureau of Statistics (KNBS) (2010-2019). The highest CPI was 18.93 with a minimum of 3.2. The average CPI for the period under review was 7.06 with a standard deviation of 4.40. Notably, maximum inflation rate was attributed to the sharp rise in petroleum products, such as gas and fuel prices. The higher CPI for the period under review could be attributed to the general elections in Kenya, which caused uncertainties on the future performance of the economy. It is instructive to note that higher inflation causes an increase in housing price, signifying that many prospective homeowners may face financial hurdles in terms of meeting the market price for residential units.

4.2.4 Real Estate Investment

The capitalization rate is the proxy measure for real estate investment performance. This information was sought from individual real estate firms. The capitalization rate was computed through the division of the net operating income by the asset value then multiplied by 100. Table 4.1 presents results upon analysis of the collected data. As indicated by the analyzed data, it is evident that the capitalization rate averaged 5.31. Similarly, the standard deviation for the years under review (2010-2019) also averaged two points suggesting that the minimum and maximum cap rate for real estate return were substantially huge. For instance, individuals or firms investing in a property use a larger cap rate in the valuation during the seasons of slow growth of rental properties. Such investors are knowledgeable of the fact that cash flows in the property market will decline in the periods ahead and they expect bigger returns in their current investments. Therefore, low cap rates indicate optimisms of growth in the property market.

4.3 Diagnostics Tests

Tests that solve possible problems like multicollinearity, normality, heteroskedasticity and autocorrelation were done prior to the execution of regression analysis. It is worth noting all the assumptions of linear regression must be fulfilled before the test is run. Stata version 15 was used in computing the tests.

4.3.1 Multicollinearity Tests

Multicollinearity was assessed through the use of Variance Inflation Factor. A VIF more than 10 indicates the presence of problems associated with multicollinearity. In other words, greater VIF and presence of multicollinearity shows a bigger standard error and low precision of the data to test the hypothesis put forth in the study.

Table 5.1: Variance inflation factor

Variable	VIF	1/VIF
IncomePerC~a	4.55	0.219621
HousingPri~x	3.82	0.261779
LendingRate	1.8	0.557052
ConsumerPr~x	1.42	0.703737
Mean VIF	2.9	

Researcher, 2023

All the values of VIF in the outcome above were less than 10. This means that the data did not have high multicollinearity. The interaction among the variables that predict investment in housing could not interfere with the outcome of the analysis.

4.3.2 Normality Test

Data was tested for normal distribution since this is one of the time series analysis assumptions that should hold true to avoid spurious results. This means that data should not have 'noisy' outliers that could potentially affect the final result (Mishra *et al.,* 2019). Jarque-Bera test that is performed on residuals examined the nature of distribution in the data. The test helped asses the null hypothesis that the residuals are normally distributed. The outcome is in Table 6.1

Table 6.1: Jarque-Bera test for normal data

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
MyResiduals	10	0.9752	0.5504	0.35	0.8400

Researcher, 2023

The researcher arrived at a determination that the data had a normal distribution. This is derived from the fact that the probability of chi-squared (p=0.8400) was more than 0.05 leading to the acceptance of the null hypothesis (Jarque & Bera, 1987)

4.3.3 Heteroscedasticity Test

In order to find out whether the data was heteroscedastic or not, the researcher performed the Breusch-Pagan Test as illustrated in Table 7.1 The test was important in finding out the presence or absence of variation in the error term which is not good for regression.

Table 7.1: Heteroscedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: Housing Price Index, Income Per Capita, Lending Rate, Consumer Price Index

chi2(4) = 1.83

Prob > chi2 = 0.7666

F(4 , 5) = 0.20

Prob > F = 0.9271

Researcher, 2023

The outcome in Table 7.1 shows high probability values for both chi square and F statistics (pro chi 2 =0.7666>0.05 or prob (F) = 0.9271 >0.05). The results guide the study in accepting the null hypothesis that the data set was homoscedastic. The lack of heteroscedasticity implies constancy in the variance of the standard error besides having a stationary unit root. This is voiced by Kim and Park (2019) who stated that the assumption of homogeneity of variance must hold before conducting time series analysis. Use of the Breusch-Pagan Test for homogeneity of variance indicates whether the variance in a time series is equal or not (Talib *et al.,* 2021).

4.3.4 Autocorrelation Test

Table 8.1 shows the outcome of Durbin - Watson test that was employed to examine autocorrelation.

Table 8.1: Durbin-watson test

```
.  reg CapitalizationRate HousingPriceIndex IncomePerCapita LendingRate ConsumerPriceIndex

      Source |       SS       df       MS              Number of obs =      10
-------------+------------------------------           F(  4,     5) =    3.39
       Model |  46.6226289     4  11.6556572            Prob > F      =  0.1062
    Residual |  17.1665311     5  3.43330622            R-squared     =  0.7309
-------------+------------------------------           Adj R-squared =  0.5156
       Total |   63.78916     9  7.08768444            Root MSE      =  1.8529

------------------------------------------------------------------------------
CapitalizationRate |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------+----------------------------------------------------------------
 HousingPriceIndex |  -.1423891   .1473979    -0.97   0.378    -.5212875    .2365092
   IncomePerCapita |  -.0000527   .0000452    -1.17   0.296    -.0001688    .0000634
       LendingRate |  -.1710533   .3767051    -0.45   0.669    -1.139405    .7972981
ConsumerPriceIndex |  -.1155081   .1673675    -0.69   0.521    -.5457399    .3147236
             _cons |   32.28044   15.27563     2.11   0.088    -6.986821    71.54769
------------------------------------------------------------------------------

. tsset Year
        time variable:  Year, 2010 to 2019
                delta:  1 unit

. dwstat

Durbin-Watson d-statistic(  5,    10) =  1.719587
```

Researcher, 2023

As illustrated in table 8.1, Durbin-Watson statistic was 1.719587. This value indicated zero autocorrelation since it was neither below 2 nor above 2 to support negative or positive autocorrelation. Similarly, d-statistics (5, 10) = 1.719587 was less than the upper limit as read from the Durbin Watson Table (d_L= 0.24, d_U= 2.82) indicating that the data set did not have autocorrelation problem. This is supported in literature by Islam and Erum (2019) who stated that a figure approaching 2 indicates that time series variables are not serially correlated. More recently, Aisami *et al.* (2021) were of the view that values between 1.5 and 2.5 are relatively normal, whereas those above 3 and less than 1 indicate high instances of serial correlation (Patrick, 2021).

4.3.5 Test for Stationarity

The outcome in Table 9.1 is of the Augmented Dickey Fuller test that was adopted in the evaluation of stationarity. The null hypothesis under determination in the ADF test was the variables had a unit root and were therefore not stationary.

Table 9.1: Unit root test results

Variable	Calculated test statistic	Critical values			Stationarity status
		1%	5%	10%	
Capitalization Rate	-1.326	-3.750	-3.000	-2.630	I (1)
Housing Price Index	-1.188	-3.750	-3.000	-2.630	I (1)
Income Per Capita	0.700	-3.750	-3.000	-2.630	I (1)
Lending Rate	-1.152	-3.750	-3.000	-2.630	I (1)
Consumer Price Index	-4.291	-3.750	-3.000	-2.630	I (0)

Source: Stata computation

From table 9.1, consumer price index was found to be stationary in level. Capitalization rate, housing price index, income per capita, and lending Rate were not stationary. Lending rate became stationary on first differencing. Capitalization rate and income per capita became stationary on second differencing. Housing price index became stationary on third differencing.

4.4 Time Series Analysis

The study adopted time series analysis, where the predictor variables were fitted into the model to establish the separate and collective influence of the predictor variables (housing prices, household income and lending rate) on the outcome variable (residential real estate investment). Table 10.1 illustrates the regression analysis

Table 1: Regression Model

Table 10.1 illustrates time series analysis findings which include coefficients of regression, standard errors, t-statistics and the corresponding probability values.

```
. regress CapitalizationRate HousingPriceIndex IncomePerCapita LendingRate ConsumerPriceIn
> dex
```

Source	SS	df	MS		
Model	8283.04562	4	2070.76141	Number of obs	= 10
Residual	41.9503764	5	8.39007528	F(4, 5)	= 246.81
				Prob > F	= 0.0000
Total	8324.996	9	924.999556	R-squared	= 0.9950
				Adj R-squared	= 0.9909
				Root MSE	= 2.8966

CapitalizationRate	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
HousingPriceIndex	1.170945	.2402426	4.87	0.005	.5533816	1.788508
IncomePerCapita	.0006578	.0000781	8.42	0.000	.000457	.0008587
LendingRate	.4067288	.1451292	2.80	0.038	.0336625	.7797952
ConsumerPriceIndex	.4823374	.1343239	3.59	0.016	.1370469	.8276279
_cons	-210.1605	25.1343	-8.36	0.000	-274.7703	-145.5507

Researcher, 2023

The outcome presented in Table 10.1 (R Square=0.995) confirm that the regression model was fit for the test of statistical significance in the relationship among study variables (the composite effect of the independent variables in explaining variation in investment in housing was 99.5%). The outcome denotes that the constant of the regression model changes was -210.1605.

The empirical model becomes:

$$\mathbf{Y=-210.16 + 1.17\ X_{1t} + 0.0007X_{2t} + 0.41X_{3t} + 0.48X_{4t} + 25.13}$$

Where:

Y= Real estate investment

X_1= housing price

X_2= household income

X_3= cost of mortgage

X_4= inflation

The coefficients of regression show that a rise by one unit in housing price index translates to a rise of magnitude 1.170945 in residential real estate investment (capitalization rate). On household income, a rise by one unit in the income per capita leads to an upsurge of magnitude 0.0006578 decrease in residential real estate investment. Similarly, a rise by one unit in the mortgage cost (lending rate) results in 0.4823374 rise in residential real estate investment.

The probability values of the t-statistics below 0.05 indicate that residential housing real estate investment was statistically significantly influenced by housing prices (t=4.87, p=0.005), household income (t=8.42, p=0.000) and the cost of mortgage (t=2.8, p=0.038).

4.4.2 Test of Moderation Effect

This regression analysis applied the interaction effect of inflation in order to determine its influence on the outcome variable (residential real estate investment). Table 11.1 presents findings of the analysis data when the moderating variable is added to the linear regression model.

Table 2: Regression under the Interaction Term

```
. regress CapitalizationRate HousingPriceIndex IncomePerCapita LendingRate HousingPriceInd
> ex_Inflation IncomePerCapita_Inflation LendingRate_Inflation

      Source |       SS       df       MS              Number of obs =      10
-------------+------------------------------           F(  6,     3) =  440.42
       Model |  8315.55562     6  1385.92594            Prob > F      =  0.0002
    Residual |  9.44037771     3  3.14679257            R-squared     =  0.9989
-------------+------------------------------           Adj R-squared =  0.9966
       Total |   8324.996     9  924.999556            Root MSE      =  1.7739

------------------------------------------------------------------------------
CapitalizationRate |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------+----------------------------------------------------------------
  HousingPriceIndex |   .2099999   .3919689     0.54   0.629    -1.03742     1.45742
    IncomePerCapita |   .0010187   .0001169     8.72   0.003     .0006468    .0013907
        LendingRate |   .6877279   .2593411     2.65   0.077    -.1376113    1.513067
HousingPriceIndex_Inf~n |   .0486003   .0235253     2.07   0.131    -.0262678    .1234683
IncomePerCapita_Infla~n |  -.0000239   7.07e-06    -3.37   0.043    -.0000464   -1.34e-06
  LendingRate_Inflation |  -.0135081   .0172485    -0.78   0.491    -.0684004    .0413843
                  _cons |  -187.9933   15.94893   -11.79   0.001    -238.7499   -137.2367
------------------------------------------------------------------------------
```

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From the results in Table 11.1, the regression model including the interaction terms appears as follows:

> Real estate investment = -187.9933 + 0.2099999 Housing Price $_t$ + 0.0010187 Household Income $_t$ + 0.6877279 cost of mortgage $_t$ + 0.0486003 Housing Price*inflation $_t$ – 0.0000239 household income*Inflation $_t$ - 0.0135081 cost of mortgage*Inflation $_t$.

Table 11.1 illustrates that the overall influence of predictors on the independent variable upon the inclusion of interaction terms in the model (Housing Price*inflation, household income*Inflation and cost of mortgage*Inflation). The influence of the predictors and the interaction terms on the independent variable was statistically significant.

The study findings revealed that the influence of inflation on the interaction between affordable housing and investment in housing was significant based on the low probability value (t=11.79, p=0.001). In-depth analysis shows that inflation was particularly significant on the influence that household income had on real estate

investment (t=3.37, p=0.043). Therefore, inflation influences the nexus between affordable housing and real estate investment.

4.5 Hypothesis Testing

The test of hypothesis applied multiple linear regression to determine acceptance or rejection of the null hypotheses.

4.5.1 **Housing** Prices and Residential Real Estate Investment

The following was the first null hypothesis (H_{01}) of the study:

H_{01}: Housing prices do not significantly affect real estate investment in the residential housing sector in Kenya.

The low value of probability in the t-test statistics (t=4.87, p=0.005) guided the study in rejecting the null hypothesis ***H_{01}***. Hence, the study chose the alternative hypothesis that housing prices significantly affect real estate investment in the residential housing sector in Kenya. This outcome recorded in this study strike similarity to past literature on the interaction between housing prices and residential real estate investment. For example, the findings of this study agree with Glaeser *et al.* (2017) and Karoki (2018) who stated that housing prices are critical predictors of investments in the Kenya real estate sector.

4.5.2 Household Income and Residential Real Estate Investment

The following null hypothesis (H_{02}) was also examined:

H_{02}: Household income does not significantly affect real estate investment in the residential housing sector in Kenya.

The low value of probability (t=8.42, p=0.000) guided the researcher in rejecting the null hypothesis ***H_{02}***. In contrast, the study finds that household income has significant influence on real estate investment in residential housing sector in Kenya. This study finding is in tandem with the existing body of literature where similar studies made the

same conclusion on the interplay between household income and residential real estate investment. For example, Chen, Hardin III and Hu (2020) established that that the propensity to consume increases as the household wealth increases, suggesting that joint property ownership attracts increased spending compared to sole proprietorship. A similar study by Nurick *et al.* (2018) in South Africa also established that household wealth play a significant role in predicting uptake of residential spaces. Moreover, Rattanaprichavej and Teeramungcalanon (2020) made a similar conclusion that household income (active or passive) is a key predictor of home ownership. The rate of capitalization (a measure for real estate investment) in Kenya is high owing to the rising property investment values coupled with increasing incomes in the real estate market (Mwaura, 2019).

4.5.3 Cost of Mortgage and Residential Real Estate Investment

The following hypothesis (H_{03}) was also analysed:
H_{03}: Cost of mortgage does not significantly affect real estate investment in the residential housing sector in Kenya.

The null hypothesis $\boldsymbol{H_{03}}$ was disallowed because the probability value in t-test statistics (t=4.87, p=0.038) is less than 0.05 at 95% level of confidence. Therefore, the study finds that investment in the housing sector in Kenya is influenced by the cost of mortgage.

The past studies that have similar outcome include the one done by Kibunyi *et al.* (2017) which concluded that microeconomic factors including lending rate (cost of mortgage) significantly influenced real estate investment. Similarly, Waithera (2017) agrees with the results of this paper by stating that investment in the Kenyan housing sector is influenced by the interest rates.

4.5.4 Moderating effect of inflation and residential real estate investment

The last hypothesis to be tested was H_{04} postulated here under:

H_{04}: Inflation does not significantly moderate the relationship between affordable housing and real estate investment in the residential housing sector in Kenya.

The study rejects this null hypothesis $\boldsymbol{H_{04}}$ because the probability value in t-test statistics (t=11.79, p=0.001)) is less than 0.05 at 95% level of confidence. In contrast, the study determines that finds that investment in residential housing sector in Kenya is influenced by inflation. Similar studies reached the same conclusion as this study. For example, Kipkirui (2015) and Kidundi (2020) established that inflation is a key predictor of low-cost home ownership. The study arrives at an outcome similar to Nabutola (2014) who determined that inflation increases the cost of housing coupled with ineffective government policies. Kipkirui (2015) also concluded that inflation affects the cost of housing, meaning that many prospective home-owners are unable to afford investments in real estate in Kenya.

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This segment summarizes the outcome of the study presented in detail in the fourth chapter above. First, the section highlights the purposes of the study and key methodology before documenting key findings. The chapter then captures the conclusions in line with the key findings before documenting policy recommendations to practitioners, policy makers and finance theory. Lastly, the chapter captures the contributions to knowledge besides highlighting areas for further research.

5.2 Summary

The study aimed to determine the influence of affordable housing on real estate investment in the residential housing sector in Kenya. The specific target was to find out the influence of housing prices, household income, and a mortgage's cost on real estate investment. In addition, the moderating influence of inflation on the interaction between the above factors and investment in real estate was also examined. The theories forming the basis of the study comprised of permanent income, liquidity preference, anticipated income, rational choice, and decision theory.

The study targeted Kenyan firms in real estate. A census technique was applied to solicit data from the firms. The study adopted ten years ranging from years 2010 to 2019. Data sources were: annual reports and financial statements from real estate companies. The data analysis was done through descriptive statistics and time series analysis and presented as figures and tables. Tests to diagnose the suitability of data for regression comprised of normality, multicollinearity, heteroscedasticity, and autocorrelation. Ethical considerations were observed to maintain integrity in the research process.

The outcome of chapter four indicated that housing prices significantly influenced real estate investment in the residential housing sector in Kenya. Data analysis established that housing prices steadily rose from 2010 through 2015 before reducing in 2016. In

2017, the cost of housing rose by more than 5 points to the highest point in 2018 before significantly decreasing in 2019. The sharp reduction in 2019 was partly attributed to more residential units' supply than the demanded units. Most of the housing units were reportedly unoccupied, leading to the prices dipping. Furthermore, with the low expenditure on consumption due to the poor state of the economy, prospective homeowners faced uncertainty in income, leading to an adverse effect on the housing markets. The weak demand for low-end housing prices, projected to have more demand, dipped the housing index even though the prices for high-end housing units, such as bungalows and maisonettes, increased.

The results confirmed that household income significantly affected real estate investment in the residential housing sector in Kenya. Data revealed that the average income per capita had increased since 2010, and this trend rose steadily without any decrease to 2019. The rise in income per capita was attributed to the GDP growth in Kenya, suggesting that the value of goods and services significantly increased, leading to higher income per capita.

The study found that mortgage cost significantly influenced real estate investment in the residential housing sector in Kenya. The cost of mortgages rose steadily from 2010 to 2012 before taking a dip in 2013. From 2013, the mortgage price reduced significantly to the lowest rate in 2019. The lending rate for the period under review decreased due to interest rate capping, suggesting that mortgage institutions could only increase the lending rate by the capping rates that CBK mandates. Furthermore, the dipping of the mortgage cost was attributed to the higher supply of residential units, thus the need for the investors to provide incentives to the prospective homeowners.

The results confirmed that inflation moderated the association between affordable housing and real estate investment in the residential housing sector in Kenya. The yearly consumer price index was examined from 2010 to 2019. Notably, the CPI showed that the inflation rate was highest in 2011 before dipping to the lowest rate in 2012. The highest inflation rate was attributed to the sharp rise in petroleum products, such as gas and fuel prices. The inflation rate rose in 2013 before slightly dropping in

2014. The inflation rate rose in 2017 before falling in 2018 and rising slightly in 2019. The higher CPI for 2017 could be attributed to the general elections in Kenya, which caused uncertainties in economic growth in the years ahead.

5.3 Conclusions

The main aim of this research was to evaluate the influence of affordable housing on investment in the Kenyan residential housing sector. The data collected and the analysis has led to a conclusion that confirms that real estate investment in Kenyan residential houses is affected by affordable housing. The study has confirmed that the capitalization rate, a measure of real estate investment, is significantly affected by housing prices, household income, and mortgage costs.

The study concludes that housing prices, measured using the housing price index, determine the ability of prospective homeowners to afford residential units. Higher prices inhibit investment in real estate as home buyers keep off purchasing commercial and residential units due to unaffordability. On the other hand, favorable price equilibrium between investments and sale prices ensures that both investors and buyers make gains in real estate.

Household income is a significant determinant of investments in real estate in Kenya. A higher income per capita translates into a higher ability of prospective homeowners to purchase real estate property. Consequently, higher income per capita attracts more investments in the housing sector. In contrast, lower income per capita lowers real estate investment in residential houses. The cost of a mortgage significantly influences investment in Kenyan residential houses. The rates at which money is lent are tied to how far a prospective residential real estate owner can afford to purchase real estate property. Higher lending rates inhibit the uptake of a mortgage in the country and consequently decrease investment in real estate. Conversely, lowering lending rates by banks encourages the uptake of mortgages and increases real estate investment in the residential housing sector in Kenya.

The study concludes that the inflation level in Kenya influences the relationship between affordable housing and real estate investment. The ability of a prospective homeowner to purchase a residential unit is significantly associated with the prevailing level of inflation in the country. Higher levels of inflation, marked by increases in consumer price indices, affect the ability of households to save money or take loans for investment in real estate. Inflation, therefore, affects income per capita, which influences the interaction between affordable housing and investment in the residential housing sector.

5.4 Policy Recommendations

Investors, manufacturers, and the government should advocate for alternative sources of building materials, incorporation of technology, and municipal and social housing to downscale the cost of housing. Alternative sources of building materials would reduce construction costs, thus making houses cheaper. Many firms and households will afford to construct homes, resulting in reduced house prices. There is a need for the integration of technology and risk management in residential housing to boost home ownership. Another recommendation is that the government should remove regulatory barriers to building new residential units. This will lower housing prices and enhance the affordability of real estate properties.

Moreover, the government should cushion citizens against economic shocks that reduce household income and the ability of people to invest in properties. Austerity acts such as raising taxes during economic crises should not reduce household income. Instead, the government should ensure that citizens have the ability and knowledge to save part of their household income and increase the ability of people to invest in real estate. Furthermore, the government should provide incentives for building affordable housing by undertaking, among others, long-term finance and tax incentives and exceptions/grants for private developers to build affordable residential units.

To increase affordability, the study recommends that households work on alternative sources of income to increase household income. Households should also need to promote a saving culture and invest the savings in fast-growing industries to generate

extra income that would be used to invest in real estate. The government should reduce excess taxation on the construction and building of residential houses to reduce the installation cost.

The study recommends that financial institutions lower the cost of mortgages to make the purchase of houses affordable in Kenya. The government and real estate companies should also make it possible for prospective homeowners to access affordable rates of mortgages by linking prospective house owners to financial institutions.

The study recommends that investments in real estate can be increased through various measures that curb inflation, including price controls on essential commodities and ensuring that interest rates encourage citizens' uptake of loans and mortgages. The government needs to cushion prospective real estate investors against the impacts of inflation.

5.5 Contribution to Knowledge

The outcome of this study builds on the available academic literature by demonstrating how various factors associated with affordable housing influence real estate investment. Further, the findings have important implications for how property developers could overcome affordable housing challenges. Suggestions on areas for more research and ways to achieve affordable housing have been put forth in this research. The research outcomes have yielded information on the housing needs of people at the bottom and/or near the bottom of the pyramid, where real estate investors leverage this information to offer better policy intervention vis-a-vis home ownership. The findings of this study have provided robust dynamics and investment trends in Kenyan real estate from the perspective of affordability and what can be done by real estate companies to remain afloat in the competitive Kenyan market.

5.6 Limitations of the Study

This study faced potential hindrances, such as access to secondary data, owing to private company laws and possible confidentiality concerns. The study faced documentation challenges since most of the published secondary data was qualitative,

while a quantitative approach was adopted in gathering data and carrying out analysis. The research was limited in scope since it only targeted data from registered firms. Moreover, the reliability of the secondary data was not guaranteed since organizations used distinct metrics for measuring and analyzing data. However, the limitation was circumvented by presenting the authorization letters from Kenyatta University and the National Commission for Science Technology and Innovation. Where secondary sources were publicly available, the researcher contacted the management of the targeted organization for faster and more accurate collaboration and collection of data. Furthermore, the document review guide enhanced the gathering of relevant data since secondary data sources were massive.

5.7 Suggestions for Further Research

The study focused on four macroeconomic variables that affect affordable housing and real estate investment in the residential housing sector in Kenya: housing price, household income, cost of mortgage, and inflation. The study recommends more research on the factors that were not considered in this research. Furthermore, the study was conducted among real estate firms registered by the government, signifying the need to study in other organizations dealing with residential real estate development, such as commercial banks and Sacco's to ascertain the trends and patterns of these findings.

REFERENCES

Adabre, M. A., & Chan, A. P. (2019). Critical success factors (CSFs) for sustainable affordable housing. *Building and Environment*, *156*, 203-214.

Adèr, H. J., Mellenbergh, G. J., & Hand, D. J. (2008). *Advising on research methods consultant's companion. Huizen:* Johannes van Kessel Publishing.

Agarwal, S., & Varshneya, S. (2022). Financial crisis and the US mortgage markets-a review. *Handbook of Real Estate and Macroeconomics*, 240-268.

Aisami, A., Abubakar, U., Manogaran, M., & Shukor, M. Y. (2021). Test for the Presence of Autocorrelation in the Morgan-Mercer-Flodin (MMF) Model used for Modelling the Total Number of COVID-19 Cases for Brazil. *Bulletin of Environmental Science and Sustainable Management (e-ISSN 2716-5353)*, *5*(1), 32-36.

Almirall, D., Compton, S. N., Gunlicks-Stossel, M., Duan, N., & Murphy, S. A. (2013). Designing a pilot sequential multiple assignment randomized trial for developing an adaptive treatment strategy. (No. 11-115.) University Park, PA: *The Methodology Center*,

Baştuğ, S., & Yercan, F. (2021). An explanatory approach to assess resilience: An evaluation of competitive priorities for logistics organizations. *Transport Policy*, *103*, 156-166.

Batayneh, K., Al Salamat, W., & Momani, M. Q. (2021). The impact of inflation on the financial sector development: Empirical evidence from Jordan. *Cogent economics & finance*, *9*(1), 1970869.

Becker S., Grossman, M. & Murphy M. (1988). A theory of rational addiction. *Journal of Political Economy*, 96(4), 675-700.

Beguy, D. Bocquier, P. & Zulu, E. M. (2010). Circular Migration Patterns and Determinants in Nairobi Slum Settlements. *Demographic Research*, 23 (20), 549-586.

Brooks, M. M. (2022). Measuring America's Affordability Problem: Comparing Alternative Measurements of Affordable Housing. *Housing Policy Debate*, 1-20.

Brueggeman, W. B., & Fisher, J. D. (2011). *Real estate finance and investments* (pp. 5-6). New York: McGraw-Hill Irwin

Chen, J., Hardin III, W., & Hu, M. (2020). Housing, wealth, income, and consumption: China and homeownership heterogeneity. *Real Estate Economics*, *48*(2), 373-405.

Chong, F. (2020). Housing price, mortgage interest rate and immigration. *Real Estate Management and Valuation*, *28*(3), 36-44.

Clauretie T. and Sirmans, G. (2006). Real Estate Finance. Theory and Practice. Thomson South – Western, Australia.

Claussen, C. A. (2013). Are Swedish houses overpriced?. *International Journal of Housing Markets and Analysis*, *6*(2), 180-196.

Cohre Daresh, J. (2008) Violations of Women's Housing Rights in Kenya's Slum Communities. Centre On Housing Rights and Evictions , Nairobi, Kenya.

Cooper, D.R.& Schindler, P.S. (2010), *Business Research Methods, 11th edn*, McGraw-HillNew York.

Creswel G. (2012). Conceptualizing and Measuring the Housing Affordability Problem ―National Research Venture 3: Housing Affordability for Lower Income Australians. Australian Housing and Urban Research Institute (AHURI), Melbourne.

De Langhe, R., & Schliesser, E. (2017). Evaluating philosophy as exploratory research. *Metaphilosophy*, *48*(3), 227-244.

Demary, M., & Voigtländer, M. (2018). *Reasons for the declining real interest rates* (No. 47/2018). IW-Report.

Dipasquale, D., & Wheaton, W.C. (1994). Housing market dynamics and the future of housing prices, *Journal of Urban Economics*, 3(5), 1-27.

Dolce, P., Marocco, D., Maldonato, M. N., & Sperandeo, R. (2020). Toward a machine learning predictive-oriented approach to complement explanatory modeling. an application for evaluating psychopathological traits based on affective neurosciences and phenomenology. *Frontiers in psychology*, *11*, 446.

Dugato, M., Favarin, S., & Giommoni, L. (2015). The risks and rewards of organized crime investments in real estate. *British Journal of Criminology*, *55*(5), 944-965.

Emmel, N. (2013). Sampling and choosing cases in qualitative research*: A realist approach.*

Fields, D. (2015). Contesting the financialization of urban space: Community organizations and the struggle to preserve affordable rental housing in New York City. *Journal of Urban Affairs*, *37*(2), 144-165.

Francis, J. J., Johnston, M., Robertson, C., Glidewell, L., Entwistle, V., Eccles, M. P., Grimshaw, J. M. (2010). *What is an adequate sample size?*

Friedman, M. (1957). The permanent income hypothesis. In *A theory of the consumption function* (pp. 20-37). Princeton University Press.

Galvez M. and Kleit R. (2011). The Location Choices of Public Housing Residents Displaced by Redevelopment: Market Constraints, Personal Preference or Social Information? Journal of Urban Affairs, 33(4).

Gardner, D., Lockwood, K., Pienaar, J., & Maina, M. I. R. I. A. M. (2019). Assessing Kenya's affordable housing market. *Centre for Affordable Housing Finance in Africa (CAHF), available at http://bit. ly/31WXBtY*.

Glaeser, E., Huang, W., Ma, Y., & Shleifer, A. (2017). A real estate boom with Chinese characteristics. *Journal of Economic Perspectives*, *31*(1), 93-116.

Government of Kenya. (2007). Housing Sector Incentives and Market Re -Engineering. Nairobi: Government of Kenya.

Green P. and Shapiro I. (1996). Pathologies of Rational Choice Theory: A Critique of Applications in Political Science. (New Haven, CT: Yale University Press).

Groshen, E. L., Moyer, B. C., Aizcorbe, A. M., Bradley, R., & Friedman, D. M. (2017). How government statistics adjust for potential biases from quality change and new goods in an age of digital technologies: A view from the trenches. *Journal of Economic Perspectives*, *31*(2), 187-210.

Habitat, U. (2018). Report on Gender Equity Assessment of Nairobi's Public Minibus Transport Services.

Hall, J. A., & Rosenthal, R. (2018). Choosing between random effects models in meta-analysis: Units of analysis and the generalizability of obtained results. *Social and Personality Psychology Compass*, *12*(10), e12414.

Han, L., & Lu, M. (2017). Housing prices and investment: an assessment of China's inland-favoring land supply policies. *Journal of the Asia Pacific Economy*, *22*(1), 106-121.

Islam, T., & Erum, T. O. O. R. (2019). Power comparison of autocorrelation tests in dynamic models. *International Econometric Review*, *11*(2), 58-69.

Jiang, Z. Q., Xie, W. J., Zhou, W. X., & Sornette, D. (2019). Multifractal analysis of financial markets: a review. *Reports on Progress in Physics*, *82*(12), 125901.

Karoki, R. W. (2013). Determinants of Residential Real Estate Prices in Kenya. Unpublished MBA Project. University of Nairobi.

Keynes, J. M. (1937). Alternative Theories of the Rata of Interest, *The Economic Journal*, 47: 241-52.

Khajeheian, D. (2019). Qualitative methods in media entrepreneurship research: Clarification of the terms framework, model and pattern. *AD-minister*, (34), 13-32.

Kibunyi, D., Ndiritu, S. W., Carcel, H., & Gil-Alana, L. A. (2017). Real estate prices in Kenya: is there a bubble? *Journal of Housing and the Built Environment*, *32*(4), 787-804.

Kieti, R. M. (2020). Affordable housing in kenya. *Africa Habitat Review*, *14*(1), 1677-1687.

Kim, T. K., & Park, J. H. (2019). More about the basic assumptions of t-test: normality and sample size. *Korean journal of anesthesiology*, *72*(4), 331.

Kipkirui, P. (2015). Factors affecting growth of housing units in Kenya. *Strategic Journal of Business & Change Management*, *2*(1).

Klimczak, K. (2010). Determinants of Real Estate Investment. *Economics and Sociology*, *3*(2), 58-66.

Krulický, T., & Horák, J. (2019). Real estate as an investment asset. In *SHS Web of Conferences* (Vol. 61, p. 01011). EDP Sciences.

Lauridsen, J., & Skak, M. (2007). *Determinants of homeownership in Denmark*. Syddansk Universitet.

Lee, S., Tidwell, A., & Jin, C. (2021). Residential Housing Market and Bank Stability: Focusing on OECD and Emerging Asian Countries. *Journal of Real Estate Research*, *43*(2), 248-270.

Lersch, P. M., & Dewilde, C. (2018). Homeownership, saving and financial wealth: A comparative and longitudinal analysis. *Housing Studies*, *33*(8), 1175-1206.

Lim, G. C., Follain, J., & Renaud, B. (2018). Determinants of home-ownership in a developing economy: the case of Korea. *Urban Studies*, *17*(1), 13-23.

Linneman, P. and I.F. Megbolugbe, (1992). "Housing Affordability: Myth or Reality?" Urban Studies, 1(29), 369-392.

Liu, Q., Liu, T., Cai, Y., Xiong, X., Jiang, H., Wang, H., & Hu, Z. (2021). Explanatory prediction of traffic congestion propagation mode: A self-attention-based approach. *Physica A: Statistical Mechanics and its Applications*, *573*, 125940.

London:Sage.

Lux, M., Gibas, P., Boumová, I., Hájek, M., & Sunega, P. (2017). Reasoning behind choices: Rationality and social norms in the housing market behaviour of first-time buyers in the Czech Republic. *Housing Studies*, *32*(4), 517-539.

Makachia, P. A. (2010). Transformation of housing in Nairobi—Dweller-initiated transformations in formal housing in Nairobi estates with case studies of Kaloleni and Buru-Buru Estates. PhD thesis, University of Nairobi, Architecture and Building Science, Nairobi

Mar Iman, A. H. (2012). Basic Aspects of Property Market Research, Penerbit Universiti Teknologi Malaysia.

Mbuguah, J. M. (2017). Factors affecting the supply of affordable residential housing units in Kenyan urban areas: A case of Nairobi City and its environs. *International Journal of Finance*, *1*(1), 53-65.

Meghir, C. (2004). A retrospective on Friedman's theory of permanent income. *The Economic Journal*, *114*(496), F293-F306.

Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of cardiac anaesthesia*, *22*(1), 67.

Mitnick. M.B (2006) Origin of the Theory of Agency. Pittsburg University Press. Pittsburg.

Mugenda, M. a. (2003). *Research Methods, Quantitative and Qualitative Approaches*. Nairobi: Acts Press

Murigu, J. (2005) An Analysis of the Decision- Making Criteria for Investing in Commercial Real Estate in Kenya. *PhD thesis, School of the Built Environment,* University of Nairobi, Nairobi.

Mutisya. R.K (2015) Urban housing affordability in Kenya: A Case Study of the Mortgage Housing Sector in Nairobi. Unpublished Thesis MBA. University of Nairobi.

Nabutola, W. (2004). Affordable Housing in Kenya: A Case Study of Policy on Informal Settlements. TSC-Land Administration and Housing Issues in Informal Settlements. 3rd FIG Regional Conference, Jakata, Indonesia.

Nurick, S., Boyle, L., Morris, G., Potgieter, J., & Allen, O. (2018). An investigation into the relatively low uptake of residential stock within South African Real Estate Investment Trusts. *Journal of African Real Estate Research*, *3*(1), 61-80.

Patrick, R. H. (2021). Durbin–Wu–Hausman Specification Tests. In *handbook of financial econometrics, mathematics, statistics, and machine learning* (pp. 1075-1108).

Piao, Y., Chen, A., & Shang, Z. (2019, August). Housing price prediction based on cnn. In *2019 9th international conference on information science and technology (ICIST)* (pp. 491-495). IEEE.

Quigley, J. M., & Weinberg, D. H. (1977). Intra-urban residential mobility: a review and synthesis. *International Regional Science Review*, *2*(1), 41-66.

Rattanaprichavej, N., & Teeramungcalanon, M. (2020). An investment decision: Expected and earned yields for passive income real estate investors. *Cogent Business & Management*, *7*(1), 1786331. Retrieved 2014-08-09.

Rogers, D., Wong, A., & Nelson, J. (2017). Public perceptions of foreign and Chinese real estate investment: intercultural relations in Global Sydney. *Australian Geographer*, *48*(4), 437-455.

Rottke, N. (2001). International Real Estate Fund Vehicles using opportunistic strategies: An Agency Theory Based Analysis. Working Paper Series # 06-002. Real Estate Management Institute (REMI)

Seitz, W. (2018). *Urbanization in Kazakhstan: Desirable Cities, Unaffordable Housing, and the Missing Rental Market*. The World Bank.

Siami-Namini, S., & Namin, A. S. (2018). Forecasting economics and financial time series: ARIMA vs. LSTM. *arXiv preprint arXiv:1803.06386*.

Steggell, C. D., Binder, S. K., Davidson, L. A., Vega, P. R., Hutton, E. D., & Rodecap, A. R. (2003). Exploring theories of human behavior in housing research. *Housing and society*, *30*(1), 3-32.

Stone, M. (2006). What is Housing Affordability? The Case for Residual Income Approach. *Housing Policy Debate* 17(1). 151 – 184.

Sugden R. (1991). Rational Choice: A Survey of Contributions from Economics and Philosophy.‖ Economic Journal 101 (407), 751-85.

Takemura, K. (2021). *Behavioral decision theory*. Springer Singapore.

Talib, H. R., Abdul-Husain, M. A., & Abd Naeem, A. (2021, March). Applying Non-Homogeneity of Variance in The Error to The Investment Function in Iraq. In *Journal of Physics: Conference Series* (Vol. 1818, No. 1, p. 012026). IOP Publishing.

Tan, T. H. (2008). Determinants of homeownership in Malaysia. *Habitat International*, *32*(3), 318-335.

World Bank (2017). Kenya needs 2 million more low-income homes: Building them would boost its economic growth. https://www.worldbank.org/en/country/kenya/publication/kenya-needs-2-million-more-low-income-homes-building-them-would-boost-its-economic-growth

Wu, J., Gyourko, J., & Deng, Y. (2015). Real estate collateral value and investment: The case of China. *Journal of urban Economics*, *86*, 43-53.

Zainon, N., Mohd-Rahim, F. A., Sulaiman, S., Abd-Karim, S. B., & Hamzah, A. (2017). Factors affecting the demand of affordable housing among the middle-income groups in Klang Valley Malaysia. *Journal of Design and Built Environment*, 1-10, 11-21.

APPENDICES

Appendix I: Document Review Guide

Financial Data	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Housing Price Index										
Income per capita										
Lending Rate										
Consumer Price Index										
Net Operating Income/ (NOI)										
Current Market Value of the Asset (CMVA)										

Source: Researcher, 2023

Appendix II: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **656270**

Date of Issue: **09/June/2021**

RESEARCH LICENSE

This is to Certify that Miss., Sophia Moraa Ongaki of Kenyatta University, has been licensed to conduct research in Nairobi on the topic: AFFORDABLE HOUSING AND REAL ESTATE INVESTMENT AMONG HOUSEHOLDS IN NAIROBI CITY COUNTY, KENYA. for the period ending : 09/June/2022.

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Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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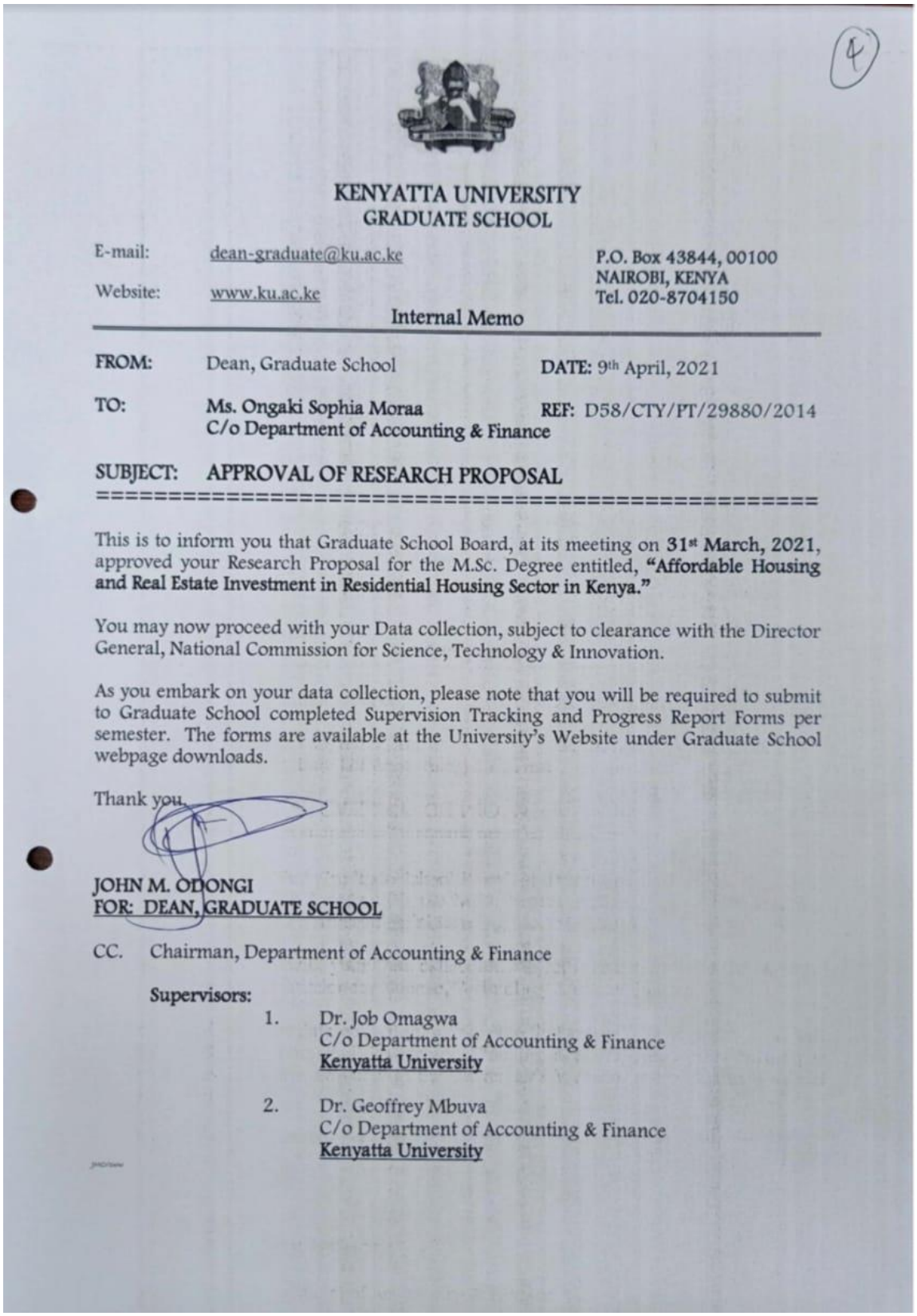
Appendix III: List Of Real Estate Firms

1. Villa Care Kenya	2. Hass Consult
3. Lynex Holdings	4. East gate apartments Ltd
5. Llyod Masika Ltd	6. Jamia Valuers & Estate Agent Management
7. Urban Bliss Realstore	8. Knight Frank Ltd
9. Milligan International Ltd	10. Regent Management Ltd
11. Neema Management Ltd	12. CB Richard Ellis Ltd
13. Alliance Realtors Ltd	14. Paragon Property Ltd
15. Lowanjo Properties Ltd	16.Urban Properties Consultants & Development Ltd.
17. Tysons Ltd	18. Norkan Investments Ltd
19. Master ways Properties Ltd	20. Cornerstone International Ltd
21. Dunhill Consulting Ltd	22. Home Africa Ltd
23. Wasco Property Consultations Ltd	24. Acorn Properties Ltd
25. Canaan Properties Ltd	26. Pinnacle Properties Ltd
27. SEB Estate Ltd	28. Liberty Real Estate Ltd
29. Bluehills Real Estate Ltd	30. Guardian Properties Ltd
31. Sundown Valuers & Realters Ltd	32. Axis Real Estate
33. Homelands Holdings Ltd	34. Mudas Properties Services Ltd
35. Legend Valuers& Estate Agents	36. Diversity Property Ltd
37. Kimly Properties Ltd	38. Easy Properties Ltd (K)
39. Eackelberg& Co. Ltd	40. Silverrock Properties Ltd
41. Gampr Investments Ltd	42. Colburne Holdings Ltd
43. Savannah Consulting Ltd	44. Joskinyagat Ltd
45. Ryden International Ltd	46. Real Appraisal Ltd
47. Jeankins Investments Ltd	48. Realken International Ltd
49. Heri Properties Ltd	50. Valentine First Venture(K) Ltd
51. Frank Valuers& Properties Management Ltd	52. Wakama Estate Agency Ltd
53. Terestam Properties Management Ltd	54. Paradise Properties Ltd
55. Chapter Consultants Ltd	56. Perscale Properties Ltd
57. Property Point Ltd	58. ENA Properties Ltd
59. Menga Management Ltd	60. Nile Real Appraisee Ltd
61. Maestro Properties Ltd	62. Town House Agencies
63. Etion Property Consultants	64. Add Property Consultants
65. Tuco Properties Ltd	66. Sortmaster Properties Ltd
67. Heritage Property Consultants	68. Value Build Management Ltd
69. Konaken Investment Ltd	70. Ngumo Properties Ltd
71. Elegant Investments Ltd	72. Arkpoint Properties Ltd
73. Karen Link Ltd	74. Vera Property Ltd
75. Beryt Properties Investments Ltd	76. Opus Property Ltd
77. Nairobi Homes Ltd	78. Rank Global Ltd
79. Landmark Realtors Ltd	80. Property Ins Ltd

Source: **Estate Agents and Valuer's Registration Board, 2023**

Appendix IV: Data Collection Letter



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Internal Memo

FROM: Dean, Graduate School **DATE:** 9th April, 2021

TO: **Ms. Ongaki Sophia Moraa** **REF:** D58/CTY/PT/29880/2014
C/o Department of Accounting & Finance

SUBJECT: **APPROVAL OF RESEARCH PROPOSAL**

This is to inform you that Graduate School Board, at its meeting on **31st March, 2021**, approved your Research Proposal for the M.Sc. Degree entitled, **"Affordable Housing and Real Estate Investment in Residential Housing Sector in Kenya."**

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology & Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking and Progress Report Forms per semester. The forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

JOHN M. ODONGI
FOR: DEAN, GRADUATE SCHOOL

CC. Chairman, Department of Accounting & Finance

Supervisors:

1. Dr. Job Omagwa
   C/o Department of Accounting & Finance
   Kenyatta University

2. Dr. Geoffrey Mbuva
   C/o Department of Accounting & Finance
   Kenyatta University