EFFECT OF ECONOMIC DETERMINANTS ON AFFORDABLE HOUSING IN KENYA

Chamwoma Katu Aggrey

A Thesis Submitted to the School of Business and Economics in Partial Fulfilment of the Requirements for the Award of the Degree of Master of Science in Economics of Masinde Muliro University of Science and Technology

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Signed…… Date…….

Dr. Ngala Consolata

Department of Economics,

Masinde Muliro University of Science and Technology

Signed…… Date…….

Dr. Umulkher Ali

Department of Economics,

Masinde Muliro University of Science and Technology.

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DEDICATION

I dedicate this proposal to God Almighty for the good health and strength He granted me throughout this journey. I also express my gratitude to my parents, Joseph Chamwoma and Lydiah Ochami, for their unwavering encouragement and support that motivated me to complete this work. To my lecturers, I salute you for the knowledge you imparted to me, which has been invaluable in my career. Thank you, my love for you is immeasurable.

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ABSTRACT

Shelter is a vital necessity and comfort for life. Housing significantly impacts health, community, economy, education, and social equity, influencing overall welfare. However, like many developing nations, Kenya struggles to provide affordable housing for it's citizens. This study aimed to explore factors affecting affordable housing in Kenya. Specifically, it examined the relationship between economic determinants and affordable housing, and the moderating effect of inflation on these relationships. Using a causal research design and Vector Error Correction Model regression analysis, the study analyzed data from 2010 to 2022. Data on FDI were sourced from the Kenya National Bureau of Statistics (KNBS) and the Central Bank of Kenya(CBK),and both remittance and Mortgage was obtained from the CBK. The Affordable housing and inflation data was sourced from the National Treasury,Ministry of Housing and development, KNBS, and the Kenya Bankers Association. Qualitative data was summarized using tables and figures. A pre-estimation test was conducted to validate the findings, with the Augmented Dicky Fuller (ADF) test confirming that all variables had a unit root at the level, while they were stationary at the second difference. Variance inflation factor (VIF) values were below 10, indicating no multicollinearity. The Jarque-Bera test result of 0.072994 (greater than 0.05) confirmed that the data were normally distributed throughout the study period. Descriptive statistics illustrated the sample's general characteristics. Correlation analysis revealed a moderate negative relationship between Economic Determinants and inflation on the Affordable Housing (-0.484778, -0.585630, and -0.280741, respectively), while there was a positive correlation between remittances and the Affordable Houing (0.613619). The Johansen test for cointegration identified two cointegrating equations. Model regression estimates were (5.407022, $p < 0.05$), (-0.215188, $p < 0.05$), and (-0.383195, $p < 0.05$)

for foreign direct investment, remittances, and mortgage interest rates which are generally referred to as economic determinants in this study.The results also indicated a significant negative moderating effect of inflation on the relationships between foreign direct investment, remittances, and mortgage with the Affordable Housing in Kenya (0.814135, $p < 0.0000$), representing a 13.13% decline when inflation was included as a moderator. The Kenyan government should implement specific initiatives or incentives to promote affordable housing, and remittances should be included in future discussions beyond 2025.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dicky Fuller Test
AFD	Affordable Housing
CFAH	Centre For Affordable Hosing
CBK	Central Bank of Kenya
COVID-19	Corona Virus Disease 2019
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GOK	Government of Kenya
GTZ	German Technical Cooperation
IMF	International Monetary Fund
INFT	Inflation rate
KENSUP	Kenya Slum Upgrading Programme
LIG	Low Income Group
MG	Mortgages
MIG	Middle Income Group
MTPL	Medium Term Plan
NHFC	National Housing Finance Corporation
RMTs	Remittances
SGR	Standard Gauge Railway

VECM	Vector Error Correction Model
UDD	Urban Data Digest
UNCTAD	United Nations Conference on Trade

OPERATIONAL DEFINITION OF KEY TERMS

Affordable Housing: Refers to housing which is adequate in quality and location and does not cost much that its occupants are unable to meet their other basic human needs.

Mortgages:A mortgage is a debt with income producing property such as retail space, office, hotel, or multifamily building as collateral (Xudong, 2008)

Economic determinants:This refers to variables which are classified as both in macro and Micro economics and are FDI,Remittances and Mortgages

Foreign Direct investment: This study adopted the World Bank (2013) definition. FDI is a net inflow of investment in order to acquire a long-term management interest in an enterprise operating in an economy other than investor. This is used to refer to foreign inflows in relation to affordable housing.

Remittances:This will refer to personal transfers, which consist of all current transfers in cash, in kind made, or received by resident households or from non-resident households.

Middle-income earners:This refers to those in employment either in public or public sector including those doing business with a minimum wage as stipulated by the government and the income is stable.

Low-income earners: This refers to those below the minimum wage as stupilated by the government and their income is unstable .

CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

The global housing shortage is a critical issue, with around 2.5 billion people living in inadequate conditions lacking basic amenities (Dodman et al., 2020). To meet this demand, 300 million new homes are required by 2030, primarily in Sub-Saharan Africa, South Asia, and Southeast Asia (World Bank, 2020). This necessitates an investment of approximately $17 trillion for land acquisition and construction, presenting a significant opportunity for the private sector (Autumn, 2020).

According to United Nations-Habitat (2018), about 815 million people, or 32% of the urban population, live in slums, mainly in developing countries. Moreover, urban poverty is increasing, shifting from rural to urban areas. The UN warns that if local governments, national authorities, civil society, and the international community do not collaborate, the number of slum dwellers in developing nations are likely to rise (UN-Habitat, 2018).

With the global population expected to reach 8 billion soon, the aging demographic, particularly among women, is going to rise (Gu, D., Andreev, K., & Dupre, M. E. 2021). The World Bank estimated that Africa's population could hit 1.5 billion by 2030, with nearly 60% residing in urban areas (United Nations, 2017). This urban population faces poor housing and sanitation standards, emphasizing the need for better housing strategies, especially for low-income earners.

1.1.0 Affordable Housing

Inadequate housing can impact negatively on urban equity and inclusion, urban safety and livelihood opportunities, and cause negative health conditions (UDD,2019).

Most countries especially Less Developed Countries are experiencing increased housing demand. Over the previous four centuries, the provision of such accommodation has been hampered by fast population growth in urban regions worldwide, particularly in developing countries (Gurran, et al., 2017).Both middle-income and low-income earners are mostly affected in accessing affordable housing which is attributed to their low income levels and high cost of housing units available.

In Africa, a significant gap in housing affordability exists, with formal housing stock unable to meet demand. More than half the urban population lives in slums, accounting for 61.7% of residents (UN-Habitat, 2013). Rising construction costs, especially in areas with high land prices and expensive materials, further exacerbate the housing deficit. Population growth in Africa continues to rise, with UN-Habitat (2013) estimating that the urban population will rise from 294 million to 742 million by 2030. This rise in population growth means that governments and urban executives across the continent will have significant issues offering affordable housing for low-income earners in particular (Lizarralde & Massyn, 2014).This is worrying because both national and local governments are not able to provide affordable housing to the population.

One of the most significant barriers to affordable housing in Sub-Saharan Africa is the high cost relative to incomes. Formal housing is unaffordable for over 85% of the urban population, a situation worsened by low and unpredictable incomes, limited financing options, and inflated housing prices. For many families, even those with steady employment, the cost of a basic house far exceeds what they can afford (Lizarralde & Massyn, 2014). Stiff competition produced by market forces in metropolitan regions of Sub-Saharan Africa exacerbates the condition as low-income earners are relegated to the background and unable to maintain up with this competition (Mansuri & Rao,

2014).Housing which is availed by market forces tend to be higher than what both Middle –Income Groups(MIG) and Low-Income Groups (LIG) earners can afford.

1.1.2 Affordable Housing in Kenya

Affordable housing remains at the centre stage of discussions in Kenya with the government putting in place various programmes and policies to support housing sector since independence.The most recent one being the housing levy which has been considered as a discriminatory policy effort towards housing.

There has been an erosion of upto 6% of disposable incomes to those in employment sector(Cyton,2024).This in effect reduces the ability to service mortgage facilities of the already high priced housing units.High construction costs,overvalued land prices and presence of private developers which produce high-end housing units have greatly affected housing affordability.

Wage

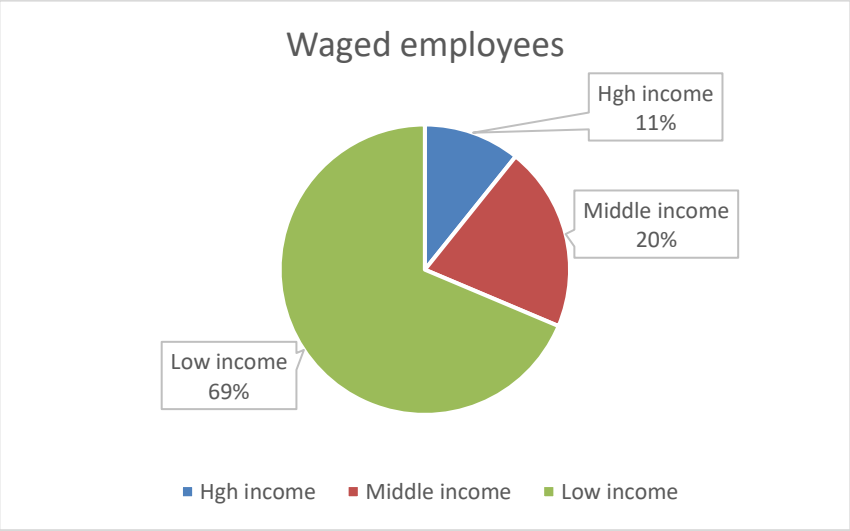


Figure 1.0 (Data source ,KNBS 2017)

High income Above Kes 100,000

Middle income Kes30,000-99000

Low income Kes 0-15670

From the above figure,the largest number of employees from both private and public sector earn a gross pay of Kes.15670 with only 11% earning a gross pay of above Kes.100,000.With such earnings subjected to statutory deductions ,employees notably middle and low income earners struggle on how to meet their daily expenses thus being unable to even finance mortgage facilities.

Affordable housing units

Description	Measurement SQM	Location	Total	Monthly repayment
Studio	20	Kiambu	640,000	3,900
One bedroom	30	Juja	960,000	5,300

Figure.2.0 (KMRC website)

Affordable housing has been categorized into three levels of incomes with the above referring to low income.This group of beneficiaries are unable to meet the above deduction with a better portion of their income committed on daily needs.Their is unable to sustain mortgage facilities to enable them access quality houses.

Private investoers and developers are interested in making return on their investments on housing sector.Housing market is autonomously determined by these segment of parties due to inadequate policies by the government to ensure equality to all.

1.1 Statement of the Problem

The issue of housing affordability has created a major discussion that touches on one of the very basic needs,shelter.Affordability of any basic need is intertwined to both price of an item and the income of the consumer or buyer.In the wake of 21st Centuary, which is characterized with rapid urbanization and ineffective housing policies,housing market has a significant role in social transformation thus need to address the pricing in this sector if income side has not been checked. In many urban areas, the demand for housing far surpasses the supply, leading to skyrocketing property prices and rent rates (KNBS,2019).This affects those in low and middle income brackets by shading them from being able to access quality shelter.

Land use regulations and ineffective policies around housing sector has not only failed to mitigate the affordable housing debate but also worsened the living conditions for low-income earners in urban and even some rural areas.The policy on housing levy in Kenya is descrimintaory in nature and does not serve the interests of all citizens given that some of those paying this statutory deduction are either servicing a mortgage loan or have completed such a commitment and they are not in any formal agreement by the state towards this deduction.

Middle-income households are those persons whose monthly income range between KES 23,671 and Kes 112,717 (KNBS,2015).This affects the demand of affordable housing because most middle-income and low-income earners have a low income which is not even enough to meet their daily needs.

According to Hass Consult (2020),housing prices have increased by more than 100%.This makes housing unaffordability to both low-income and middle-icome earners to increase.There is need to bring down the cost of housing so that all income groups are able to access.Subsidized housing units for low income earners has an

influence on reducing slums and poor housing facilities.Economic determinants such as Foreign Direct Investment(FDI),Mortgages, and Remittances have the ability in reducing the cost on housing.

Affordable housing needs a multidimensional approach especially on funding model and a feasible policy framework so that the prices of affordable housing units are at the manageable levels to low and middle income earners.

1.2 Objectives of the Study

1.2.1 General objective

To establish the effect of Economic Determinants on affordable housing in Kenya.

1.2.2 Specific objectives

The specific objectives of the study were:

i. To determine the effect of foreign direct investment on Affordable Housing in Kenya.
ii. To establish the effect of remittances on Affordable Housing in Kenya.
iii. To examine the effect of mortgages on Affordable Housing in Kenya.
iv. To determine the moderating effect of inflation on the relationship between foreign direct investment inflows, remittances, and mortgage on Affordable Housing in Kenya.

1.3 Research Hypotheses

This study tested the following hypothesis.

H_{O1}: There was no statistically significant effect of foreign direct investment on Affordable housing in Kenya.

H_{O2}: There was no statistically significant effect of remittances on Affordable housing in Kenya.

H_{O3}: There was no statistically significant effect of mortgage on Affordable housing in Kenya.

H_{04}: There was no statistically significant moderating effect of inflation on the relationship between foreign direct investment inflows, remittances, and mortgages on housing prices in Kenya.

1.5 Significance of the Study

This study analyzed the effect of Economic determinants on affordable housing in Kenya from 2010 to 2022. This 13-year period is notable for the first Medium Term Plan (MTP) of Vision 2030, which emphasized on affordable housing initiatives that began in 2008. During this time, FDI and remittances had increased in Kenya. Although Kenya was the fifth-largest FDI recipient in Africa in 2020, World Bank data indicates a decline in FDI inflows that year compared to 2011-2017, largely due to the COVID-19 pandemic. Average FDI inflows from 2011 to 2016 surpassed 5% of GDP. Furthermore, government policies have enhanced social protection and housing, particularly through the creation of the Kenya Mortgage Refinance Company (KMRC) and reforms to the Retirement Benefits Authority, aimed at promoting homeownership. The housing sector has seen substantial investment, with a key focus towards affordable housing,targeting housing supply for specific societal groups.

1.6 Limitation of the study

These diverse sources may contain contradictory information, complicating the collection of accurate data. To ensure reliability, the researcher employed a triangulation approach, focusing on internationally recognized sources such as the

World Bank and KNBS. The findings from these sources were compared and found to be consistent.

1.7.0 Contextualization of Variables

1.7.1 Affordable Housing

The term 'housing affordability' began to be used from the 1980s and may be defined as the capacity of households to meet housing costs, while maintaining the ability to meet other basic costs of living; a rent is affordable when it leaves the consumer with a socially acceptable standard of both housing and non-housing consumption after rent is paid; a household is said to 10 have a housing affordability problem when it pays more than a certain percentage of its income to obtain adequate and appropriate housing (Napoli, 2017).

1.7.2 Economic Determinants

Economic Determinants refers to the mix of foreign cash flows and price of internal key input termed as mortgage.These are;Foreign Direct Investment,Remittances and Mortgages

1.7.4 Remittances

According to Fortun & Nzai (2023),remittances have become frequent payments made by foreign workers to family back at home thus becoming a vital part in economic growth ,particularly in developing nations.In 2019, $271 million was sent by international migrants, making it one of the largest sources of overseas aid for emerging countries. The total global remittances rose to $707 billion in 2019, with $746 billion predicted for 2020. Low- and middle-income countries received an increase of $554 billion in 2019, surpassing foreign direct investment. Top recipients included India, China, Mexico, the Philippines, and Egypt (World Bank, 2020).This implies that

remittances has a space in economic and social transformation thus important in housing sector.

1.7.5 Mortgages

The mortgage market remains to be a vital in the housing sector especially by financial institutions to both private developers and investors.However, development exercises require a great deal of cash-flow to execute (Mwathi & Karanja, 2017).The aspect of mortgage financing remains at the centre stage of contributing towards housing with focus being the role commercial banks play in the mortgage sector.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section reviews relevant theoretical and empirical literature, along with a conceptual framework illustrating the relationships among the discussed variables in this area of study.

2.1 Theoretical Literature

2.1.1 Hedonic Price Theory

The theory adopted originates from Lancaster ‘s (1966) consumer theory and Rosen theoretical model which has been widely used in the scientific analysis and study of various facets of housing markets. It recognises price factors based on the notion that price has inherent qualities of the good being sold as well as external influences on it. Hdonic valuation method has been adapted from the previous studies here also. A large number of research works have adopted the hedonic pricing model in research and analysis.This model is given with the following equation:

$Pi = \beta_0 + \beta_1 \text{SA} + \beta_2 \text{LA} + \beta_3 \text{EA}$……2(a)

Where;

Whilst Pi = Housing prices, SA = Structural attributes, LA = Location attributes, EA = Environment attributes. Structural attributes are mean age, covered area, Number of rooms, number of bathrooms and direction of the property while location attributes are distance from the city center, hospitals, and education institute Environmental attributes include cleanness of area and distance from Industrial Zone.
The previous research works indicated that property value depends on certain characteristics related to property and several works have defined the key

characteristics associated with structural characteristics, location characteristics and environment characteristics that act a pre-dominant role in the process of determining price of residential properties (Hussain et al. , 2019; Li et al. , 2018; Gizem et al. , 2018)

This theory was chosen due to its elaborate explanation of House price determination in the different studies as a stand a1one model that explains the pricing model in the housing sector more so in real estate sector.This theory creates an analytical approach in determining appropriate prices in housing sector so as to support housing affordability.It is evident that prices of housing units vary from one place to another thus creating inconsistencies in house pricing.

2.1.2 The Neoclassical Solow growth theory (endogenous)

The Cobb-Douglas production function is a mathematical model that shows how different inputs, like labor and capital, work together to produce goods or services. It helps explain how changes in these inputs affect overall output.

$$Q = AL^{a} C^{\beta} \quad \text{.....(2b)}$$

The equation above is defined as follows: $\mathbf{Q_t}$ represents the total output, in this scenario, it shows the number of houses developed by both National Housing Corporation (Kenya government) and private sector developers,$\mathbf{C_t}$**;** was technical productivity at a time **t** which was a positive constant;L_t was labour at time **t**; $\mathbf{K_t}$ was other physical capital of the country at a time t.

According to Chiang (1984), some of the major features of this function are:

It is linearity homogeneous such that ($\alpha+\beta=1$)

It is homogeneous of degree ($\alpha+\beta$)

This theory has several limitations: it overlooks dynamic market conditions and their impact on output, making it inadequate for understanding how firms adjust output in response to changing input prices and other market factors. Additionally, it assumes that inputs of the same type are identical and interchangeable, which is unrealistic.

This theory is pertinent to the study as it was recognized in the 1920s as an explanation for the determinants of output value (Biddle, 2012). House construction requires both labor and capital, with capital formation significantly influenced by interest rates, which serve as the fundamental basis for determining mortgage rates.

Equation (2a) can be modified in the case of more than two variables (Chiang, 1984). The model for this research work can be deduced as follows:

$AFH_t = C_t^{\beta} . FDI_t^{\beta 1} . MG_t^{\beta 2} . RMTS_t^{\beta 3}$ .....(2c)

Equation (b) above was expressed in terms of a Cobb Douglas function model where:

AFHt refers to the total number of affordable units built in Kenya cross sectional area of time t through both state and private led initiatives. Obajo (2018) employed the similar approach and explanation of moderating variables in research on the effects of monetary factors on the Kenyan formal housing

The expanded formal housing growth model in Cobb-Douglas with control variables is as follows:

$AFH_t = C_t^{\beta} . FDI_t^{\beta 1} . MG_t^{\beta 2} . RMTS_t^{\beta 3}$ .....(2d)

2.1.3 Monopolististic Competition Thoery

The theory of Monopoly competition was developed by Edward Hastings Chamberlin in his book known as _Theory of Monopoly competition_ which was published in 1933.

The theory has centered on synthesizing market features of firms trading in products of substitutes though may not be identical. According to the book, these firms are said to possess market power which goes hand in hand with the fact that prices of products or services can be regulated since other firms cannot overpower them. However, the market is still competitive due to the fact that both buyers and sellers have preferences when it comes to various products. The following conditions hold; on the market, there is a large number of manufacturers, there is also a large number of buyers, and on the market no individual firm is able to control the prices. There are low entry and exit barriers because consumers perceive some other factors, which are non-price factors between the products of the competitors.

The general flaws of this theory are; higher prices, limited selections, governmental interferences, and antitrust laws. It is used here to explain the existence of controlled market price of house by the producer/developers where consumers have no bargaining power on the market price of housing of units. Some of the forces that have some level of control over the determination of the price of housing units include the players in the housing market like developers and mortgage lenders. For example, when mortgage lenders are planning to increase the lending rates, of course the prices of houses increase meaning that low income earners cannot be housed. From the analysis it is clear that Mortgage interest rates impacts the prices of houses hence reducing the number of affordable houses. As found by Kimani (2020), who studied on the strategic directions and execution of affordable housing in Nairobi city County in Kenya in which mortgage was adopted in research showed that mortgage lenders make it certain that house prices remain affordable whenever they increase their rates. This is in conformity with the finding made in this research.

This theory was classified very important in this study so as to explain the role of government intervention in the housing sector because of incomplete markets and externalities the resulting impacts of earnings and wealth distribution, accessible to low-income earners because most of high end housing units are majorly constructed by private developers.

2.2.4 Public Interest Theory

Pigou developed the theory in 1932. The author was convinced that the regulations are put together in the public as they are thought to be created to meet the public's need to address the ineffective mechanisms that are often witnessed. Regulations are perceived to be in the social interest of doing good, for the society and not the interests of any particular individual. The theory, in his broad perspective, avows that regulations are aimed at safeguarding and benefiting the general masses. It can further be defined that M is the optimal provision of limited resources for private and public goods. It entails the use of legal tools to facilitate socio-economic policy objectives for example, the government may put in place economic and social regulations to achieve aims such as, allocative efficiency stabilization or equitable income distribution. Based on the Public Interest Theory that postulated government regulation as the means for overcoming the vices associated with imperfect competition, imbalance in market activities, market failure, and undesirable market outcomes. It brings about this improvement by either enhancing, maintaining, or copying the process of either facilitating or operating in the market. Markets in exchanging goods and production factors entails definition, allocation and affirmation of individual property rights and freedom to contract. Hertog (2003) argued that working in the interest of the public is the general behavior of government officials and that there is no difference between policy formulation and policy administration to achieve the greatest level of efficiency.

In applying this theory in housing market, Its important to note that the level of competition is relative to the market structure that is being considered. It would mean that states are assumed to address housing market imperfections and disadvantages and in a comprehensive manner regulate such markets to ensure affordable, adequate and well-located housing for citizens from all income groups. This theory attempted to rationalize that any interference with the housing market will be regarded as being economically efficient, assuming that the value of offering such housing surpasses the worth of the interventions. It was perceived as a necessary control mechanism of flaws prevalent in an economy.This theory justifies the roles of a government or state in putting in place corrective measures to curb the challenges experienced in housing sector.Affordable housing has remained at the centre of discussion of states.For instance,Vision 2030 ,Big four Agenda and the most recent one being enactment of Housing Levy Fund are stategies focusing on afforadable housing to low-income earners in Kenya which aim at eradicating slums in urban centres and giving quality homeownership to all.

This research work outlines recommendations to stakeholders especially the government so as to achieve its constitutional mandate on housing affordability and accessibility by its people. This refers to policies that facilitate growth of housing sector and making it more affordable to low-income earners.

2.3 Empirical Literature

2.3.1 Foreign Direct Investment and formal housing

Zhu (2010) tested research hypotheses on the determinants of FDI in real estate using data from 35 Chinese cities between 2008 and 2012, finding that both local and foreign demand attract foreign real estate developers. In cases where foreign investors are

involved in real estate, cities with firms engaged in international business and international occupants of hotels or apartments near offices are relevant. The author noted that while tourism is one of the largest contributors to Kenya's Gross Domestic Product, it plays a minimal role in shaping formal housing policies. From a broader perspective, the findings indicate that FDI positively impacts the contribution of formal housing to improve the socio-economic status of people, particularly those in slum areas.

Salaman el al. (2024) reports that Rwanda has experienced a spike in investment in its real estate industry, particularly affordable housing developments, as a result of measures aimed at attracting foreign direct investment.This suggests that foreign direct investment (FDI) provides additional funding and strategic guidance for affordable housing

A study by Castro et al (2007) that seek to gauge the impact of two proxies of the road network (total length of road and the paved roads) as well as electricity (installed power capacity and gross generation) on FDI attraction in Argentina, the authors were able to settle on the fact that paved and reliable roads do matter in attracting FDI. Per capita, paved roads significantly increase FDI by 17% to 33% for each 10% rise. It would also boost energy supply in neighboring provinces, potentially increasing FDI inflows by 12% to 14%. This study has a gap because it fails to demonstrate how this variable affects housing in multiple ways. If FDI positively impacts formal housing in Kenya, then increased energy connectivity should be anticipated. The conclusion from the energy production argument is that an increase in electricity users leads to lower long-term production costs. In addition, the high generation of electricity at a low-cost results in higher efficiency in the various production sectors of the economy.

In Kenya, Voorpijl (2011) focused on the benefits and drawbacks of foreign involvement. Taking a qualitative case study with a specific sample of investors who had made a long-term investment. The strengths of analyzing the investment climate emerged from the study. It is known to shed light on the type of FDI that can be directed towards a particular country's investment climate. Additionally, Voorpijl went on and point out that some of the key investment incentives include the extensiveness and availability of good infrastructure and the availability of an educated and relatively cheap but competent labour force. It was necessary to employ various econometric structures in explaining the effects of FDI on the housing sector in Kenya.

2.3.2 Remittances and affordable housing

In their 2014 study, Freeman and Harden delved into the prevalence and impact of down payment assistance in affordable home ownership. The descriptive analysis they conducted confirmed that loans incorporating seller-funded profit assistance intentionally performed lower than others. Meanwhile, a 2015 study by Amoss et al. in Ghana examined the challenges of real estate development from the developer's perspective. Their quantitative research revealed that the main challenges revolved around development and obtaining building permit approvals. However, it is important to take a different approach to determine the combined impact of remittance on affordable housing in Kenya.

Adams and Cuecuecha (2013), in the case of Ghana, examined the usage of remittances by the households and the extent to which they affect poverty by using a nationally representative household survey “Ghana Living AWAN et al: Qualitative nature of remittances and its effects on expenditure and poverty: An analysis of NES (National Expense and Savings which are monthly averaged based on NSSO; 2005-06). Multinomial Logit Two Stage was applied. They concluded that, on average,

households receiving international remittances spent 2.4% of their budget, while those receiving internal remittances spent 1% less on food compared to non-recipients. Generally, these households allocated an additional 6% to education and 7% to housing. The marginality ratio for health spending was 8% and 3% higher among recipients than non-recipients, indicating a tendency to invest. Additionally, remittances were found to play a significant role in poverty reduction, with internal remittances decreasing poverty likelihood by 17% and international remittances by 97%. From the study, the highest margin used which resulted in remittances was from housing at 5 undefined This; however, suggests that, in general, the levels of affordable housing development can be boosted through the use of remittances from abroad as a form of funding this sector to address the increasing problem of the growing number of slums in most urban centers in the country.

According to Estaban(2021) there is a positive influenc of remittances on housing sector.This was carried out in Colombia on quaterlty data from 2001-2016 using VAR model. The results from the estimations point towards the hypothesis that remittances are being used to increase the supply of housing. This interesting finding is justified by recognizing that the additional supply of housing creates a downward pressure on the housing prices.Therefore,there is need to examine the effect of remittances on affordable housing as an emerging issue in the housing sector to both middle-income aand low-income earners in Kenya.

2.3.3 Mortgages and Affordable Housing

In their 2014 study, Freeman and Harden explored the prevalence and impact of down payment assistance in affordable home ownership. The study's descriptive analysis revealed that loans with seller-funded assistance tended to perform lower than other loans intentionally. Meanwhile, Amoss et al. (2015) conducted a study in Ghana on the

challenges of real estate development from the developer's perspective. They utilized quantitative research techniques to identify issues related to development and building permit approvals. Furthermore, Asaberee, McGowan, and Mookle (2014) focused on the role of financing and economic development in Africa. Their study, using ordinary least squares (OLS), highlighted the statistically significant influence of the mortgage market size on GNI per capita. Additionally, Odi's 2014 research in Nigeria investigated the implications of mortgage financing for housing for all by 2020. The study found a positive correlation between the supply of housing and roof gauge credit. However, research on the impact of monetary factors on the desire for shelter in Kenya neglected the role of mortgage financing, particularly for low-income earners in the formal housing market.

Tiwari and Moriizumi (2010) analyze the efficiency of housing finance and employ a comparative analysis of the mortgage instrument in Japan, through a regression model. It was also established that the house mortgage lenders especially the government housing loan corporation have not provided adequate solutions to housing finance risk and that there is no secondary market that can provide solutions in the pricing of mortgages. It was necessary to assess the effects of mortgages on formal housing in Kenya with a different method. This is to confirm the previous analysis and to be able to give general trends not only in Kenya but also in other developing countries.

A study on approaches to housing provision in Malawi was conducted by Manda, Nkhana, and Mitlin (2011). It exposed one of the significant implementation strategies as secure tenure and upgrading, and that government policy, under the housing delivery system, is that people of all income levels should be provided with housing. They proposed that there are three models of housing provision for both urban and rural, including the establishment of traditional housing zones under local governments,

granting of surveyed plots with titles to construct houses via mortgage systems, and lastly, consolidation of squatter informal settlements. It was necessary to submit mortgages to various types of analysis in various countries to determine their impact on formal housing. As it is evident that Kenya falls among sub-Saharan countries that have experienced a great challenge in the provision of housing, it had to embark on testing how mortgages affect the formal housing sector.

VECM was used by Theodore and Panagiotis (2015) to establish the determinants of the housing market in Greece: the authors found that mortgage loans were one of the most influential variables identifying 29% of variation in the change of the housing price index. This paper analyzed the correlation between the housing price index and macroeconomic factors such as retail sales, consumer price index, mortgage loans, and taxes. Contrary to the study by Theodore and Panagiotis (2015) on Greece, studies in Kenya had not capitalized on the impact of mortgages on formal housing relative to other macroeconomic factors like FDI and RMTS.

In his analysis of the impact of interest rate fluctuation on real estate growth in Kenya, Miriuki revealed that a change in interest rate negatively affects the growth rate of real estate. Data obtained from KNBS and Hass Consulting firm for the period between 2008 and 2012 allowed Miriuki to determine that when the interest rate rises, the growth rate of real estate declines. Miriuki also suggested that within real estate, the number of housing units has increased to accommodate the price inelasticity of demand for housing. This means that while low-income earners shift from 'many people per house' to 'many houses per people', the 'upper middle house units' purchase more due to the demand boost from multinational corporations and international organizations staff, leading to higher house prices in Kenya.

In Kenya, the specific interest rates were determined by the CBK and not influenced by any other factors. Mortgage rates are derived from the current interest rates of all the commercial banks and other institutions dealing in mortgage loans. When it came to mortgage financing, particularly in providing formal housing, there was limited information available in Kenya. This was also sometimes known as changes in mortgage rates, where lending institutions differ in their rates.

2.4 Summary of Research Gaps

All individuals have a right to hold basic living conditions that are sufficient to support the sustainable health of both them and their families, inclusive of food, clothing, shelter, and necessary medical facilities, as well as social necessities (UDR,1948). This places the aspect of housing in the limelight for all other calamities and incidental services which is necessary. The prior work of Voorpijl (2011) focused on the positive and negative changes associated with foreign involvement.

The current research employed a qualitative method with a target group consisting of investors who had made a long-term investment. Some of the benefits of studying the investment climate were revealed in the course of the research. The international business environment provides some insights into which form of FDI can be directed to a particular country. In addition, Voorpijl (2011) noted some of the key investment incentives such as; the availability and accessibility of good infrastructure and education and trained human resources in terms of quality at reasonably low costs. It was about time to take into account housing as being among the key infrastructural developments since, with it, the government in a way was able to deliver services to the public members. It helps in enabling an ordered approach to the use of health services.

Mortgages have been researched with much emphasis on inflation and interest rates. From a study done by Obajo (2017) on the impact of money market factors on housing. In the research work, mortgages were not considered in the model, but the inflation rate was included in the independent variables. The rising deficit gap in housing strongly implies that the prior examination and suggestions proffered do not appear to rectify the housing strain. It was in this work employed the above variables as moderate and independent variables, inflation, and mortgages respectively.

Recent research conducted in Africa has focused on the impact of remittances on poverty. A study by Anyanwu and Erhijakpor (2010) analyzed the relationship between international migration and poverty in Africa using cross-sectional international remittances data. The study found that a $10 increase in official international remittances per capita could reduce poverty by 9%. Another study by Anyanwu in 2009 found that money spent by international migrants positively impacts income inequality in African countries. Additionally, research by Balde (2011) observed that remittances significantly affect savings and investment in sub-Saharan Africa (SSA). The study revealed that although the volume and share of remittances flowing to SSA were lower than foreign aid, the overall impact of remittances on savings and investment was positive on average. However, there has been a lack of discussion on migration-related issues and their consequences on the land and housing market. Furthermore, no specific interventions have been identified to encourage the use of diaspora savings for housing finance in African destination countries (Serageldin et al., 200

2. 5 Conceptual Framework

The role of a conceptual framework is to map the research variables as they are needed in this study (Wanjala,2023). The conceived association entailed how the independent variables namely; FDI, Remittances, and Mortgages affected affordable housing.

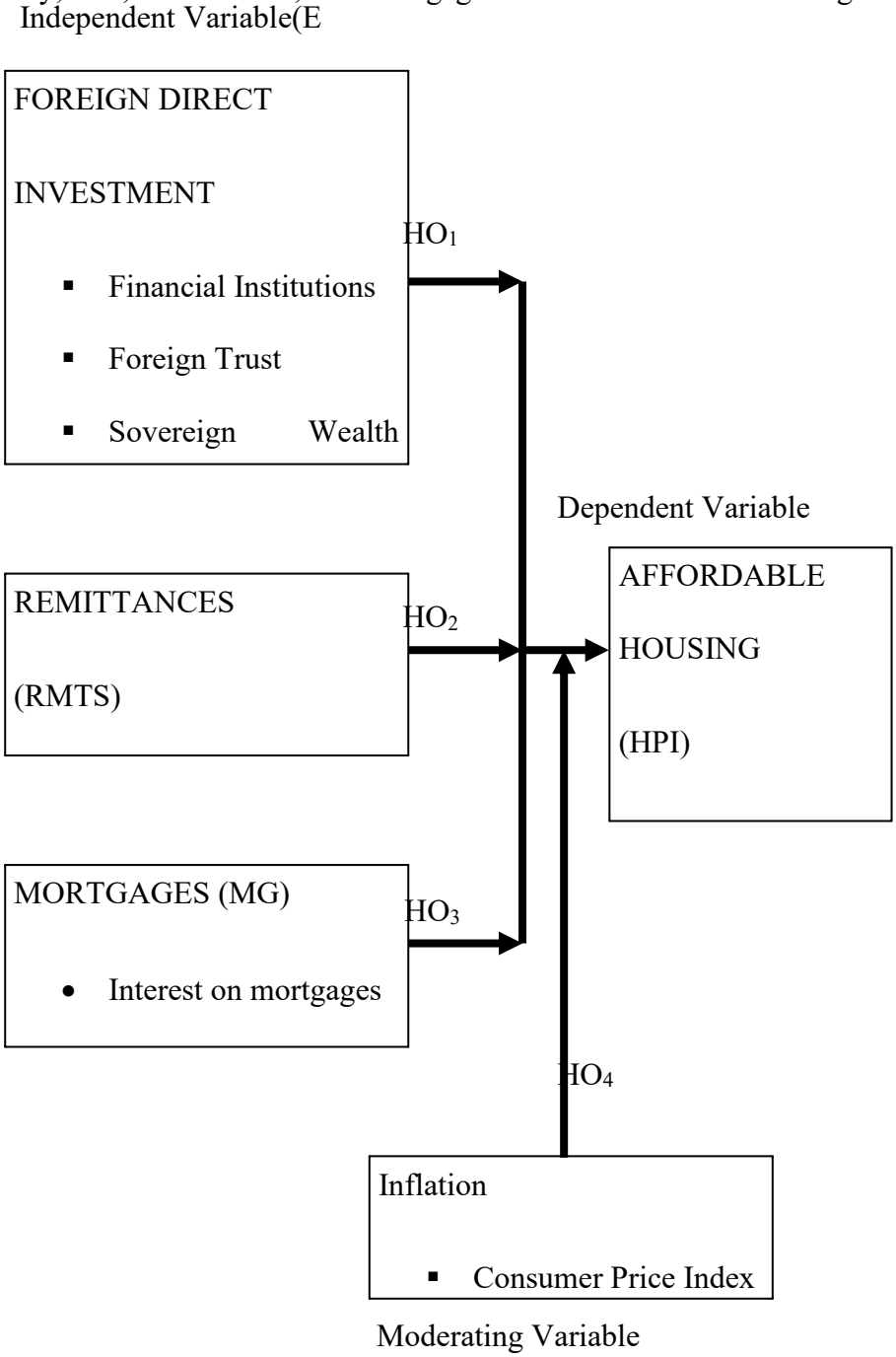


Figure 2.1: Conceptual Framework

Source: Authors computation 2025

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Overview

3.1 Research Design

The purpose of research design is to position data collection and data analysis tools in a way that best serves the research purpose. The study used casual research design in conjunction with empirical models for assessing the impacts of FDI, migration remittances, and Home mortgages on affordable housing in Kenya. As mentioned by (Kothari,2021) this research design is appropriate for time series data. To analyze quantitative data, the work used inferential statistics as its main analytical tool. The used study variables were data spanning for the year 2010 to 2022.

3.2 Study Area

This research work was done in Kenya, a country made up of a national Government and fourty seven County Governments with a population of about 47.4 Million (KNBS,2021).Kenya is urbanizing very rapidly with percentage of urban population having ncreased from 5.3% in 1948 to 31.2% representing 14.8 million people in 2019 (SDP,2021).With such,there is an increase in demand for basic needs which include housing and other welfare benefits such as proper sanitation and access to clean water among others.

According to Habitat for Humanity (2017),Kenya features in a list of countries with the largest slums in the world of which Kibera slum is at the top with 700,000 people.This means that people are uable to access proper housing facilties.As pointed out by KNBS (2021),Kenya’s income inequality levels have worsened with arise from 35.8% to 38.7%.Poor income levels contribute to housing affordability both in rural and urban areas.

Due to income inequalities and rapid urbanization, there is a need to understand the effect of Economic determinants which are FDI,Remittances and mortgages on affordable housing. There is a lack of empirical studies showing how the above-mentioned variables affect affordable housing in Kenya.

3.3 Data Collection

In this particular study, the content analysis method was found to be the most suitable for gathering data from secondary sources. The data collected for this research consisted of time series data obtained from the World Bank website and statistical yearbooks from the Kenya National Bureau of Statistics (KNBS). The data on % FDI of GDP for the years 2010-2020 were extracted from the UNCTAD and World Bank databases. The real value of remittances was gathered from a published economic survey from KNBS. Data on mortgage interest rates were sourced from the World Bank website and KNBS database for each year from 2010 to 2022. The House Price indices information was obtained from the Kenya Bankers Association, and the data on interest rates was obtained from the Kenya National Bureau of Statistics. The credibility of the data was ensured as it was collected from a semi-autonomous government entity responsible for compiling, categorizing, and publishing open data for statistical use.

3.4 Data Analysis and Presentation

The process involves writing a brief summary of raw data and extracting meaning from it (Politano, Walton & Parrish, 2018). The secondary data collected through questionnaire surveys were statistically described and analyzed using inferential statistical methods. Descriptive statistics included measures of central tendency, variability, minimum, maximum, skewness, and kurtosis. On the other hand, inferential statistics were used to estimate multivariate regression analysis. These inferential

statistics were applied to test the hypothesis that the explanatory variables (inflation, FDI, and currency exchange rate) were statistically significant in explaining the growth of the manufacturing sector. All data analysis was conducted using EViews software, specifically version 13. This software was chosen for its capability to analyze time series data.

3.5 The Models

The analytical framework in chapter two suggested that all variables are treated as endogenous and allow every variable to influence each other with a reasonably distributed lag and degrees of freedom. This was to say that housing prices are the same function of the three explanatory variables. Mathematically, it was expressed as:

$AFH_t = C_t^{\beta} . FDI_t^{\beta 1} . MG_t^{\beta 2} . RMTS_t^{\beta 3}$ .....(2b)

Where: HP_t was the house prices; FDI was a foreign direct investment; RMTs represented remittances and MGs represented mortgages all in period t. When subjected to lags, the equation was as follows:

$$\mathrm{HP}_t = \aleph_0 + \sum_{i=o}^{q} \aleph_i \mathrm{HP}_{t-i} + \sum_{i=0}^{q} \beta \mathrm{FDI}_{t-i} + \sum_{i=0}^{q} \gamma \mathrm{RMTs}_{t-i} + \sum_{i=0}^{q} \Phi \mathrm{iMGs}_{t-i} + \mu_t \quad ..$$

Where: $\aleph_0, \aleph_i, \beta, \gamma, \Phi$i, are parameter estimates.

FDI was same function of the three explanatory variables which was expressed as:

FDI=f(HP,RMTs,MGs)……..……(**3.3**)

$$\mathrm{FDI}_t = \aleph_0 + \sum_{i=o}^{q} \aleph_i \mathrm{FDI}_{t-i} + \sum_{i=0}^{q} \beta \mathrm{HP}_{t-i} + \sum_{i=0}^{q} \gamma \mathrm{RMTs}_{t-i} + \sum_{i=0}^{q} \Phi \mathrm{iMGs}_{t-i} + \mu_t \quad (3.5)$$

RMTs were same function of the three explanatory variables which was expressed as:

RMTs=f(HP,FDI,MGs)……..……(**3.5**)

$\text{RMTs}_t = \gamma_0 + \sum_{i=o}^{q} \gamma_i \text{RMTs}_{t-i} + \sum_{i=0}^{q} \beta \text{FDI}_{t-i} + \sum_{i=0}^{q} \gamma \text{HP}_{t-i} + \sum_{i=0}^{q} \Phi \text{iMGs}_{t-i} +$

μ_t .(**3.6**)

MGs were same function of the three explanatory variables which was expressed as:

RGs=f(HP,FDI,RMTs)……..…….……(**3.7**)

$\text{MGs}_t = \gamma_0 + \sum_{i=o}^{q} \gamma_i \text{MGs}_{t-i} + \sum_{i=0}^{q} \beta \text{FDI}_{t-i} + \sum_{i=0}^{q} \gamma \text{HP}_{t-i} + \sum_{i=0}^{q} \Phi \text{iRMTs}_{t-i} +$

μ_t …(**3.8**)

3.5.1 Econometric Model Specifications

Data were analyzed in two stages;

Step 1: Use a multivariate linear regression model in testing the hypothesized relationship between affordable housing, and the independent variables; Foreign Direct Investment, Remittances, and Mortgages.

The following model was employed;

$\boldsymbol{Y_t = \beta_0 + \beta_1 X_1 t + \beta_2 X_{2t} + \beta_3 X_{3t} + \mu}$ **……3.9**

Where; $\boldsymbol{Y_t}$=Criterion variable,which is the affordable housing measured by House prie Index

$\boldsymbol{\beta_0}$ =Constant

$\boldsymbol{\beta_1}$ ….$\boldsymbol{\beta_3}$= the slope representing the extent to which affordable housing changes as the regressor changes by a unit.

$\boldsymbol{X_1}$ =FDI

$\boldsymbol{X_2}$ =Remittances

$\boldsymbol{X_3}$ =Mortgages

$\boldsymbol{\mu}$ = error term

The coefficient of determination($\boldsymbol{R^2}$) was applied in showing the variation in $\boldsymbol{Y_t}$ (Affordable housing) explained by the variation in FDI ($\boldsymbol{X_1}$),Remittances ($\boldsymbol{X_2}$), and mortgages($\boldsymbol{X_3}$)

Step 2:Employed a hierarchical regression analysis in deducing the moderating effect of inflation rate on joint effets of Foreign Direct Investment,Remittances and Mortgages on Affordable Housing.The following model was used;

$\boldsymbol{Y_t = \beta_0 + \beta_1 X_{1t} M_t + \beta_2 X_{2t} M_t + \beta_3 X_{3t} Mt + \mu}$ **…….4.0**

$\boldsymbol{\beta_0}$ =Constant

$\boldsymbol{\beta_1 X_{1t} M_t}$,$\boldsymbol{\beta_2 X_{2t} M_t}$,$\boldsymbol{\beta_3 X_{3t} Mt}$:are interacton terms used to show the moderating effect.

The study compared ($\boldsymbol{R^2}$) regresson model with and without the moderating variable to see if there was a difference in $\boldsymbol{R^2}$.F-test was applied in establishing whether the ariation in $\boldsymbol{R^2}$ was statistically significant.

3.7 Pre-Estimation Diagnostic Tests

The research performed descriptive statistics,Inferential statistics,Uni root test,Phillip Perron test for structural breaks,determination of optimal lag length,and bounds cointegraton test.

3.7.1 Descriptive Statistics

Descriptive statistics are indices depicting a given representative (Kothari,2021)They allow the researcher to illustrate the spread of variables utilizing certain indices or statistics (Leavy,2017)

Raw data was used while analyzing descriptive statistics instead of transformed data as suggested by Aldous (2016).

3.7.2 Inferencial statistics

They generalize the results obtained from sample to a broder ppulaton with a certan level of confidence (Wanjala,2023).They are essential in evaluating the study's hypotheses and stiatig te population parameters (Kothari,2021)

3.7.3 Correlational Analysis

Correlatonal analysis measures the extent to which variables associate with each other(Gujarat,2022).In this sudy,correlational analysis was performed at the level of varibles.The study adopted pirwis correlational analysis in determining the strength and the wy in which the varibles under associate.

3.7.4 Unit Root Test

When a dataset displays a consistent mean and variance over time,it is deemed stationry (Gujarat,2022).Augumeted Dicky-Fuller was used to evaluate in this time series data .

If the model was non-stationary in this case the model was integrated of order d and if a linear combination of this model was integrated of order less than d then this model was described as cointegrated. _ARIAL – Co integration test detects circumstances

under which two or more nonstationary time series were integrated in a way that they can not move independently in the new world of long-run equilibrium. Engle-Ganger was not used and instead, the Johansen test was used because the Johansen test is useful for more than one cointegrating equilibrium. Under this test, either trace or eigenvalue was determined where a null hypothesis was the number of cointegrating factors i.e., r=r*

The non-stationary model was then transformed into a stationary model through the process of differencing which led to VAR estimates (Gujarati, 2009).

3. 7. 6 Normality Test

As Kamau pointed out in 2021 normality test provides an understanding of whether or not all data is normally distributed. The test is informed by a premise of normal distribution of the variable of interest is equal to zero Ha; H0:$\mu = 0$ (Aljandali & Tatahi,2018).

3. 7. 8 Multicollinearity

This happens in a multivariate regression model whereby the predictor variables have or show high linear correlation coefficients (Wanjala,2023). Variance Inflation Factors (VIF) were applied to assess the problem of multicollinearity. If the VIF value remains below 10, it further supports the fact that there is no issue with multicollinearity (Gogtay & Thatlle,2017).

3. 7. 9 Determining the Optimum Lag Length

While choosing the lag length of the unrestricted VAR order, the researcher first looked at the optimum lag length for the model before proceeding to estimate the model. According to Mittelhammer (2013), this step is useful to prevent too many lags that lead to the loss of degrees of freedom and results in the serial correlation of the error

terms or even multiple collinearity. Optimal lag length selection was done using the Akaike Information Criterion (AIC) because it adhered to the rule of thumb that recommends the model that yields the lowest value of the selection criteria.

3.8 Post-Estimation Diagnostic Tests on Regression Residuals

The diagnostic checks which were conducted by the researcher are; autocorrelation, heteroscedasticity, multicollinearity, and model stability test.

3.9 Autocorrelation

There was an assumption in the use of OLS that errors of subsequent observation should not be dependent on each other (Flick, 2020). Thus the method of Durbin's test for autocorrelation was applied to find out whether errors in successive observations were correlated. The method applied while testing for autocorrelation in the research was the Breusch-Godfrey Serial Correlation LM Test. The first hypothesis was that there was no autocorrelation; H0: $p > 0.05$. Equally so, the research alternative hypothesis was that autocorrelation of a variable was present; H1: $p < 0.05$.

3. 10 Heteroscedasticity

However, OLS assumed that all the disturbance terms (μ) included in the population regression function should be homoscedastic; errors incorporated within it should have an equal variance (Politano et al., 2018). To check whether the assumption for homoscedasticity was violated or not this test of heteroscedasticity was done. If heteroscedasticity was present then this meant that OLS estimators were unbiased and also suffered from inefficiencies. whereby the Breusch–Pagan test which is a chi-squared test was employed to check for inherent heteroscedasticity. The value of the test statistic was asymptotically chi-squared with k df. If the test statistic acquired a p-

value less than the set threshold ($p < 0.05$), the null hypothesis of homoscedasticity was refused and heteroscedasticity was assumed.

3. 11 Model Stability Test

The stability of the regression model was confirmed using a Cumulative Sum Test (CUSUM) test in the course of the research. As postulated by Zeileis (2004), the decision criterion for the test was that if all the variables in the model were within the 5 percent boundary line then it would mean that the model was stationary.

3. 12. Ethical Consideration

As much as it was here and there, the study mainly used secondary sources of data and information. The information gathered must be credited in that, the author and year of the information was cited. During the research process, a letter was sought from the university to act as approval to access any information from any other institution that was deemed relevant during the research process. The study obtained a research permit (NACOSTI NUMBER:512011 finding support for the research endeavor was provided by the National Commission for Science, Technology, and Innovation (NACOSTI).

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.0 Introduction

This chapter presents the findings of the analyzed data and discusses them. The analysis focuses on assessing the existing relationship between Foreign Direct Investment, Remittances and Mortgages on Affordable Housing with inflation as a moderating variable. It begins with the preliminary findings of descriptive statistics which is also explained by trends,followed by correlation, followed by complex time series analysis results

4.2 Descriptive statistics

The study adopted quarterly data obtained from World Bank and KNBS to perform various statistical analysis which determined mean, standard deviation, minima, maxima, skewness, and kurtosis. According to Aldous (2016), raw data should be used while analyzing descriptive statistics and not transformed data.

Table 4.1: Summary of Descriptive Statistics
Sample: 2010Q1 2022Q4

	AFD	FDI	RMT	MG	INF
Mean	110.5656	1.826506	168913.0	12.90254	6.997500
Median	109.0600	1.537500	140028.9	12.80500	6.335000
Maximum	127.0000	4.028000	345125.6	18.50000	16.45000
Minimum	100.0000	0.901000	47949.67	9.010000	3.960000
Std. Dev.	7.670653	0.823523	90700.16	2.413846	2.702311
Skewness	0.357472	0.920847	0.541053	0.260818	2.066058
Kurtosis	1.817857	2.699788	2.058558	2.087842	7.141223
Observations	52	52	52	52	52

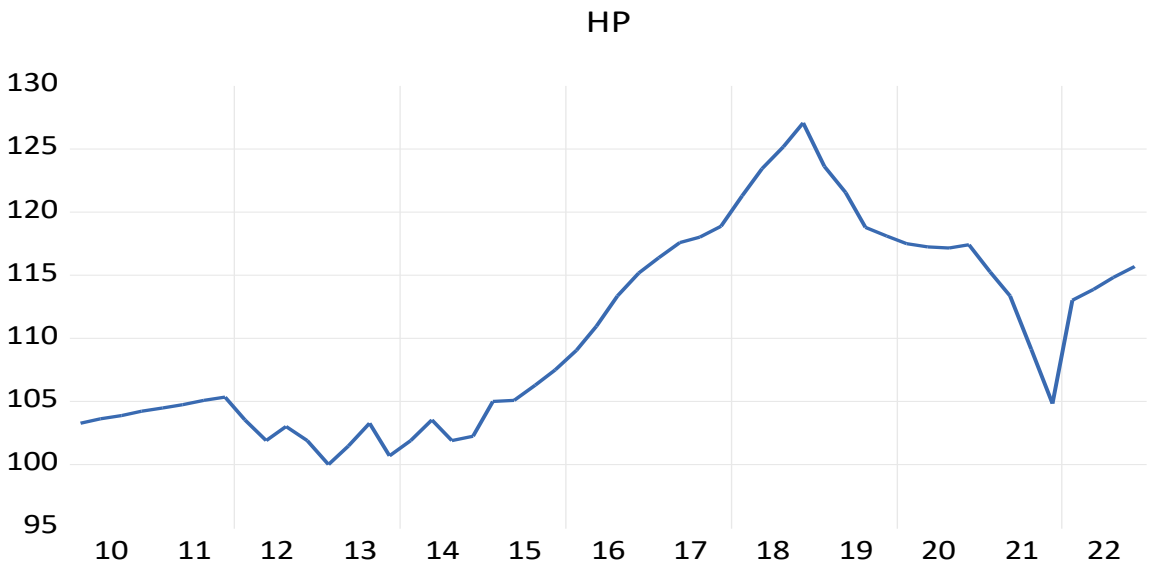
Source: (Author's computation based on EViews 13)

From Table 4. 1, while Affordable Housing occupied a position of 26 with a SD of 34, the mean was 110. 5656, a standard deviation of 7. Of these, the smallest value is 670653 while the minimum value is 100. 00 as the Minimum incremental step and a maximum value of 127. 00. For example, it has a mean value of 5, and standard

deviation of 2, and also a skewness of 0. 357472 which is closer to zero indicating that the above variable has normal skewness. Affordable Housing has a kurtosis of 1.817857 implying a normal or mesokurtic implying that the platykurtic Foreign Direct Investment (FDI) has a skewness of 1. 826506 >0. 5 which is relatively close to the normal distribution or mesokurtic with or positive skewness. Remittances have a mean of 168913.0, a standard deviation of 90700.16, a minimum value of 47949.67and a maximum value of 345125.6. Remittances has a kurtosis value of2.058558<3(normal/mesokurtic), implying that it is leptokurtic. Mortgages has a mean of 12.90254, a standard deviation of 2.413846, a minimum value of, and a maximum value of 18.50000. Mortgages has a skewness of 0.260818, a normal distribution of the series. Inflation has a mean of 6.997500, a standard deviation of 2.702311, a minimum value of 3.960000, and a maximum value of 16.45000. Also, inflation has a skewness of 2.066058>0.5, indicating a positive skewness.

1.1.1 Trends

Figure 4.1 Affordable Housing

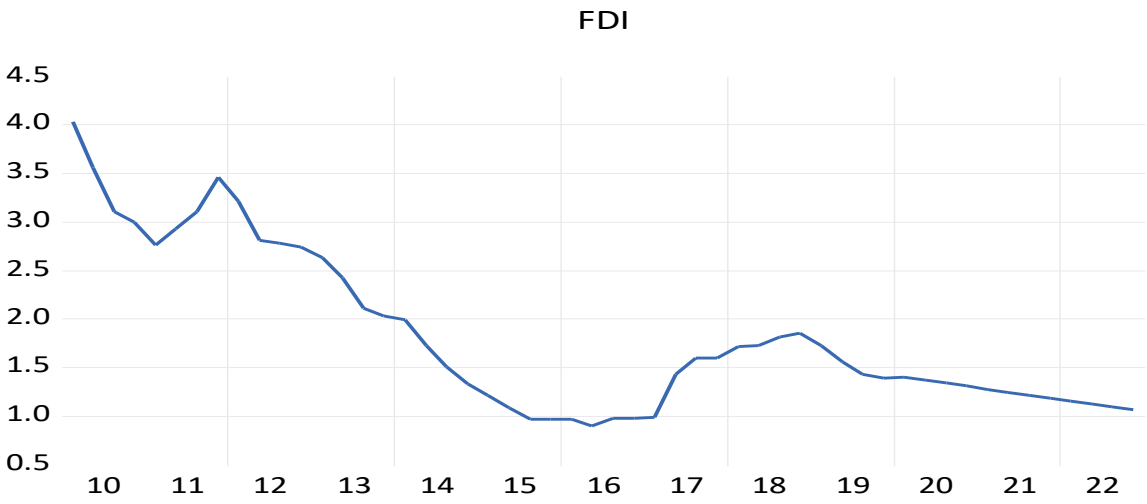


The Affordable Housing in Kenya from 2010 to 2022 exhibits notable fluctuations, reflecting the dynamics of the housig market over this period. The index starts near the minimum value of 100, indicating relatively stable housing prices during the early years. From 2013 onwards, there is a gradual increase in the index, suggesting a steady rise in housing prices. This trend could be attributed to factors such as urbanization, increased demand for housing, and significant investment in infrastructure projects, which likely drove up property values in urban areas.

The index peaks at 127 around 2018, marking the highest point in the period. This peak likely reflects a housing boom, possibly fueled by high demand and speculative investment in the housing sector. However, after reaching this maximum, the index begins to decline, with a sharp drop around 2020, potentially due to economic disruptions caused by the COVID-19 pandemic, which affected household incomes and reduced demand for housing. Despite this drop, the index shows signs of recovery by 2022, indicating a possible stabilization or renewed growth in housing prices as the

economy begins to recover and demand for housing picks up again. This overall trend highlights the cyclical nature of the housing market in Kenya, influenced by economic conditions, demand, and investment patterns.

Figure 4.2 Foreign Direct Investment

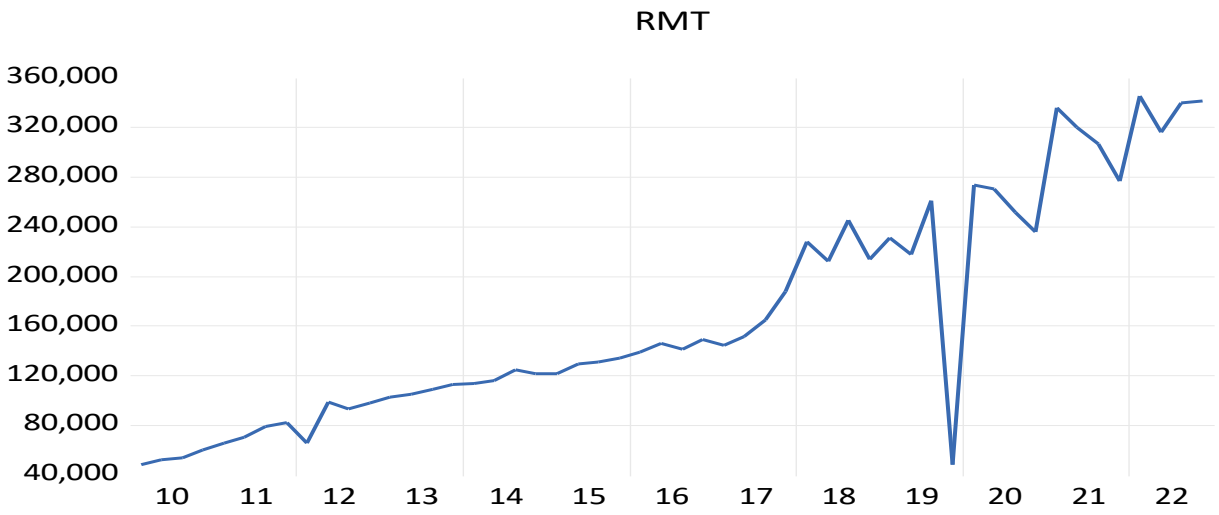


The trend of Foreign Direct Investment (FDI) in Kenya from 2010 to 2022 shows a significant decline, with a maximum of 4.03% around 2010 and a minimum of 0.90% by 2022. Initially, FDI was relatively high, driven by factors such as political stability after the 2007-2008 post-election violence and increased infrastructure development that attracted foreign investors. However, this upward momentum did not last long, as FDI began to decline steadily after 2012, likely due to global economic downturns, rising security concerns, and challenges related to corruption and bureaucratic inefficiencies that made Kenya less attractive to foreign investors.

As the years progressed, FDI continued to decrease, reflecting a challenging investment climate. The lowest point in 2022 coincided with global uncertainties such as the COVID-19 pandemic and persistent domestic issues like political instability and economic challenges. Despite occasional efforts to boost investor confidence through infrastructure projects and economic reforms, Kenya struggled to maintain the levels of

FDI seen at the beginning of the decade. The trend indicates a need for more robust policy interventions and reforms to reverse the decline and create a more favorable environment for foreign investment.

Figure 4.3 Remittances

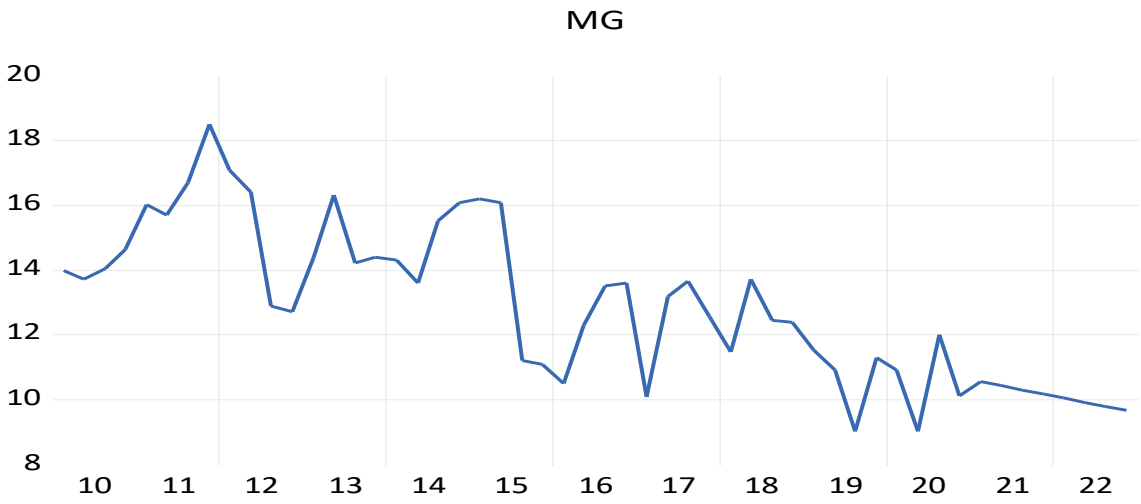


The trend of remittances (RMT) in Kenya from 2010 to 2022 highlights a significant and steady increase in the flow of funds sent by the Kenyan diaspora back to the country. Starting at a minimum value of 47,949.67, remittances were relatively modest in the early years, reflecting the gradual growth of the Kenyan diaspora and the early adoption of financial systems that facilitated international money transfers. During this period, remittances were an important, though smaller, source of income for many Kenyan households, supporting basic needs, education, and small business investments.

By 2022, remittances reached a remarkable maximum of 345,125.6, indicating a dramatic increase over the years. This sharp rise can be attributed to several factors, including the expanding Kenyan diaspora, improvements in digital and financial infrastructure , and a growing recognition of the vital role that remittances play in supporting families and communities. The increase also suggests that even during global challenges, such as the COVID-19 pandemic, the Kenyan diaspora remained

committed to sending money home, underscoring the importance of these funds in sustaining livelihoods and contributing to the broader economy. This trend reflects the resilience and growing economic influence of remittances as a crucial lifeline for many Kenyans.

Figure 4.4 Mortgages

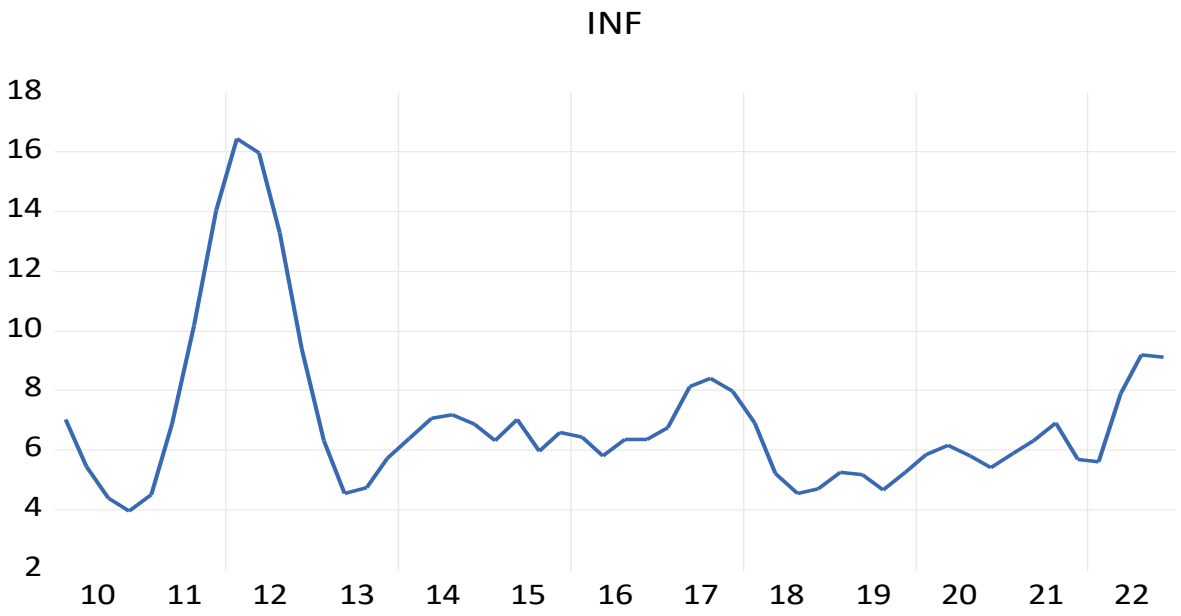


The trend of mortgages (MG) in Kenya from 2010 to 2022 reveals a gradual decline in the uptake of mortgage loans, reflecting challenges within the housing and financial sectors. Starting at a relatively higher level, mortgage uptake was initially strong, driven by growing urbanization, a rising middle class, and increasing demand for homeownership. During the early years, the Kenyan market experienced a surge in mortgage activity as financial institutions expanded their mortgage products, and more Kenyans sought to invest in property. However, this momentum began to slow down as the years progressed.

By 2022, mortgage uptake had declined significantly, reflecting a more cautious approach from both lenders and potential homeowners. Several factors contributed to this downward trend, including high interest rates that made mortgages less affordable for the average Kenyan, stringent lending criteria, and economic challenges that

affected household incomes. The sharp declines during certain periods also suggest that external factors, such as economic uncertainties or regulatory changes, played a role in reducing the demand for mortgages. Despite the persistent demand for housing, the mortgage market in Kenya has struggled to maintain its earlier growth, highlighting the need for more accessible and affordable financing options to support homeownership in the country.

Figure 4.5 Inflation



The trend of inflation in Kenya from 2010 to 2022 reveals significant fluctuations, with a peak of 16.45% around 2011 and a minimum of 3.96% around 2018. The spike in 2011 can be attributed to external factors such as global increases in food and fuel prices, alongside internal challenges like droughts that led to food shortages. This period of high inflation was marked by a sharp rise in the cost of living, reflecting the vulnerability of the Kenyan economy to both global and domestic pressures. Following this peak, inflation rates gradually declined as the government implemented measures to stabilize the economy, resulting in more moderate inflation levels between 2012 and 2017.

By 2018, inflation reached its lowest point at 3.96%, indicating a period of relative economic stability, with controlled food and fuel prices and effective economic policies. However, from 2018 onwards, inflation began to rise again, reaching around 8% by 2022. This increase can be linked to the impact of global economic conditions, such as rising oil prices, and domestic challenges, including the economic disruptions caused by the COVID-19 pandemic. The gradual upward trend toward the end of the period highlights the ongoing challenges Kenya faces in maintaining price stability amidst both external shocks and internal economic pressures.

4.3 Correlation Analysis

Correlational analysis measures the extent to which variables associate with each other (Gujarat,2022).The fundamentl aim of coreletion analysis is to show if a positive or negative association exists between variables and how strongly they relate (Gogtay & Thattle,2017).In this study,correlation was performed at the level of variables.

Table 4.2: Correlation Matrix Analysis

	AFD	FDI	RMT	MG	INF
HP	1.000000	-0.484778	0.613619	-0.585630	-0.280741
FDI	-0.484778	1.000000	-0.629642	0.618277	0.334149

RMT	0.613619	-0.629642	1.000000	-0.744621	-0.182323
MG	-0.585630	0.618277	-0.744621	1.000000	0.356719
INF	-0.280741	0.334149	-0.182323	0.356719	1.000000

Source: (Author's computation based on EViews 13)

From table 4.2 above, AFD and FDI have a moderate negative relationship because -0.484778 is closer to -0.5. Also, AFD and RMT have a positive relationship of 0.613619 meaning remittances increases AFD. Besides, AFD has a moderate negative relationship with MG because-0.585630 is far from -1 but closer to -0.5.AFD and INF have a weak negative relationship since -0.280741is far away from -1.

4.4 Test for Stationarity

According to Green (2005) time series data contains unit root in other words the series are nonstationary. This implies that mean and variance changes over time. Series containing unit root are differenced of any order until they attain the stationarity property. In this study,Dickey-Fuller unit root test proposed by Augmented Dickey & Fuller (1979), and Phillips-Perron test proposed by Phillips & Perron (1988) were used.

Table 4.3: Unit root tests – Augmented Dickey Fuller (ADF)at levels

Number of observations = 52

At Levels

Variables	ADF T-statistic	Prob	Critical values			Conclusion
			1%	5%	10%	
AFD	-1.074681	0.7189	-3.565430	-2.919952	-2.597905	Unit root
FDI%GDP	-1.847030	0.3538	-3.581152	-2.926622	-2.601424	Unit root
RMT	0.654993	0.9898	-3.574446	-2.923780	-2.599925	Unit root
MG	-2.220267	0.2018	-3.565430	-2.919952	-2.597905	Unit root
INF	-5.418252	0.0000	-3.568308	-2.921175	-2.598551	I (0)

Source: (Author's computation based on EViews 13)

From table 4.3 above, the AFD has an ADF test statistics value of -1.074681. Since only absolute value is considered and not signs, 1.074681<5% critical value (2.919952), thus we fail to reject the null hypothesis to confirm that the unit root is present. FDI has an absolute value of 1.847030<5% critical value (2.926622), meaning the series are not stationary at level thus we fail to reject the null hypothesis. RMT has an ADF test statistics of 0.654993<5% critical value (2.923780) thus we fail to reject the null hypothesis to confirm that the unit root is present. MG have a ADF test statistics value of 2.220267<5% critical value (2.919952) indicating that the series are not stationary at levels, therefore we fail to reject the null hypothesis which states that the

series have a unit root. Besides, INF had an ADF test statistics value of 5.418252>5% critical value (2.921175) indicating that the series are stationary at level, thus the null hypothesis is rejected in favor of alternative hypothesis. In general, only AFD, FDI, RMT and MG were not stationary at levels therefore they were subjected to unit root test at first difference. INF was stationary at levels.

Table 4.4: Unit root tests – Augmented Dickey Fuller (ADF)at first difference

Number of observations = 52

At Levels

Variables	ADF T-statistic	Prob	Critical values			Conclusion
			1%	5%	10%	
AFD	-5.760401	0.0001	-4.152511	-3.502373	-3.180699	I (1)
FDI%GDP	-2.126216	0.2357	-3.584743	-2.928142	-2.602225	Unit root
RMT	-8.186029	0.0000	-3.574446	-2.923780	-2.599925	I (1)
MG	-8.520044	0.0000	-3.568308	-2.921175	-2.598551	I (1)

Source: (Author's computation based on EViews 13)

From table 4.4 above, AFD, RMT and MG were stationary at first difference since their ADF t-statistics 5.760401, 8.186029 and 8.520044 were greater than their critical values at 5% level of significance. FDI was not stationary at first difference it only became stationary upon second difference.

Table 4.5: Unit root tests – Augmented Dickey Fuller (ADF)at second difference

Number of observations = 52

At Levels

Variables	ADF T-statistic	Prob	Critical values			Conclusion
			1%	5%	10%	
FDI%GDP	-4.705565	0.0004	-3.705565	-2.928142	-2.602225	I (1I)

Source: (Author's computation based on EViews 13)

Table 4.5 above indicates that FDI was considered as *I(II)*since it only became stationary at second difference hence integrated of order (*II).*

Table 4.6:Unit root tests – Phillips-Perron various first levels

Number of observations = 52

At Levels

Variables	Phillips-Perron Adj. t-statistic	Prob	Critical values			Conclusion
			1%	5%	10%	
AFD	-5.836370	0.0000	-3.568308	-2.921175	-2.598551	I (1)
FDI%GDP	-4.515232	0.0006	-3.568308	-2.921175	-2.598551	I (I)
RMT	-27.51728	0.0001	-3.568308	-2.921175	-2.598551	I (1)
MG	-12.48172	0.0000	-3.568308	-2.921175	-2.598551	I (I)
INF	-3.531686	0.0110	-3.568308	-2.921175	-2.598551	I (I)

Source: (Author's computation based on EViews 13)

Table 4.6 shows the results from Philips Perron. HP, FDI, RMT, MG and INF depicted an *I(I)* meaning that the series were stationary at first difference, thus integrated of order one.

4.5 Determination of Optimum Lag Length

To test for the number of tests for cointegration ranks or fit cointegrating in the VECM model lag length must be specified. According to Thomas (2008), a dependent variable responds to an independent variable with a lapse in time, which is known as a lag. Mittelhammer (2013) opines that too many lags are not good because they lead to loss of degrees of freedom, can cause serial correlation in the error terms, and misspecification errors. Besides, they can cause multicollinearity. Therefore, the rule of thumb is that choose a model that gives the lowest value of the selection criteria.

Table 4.7: Vector Autoregressive Lag Selection Criteria

Endogenous variables: D(AFD)

Exogenous variables: C DDFDID(RMT)D(GMG) INF

VAR Lag Order Selection Criteria

Sample: 2010Q1 2022Q4

Included observations: 46

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-840.3363	NA	6.30e+09	36.75375	36.95252	36.82821
1	-786.4279	93.75373	1.81e+09	35.49687	36.68946*	35.94362
2	-740.0266	70.61069*	7.42e+08*	34.56637*	36.75279	35.38542*
3	-718.6133	27.93037	9.62e+08	34.72232	37.90256	35.91366
4	-696.4575	24.08242	1.35e+09	34.84598	39.02005	36.40961

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Source:(Author's computation based on EViews 13)

Nielsen (2001) shows that several methods can be used to select lag length for a VAR model with *I (1)* variables. From the output on table 4.7 the maximum number of lags used was two lags for this multivariate model because the Final prediction error (FPE), Akaike information criterion (AIC) and Schwarz information criterion (SC) tests all chose two lags, as indicated by the "*" in the output.

4.6 Bounds Cointegration Test

Wolde-Rufael (2010) states that the bounds cointegration test is the best approach to use if variables in a model are cointegrated to different orders. There are three outcomes after performing the stationarity test. First, series are integrated of order 0 (no differencing required). Second, series are integrated of order 1 (stationary after first difference). Third, series integrated at different orders (a combination of *1(0)* and *1(1)* series. Since the research variables are integrated at different orders the researcher chose to use Bounds Cointegration Test.

According to Adom, Bekoe, &Akoena (2012), cointegration exists when there is a linear combination of two or more nonstationary variables that is stationary. Therefore, the cointegration test is a useful technique used to discover any relationship that links nonstationary variables together in the long-run. The hypotheses are;Null hypothesis H_0: No cointegrating equation and Alternative hypothesis H_1: H_0 is not true.

Cointegration test is performed on the level form of variables and not their first difference. However, the log transformation of raw variables can also be used. Decision criteria; rejection is made at 10%, 5%, 2.5%, and 1% level. The null hypothesis is rejected if the calculated *F* statistic is greater than the critical value for the upper bound 1(1), then the presence of cointegration can be confirmed, which implies there is a long-run relationship (Wolde-Rufael, 2010). If the null hypothesis is rejected, the long-run

error correction model is estimated. However, if the calculated *F* statistic is lower than the critical value of the lower bound *1(0*), it is concluded that cointegration does not exist (Adom et al., 2012). Hence no long relationship exists. Therefore, the researcher fails to reject the null hypothesis. At this stage the short-run autoregressive distributed lag model (ARDL) is estimated. Moreover, the test is considered inclusive if the

f-statistic falls between the lower bound *1(0),* and the upper bound *1(1).*

The cointegration test is performed on the level form of variables and not their first difference. However, the log transformation of raw variables can also be used. Decision criteria; rejection is made at 10%, 5%, and 1% level. The null hypothesis is rejected if the calculated *F* statistic is greater than the critical value for the upper bound 1(1), then the presence of cointegration can be confirmed, which implies there is a long-run relationship (Wolde-Rufael, 2010). If the null hypothesis is rejected, the long-run error correction model is estimated. However, if the calculated *F* statistic is lower than the critical value of the lower bound *1(0*), it is concluded that cointegration does not exist (Adom et al., 2012). Hence no long relationship exists. Therefore, the researcher fails to reject the null hypothesis. At this stage the short-run autoregressive distributed lag model (ARDL) is estimated. Moreover, the test is considered inclusive if the F-statistic falls between the lower bound *1(0),* and the upper bound *1(1).*

Table 4.8: Bounds Cointegration Test

Test Statistic			Value			
F-statistic					2.553139	
	10%		5%		1%	
Sample Size	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
45	2.402	3.345	2.850	3.905	3.892	5.173
50	2.372	3.320	2.823	3.872	3.845	5.150
Asymptotic	2.200	3.090	2.560	3.490	3.290	4.370

* I(0) and I(1) are respectively the stationary and non-stationary bounds.

Source:(Author's computation based on EViews 13)

From table 4.8, F-statistic (2.553139) is less than the critical values 2.850,2.823, and 2.560 of the lower bound *I(0)*, at 5%, significance level. Therefore, the researcher failed to reject the null hypothesis and concluded that cointegration does not exist between the variables. Hence, there is no long-run relationship between the variables in the model.

Table 4.12: Regression Analysis Results
Source:(Author's computation based on EViews 13) Probability value of (0.0000)
Dependent Variable: D(AFD)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DD(FDI)	5.407022	1.959010	2.760079	0.0087
D(RMT(-1)	0.215188	0.072177	2.981392	0.0030
DMG(-1)	-0.383195	0.348007	-1.101114	0.0335
C	-136.6972	36.80769	-3.713821	0.0006

R-squared	0.795435	Mean dependent var	112.6220
Adjusted R-squared	0.770479	S.D. dependent var	7.602240
S.E. of regression	2.004474	Akaike info criterion	4.508637
Sum squared resid	100.4479	Schwarz criterion	5.141967
Log likelihood	-75.17274	Hannan-Quinn criter.	4.737629
F-statistic	38.28423	Durbin-Watson stat	2.296454
Prob(F-statistic)	0.000000		

implies that the variables in the model are jointly significant in explaining the variation of Affordable Hosing Kenya at 5% level of significance.

The regression equation obtained from the analysis is;

AFH_t= -136.6972+ 5.407022*FDI_{t-1}+0.215188*$RMTS_{t-1}$-0.383195*MG_{t-1}

Where AFH_t = First differenced of the ffordable Housing

FDI = Foreign Direct Investment acting as an explanatory variable in the model.

DRMT(-1)= Lag 1 of first differenced Remittances as an explanatory variable in the model.

MG (-1)= Lag 1 of Mortgages as an explanatory variable in the model.

$_t$=Time series data.

The regression model was fit and statistically significant at the 5% level of significance according to table 4.12 where the p-value for the F-statistic was 0.000<0.5 and the measure of goodness of fit,R^2 value was 0.795435 which showed that variane in regressor predicted 79.5435% of variance in the dependent variable.Therefore,other macroeconomc varibles that were not captured in the study accounted for 13.5% variane in affordable housing sector.

Results and Discussion a per the Study Objectives

The study's overall objective was to establish how Foreign Direct investment, Remittanes and Mortgages affected housing affordability in Kenya

4.7.1 The effect of Foreign Direct Investments on Affordable Housing

The study's first aim was to assess the effect of Foreign Direct Investment on affordable housing in Kenya. The results revealed that foreign direct investment and affordable housing in Kenya have a significant positive relationship, hence the null hypothesis was rejected. FDI inflows causes an increase in affordable housing demand in Kenya as shown by a positive and significant coefficient of 5.407022 from the regression model. This finding can be attributed to an increase in supply of houses in the market which reduces house prices thus increase in demand.Foreign direct investment has a great impact on the average selling price of affordable houses.This implies that affordable

housing has a positive relationship with foreign direct investment and fall as FDI decreases.

The study shows that an increase in FDI positively triggers an increase in the demand for affordable housing pushing low the housing prices because it tends to increase the supply of affordable housing in the market. The legislation related to Kenya's housing industry is still incomplete and lacks legal provisions for foreign direct investment in the housing sector, and this makes it easier for international investment to enter the real estate market on a large scale. Under such circumstances, the Kenyan government should introduce clear policies and regulations that are in line with Kenya's national conditions as soon as possible, so that foreign direct investment can be based on the law and guide the flow of foreign direct investment.

FDI has a significant effect on housing price and this study is in line with findings of Liu (2011) and Amondi (2016) who found out that FDI has a positive and notable effect on house price. However, even if large part of the previous literature studied agrees with these findings, Boers (2017), found that there is no significant relationship between FDI and house price in Sweden.

4.7.2 The effect of Remittances on Affordable Housing

The second aim of this study was to establish the effect of remittances on housing prices in Kenya. To accomplish this, the second hypothesis of the study stated that there is no significant effect of remittances on residential house prices in Kenya. Diaspora remittances had a positive and significant impact on Kenya's housing price as depicted from the regression results in Table 4.11. The coefficient results for the diaspora remittances were 0.215188 and a (p value 0.0030< 0.05) hence the effect of remittances value of 0.215188 shows that diaspora remittances had a positive and significant effect

on residential house price. The coefficient of remittances of 0.215188 was implying that 1% increase in the remittances would lead to 21.52% increase in residential house price in Kenya and vice versa. This means that diaspora remittances had a significant positive effect on affordable housing. The study's second aim was to assess the effect of remittances on affordable housing in Kenya. The results revealed that remittances and affordable housing have a significant positive relationship, hence the null hypothesis was rejected. Remittances cause an increase in demand of affaordable housing as shown by a positive and significant coefficient of (0.215188) from the regression model.Remittances increase disposable income in the recipient country.The funds received create demand towards affordable housing with other welfare benefits.This means that a one percentage increase in remittances causes a 21.51% icrease in demand of affordable housing.

This study's results are consistent with Ahmed et al. (2020) in Pakistan who noted linkages between remittances to economic growth that led to increased house prices and Njoroge (2018) in Kenya who showed that an increment in money supply from remittances sparked economic growth that culminated in an increase in house prices. Similarly, J. K. A. Jack, Okyere, and Amoah (2019) while looking at Ghana, argued that an increase in remittances, increased households disposable incomes exerting demand forces within the real estate market leading to an increase in house prices.

4.7.3 The effect of Mortgages on Affordable Housing

The third aim of this study was to establish the effect of mortgages on housing prices in Kenya. To accomplish this, the third hypothesis of the study stated that there is no significant effect of mortgages on residential house prices in Kenya. Mortgages was discovered to be a macroeconomic factor affecting affordable housing in Kenya with a p-value of 0.0335< 0.05 showing that the coefficient is statistically significant and has

a negative coefficient of -0.383195, implying that a one-percentage increase in mortgages interest rates decreases affordable housing demand by 38.32% percent on average Ceteris Paribus in the short-run.

Higher mortgage interest rates trigger the demad for affordable housing.An increase in mortgage interest rates causes an increase in prices of affordable housing. These findings are consistent with the findings from Ding, X. (2022) who found out a significant negative correlation between mortgage interest rate and housing prices in US, while Xu and Tang (2014) reported a similar finding on the UK housing market.

4.7.4 The Moderating effect of inflation on the Association between Macroeconomic Aggregates and Housing Affordable Housing

According to Dharma (2018), a moderating variable affects the relationship between explanatory variables and the dependent variable. Understanding the effect of the moderating variable helped the researcher to establish the actual level of association between independent variables (foreign direct investment, remittances, and mortgages) and dependent variable (Housing price index). Changes in values of R^2 were used to measure the effect of the intervening variable.

REGRESSION ANALYSIS

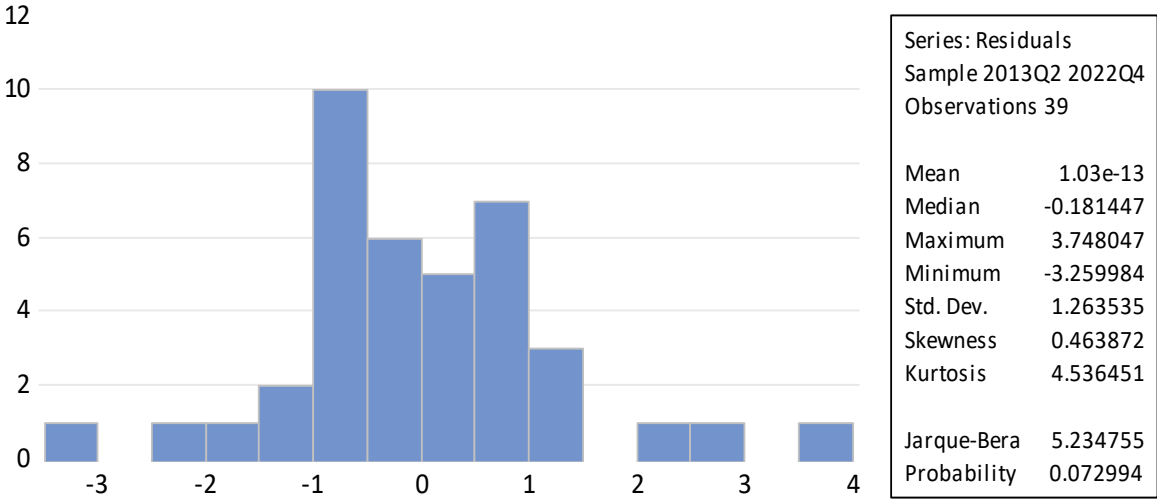
The first table shows that without inflation rate as a moderating variable, R^2 is 0.795435, on the other hand, the second table indicates that when inflation as a moderator is added in the model R^2 becomes 0.684135.This means that the intervention of inflation caused foreign direct investment, remittances, and mortgages to jointly explain 68.4135% variation in affordable housing which is a decline right from 79.5435%. Therefore, the independent variables jointly explain the variation in the dependent variable by decline of 11.13% through the moderating variable(inflation). Furthermore, the F-statistical probability value in the second table is 0.000000<0.05, indicating that the moderation of inflation is statistically significant. Housing demand decreases in the case of a decrease in the purchasing power of people who demand housing, i.e. in high inflationary environments. Housing prices also decrease due to the decrease in housing demand. Therefore, inflation can have a decisive impact on house prices.

4.8 Post Estimatiom Diagnostic Tests

4.8.1 Test for Normality

The residual should be normally distributed. The research used Jarque-Bera statistics test to test for normality in the model. The null hypothesis was that residuals were normally distributed H_0>0.05 (Koizumi, Okamoto & Seo, 2009). The alternative hypothesis was that residuals were not normally distributed H_1<0.05.

Figure 4.1: Jarque-Bera Statistics Test for Normality



Source:(Author's computation based on EViews 13)

From the table, the p-value for Jarque-Bera test is 0.072994>0.05, therefore the researcher accepted the null hypothesis at a 5% level of significance and rejected the alternative hypothesis, indicating that the model residuals were normally distributed.

4.8.2 Test for Multicollinearity

Multicollinearity occurs when the independent variables are highly correlated. Multicollinearity makes the standard errors to be big, which lowers t-statistics values and increases p-values, making independent variables to be statistically insignificant in the model (Dane, 2017). The research used Variance Inflation Factors (VIF) to test multicollinearity. The decision criteria are that if VIF value<10, then no severe multicollinearity exists in the model, and no intervention is needed. However, if the VIF>10, it means there is a severe presence of multicollinearity in the model.

Table 4.11: Multicollinearity Test

	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF

D(AFH(-1))	0.033794	1.395813	1.375784
DD(FDI)	1.242432	25.25509	2.406270
D(RMT)	0.841347	1.031581	1.025581
D(MG)	1.625650	2159.681	1.917898
INF	0.386976	143.9330	8.279652
C	300.5774	2456.669	NA

Source:(Author's computation based on EViews 13)

Centred VIF uses the R^2 from a regression where the intercept is included.This property accounts for the correlation between explanatory variables thus appropriate for detecting multicollinearity while uncentred VIF uses R^2 from a regression without an intercept,which can be misleading because it does not correctly measure collinearity in most practical cases.

Multicollinearity results in Table 4.11 above showed that no variable was highly collinear. This is because neither of the variables' VIFs exceeded 10.

Table 4.9: Test for Serial Correlation

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.583110	Prob. F(2,32)	0.5640
Obs*R-squared	1.476841	Prob. Chi-Square(2)	0.4779

Source:(Author's computation based on EViews 13)

From the table 4.9, the probability Chi-Squared (2) of the observed R-squared value is 0.4779, which is greater than 0.05. Therefore, the researcher cannot reject the null hypothesis, meaning there is no autocorrelation in the model. Hence the null hypothesis is accepted at a 5% level of significance while the alternative hypothesis is rejected

4.8.3 Test for Heteroscedasticity

The error terms should have the same variance for the regression function to be homoscedastic (Politano et al., 2018). The research used Breusch–Pagan test to check if there was heteroscedasticity in the model. The null hypothesis states that there is no heteroscedasticity; H0: $p>0.05$. The alternative hypothesis states that there is heteroscedasticity in the model; H1: $p<0.05$.

Table 4.10: Test for Heteroskedasticity
Heteroskedasticity Test: Breusch-Pagan-Godfrey

Null hypothesis: Homoskedasticity

F-statistic	0.931201	Prob. F(23,15)	0.5728
Obs*R-squared	22.93635	Prob. Chi-Square	0.4645
Scaled explained SS	5.999503	Prob. Chi-Square	0.9999

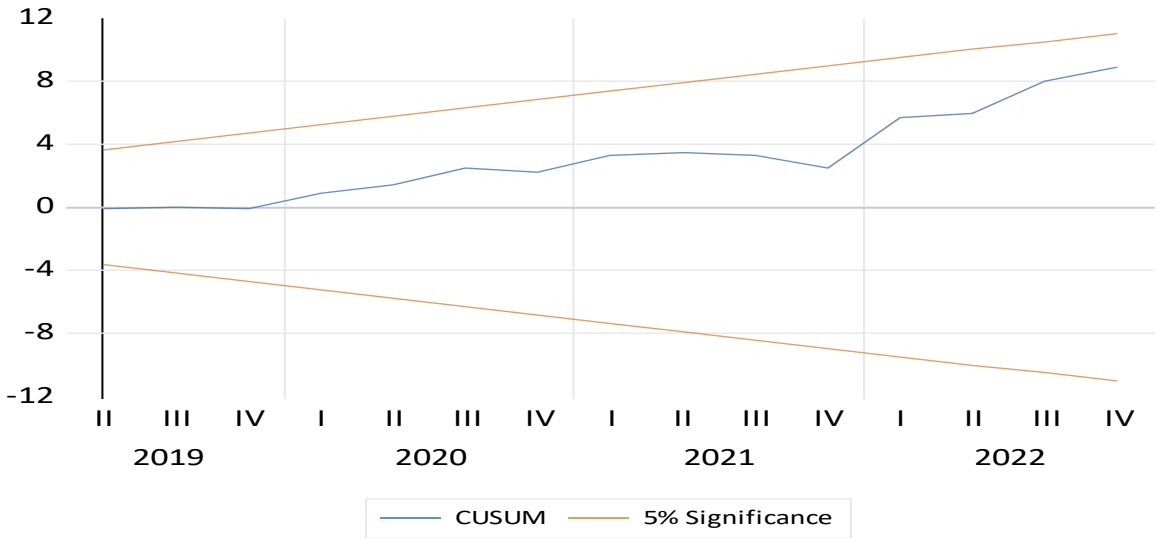
Source:(Author's computation based on EViews 13)

From the table 4.10 above, the Prob > Chi-Square value is 0.4645 which is higher than 0.05 thus showing the absence of heteroscedasticity and therefore the alternative hypothesis is rejected in favour of the null hypothesis.

4.8.4.CUSUM Test for Model Stability

Figure 4.2 shows that all variables in the model lie within the 5% boundary, meaning that the model is stable as supported by Zeileis (2004).

Figure 4.2: CUSUM Test for Model Stability



CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter summarizes the findings presented in the previous section, allowing for multiple inferences and suggestions based on the analysis' results, with key insights provided below. Additional research directions are also proposed to enhance understanding of the concept.

5.1 Conclusion of the Study

This paper analyzed the impact of economic determinants on affordable housing in Kenya, focusing on FDI inflows, remittances, housing mortgages, and the moderating effect of inflation. A causal analytical research design was employed, with descriptive statistics used to identify outliers and describe the sample characteristics.

The ADF and PP tests indicated that Affordable housing and remittances had unit roots, but all variables became stationary after first differencing. Various post-diagnostic checks on the estimated model revealed that data were normally distributed according to the Jarque-Bera test. Residual autocorrelation was absent, as confirmed by the Durbin-Watson test at a lag of two, and heteroscedasticity was also ruled out. The Multicollinearity test showed no issues, and analysis of the unit circle confirmed the validity of all values. The Bounds cointegration test suggested no long-run relationship among the studied variables.

Regression tests provided coefficients and "t" values for independent variables concerning the dependent variable, indicating that FDI and remittances positively affect the house price index, while mortgages and inflation also contribute to an increase in housing prices. Below is a summary of the findings aligned with the study's objectives.

5.1.1 Effects of Foreign Direct investments on Affordable Housing

The study aimed to assess the impact of foreign direct investment (FDI) on affordable housing in Kenya. The analysis revealed a positive relationship between FDI and affordable housing, leading to the rejection of the null hypothesis. A significant coefficient of 5 from the regression model indicates that FDI inflows increase the demand for affordable housing. This effect is attributed to a high supply of houses in the market, which lowers prices and boosts demand. New empirical findings show that the average selling price of affordable houses is strongly influenced by FDI, suggesting an inverse relationship: affordable housing increases with high FDI and decreases with low FDI.

The study concludes that rising FDI positively affects the demand for affordable housing, which in turn lowers housing prices by increasing supply. There is robust evidence supporting the influence of FDI on house prices, consistent with Liu (2011) and Amondi (2016), which highlight FDI's significant positive impact. However, Boers (2017) noted that the correlation between FDI and house prices in Sweden is not significant.

5.1.2 Effect of Remittances on Affordable Housing

The second aim of this study was to establish the effect of remittances on affordable housing in Kenya.From the results,remittances had a positive effect on affordable housing thus rejection of the null hypothesis.Affordable housing demand was influenced by remittances as evidenced by a statistically significant coefficient of 0.215188 in the regression function.

Remittances increase disposable income to a household available for purchasing goods and services, including housing.It demonstrated that, a percent increase in remittances

corresponds to a 21 percent increase in job opportunities for recipients, resulting in a rise for demand of affordable housing.

5.1.3 Effects of Mortgages on Affordable Housing

The results indicated a weak negative correlation between mortgages and affordable housing, with a correlation coefficient of -0.39750. The regression analysis revealed a statistically significant negative coefficient of -0.383195 for mortgages (p-value = 0.0335 < 0.05), suggesting that mortgages adversely affect the house price index in Kenya. Specifically, a unit increase in mortgage interest rates results in a 0.383195 unit decrease in house prices, assuming all other factors remain constant.

Additionally, higher mortgage rates are associated with declines in housing price changes. As previously mentioned, increased mortgage rates reduce affordability, leading potential buyers to abandon the market. In the short term, unchanged housing supply coupled with decreased demand will likely result in lower house prices.

5.1.4 Effects of Moderating Variable on Affordable Housing

The findings also revealed that inflation significantly negatively moderates the relationship between foreign direct investment (FDI), remittances, and mortgages with the housing price index. Including inflation in the model reduced the R^2 value from 0.795435 to 0.684135, indicating a 0.1113% decrease in the explanatory power of the independent variables. This effect is statistically significant, with an F-statistic probability of 0.000000 < 0.05.

5.2 Conclusion

From the results, the data showed a positive relationship on affordable housing by both foreign direct investment and remittances. However, inflation negatively impacted the Affordable Housing in Kenya throughout the study. Consequently, the null hypothesis

stating that FDI and mortgage interest rates do not significantly impact the Affordable housing was rejected. Furthermore, inflation notably influences the relationship among FDI, remittances, mortgages, and the Affordable Housing in Kenya.

In conclusion, significant investment is essential for the realization of Kenya's government aspirations as outlined in the Bottom-up Economic Transformation Agenda (BETA) and Vision 2030. This can be achieved collaboratively with both foreign and domestic developers and investors. To enhance investment efficiency, the government should implement public-private partnerships (PPP) to incentivize investors by removing taxes on land and essential construction materials. Additionally, Slowering mortgage interest rates would make home ownership more accessible, encouraging builders to construct affordable housing.

5.2.2 Recommendations

The conclusions of an empirical study lead to the following policy recommendations.

5.2.2.1 FDI and Affordable Housing

The study indicated a positive relationship between foreign direct investment (FDI) and the availability of affordable housing in Kenya. Accordingly, the national government, through the Ministry of Lands, Public Works, Housing, and Urban Development, should develop a policy document that includes:

i. A special pension scheme for foreign investors in the housing sector to reduce tax burden on the investors.

ii. Tax incentives for foreign investors who commit to a specific minimum investment in housing.

iii. Improvement on land policies and ownership by the government so as to reduce property loss thorugh legal disputes.

iv)A special tax incentive to manufacturers to reduce the cost on construction inputs

These measures are designed to build investor confidence in the country and bringing the cost of construction low.

5.2.2.2 Remittances and Affordable Housing

Analysis of the study highlights a positive impact of remittances on affordable housing in Kenya. Thus, the following recommendations are proposed:

i. The government, through the ministries of Foreign Affairs and National Treasury, should advocate for the integration of the domestic electronic billing system (M-Pesa) into global financial platforms. This strategic innovation would enhance international fund transfers but requires substantial technological investment.

ii. The Ministry of Foreign Affairs should ensure all agents involved in the enrollment of Kenyans abroad are registered. A self-registration system should be established for Kenyans living overseas, facilitating the creation of a special savings scheme with dividends to support the housing sector.

5.2.2.3 Mortgages and Affordable Housing

The study demonstrated a significant negative effect of mortgages on affordable housing.This implied that an increase in motgage interest rates had a negative effect on affordable housing.There is need the Central Bank of Kenya to cap the interest rates for mortgages so as to regulate the housing prices.This lowers the cost of houses in the market.

5.3 Suggestions for Further Research

The study mainly focused on how selected economic determinants variables influenced affordable housing in Kenya on low-income earners.Therefore,the study suggests that another study be carried out with different independent variables (Government spending,Taxation rates and Income levels) affect housing affordability.

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APPENDICES

Appendix I: Map of Study Area

Appendix II: Data

YEARS	HP	FDI	RMT	MG	INF
2010Q1	103.26	4.03	47,949.67	13.98	7.03
2010Q2	103.56	3.56	52,130.67	13.71	5.43
2010Q3	103.85	3.11	53,734.00	14.04	4.4
2010Q4	104.15	2.99	60,166.67	14.64	3.96
2011Q1	104.44	2.76	65,491.67	16.01	4.49
2011Q2	104.74	2.93	70,027.67	15.71	6.88
2011Q3	105.04	3.11	79,071.33	16.71	10.18
2011Q4	105.33	3.46	82,452.33	18.5	14.02
2012Q1	103.45	3.21	65,317.67	17.1	16.45

2012Q2	101.87	2.81	98,702.67	16.41	15.97
2012Q3	102.97	2.78	93,358.00	12.9	13.29
2012Q4	101.87	2.74	98,262.33	12.71	9.38
2013Q1	100	2.63	102,911.24	14.41	6.33
2013Q2	101.42	2.43	104,983.54	16.31	4.56
2013Q3	103.25	2.11	109,111.55	14.21	4.75
2013Q4	100.66	2.03	113,185.14	14.4	5.72
2014Q1	101.86	1.99	113,658.26	14.31	6.39
2014Q2	103.45	1.73	116,376.62	13.61	7.05
2014Q3	101.87	1.51	124,441.96	15.51	7.19

2014Q4	102.18	1.34	121,683.78	16.087	6.88
2015Q1	104.99	1.21	121,379.32	16.2	6.31
2015Q2	105.01	1.09	129,845.88	16.07	7.03
2015Q3	106.27	0.97	130,829.31	11.2	5.97
2015Q4	107.48	0.97	133,956.23	11.087	6.58
2016Q1	108.99	0.97	138,526.52	10.51	6.45
2016Q2	110.87	0.90	145,647.93	12.3	5.8
2016Q3	113.31	0.98	141,531.33	13.51	6.34
2016Q4	115.1	0.98	149,061.94	13.608	6.35
2017Q1	116.37	0.99	144,199.55	10.09	6.76

2017Q2	117.52	1.43	151,660.35	13.2	8.13
2017Q3	118.01	1.60	164,939.72	13.66	8.4
2017Q4	118.81	1.60	188,168.30	12.56	7.98
2018Q1	121.29	1.71	227658.32	11.48	6.89
2018Q2	123.42	1.72	211986.55	13.71	5.2
2018Q3	125.1	1.81	245674.03	12.46	4.53
2018Q4	127	1.85	213835.23	12.4	4.69
2019Q1	123.56	1.73	231149.89	11.53	5.24
2019Q2	121.47	1.56	217818.33	10.91	5.16
2019Q3	118.76	1.43	261289.94	9.01	4.67
2019Q4	118.04	1.40	47,949.67	11.3	5.24
2020Q1	117.44	1.40	273455.27	10.9	5.84
2020Q2	117.2	1.37	270599.51	9.01	6.16
2020Q3	117.1	1.34	251637.39	12	5.79
2020Q4	117.37	1.31	235731.81	10.1	5.41
2021Q1	115.23	1.28	336016.18	10.55	5.9

2021Q2	113.32	1.25	319815.71	10.43	6.3
2021Q3	109.13	1.22	306997.97	10.3	6.9
2021Q4	104.77	1.19	276467.87	10.17	5.7
2022Q1	112.98	1.16	345125.55	10.04	5.6
2022Q2	113.87	1.13	315964.11	9.92	7.9
2022Q3	114.76	1.10	340260.06	9.79	9.2
2022Q4	115.65	1.07	341277.73	9.66	9.1

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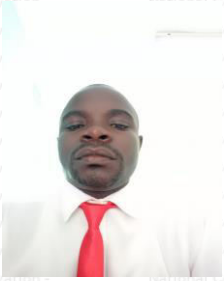

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