

**THE EFFECT OF FOREIGN DIRECT INVESTMENT INFLOWS
ON RESIDENTIAL REAL ESTATE PRICES IN KENYA**

BY

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DECLARATION

Student Declaration

I hereby declare that this research project is my own original work and that it has not been presented to any other university for a degree award.

Signed

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Supervisor Declaration:

This research project has been submitted for examination with my approval as the candidate's university supervisor.

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DEDICATION

I dedicate this study to my family, particularly my dad and mum and my little angels Sherry, Brian, Sasha and Shiru who supported me through my graduate studies.

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ABBREVIATIONS

ANOVA	Analysis of Variance
AVIC	Aviation Industry Corporation of China
CBR	Central Bank Rate
DSQ	Domestic Servants Quarter
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IMF	International Monetary Fund
KBA	Kenya Bankers Association
KBA-HPI	Kenya Bankers Association – Housing Price Index
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNBS	Kenya National Bureau of Statistics
MNC	Multinational Corporation
NCA	National Construction Authority
NEMA	National Environmental Management Authority
OECD	Organisation for Economic Co-operation and Development
SPSS	Statistical Package for Social Science
UNCTAD	United Nations Conference on Trade and Development

ABSTRACT

Residential real estate is considered significant as it is both an investment and a consumption good. In Kenya, residential real estate has experienced tremendous growth over the last decade due to the mismatch in supply and demand, as noted by various real estate agencies. In 2017, the World Bank estimated the demand for housing in Kenya to be two million units against an annual supply of less than 50,000 units therefore explaining the continued rise in prices. Foreign direct investment on the other hand is considered a resilient and major source of finance developing countries. Further, the real estate industry has experienced entry by foreign investors through mergers and acquisitions as well as Greenfield investments. The study sought to establish the effect of foreign direct investment on residential real estate prices in Kenya. In addition to foreign direct investment, the study used interest rates, inflation and GDP growth rates as control variables for the study. A descriptive research design was used with the study period of ten years (2008-2017) and data analysed using SPSS. Data on house prices was collected over the last ten years and a housing price index developed using the hedonic regression method. The study concluded that changes in foreign direct investment, interest rates, inflation and GDP collectively account for 75% of the changes in housing prices as represented by the coefficient of determination $R^2 = 0.751$. Foreign direct investment accounted for the largest effect followed by inflation rate, interest rate and finally GDP growth. Foreign direct investment, GDP and inflation were established to have a negative effect on housing prices while interest rate was established to have a positive impact on housing prices. Foreign direct investment was also the only variable that was established to have a significant impact on housing prices at a level of confidence of 95%. The study recommended that lending institutions, particularly commercial banks and the Central Bank should be engaged to ensure interest rates remain affordable and stable to encourage both home developers and buyers to take up credit for investment in residential real estate. Further, the government ought to encourage FDI so as to lower the cost of housing for its population through tax incentives.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

According to UNCTAD (2018), FDI is considered the major source of external finance and the most resilient source of finance to economic and financial shocks for developing economies. Foreign investors invest in various segments of the economy, including real estate hence affecting real estate prices. According to Wilhelms (1998), FDI inflows are determined by some institutional variables including policies and regulations and the implementation of the same. The same is reiterated by Knight Frank (2018), who noted that the rapid urbanization, positive GDP growth, expanding middle class and favorable demographics have contributed to making Kenya an ideal investment destination for foreign investors in various sectors, including the real estate sector. Some of the developments in real estate with significant foreign investment include the Two Rivers Development in Ruaka, Erdemann Property residential development in Syokimau and residential development by AVIC in Westlands.

Research has established that foreign direct investment (FDI) fosters GDP growth and employment in the host country (Bardhan & Kroll 2007; Jacobs, 2001; Kimotho, 2010; World Bank, 2001). FDI has a ripple impact on house prices through growth in GDP as well as employment. An increase in FDI results in increased GDP growth, which reflects the wellbeing of the population and therefore increasing the population's purchasing power resulting in increased demand for housing. An increase in FDI through the setting up of MNCs on the other hand, results in increased employment (Jacobs, 2001) resulting in increased demand for housing resulting in investors, both local and foreign, investing in residential houses to meet this increased demand.

The Kenyan residential real estate market experienced an unprecedented positive growth between 2010 and 2012, with an increase of prices of over 30% per annum (Knight Frank, 2018). This unprecedented growth was followed by a price correction that saw the decline in price increase as the market matured (Knight Frank, 2018). This market has however remained attractive to investors as the real estate industry, in general, has consistently outperformed other asset classes over the last couple of years with annual returns averaging 24.3% against annual returns on other asset classes, averaging 13.2% (Cytonn Real Estate 2018). The continued high demand of housing estimated at two million against an annual supply of 50,000 units has made residential real estate an attractive market for investors (Cytonn Real Estate, 2018). In 2017, Kenya also experienced a 71% increase in FDI inflows due to increased domestic demand, growth of the ICT sector and tax incentives to foreign investors (UNCTAD, 2018). According to UNCTAD (2018), developing countries have been receiving a growing portion of FDI inflows with 47% of the gross FDI inflows in 2017 being absorbed by developing countries as compared to 36% in 2016. This study therefore seeks to establish if FDI has an influence on residential real estate prices.

1.1.1 Foreign Direct Investment

According to Pilinkiene (2008), FDI can be defined as long term capital injections through ownership to a foreign company that is controlled by an investor. According to the International Monetary Fund (IMF), FDI is generally considered the presence of both long-term relationships between the foreign investor and the receiving entity and a substantial level of influence by the foreign investor on the running of the enterprise (IMF, 1993).

FDI can take either of two forms of investment: Greenfield investments or mergers and acquisitions (M & A). The form of FDI where a foreign investor establishes a new enterprise in a foreign market is referred to as Greenfield investment. Instead of starting from scratch, a foreign investor may choose to merge with a local firm, acquire shares in an existing entity, or have a joint venture agreement with a firm in the foreign market (UNCTAD, 2009). Foreign Direct Investment can either be horizontal, vertical or conglomerate. Horizontal FDI is considered to occur when a firm carries out an identical production abroad as it does locally while vertical FDI is considered to occur when a multinational corporation breaks down its production process globally and allocates each production stage to the most efficient country for that stage. Conglomerate FDI occurs if a firm expands its line of business abroad by carrying out activities not carried out by its home firm. The choice of the mode of FDI will be influenced by the need to increase market power or reduce transaction cost (Cruijssen et al., 2007; Hakkinen et al., 2004).

According to the World Investment Report (2012), FDI can be divided into three; reinvested earnings, equity capital, and intra-company loans. Equity capital takes the form of a foreign direct investor purchasing shares in a firm in the foreign market. Reinvested earnings on the other hand are a direct investor's part of earnings not paid out as dividends or earnings not paid out to the direct investor but rather reinvested in the enterprise. Intra-company loans are short-term as well as long-term loans between direct investors and other affiliate enterprises. FDI flows are calculated on a net basis: the net between the credits of capital transactions and debits between direct investors and their foreign affiliates or net acquisitions of assets and net incurrence of liabilities (UNCTAD, 2017). An analysis of effects of various forms of capital inflows including FDI, portfolio flows, and other investment capital flows by Waweru and Ochieng

(2012) revealed FDI had a negative effect on GDP growth unlike other investment capital flows.

1.1.2 Residential Real Estate Prices

Real estate can be defined as land and everything else affixed to it, such as buildings, pavements or other structures (Brueggeman & Fisher, 2011). Real estate is divided into four main categories; agriculture, commercial, development and residential real estate (Michigan State Tax Commission, 2013). According to Brueggeman and Fisher (2011), residential real estate or housing is considered both a consumption good and an investment. When the buyer intends to live in the house they purchase, it is considered a consumption good while it is an investment if the buyer intends to keep the house as part of their portfolio and benefit from rental income and/ or capital appreciation.

Residential real estate is very important as it contributes significantly to the wealth of individuals as one author rightly said, “Far more important to the world’s economies than the stock markets are wage and salary incomes and other non financial sources of livelihood such as the economic value of our houses and apartments. This is where the bulk of our wealth is found” (Shiller, 2003).

In competitive markets, market prices are dependent on demand and supply. Residential real estate prices are also dependent on forces of demand and supply. The high demand of housing against the low supply has constantly pushed residential property prices up. The rising cost of housing coupled with limited financing for potential homeowners has resulted in unaffordability of housing for the vast majority of the Kenyan population (World Bank, 2017).

Brueggeman and Fisher (2005) present three reliable approaches to estimation of residential real estate value, hence price, for residential real estate properties; sales

comparison approach, cost approach as well as the income approach. The sales comparison approach involves using prices of comparable properties sold recently and adjusting the sale price for differences including; amenities, age, level of finishing and size of the house. A house with a swimming pool for instance will be valued at a high price than a house without one. The cost approach on the other hand involves calculating the replacement cost of the property, deducting depreciation and adding the cost of land. The income approach is similar to the approach used to value most assets in finance where the value of an asset is calculated as the present value of all future expected cash flows. Future expected cash flows for residential property are determined from rental incomes of comparable properties. The two most common methods of valuation used are the sales comparison approach as well as the cost approach. Valuation of residential properties in Kenya is mainly carried out by professional real estate valuers.

House prices have been found to be of great interest by policy makers, real estate developers, banks as well as home owners (Schulz & Werwatz, 2004). It is therefore expected that these categories of sector players track housing prices through price indices. Residential property price indices produced by various industry players are a critical indication of growth of the sector. The major sources of property price indices in Kenya are the Kenya Bankers Association (KBA) and Hass Consult, who prepare the indices based on various segments of housing including the lower, middle and upper market segments.

1.1.3 Foreign Direct Investment and Residential Real Estate Prices

There has been a global shift in policy towards liberalization and globalization of economies to attract FDI inflows by both developing and developed economies for the

economic benefits associated with it (Lensink & Morrissey, 2001). Various studies conducted in various economies have established FDI inflows in a country have positive effects on the GDP growth of the host country (Hussain & Haque, 2016; Jacobs, 2001; Kimotho, 2010; Laak, 2017; World Bank, 2001).

Economic growth has a positive effect on the development of the real estate industry as it creates increased demand for housing pushing housing prices up. A study carried out by Mwalili (2014) established that GDP had a positive effect on housing prices in Kenya due to increased demand for housing, which results in an increase in house prices. A report by Knight Frank (2018) found that Kenya's growing GDP has made it an ideal location for both local and international investors. In addition to the growth in GDP, the annual rapid urbanization at 4.3% compared to the global average of 2.0% and high annual population growth of 2.6% compared to an average of 2.3% for Sub-Saharan Africa has led to increased FDI.

Bardhan & Kroll (2007) in their research paper on globalization and real estate established that the setting up of MNCs increased demand for housing through increased employment. Establishment of MNCs results in increased demand for houses in the upper market segment by the senior managers of the MNCs. The increased demand raised rents and hence prices in those market segments. Jacobs (2001) in his study on the effects of FDI established that FDI influences the labor market by creating employment in both the urban and rural areas. The increased employment of locals also results in increased demand for housing in all segments of the housing market. Establishment of MNCs in a country therefore affects all segments of the housing market by increasing demand therefore pushing prices up.

Further, FDI is critical in filling in the financial deficit between essential capital for investments and internal savings ability of a nation (Castilla, 2005). This additional capital inflow through FDI goes a long way in funding various sectors of the economy including real estate investments. These additional funds are critical for the housing market supply side, especially at a time when the private sector credit in Kenya has gone down.

A study by Jr-Tsung, Yu-Ning Hwang and Kuang Tu Lo (2014) investigated the role of real estate FDI on the rise of property prices in Shanghai, the most rapidly-growing city in China. The study established that in the long run, real estate FDI was found to have a statistically positive relationship with commercial property prices. Based on these findings, it can be argued that FDI has a significant effect on real estate property prices in the host country.

1.1.4 Residential Real Estate in Kenya

According to the World Bank report on housing (2017), the housing deficit in Kenya in 2017 was two million housing units against an annual supply of less than 50,000 units. This was mainly attributed to the growing population as well as the growing employment to population ratio. According to KIPPRA (2017), Kenya's population in 2016 was estimated to be 45.4 million and growing at an annual rate of 2.9%. According to Cytonn Real Estate, the increasing demand for housing not matched by the supply of housing has resulted in rising house prices over the years.

The residential market has however not been at its best performance in the last two years as noted by Cytonn Real Estate (2018) and KBA (2017). The residential market returns were at 8.2% for quarter one of 2018, a 1.2% fall from the 9.4% returns recorded in 2017. The 9.4% returns were a drop from 12.6% returns experienced in 2016 (Cytonn

Real Estate, 2018). The poor performance was attributed to decline in the performance of specific markets; the upper middle market for apartments and lower middle market for detached units. The poor performance of these segments of the market was linked to the prolonged electioneering period in 2017 and the decline in credit facilities in the private sector (Cytonn Real Estate, 87; KBA, 2017; Knight Frank, 2018). The credit crunch in particular affected households relying on mortgages for purchase of houses, hence affecting demand and house prices (KBA, 2017).

The rising prices of housing, particularly for the middle and low income markets, have influenced the current government's key agendas commonly referred to as 'The Big Four' which are; food security, affordable housing, enhancing manufacturing and affordable healthcare. On affordable housing, the government intends to put up 1,000,000 new affordable housing units by 2022. In the June 2018 budget, the government allocated money for the affordable housing agenda. In addition, the government has been keen to encourage private participation especially through funding and development of the intended affordable housing units. This is critical because the private sector in Kenya takes the largest share of the market with the government having minimal participation through the National Housing Corporation (Otwoma, 2012).

The real estate sector in Kenya has attracted foreign firms, who have either acquired local consultancy firms or are involved in development of housing units. The three major acquisitions that have taken place are: UK based Mace acquired YMR, a quantity surveying firm; South African based Turner and Townsend acquired a majority stake in MML Kenya, a project management firm while Atkins PLC, a firm based in Britain acquired an engineering consultancy firm Howard Humphreys East Africa Limited. Some of the foreign investors involved in developing housing units are; Chinese firm,

AVIC, that invested \$70 million in real estate with a significant amount of the investment going into residential real estate, Jiangxi Water and Hydropower Construction Company, who acquired 38.9% of the Two Rivers Development and Erdemann Property, who are putting up a residential development, in the outskirts of Nairobi, the capital centre, valued at \$60 million (Knight Frank, 2008).

1.2 Research Problem

Residential properties serve as housing for a country's population and include apartments or flats as well as detached units such as bungalows, townhouses and maisonettes. When people purchase real estate, they do so either for consumption or for investment purposes. In both cases, price is a major consideration in decision-making when purchasing a house. The increase in residential real estate prices on the other hand, has resulted in unaffordability of housing for the greater population. The high prices of residential real estate have influenced the current government's focus on provision of affordable housing, as part of its four main agendas, through partnership with the private sector by providing incentives for private investors to develop the targeted housing units. KIPPRA (2017) suggests that the government should implement policies that result in lower cost of doing business in the country to encourage FDI. The government has already implemented some policies meant to encourage FDI inflows into the country including tax incentives, reducing the cost of power and creation of special economic zones. It would be important to know the effect of FDI on residential real estate so as to guide developers, investors and policy makers.

Prices of residential real estate have been increasing at an increasing rate but started increasing at a decreasing rate from the third quarter of 2016 (KBA, 2018). This trend has been attributed to shrinking credit facilities for the private sector. Even with this

trend, real estate in general has continued to be a major source of the country's GDP growth contributing 8.4% in 2014, 10.2% in 2015, 12.3% in 2016 and 10.6% in 2017 (KNBS, 2018). The favorable business environment in the country coupled with steady economic growth has attracted MNCs into the country in various sectors of the economy. MNCs which have their regional headquarters in the country include General Motors, IBM, Google, Huawei, Proctor & Gamble, Nestle, Coca-Cola, and PricewaterhouseCoopers. FDI inflows through investment by MNCs to a country, bring about increased demand for housing in the upper income market as more expatriates move into the country and require to be housed. These corporations provide employment for the local population as well, increasing demand for all segments of the housing market. Increased foreign investment in the country therefore results in both increased demand for housing and increased investment in real estate.

Selim (2008) analyzed characteristics of houses in Turkey as opposed to macroeconomic variables. Vizek (2010) studied house price changes in six European countries and established that interest rates have an impact on housing prices in a majority of developed countries in the long run. International studies have concluded that some of the effects of FDI are improved infrastructure in the host nation (Anop, 2010), increased foreign direct investment in real estate, especially in developing countries (Bardhan & Kroll, 2007), creating new employment opportunities (Bloomstrom & Kokko, 2003), promoting economic growth and transfer of knowledge and technologies (Voorpijl, 2011). No particular study focused on the relationship between FDI and residential real estate prices in a developing country context.

Several studies have been conducted to investigate the impact of various macroeconomic variables on house prices in Kenya. A study by Mwololo (2012) established that some of the factors that positively influence residential real estate prices

are interest rates, inflation and real GDP. The research by Arte (2017) established that there was a negative relationship between GDP and house prices, contradicting the earlier study, but established a positive relationship between inflation, interest rates and money supply and residential real estate prices. Other determinants of real estate prices in Nairobi were established to be population growth and employment growth (Julius, 2012). A study by Jamesa (2016) sought to establish the effect of FDI on the growth of real estate firms in Kenya by the use of both qualitative and quantitative data across 80 real estate firms. A study by Laak (2017) that sought to establish the relationship between select macroeconomic variables and FDI established a strong relationship between FDI and GDP and exchange rate and a weak relationship between FDI and inflation and interest rate. Of the various local studies carried out, there exists a research gap on the relationship between FDI and residential real estate prices. This study focuses on finding out whether FDI inflows have an effect on residential real estate prices in the host country. The research seeks to answer the question; what is the effect of FDI inflows on residential real estate prices in Kenya?

1.3 Research Objectives

The objective of this study is to establish the effect of foreign direct investment inflows on residential real estate prices in Kenya.

1.4 Value of the Study

The findings of this study will be valuable to the government and policy makers in determining whether to implement policies that encourage FDI inflows into the country or limit FDI inflows. Residential real estate prices affect both consumers, who form the bulk of the population, and investors. The government being the regulator will need to

seek a balance between FDI inflows and residential real estate prices so as to encourage GDP growth and protect the population from rising house prices.

This study will be useful to both local and foreign investors seeking to invest in residential real estate. A close watch at FDI inflows into the country will guide the investors on the optimum time to invest in residential real estate properties so as to reap maximum returns through price appreciation. The study will also be of value to local developers seeking partnerships with foreign firms through funding of residential real estate developments.

The study will also benefit the body of academia by seeking to fill the research gap that exists on the relationship between FDI inflows and residential real estate prices. This study will form the basis of further research on other real estate segments including pricing, growth and investment that require to be researched on.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews relevant literature as well as past studies conducted on the research variables. This chapter also explores theories that have been developed and advanced on the variables and the research problem therefore exploring the conceptual framework on which this research is based on.

2.2 Theoretical Review

Several theories on foreign direct investment have been developed and advanced by researchers creating a broad body of knowledge. Some of these theories are critical in clarifying the relationship between FDI and housing prices. Three theories have been explained in this section namely; the eclectic paradigm, the internalization theory and the institutional FDI fitness theory.

2.2.1 The Eclectic Paradigm

This theory, advanced by Dunning (1980), provides a framework that is followed by foreign firms in their determination on whether to pursue FDI. According to this theory, three factors must be considered before a firm decides to pursue FDI; ownership advantages, internalization advantages and location specific factors. Based on the three factors, the theory is also referred to as the ownership, location and internalization (OLI) paradigm.

First, an enterprise must possess net ownership advantage over its competitors. These are specific to an enterprise and unique to a single enterprise such as branding, copyright, trademarks, patents, technology and management of internally available

skills. These ownership advantages allow the firm to enjoy lower production costs giving it a competitive edge over its competitors in a foreign economy (Buckley & Casson 1976).

Secondly, a firm must have internalization advantages, meaning a firm must be making more profit by utilizing its ownership advantages as compared to when it outsources them to a foreign firm through licensing or management contracts. Profitability influences a firm's decision to invest in a foreign market. A firm that is profitable organizes its resources more efficiently and also creates resources that are critical for future expansion of the firm (Cantwell & Sanna-Randaccio, 1993). If it is cost effective and therefore profitable, the firm will choose to operate in a foreign market by retaining the performance of the work or production internally. Ownership advantages have a tendency to compensate for extra costs linked to starting and operating in a foreign market, costs not incurred by local firms (Dunning, 1988).

Lastly, it must be profitable for a firm to utilize these advantages within a particular location. The considerations in this case will be fixed in nature and location specific such as the available natural resources, human capital and the legal framework in the location under consideration as compared to another location. MNCs always prefer locations where institutional framework facilitates development of their ownership advantages (Rugman & Verbeke, 2001).

It is important to note that the three conditions are interrelated. Boddewyn (1985) discussed this interrelatedness by arguing that a firm will be more likely to engage in FDI if it enjoys ownership advantages therefore having a greater incentive to internalize them to be more profitable to exploit them in foreign economies. According to this theory, the three conditions should be met simultaneously for a firm to pursue FDI.

2.2.2 The Internalisation Theory

This theory was advanced by Buckley and Casson (1976), Hennart (1982) and Casson (1983). This theory is based on the imperfections that exist in both the goods and factor markets, creating barriers to free trade. The theory analyses three major intangible assets, which are largely based on proprietary information. The assets are: effective and dedicated management, technological know-how, marketing ability and consumer goodwill. Most organizations protect these intangible assets through intellectual property and secrecy, where intellectual property regulations are not strong enough.

According to this theory, a firm expands to foreign economies only when it is able to internalize the market for their knowledge. A firm therefore has to carry out a cost benefit analysis in determining whether to invest directly or to license their knowledge to local firms. It is considered riskier to license knowledge to local firms than to internalize it. On the other hand, it might be cheaper to license to a local firm instead of operating a subsidiary. For a value maximizing firm, the expected returns of exploiting their knowledge through a subsidiary must be higher than the cost of running it. The internalisation theory implies that shareholders' value will be increased through FDI. Internalisation therefore results in larger and more multinational enterprises hence encouraging FDI (Buckley and Casson, 1976).

2.2.3 Institutional FDI Fitness Theory

This Theory, advanced by Wilhelms (1998), postulates that FDI is determined more by institutional variables that vary such as policies, regulations and their implementation than by variables that do not vary giving a nation competitive advantage in the FDI market such as population size. The term FDI fitness refers to the ability of a nation to attract, absorb and retain foreign direct investment by being able to meet the

expectations of foreign investors therefore maintaining an upper hand in FDI inflows. This theory explains why FDI is unevenly distributed across countries and more so out of proportion to natural resources. This theory is based on four important pillars: the government, the market, education and socio-cultural factors.

Of the four, socio-cultural factors lie at the bottom of the pyramid. The higher the degree of integration of an investor's socio-culture with that of the host country, the greater the incentive to invest (Wilhelms, 1998). Education fitness lies right above socio-culture, as it creates a favourable environment for investment due to technological advancement, availability of skilled labour, information and enhanced research and development. The actual education requirements for FDI vary depending on the MNC and the skills requirement for individual projects (Wilhelms, 1998).

The third pillar, the market, addresses the economic and financial concerns of foreign investors, specifically physical capital such as machinery and financial capital that relates to credit facilities. A study by Karau and Mburu (2016) on the effect of economic factors on FDI established that GDP growth was positively correlated with FDI inflows while inflation had a negative effect on FDI inflows. Return on capital was also found to be positively correlated with FDI inflows (Asiedu, 2002). Developed financial markets are therefore considered a prominent feature in the MNCs investment decision making process (Makoni, 2015).

Finally, the government plays a key part in drawing and retaining FDI through regulation of the other three institutions through policy. Factors that promote government fitness include low corruption levels, high transparency and accountability levels, strong rule of law and political stability (Karau & Mburu, 2016), infrastructure development (Moody, 1992), economic openness (Asiedu, 2002).

A study carried out by Wilhelms and Witter (1998) to test the theory by ordinary least squares analysis for 67 countries established that government and market fitness were the most critical of the four factors in attracting FDI. Location, socio-culture and population were found to be lowly correlated with FDI inflows. Muthoga (2003) investigated the determinants of FDI inflows in Kenya and found that internal rate of return, economic openness, GDP growth rate, availability of credit and level of domestic investment improve a country's ability to attract FDI inflows.

2.3 Determinants of Residential Real Estate Prices

Several factors have been established to affect residential real estate prices from past studies. Some of these factors are: interest rates, inflation, gross domestic product, demographics and money supply.

2.3.1 Interest Rates

Interest rates affect both supply and demand of housing. According to Keynes (1936), interest rates represent the cost of borrowing funds over a specific period of time. Studies have established that interest rates affect housing prices (Hilbers, Lei & Zacho, 2001). A rise in interest rates results in an increase in the cost of mortgages limiting the number of potential buyers who can access credit to purchase houses, resulting in a reduction in demand for housing and pushing down the property prices. On the other hand, a drop in interest rates results in an expanded mortgage uptake therefore increasing demand for housing resulting in a rise in house prices.

An investigation by Otwoma (2012) on the relationship between interest rates and property prices showed inconsistent relationship between the two variables. During periods when interest rates were low, an increase in interest rates resulted in increased demand for housing as buyers rushed to take mortgages with the aim of locking in the

low interest rates as they expected interest rates to rise further. The increased demand for houses resulted in increased housing prices therefore showing a positive correlation between the two variables. Alternatively, when interest rates were high, a fall in interest rates stimulated housing prices as buyers rushed in to take advantage of these interest rates through mortgage financing.

The supply and demand of capital affects interest rates and hence the return on investment for investors (Liow, Ibrahim & Huang, 2005). By affecting the return on investment for investors, interest rates affect the supply of housing. When interest rates are high, people tend to save more to gain from the high interest rates resulting in reduced investment in various sectors including real estate. According to Cytonn Real Estate, developers shy away from developing houses using debt when interest rates are high further resulting in reduced investment in real estate.

2.3.2 Inflation

Inflation is the sustained increase in overall prices of goods and services in the market during a given period of time. Inflation is measured using the Consumer Price Index (CPI), which is based on a basket of goods consumed by households (Liow, Ibrahim and Huang, 2005). Inflation erodes the purchasing power of the economy resulting in consumers purchasing fewer goods and services with their disposable income (Juma, 2014).

Various studies carried out by Kearl (1979), Taltavull and McGreal (2009) and Tsatsaronis and Zhu (2004) established that inflation has an effect on housing prices. There are however conflicting views on the impact of inflation on housing prices. Some researchers established that inflation results in increased housing prices, others found no significant effect while others found there to be an inverse relationship.

During periods when inflation is great, the prices of many goods and services including building materials and labour escalate resulting in a rise in the cost of development of residential houses. Developers tend to pass on the increased cost of development to buyers by increasing the house prices (Yu Xiao, 2006). During periods of high inflation, consumers tend to divert most of their funds to consumables and sometimes eat into their investment funds resulting in reduced investment in real estate (Sabal, 2005). High inflation can therefore result in decreased demand for housing and hence a fall in prices.

High inflation tends to result in high interest rates as lenders charge a premium in an attempt to compensate them for the expected erosion in the value of mortgage repayments (Safia, 2015). The increase in interest rates as a result of an increase in inflation rates pushes house prices up.

Using Gordon's growth model, real estate prices are determined by discounting the future expected rental income using an appropriate discount rate. In an inflationary environment, investments would be affected as the discount rates would be increased to compensate for reduced purchasing power of future cash flows (Liow, Ibrahim & Huang, 2005). Expected higher residential real estate prices would therefore be compensated by the higher discount rate and therefore, housing prices would remain unchanged.

Some studies have focused on the use of real estate investments to hedge against expected and unexpected inflation. The general conclusion has been that real estate can be used, to some extent, to hedge against inflation making it a preferred investment mode during times of high inflation (Chaney & Hoesli, 2010).

2.3.3 Gross Domestic Product

GDP is the total monetary value of all goods and services produced in an economy in one year. According to Schiller (2008), GDP growth is a reflection of an increase in the output of both goods and services in an economy. A country's economic growth and therefore growth in GDP per capita is a reflection of the population's income and hence standard of living. GDP has a strong correlation with housing prices (Ong, 2013).

When GDP per capita for a country is high, the purchasing power of the population is also high resulting in increased demand for housing, which then results in increased house prices. A decline in GDP growth which also results in a decline in GDP per capita reflects reduced purchasing power of the population, hence lower demand for housing, which results in reduced house prices. Generally speaking, when the economy is sluggish, the housing market is equally sluggish. According to a research by Mwololo (2014), real GDP has a significant effect on housing prices as growth in GDP results in higher demand for housing, which leads to higher house prices.

In addition, GDP growth has an impact on real estate growth as a whole. Increase in a country's wealth results in an increase in income earned by the citizens as well as an increase in investments in real estate among other sectors. When more citizens invest in real estate, housing prices are expected to go up with increased demand for housing. As noted by KNBS (2018), real estate sector has been growing with growth in GDP and is now one of the major contributors of GDP growth.

2.3.4 Demographics

According to Brueggeman and Fisher (2011), growth in population and households are a necessary condition for growth in demand for housing, while employment growth is an important driver of affordability of housing. A growing population definitely comes

with the need to be housed therefore increasing demand for housing, as is the case in Kenya (Cytton, 2018).

An increase in households with young children would result in an increase in demand for larger houses. A study by Bourassa et al (2005) on the origins of housing price variations in some New Zealand markets established that changes in total employment affect changes in prices. A rise in employment resulted in a rise in demand for housing both as a consumer good and an investment. The increase in employment levels would result in an increase in the population that has access to mortgage facilities and hence increased demand for housing and increased house prices. Case and Shiller (1990) established that changes in employment were critical in predicting house prices in the U.S. A study by Cannon, Miller and Pandher (2006) established that income, rents and population density had a positive impact on returns on housing investments and hence prices.

2.3.5 Money Supply

Money supply is a measure of the amount of money in circulation in an economy. Increased growth of money supply in an economy could result in an inflationary environment, which would in turn affect investments as the discount rates would be increased to compensate for reduced purchasing power of future cash flows (Liow, Ibrahim & Huang, 2005). An increase in money supply has a similar effect on disposable income therefore increased demand for housing as more people can afford to buy and rent houses pushing prices up.

2.4 Empirical Review

Various studies have been conducted in the past on the determinants of residential real estate prices with most of them focusing on macroeconomic variables such as GDP,

inflation, exchange rate, interest rates and government policy. Studies that have been carried out on FDI have also focused on its effect on macroeconomic variables.

A study carried out by Arte (2017) analysed the effect of selected macroeconomic factors namely; inflation, money supply, GDP, interest rates and exchange rates on housing investment in Kenya. This study was based on secondary data collected over a period of 10 years, from 2007 to 2016, and analysed using regression analysis. Based on the analysis, it was established that there exists a positive correlation between money supply, inflation and residential real estate prices in Kenya but an inverse relationship between GDP and housing prices. It was also established that exchange rates and interest rates do not affect housing in Kenya. This study however, did not look into the impact of FDI as one of the independent variables that affects housing prices.

A study by Ochieng and Anyango (2013) analysed the impact of exchange rate volatility on FDI in Kenya across different exchange rate regimes namely fixed rate, pegged rate and floating rate regimes. The study was based on secondary data collected for the periods 1981 to 2010 from the IMF, Central Bank and World Bank websites. The study established that there exists a positive but weak correlation between exchange rates and FDI and recommended a more controlled macroeconomic environment in Kenya. The study also noted that FDI had positive effects on the host country including transfer of technology, creation of employment and economic growth. The study did not however analyse the effect of FDI on real estate.

A study by Jamesa (2016) analysed the effect of FDI on the growth of real estate firms in Kenya by use of a descriptive research design that targeted 80 real estate companies, where questionnaires were distributed across the firms for collection of data. The study established that FDI influenced the growth of the real estate firms significantly. The

study further established that there was a threat of a decline in economic growth from increased FDI inflow as it would result in a reduction in investment opportunities for local investors. The study did not however analyse the effect of FDI on real estate prices.

Maingi (2014) carried out a study on the effect of FDI on economic growth in Kenya by analyzing the relationship between FDI and four macroeconomic variables namely; GDP, openness, human capital and government expenditure. The study was based on secondary data on the variables collected over a period of 10 years, from 2004 to 2013 and analysed by use of regression analysis. This study established that FDI had a positive effect on the country's GDP. The researcher therefore recommended adoption of policies that would attract FDI inflows while at the same time putting in place measures to protect local firms from the negative effects of FDI such as crowding out.

Karoki (2013) in a study on determinants of housing prices analysed the effect of interest rates, GDP, money supply and inflation on housing prices in Kenya. The study utilized secondary data collected over a duration of eight years, from 2005 to 2012. The study established a consistent upward trend in the property prices over time, based on the data collected resulting in the conclusion that real estate is stable unlike other factors such as interest rate and exchange rate that kept fluctuating. While the study established a negative relationship between interest rates and housing prices, the other variables- GDP and level of money supply- were found to influence housing prices positively.

In his study on financial liberalization, Waini (2014) analysed secondary data on central bank rate (CBR), interest rates, inflation and real estate prices collected between 2000 and 2013. These variables were observed to fluctuate over the years, with real estate reflecting an upward trend throughout the period. Through regression analysis, he

established a positive correlation between these variables and real estate prices with the CBR having the greatest influence on the prices. Among the recommendations was the need for careful regulation of the CBR as it had a major influence on real estate prices. He also noted the need for policies that regulate real estate prices to ensure housing is affordable to the citizens of the country.

Muriuki (2013) used secondary data from KNBS and Hass Consult collected between 2008 and 2012 to analyse the impact of interest rate volatility on the growth of the real estate market in Kenya. This study established that interest rates have an inverse relationship with real estate growth. Based on this study, it was established that the price inelasticity of demand for housing affected growth of the real estate sector in general. The setting up of MNCs in Kenya was also found to push up housing demand and hence prices for executive apartments. This study went further to recommend further research on the effect of FDI on the growth of the real estate industry.

Huang, Hwang and Lo (2014) carried out a study to establish whether or not FDI in the real estate sector had an effect on Shanghai's rising real estate prices. The researchers analyzed monthly data collected between 2003 and 2010 with the Autoregressive Distributed Lag (ARDL) approach to cointegration. This study found that real estate FDI does not have a significant effect on residential and office real estate prices in Shanghai in the short run but was found to have an effect in the long run. These findings also suggested that the regulations on capital inflows in Shanghai's real estate sector could have been ineffective on regulating the real estate prices. These findings were against popular belief at the time that real estate FDI was affecting the rising real estate prices in Shanghai.

A study carried out in China on the interact among capital flows, money supply and real estate prices by Taguchi and Tian (2017) utilized the vector auto-regression (VAR) to analyse data, collected across seventy cities in China from 2007 to 2016. Money supply was considered a domestic factor while capital flows were considered an external factor. The research found that domestic money supply had a major influence to China's property prices but not so with external capital flows. The study recommended enhancement of its monetary policies to regulate the rising property prices.

Bardhan and Kroll (2007) in their research paper on globalization and real estate analysed the effects of globalization of markets with a major focus on its effect on the real estate sector. Besides growth in manufacturing industry, globalisation was found to involve the internalization of the service sector and various sub sectors of real estate industry with many contractors, consulting service firms and brokerage firms s having expanded operations outside the United State into other economies. The integration of the global financial markets as well as development of a wide range of financial instruments also encouraged US based investors to capitalize on foreign real estate ventures. Globalisation had changed demand dynamics a large number of consumers of both commercial and residential real estate were noted to be MNCs. On the supply side, globalization and offshoring had an effect on the source of inputs for construction. As is the current situation in Kenya, the research noted that China was a major producer and source of building materials in the United States.

Chernysheva (2011) carried out a research to analyse the changes in the Swedish real estate market and its relationship to FDI between 2000 and 2010. This study used a deductive approach by analyzing past research and theories on the topic. According to the research the changes observed in the Swedish real estate market within the period

considered included increased difficulty in obtaining finance, increased use of structured deals, decreased risk and yield levels, diversification was more important and higher selectiveness by investors in selecting their investments. The changes in the Swedish real estate market were traced to changes in macroeconomic variables – interest, exchange rates, inflation and GDP, microeconomic variables – operation expenses and transaction costs and behavioural issues – language barriers, socio-cultural practices and policy.

2.5 Conceptual Framework

This is a schematic representation of the research variables and their relationships. This study focused on the effects of FDI inflows on residential real estate prices in Kenya. The independent variable was FDI inflows while the dependent variable was residential real estate prices. Control variables were interest rates, inflation and GDP.

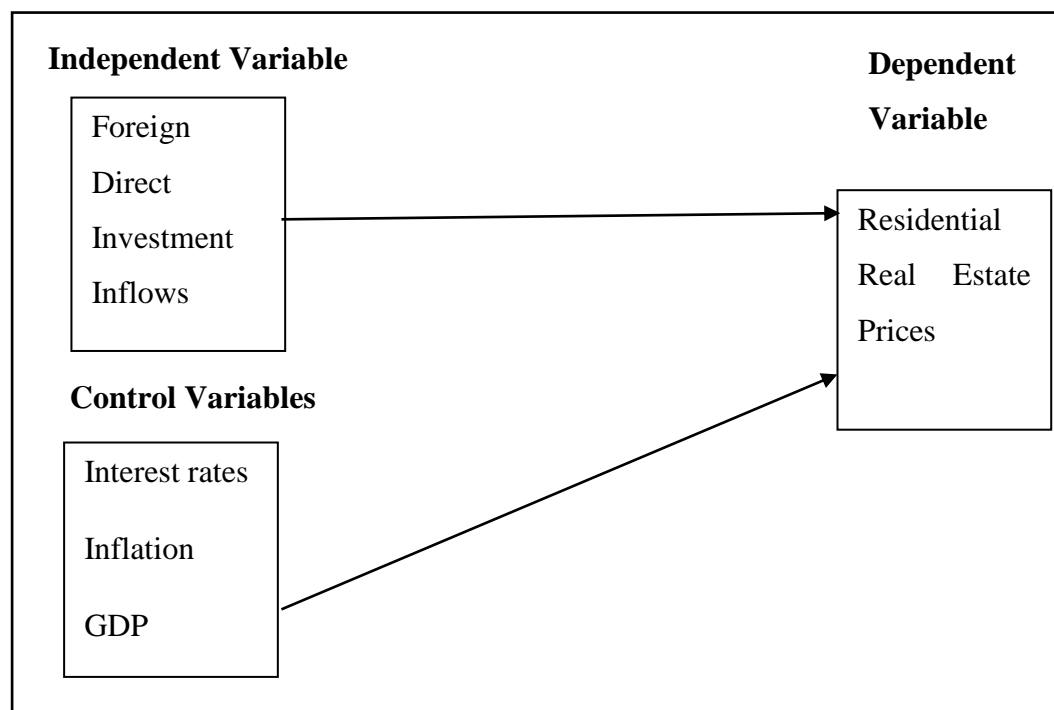


Figure 2.1 Conceptual Model.

2.6 Summary of the Literature Review

Under this chapter, three theories were discussed in an effort to explain the relationship between FDI and residential real estate prices. The theories covered were: the eclectic paradigm, internalization theory and institutional FDI fitness theory. Five determinants of housing prices namely; interest rates, inflation, GDP and money supply were then discussed including their influence on housing prices. Local and international studies were analysed in connection with FDI and real estate and most of them had conflicting conclusions therefore making them inconclusive. A research gap was also identified on the relationship between FDI and residential real estate prices as shown in the table below.

Table 2.1 Summary of Literature Review

Author of Study	Focus of Study	Methodology	Findings	Knowledge Gaps	Focus of Current Study
Arte (2017)	Effect of macroeconomic variables on housing investment in Kenya	This study analysed secondary data collected over a period of 10 years using correlation and regression analysis.	While money supply and inflation have a positive relationship with residential real estate prices, exchange rates and interest rates do not have an impact on housing prices in Kenya.	The study did not analyse the effect of FDI on housing prices.	Effect of FDI on residential real estate prices.
Bardhan & Kroll (2007)	Effect of globalization on the real estate industry	The research analysed secondary data in the United States on FDI in real estate, import and export data on building materials, demographics and foreign investment by US based real estate firms.	Globalisation had encouraged investment by US based investors in foreign real estate, it changed demand dynamics as foreign firms raised the demand for real estate and on the supply side, the real estate industry was receiving supply of materials from various nations.	The study did not investigate the effect of globalization on real estate prices	Effect of FDI on residential real estate prices.
Chernysheva (2011)	Changes in the Swedish real estate market between 2000-2010	This study used a deductive approach by analyzing past research as well as known theories.	Changes noted in the real estate industry included increased difficulty in obtaining finance, increased use of structured deals, decreased risk and yield levels, diversification was more important and higher selectiveness by investors. These changes were traced to micro and macroeconomic factors as well as behavioral issues.	The study did not carry out an in-depth analysis of the causes of the changes.	Effect of FDI on housing prices.

Jamesa (2016)	Effect of FDI on the growth of real estate firms in Kenya	Primary data from 80 real estate firms in Kenya and analysed by descriptive analysis for quantitative data and content analysis for qualitative data.	FDI has a positive influence on the growth of real estate firms in Kenya.	The study did not analyse the effect of FDI on residential real estate prices but rather focused on real estate firms.	Effect of FDI on residential real estate prices.
Maingi (2014)	Effect of FDI on GDP growth in Kenya	The study analysed secondary data collected over a period of 10 years using correlation and regression analysis.	FDI has a positive effect on economic growth in Kenya.	This study did not analyse the effect of FDI on residential real estate prices.	Effect of FDI on housing prices.
Karoki (2013)	Determinants of housing prices in Kenya	The study analysed secondary data on GDP, inflation, interest rates, inflation and housing prices collected over a period of 8 years using correlation and regression analysis.	Interest rates have a negative impact on housing prices but GDP, and level of money supply have a positive impact on housing prices	This study did not investigate the impact of FDI on housing prices	Effect of FDI on residential real estate prices.
Waini (2014)	Effect of financial liberalisation on real estate prices in Kenya	The study analysed secondary data collected over a period of 14 years using correlation and regression analysis.	CBR, interest rates and inflation influence real estate prices positively, with the CBR having the greatest influence.	The study did not analyse the effect of FDI on real estate prices	Effect of FDI on residential real estate prices.
Muriuki (2013)	Effect of interest rate volatility on the growth of the real estate sector	The study analysed secondary data from KNBS and Hass Consult collected between 2008 and 2012	Interest rates have an inverse effect on the growth of real estate sector.	The study did not explore the effect of FDI on real estate sector.	Effect of FDI on housing prices.

Huang, Hwang and Lo (2014)	Role of real estate FDI in Shanghai's real estate prices	The study analyzed monthly data collected between 2003 and 2010 with the Autoregressive Distributed Lag (ARDL) approach to cointegration	Real estate FDI had no significant effect on housing and office prices in the short run but had a significant effect on office prices in the long run.	While the study focused on the effect of real estate FDI, on real estate prices, it did not analyse the effect of the aggregate FDI inflow on real estate	Effect of FDI on housing prices.
Ochieng and Anyango (2013)	The effect of exchange rate volatility on FDI in Kenya	The study analyzed data collected over a period of 30 years from 1981-2010 using correlation and regression analysis	There was a positive but weak correlation between exchange rates and FDI inflows in Kenya	The study did not explore the relationship between FDI on real estate sector.	Effect of FDI on housing prices.
Taguchi and Tian (2017)	The interaction among capital flows, money supply and property prices in China.	The study analyzed data, collected across seventy cities in China from 2007 to 2016 vector auto-regression (VAR).	Domestic money supply had a major influence to China's property prices but not so with external capital flows	The study aggregated all properties in the study without analyzing the effect of capital flows on residential real estate properties only	Effect of FDI on housing prices.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the methodology used in carrying out the research. It explains the research design, the target population, procedures applied in collecting data and data analysis techniques applied in the study.

3.2 Research Design

Research design refers to the way data is collected and analysed. This study employed a descriptive research approach. According to Glass & Hopkins (1984), descriptive research involves collecting data that describes events, organizing it, tabulating and describing the data collected. Descriptive research design is useful in establishing relationships between variables and is therefore relevant for this study.

3.3 Data Collection

The study employed secondary data from the market. Secondary data on foreign direct investment inflows was collected from the UNCTAD website. While local sources of data, KNBS and Central Bank, did not have a record of FDI inflows into the country, UNCTAD was considered a reliable source of this data as it had global statistics of FDI inflows and outflows. For inflation rate, the consumer price index from KNBS was used. Data on interest rates was collected from KNBS and the Central Bank.

A residential real estate price index was developed to measure changes in residential real estate price. In Kenya, there are two major organizations that produce residential real estate price indices namely; Hass Consult - a real estate consultancy firm and the Kenya Bankers Association (KBA). The KBA housing price index, whose framework

is elaborate, was launched in 2013, while the Hass property index was launched in 2005 but does not provide a clear framework within which the index is developed. A housing price index was therefore developed using data collected from developers and real estate agents for houses sold over the last ten years between 2008 and 2017.

3.4 Diagnostic Tests

The analysis of variance (ANOVA) – the p-statistic and the F-test were employed in determining the statistical significance of any relationships between the variables.

3.5 Data Analysis

The collected data was analysed using the Statistical Package for Social Sciences (SPSS). Measures of central tendency namely; mean, maximum, minimum and standard deviation covered the descriptive statistics.

A correlation analysis was carried out to establish if there were any relationships existed between the variables at a significance level of 5% and how significant these relationships were. The correlation coefficient (R) was used as a measure of strength of relationships between the variables in the study. The coefficient of determination (R^2) was critical in analyzing how differences in residential real estate prices can be explained by differences in foreign direct investment, interest rates, inflation and GDP.

A multiple regression analysis was then carried out to check if any statistically significant relationships exist between the independent variables (foreign direct investment, interest rates, inflation and GDP) and dependent variable (residential real estate prices).

The multiple regression model that was applied to model the data is:-

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where:

Y = Residential real estate prices, measured by a housing price index, which was developed using ten-year data on house prices in Kenya

X_1 = Foreign Direct Investment Inflows, measured by the annual FDI inflows as a percentage of GDP obtained from the UNCTAD website

X_2 = Interest rate, measured by the annual average bank lending rate obtained from CBK

X_3 = Inflation rate, measured by the annual Consumer Price Index obtained from KNBS

X_4 = Gross Domestic Product, measured by annual GDP growth rate obtained from KNBS.

β_0 = Constant

$\beta_1, \beta_2, \beta_3, \beta_4$ = Regression coefficients

ϵ = Error term, which represents effects of omitted variables that affect the housing prices in Kenya but not explained by the regression analysis.

3.5.1 Developing a Housing Price Index

According to Singh (2014), there are three main methods used internationally in computing the housing price index namely; use of the simple average of observed prices, repeat sales method and the hedonic regression method. The research further noted that development of a housing price index was complex due to the varying nature of houses on sale and the infrequency of transactions.

In developing a housing price index, it is critical to take into consideration the changes in house characteristics as changes in prices can be due to price changes only or changes

in the characteristics of houses on sale (KBA, 2015). This is why the repeat sales method and hedonic methods are more popular.

The repeat sales method compares properties that have been in the market several times over the selected period by using a regression model, in which the repeat sales data is pooled. The advantage of this method is that the property characteristics such as location and size are matched and held constant during the sampling period but is disadvantageous in that it lacks inconsistency in the case of new periods been included in the model. The method's other shortcoming is that it does not account for quality changes in the sampled houses such as improvements or renovations (Bailey et.al., 1963).

The hedonic regression method, which was applied this study, is more elaborate as it can be used to adjust for changes an individual house characteristics as well as changes in the houses in the samples by relating the selling prices of houses to their characteristics (Shiller, 1996). According to Eurostat (2013), the hedonic method is built on the principle that the price of a house is a dependent on its quality ($P_n^t = f(z_{n1}^t \dots z_{nk}^t, \varepsilon_n^t)$).

Where:

$$t = 0, \dots, T$$

$$\varepsilon_n^t = \text{error term}$$

$$z_{n1}^t = \text{characteristics of the house}$$

The hedonic method has been found to be superior to other methods as it can be utilize data several times, whether it is a repeat sale or not, and it can be used run the available sales data without requiring previous sales data (Miller and Skalarz, 2008). The main

disadvantage of the hedonic method is that it has a high data requirement of the selling prices and house characteristics, making the cost of data collection expensive (Clapham et al, 2006). The hedonic model is represented as (Eurostat, 2013):-

$$P_n^t = \beta_0^t + \sum_{k=1}^k \beta_k^t z_{nk}^t + \varepsilon_n^t \quad (3.2)$$

Where:-

β_0^t and β_k^t are intercepts

z_{n1}^t = characteristics of the house

ε_n^t = error term

An alternative to the hedonic model presented in 3.2 is the log-linear model, which has been found to perform reasonably well when the land size is not included as an explanatory variable. The log-linear model, which was used in developing the house price index in this study, is represented by (Eurostat, 2013):-

$$\ln P_n^t = \beta_0^t + \sum_{k=1}^k \beta_k^t z_{nk}^t + \varepsilon_n^t \quad (3.3)$$

Where:-

β_0^t and β_k^t are intercepts

z_{n1}^t = characteristics of the house

ε_n^t = error term

KBA (2015) established the main driver of price changes as number of bedrooms, number of floors, location, number of bathrooms, type of the house (apartment, bungalow, maisonette, town house), master ensuite, age of the house and presence of a garage, DSQ, shopping mall, parking bays, balcony, gymnasium, borehole, fire place, garden, separate dining and swimming pool. Due to the limited resources that were

available for data collection, the house characteristics (z_{ij}) considered were based on their significance from the various reports released by KBA: type of house number of bedrooms, is the house ensuite or not, number of floors, location and presence of a balcony, DSQ, swimming pool and parking.

Data was collected on house prices and characteristics for a period of ten years from 2008-2017 from developers and real estate agents. For the continuous variables such as number of bedrooms, the house plinth area and number of floors, the absolute values were used. For the categorical variables such as presence of parking, presence of a DSQ, presence of parking and ensuite, a set of dummy variables taking the value of 1 if the characteristic was present and 0 if the characteristic was absent were used (Eurostat, 2013). For house type the dummy variable 1 was used for apartments while 0 was used for detached units.

In compiling the price index, a regression was run for each time period and the index built using the predicted prices from the regression analysis (Eurostat, 2013). In calculating the predicted prices for each period, a ‘standard’ property with fixed characteristic (z_k^*) was considered by setting z_k^* to be equal to the sample averages of the base period (\bar{z}_k^0) to generate the Laspeyres-type characteristics price index. The resulting predicted prices were given by (Eurostat, 2013):-

$\hat{p}_n^0 = \exp(\hat{\beta}_0^0) \exp[\sum_{k=1}^k \hat{\beta}_k^0 z_{nk}^0]$ for period 0 and $\hat{p}_n^t = \exp(\hat{\beta}_0^t) \exp[\sum_{k=1}^k \hat{\beta}_k^t z_{nk}^t]$ for time t.

The Laspeyres-type characteristics price index is given by (Eurostat, 2013):-

$$P_{CPGL}^{0t} = \frac{\exp(\hat{\beta}_0^t) \exp[\sum_{k=1}^k \hat{\beta}_k^t \bar{z}_k^0]}{\exp(\hat{\beta}_0^0) \exp[\sum_{k=1}^k \hat{\beta}_k^0 \bar{z}_k^0]}$$

3.5.2 Inferential Statistics

The analysis of variance (ANOVA) test was carried out. The p-statistic and F-statistic were used to test the significance of the relationships identified. The p-value was compared to the alpha level selected for the analysis while the F-statistic was compared to the F-critical value, to test the statistical significance of any relationships between the variables.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the information analyzed from the data collected during the study on the effect of FDI on residential real estate prices in Kenya. Data was collected from secondary sources covering ten years from 2008 to 2017 and analyzed with the aid of the Statistical Package for Social Sciences (SPSS).

4.2 Data Analysis and Presentation

4.2.1 Housing Price Index Development

The mean characteristics of a ‘standardized’ house for period zero (\bar{z}_k^0) were:-

Table 4.1: Mean Characteristics of Year 0 (2008)

	Characteristic	Mean
\bar{z}_1^0	Location	.50
\bar{z}_2^0	House Type	.40
\bar{z}_3^0	Plinth Area	125.30
\bar{z}_4^0	No of Bedrooms	2.80
\bar{z}_5^0	All Ensuite	.10
\bar{z}_6^0	No of Floors	3.30
\bar{z}_7^0	Presence of a Balcony	.60
\bar{z}_8^0	Presence of a DSQ	.10
\bar{z}_9^0	Presence of a Swimming Pool	.30
\bar{z}_{10}^0	Presence of a Parking	1.00

The table above shows the means of the individual characteristics of the houses samples in the base year, 2008. The mean of the location is 0.5 as there was an equal number of samples representing both the high income housing and low income housing. The mean for the house type was 0.4 meaning there were more detached units than apartments in the sample selected. The mean plinth area from the selected sample was 125.30 square

metres while the mean number of bedrooms was 2.80. The average number of floors of the samples selected was 3.3. The means for the other characteristics were 0.1 for ensuite bedrooms, 0.6 for presence of a balcony, 0.1 for presence of a DSQ, 0.3 for presence of a swimming pool and 1.0 for parking as all houses had provision for parking.

After running regression analyses for each time period, the following were the results:-

Table 4.2: Regression Analysis for Year 0 (2008)

Variable	Coefficients						
	Unstandardized Coefficients		Standardized Coefficients	t-stat	Sig. Level	95.0% Confidence Level	
	Coefficient	Std. Error	Coefficient			Lower Bound	Upper Bound
1 (Constant).	15.311	.184		83.018	.000	14.900	15.722
Location	.525	.128	.710	4.111	.002	.240	.809
House Type	-.166	.759	-.220	-.219	.831	-1.856	1.524
Plinth Area	.000	.001	.059	.418	.685	-.002	.003
No of Bedrooms	.004	.061	.009	.065	.950	-.131	.139
All Ensuite	.150	.145	.121	1.029	.328	-.174	.473
No of Floors	-.009	.095	-.065	-.091	.929	-.221	.204
Presence of a Balcony	.471	.116	.624	4.061	.002	.213	.730
Presence of a DSQ	-.166	.119	-.134	-1.393	.194	-.430	.099
Presence of a Swimming Pool	-.177	.540	-.220	-.329	.749	-1.380	1.025

Table 4.3: ANOVA for Year 0 (2008)

Model	SS	dof	Mean Square	F-stat	Sig. Level
1 Regression	2.655	9	.295	38.431	.000
Residual	0.77	10	.008		
Total	2.732	19			

The regression equation for year 0 (2008) therefore becomes:-

Table 4.4: Regression Analysis for Year 1 (2009)

Variable	Coefficients						
	Unstandardized Coefficients		Standardized Coefficients	t-stat	Sig. Level	95.0% Confidence Level	
	Coefficient	Std. Error	Coefficient			Lower Bound	Upper Bound
1 (Constant)	15.144	.279		54.352	.000	14.531	15.758
Location	.447	.122	.789	3.658	.004	.178	.716
House Type	-.335	.155	-.591	-2.165	.053	-.675	.005
Plinth Area	.003	.001	.394	1.796	.100	-.001	.006
No of Bedrooms	.093	.089	.157	1.054	.315	-.102	.288
All Ensuite	-.031	.116	-.050	-.266	.795	-.285	.224
No of Floors	.047	.030	.390	1.582	.142	-.018	.112
Presence of a DSQ	.139	.088	.244	1.572	.144	-.056	.333
Presence of a Swimming Pool	.087	.118	.110	.733	.479	-.174	.348

$$\ln p^0 = 15.311 + 0.525z_1^0 - 0.166z_2^0 - 0.04z_4^0 + 0.15z_5^0 - 0.009z_6^0 + 0.471z_7^0 - 0.166z_8^0 - 0.177z_9^0 + \varepsilon^0$$

The predicted price $\hat{p}^0 = 7,085,067.80$

Table 4.5: ANOVA for Year 1 (2009)

Model	SS	dof	Mean Square	F-stat	Sig. Level
1 Regression	1.354	8	.169	7.482	.002
Residual	0.249	11	.023		
Total	1.603	19			

The regression equation for year 1 (2009) therefore becomes:-

$$\ln p^1 = 15.144 + 0.447\bar{z}_1^0 - 0.335\bar{z}_2^0 + 0.003\bar{z}_3^0 + 0.93\bar{z}_4^0 - 0.31\bar{z}_5^0 - 0.047\bar{z}_6^0 + 0.139\bar{z}_8^0 + 0.087\bar{z}_9^0 + \varepsilon^1$$

Table 4.6: Regression Analysis for Year 2 (2010)

Variable	Unstandardized Coefficients		Standardized Coefficients	t-stat	Sig. Level	95.0% Confidence Level for Coefficient	
	Coefficient	Std. Error	Coefficient			Lower Bound	Upper Bound
1 (Constant)	15.995	.338		47.299	.000	15.242	16.749
Location	.498	.150	.829	3.320	.008	.164	.832
House Type	-.325	.168	-.550	-1.933	.082	-.701	.050
Plinth Area	.001	.001	.205	1.202	.257	-.001	.004
No of Bedrooms	-.145	.096	-.273	-1.509	.162	-.358	.069
All Ensuite	.141	.123	.192	1.145	.279	-.134	.416
No of Floors	.038	.029	.271	1.301	.222	-.027	.103
Presence of a Balcony	.058	.094	.093	.612	.554	-.152	.267
Presence of a DSQ	.086	.097	.143	.879	.400	-.132	.303
Presence of a Swimming Pool	.168	.116	.204	1.457	.176	-.089	.426

The predicted price $\hat{P}^1 = 8,932,088.68$

Table 4.7: ANOVA for Year 2 (2010)

Model	SS	dof	Mean Square	F-stat	Sig. Level
1 Regression	1.548	9	.172	9.248	.001
Residual	0.186	10	.019		
Total	1.733	19			

The regression equation for year 2 (2010) therefore becomes:-

$$\ln p^2 = 15.995 + 0.498z_1^0 - 0.325z_2^0 + 0.001z_3^0 - 0.145z_4^0 - 0.141z_5^0 + 0.038z_6^0 + 0.058z_7^0 + 0.086z_8^0 + 0.168z_9^0 + \varepsilon^2$$

Table 4.8: Regression Analysis for Year 3 (2011)

Coefficients

Variable	Unstandardized Coefficients		Standardized Coefficients	t-stat	Sig. Level	95.0% Confidence Level	
	Coefficient	Std. Error	Coefficient			Lower Bound	Upper Bound
1 (Constant)	15.698	.395		39.759	.000	14.818	16.578
Location	.354	.193	.310	1.840	.096	-.075	.784
House Type	-.277	.251	-.241	-1.104	.295	-.836	.282
Plinth Area	.003	.001	.416	1.901	.087	.000	.006
No of Bedrooms	-.029	.106	-.029	-.270	.793	-.264	.207
All Ensuite	.194	.223	.147	.870	.405	-.302	.690
No of Floors	.018	.070	.056	.251	.807	-.138	.173
Presence of a Balcony	.111	.115	.084	.969	.356	-.145	.368
Presence of a DSQ	.136	.063	.217	2.157	.056	-.004	.277
Presence of a Swimming Pool	.110	.186	.069	.589	.569	-.305	.525

The predicted price $\hat{P}^2 = 9,841,444.52$

Table 4.9: ANOVA for Year 3 (2011)

Model	SS	dof	Mean Square	F-stat	Sig. Level
1 Regression	6.190	9	.688	20.755	.000
Residual	0.331	10	.033		
Total	6.522	19			

The regression equation for year 3 (2011) therefore becomes:-

$$\ln p^3 = 15.698 + 0.354z_1^0 - 0.277z_2^0 + 0.003z_3^0 - 0.029z_4^0 - 0.194z_5^0 + 0.018z_6^0 + 0.111z_7^0 + 0.136z_8^0 + 0.110z_9^0 + \varepsilon^3$$

The predicted price $\hat{P}^3 = 10,802,370.78$

Table 4.10: Regression Analysis for Year 4 (2012)

Variable	Unstandardized Coefficients		Standardized Coefficients	t-stat	Sig. Level
	Coefficient	Std. Error	Coefficient		
1 (Constant)	16.130	.378		42.619	.000
Location	.802	.139	.638	5.764	.000
House Type	-.604	.321	-.473	-1.880	.089
Plinth Area	.003	.001	.480	2.743	.021
No of Bedrooms	-.258	.153	-.392	-1.683	.123
All Ensuite	.163	.120	.113	1.360	.204
No of Floors	.066	.078	.150	.839	.421
Presence of a Balcony	.082	.119	.060	.690	.506
Presence of a DSQ	.224	.131	.175	1.707	.119
Presence of a Swimming Pool	.081	.167	.046	.482	.640

Table 4.11: ANOVA for Year 4 (2012)

Model	SS	dof	Mean Square	F-stat	Sig. Level
1 Regression	7.532	9	.837	28.736	.000
Residual	0.291	10	.029		
Total	7.823	19			

The regression equation for year 4 (2012) therefore becomes:-

$$\ln p^4 = 16.130 + 0.802z_1^0 - 0.604z_2^0 + 0.003z_3^0 - 0.258z_4^0 + 0.163z_5^0 + 0.066z_6^0 + 0.082z_7^0 + 0.224z_8^0 + 0.081z_9^0 + \varepsilon^4$$

The predicted price $\hat{P}^4 = 11,517,120.65$

Table 4.12: Regression Analysis for Year 5 (2013)

Coefficients							
Variable	Unstandardized Coefficients		Standardized Coefficients	t-stat	Sig. Level	95.0% Confidence Level	
	Coefficient	Std. Error	Coefficient			Lower Bound	Upper Bound
1 (Constant)	15.177	.381		39.799	.000	14.327	16.026
Location	.410	.216	.488	1.898	.087	-.071	.891
House Type	-.245	.224	-.264	-1.093	.300	-.743	.254
Plinth Area	.004	.003	.312	1.345	.208	-.002	.010
No of Bedrooms	.079	.108	.139	.734	.480	-.161	.318
All Ensuite	-.176	.178	-.176	-.991	.345	-.573	.220
No of Floors	.034	.040	.181	.864	.408	-.054	.123
Presence of a Balcony	.130	.154	.141	.846	.418	-.213	.473
Presence of a DSQ	.086	.147	.107	.586	.571	-.242	.415
Presence of a Swimming Pool	.228	.227	.284	1.007	.338	-.277	.734

Table 4.13: ANOVA for Year 5 (2013)

Model	SS	dof	Mean Square	F-stat	Sig. Level
1 Regression	2.719	9	.302	6.197	.004
Residual	0.488	10	.049		
Total	3.207	19			

The regression equation for year 5 (2013) therefore becomes:-

$$\ln p^5 = 15.177 + 0.410\bar{z}_1^0 - 0.245\bar{z}_2^0 + 0.004\bar{z}_3^0 + 0.079\bar{z}_4^0 - 0.176\bar{z}_5^0 + 0.034\bar{z}_6^0 + 0.130\bar{z}_7^0 + 0.086\bar{z}_8^0 + 0.228\bar{z}_9^0 + \varepsilon^5$$

The predicted price $\hat{P}^5 = 11,055,357.39$

Table 4.14: Regression Analysis for Year 6 (2014)

Coefficients							
Variable	Unstandardized Coefficients		Standardized Coefficients	t-stat	Sig. Level	95.0% Confidence Level	
	Coefficient	Std. Error	Coefficient			Lower Bound	Upper Bound
1 (Constant)	14.878	.493		30.205	.000	13.780	15.975
Location	.548	.157	.394	3.500	.006	.199	.897
House Type	-.137	.328	-.098	-.418	.685	-.868	.594
Plinth Area	.003	.001	.427	2.855	.017	.001	.005
No of Bedrooms	.221	.161	.207	1.373	.200	-.137	.578
All Ensuite	.209	.148	.150	1.413	.188	-.121	.540
No of Floors	.001	.074	.002	.009	.993	-.165	.166
Presence of a Balcony	.140	.169	.072	.831	.426	-.236	.515
Presence of a DSQ	-.077	.214	-.055	-.359	.727	-.553	.400
Presence of a Swimming Pool	.335	.196	.145	1.708	.118	-.102	.772

Table 4.15: ANOVA for Year 6 (2014)

Model	SS	dof	Mean Square	F-stat	Sig. Level
1 Regression	9.110	9	1.012	18.178	.000
Residual	0.557	10	.056		
Total	9.667	19			

The regression equation for year 6 (2014) therefore becomes:-

$$\ln p^6 = 14.878 + 0.548z_1^0 - 0.137z_2^0 + 0.003z_3^0 + 0.221z_4^0 + 0.209z_5^0 + 0.001z_6^0 + 0.140z_7^0 - 0.077z_8^0 + 0.335z_9^0 + \varepsilon^5$$

The predicted price $\hat{P}^6 = 11,746,413.25$

Table 4.16: Regression Analysis for Year 7 (2015)

Variable	Coefficients						
	Unstandardized Coefficients		Standardized Coefficients	t-stat	Sig. Level	95.0% Confidence Level	
	Coefficient	Std. Error	Coefficient			Lower Bound	Upper Bound
1 (Constant)	15.854	.141		112.24	.000	15.539	16.169
Location	.433	.105	.355	4.141	.002	.200	.667
House Type	-.621	.166	-.560	-3.751	.004	-.991	-.252
Plinth Area	.002	.001	.361	3.417	.007	.001	.004
No of Bedrooms	.111	.050	.216	2.210	.052	-.001	.223
All Ensuite	.200	.045	.292	4.474	.001	.100	.299
No of Floors	.004	.074	.003	.048	.963	-.162	.169
Presence of a Balcony	.083	.021	.529	3.958	.003	.036	.129
Presence of a DSQ	-.058	.134	-.047	-.433	.674	-.356	.240
Presence of a Swimming Pool	-.246	.139	-.231	-1.768	.107	-.556	.064

Table 4.17: ANOVA for Year 7 (2015)

Model	SS	dof	Mean Square	F-stat	Sig. Level
1 Regression	5.499	9	.611	57.679	.000
Residual	0.106	10	.011		
Total	5.605	19			

The regression equation for year 7 (2015) therefore becomes:-

$$\ln p^7 = 15.854 + 0.433\bar{z}_1^0 - 0.621\bar{z}_2^0 + 0.002\bar{z}_3^0 + 0.111\bar{z}_4^0 + 0.200\bar{z}_5^0 + 0.004\bar{z}_6^0 + 0.083\bar{z}_7^0 - 0.058\bar{z}_8^0 - 0.246\bar{z}_9^0 + \varepsilon^7$$

The predicted price $\hat{P}^7 = 13,679,200.68$

Table 4.18: Regression Analysis for Year 8 (2016)

Model	Coefficients						
	Unstandardized Coefficients		Standardized Coefficients	t-stat	Sig. Level	95.0% Confidence Level	
	Coefficient	Std. Error	Coefficient			Lower Bound	Upper Bound
1 (Constant)	15.446	.366		42.159	.000	14.630	16.263
Location	.717	.375	.708	1.914	.085	-.118	1.551
House Type	-.550	.352	-.543	-1.564	.149	-1.333	.233
Plinth Area	.000	.005	-.042	-.075	.942	-.012	.011
No of Bedrooms	.217	.221	.257	.981	.350	-.276	.709
All Ensuite	-.190	.298	-.150	-.639	.537	-.854	.473
No of Floors	.096	.077	.460	1.242	.243	-.076	.267
Presence of a Balcony	.113	.157	.109	.717	.490	-.237	.462
Presence of a DSQ	.031	.244	.030	.125	.903	-.513	.574
Presence of a Swimming Pool	-.085	.339	-.037	-.251	.807	-.841	.671

Table 4.19: ANOVA for Year 8 (2016)

Model	SS	dof	Mean Square	F-stat	Sig Level
1 Regression	4.637	9	.515	10.405	.001
Residual	0.495	10	.050		
Total	5.132	19			

The regression equation for year 8 (2016) therefore becomes:-

$$\ln p^8 = 15.446 + 0.717z_1^0 - 0.550z_2^0 + 0.000z_3^0 + 0.217z_4^0 - 0.190z_5^0 + 0.096z_6^0 + 0.113z_7^0 + 0.031z_8^0 - 0.085z_9^0 + \varepsilon^8$$

The predicted price $\hat{P}^8 = 14,425,878.48$

Table 4.20: Regression Analysis for Year 9 (2017)

Model	Coefficients						
	Unstandardized Coefficients		Standardized Coefficients	t-stat	Sig level	95.0% Confidence Level	
	Coefficient	Standard Error	Coefficient			Lower Bound	Upper Bound
1 (Constant)	14.724	.197		74.802	.000	14.291	15.158
Location	.293	.076	.422	3.868	.003	.126	.460
House Type	-.765	.254	-.479	-3.010	.012	-1.324	-.206
Plinth Area	.014	.002	.913	7.565	.000	.010	.018
No of Bedrooms	-.135	.057	-.276	-2.379	.037	-.259	-.010
All Ensuite	.942	.140	.968	6.752	.000	.635	1.249
No of Floors	.138	.055	.563	2.525	.028	.018	.259
Presence of a DSQ	-.016	.065	-.023	-.245	.811	-.160	.128
Presence of a Swimming Pool	.176	.061	.241	2.884	.015	.042	.310

Table 4.21: ANOVA for Year 9 (2017)

Model	SS	dof	Mean Square	F-Stat	Sig. Level
1 Regression	2.358	8	.295	55.216	.000
Residual	0.059	11	.005		
Total	2.417	19			

The regression equation for year 9 (2017) therefore becomes:-

$$\ln p^9 = 14.724 + 0.293z_1^0 - 0.765z_2^0 + 0.014z_3^0 - 0.135z_4^0 + 0.942z_5^0 + 0.138z_6^0 - 0.000z_7^0 + 0.016z_8^0 + 0.176z_9^0 + \varepsilon^9$$

The predicted price $\hat{P}^9 = 15,013,235.49$

From the ANOVA tests for each of the regression analyses, the F values are larger than the critical values at confidence levels of 95%. In that case, all the regression models are statistically significant and a good fit for the models.

Below is a summary of the predicted prices from the regression analyses:-

Table 4.22: Summary of Predicted Prices

Period/ Year	Year	Predicted Price (\hat{P}^t)	Housing Price Index (HPI)
0	2008	7,085,067.80	1.00
1	2009	8,932,088.68	1.26
2	2010	9,841,444.52	1.39
3	2011	10,802,370.78	1.52
4	2012	11,517,120.65	1.63
5	2013	11,055,357.39	1.56
6	2014	11,746,413.25	1.66
7	2015	13,679,200.68	1.93
8	2016	14,425,878.48	2.04
9	2017	15,013,235.49	2.12

4.2.2 Descriptive Statistics

Descriptive statistics refer to the measures that define the general nature of data. The table below shows various descriptive statistics.

Table 4.23: Descriptive Statistics

Variable	Min	Max	Mean	Standard Deviation
Housing Price Index	1.00	2.12	1.6110	0.35022
Foreign Direct Investment as % of GDP	0.56	4.03	2.0320	1.206287
Interest Rate	13.64	20.04	16.0270	2.25101
Inflation Rate	3.96	26.24	9.6300	6.44198
GDP Growth Rate	1.50	8.40	5.1100	1.90406

From the table above, the minimum housing price index was 1.00 while the maximum was 2.12 over the year of study. The housing price index had a mean of 1.611 and a standard deviation of 0.35022. The minimum value for foreign direct investment as a % of GDP was 0.56 while the maximum value was 4.03 and the mean was 2.0320 while the standard deviation was 1.206287. Interest rates had a minimum value of 13.6%, a maximum value of 20.04%, a standard deviation of 2.25 and a mean of 16.03%. Inflation rate on the other hand had a minimum value of 3.96%, a maximum value of 26.24%, a standard deviation of 6.44198 and a mean of 9.6300%. The minimum value for annual GDP growth rate was 1.50% with a maximum value of 8.4%, a standard deviation of 1.90 and a mean of 5.11%.

4.2.2 Correlation Analysis

Correlation analysis establishes relationships between two variables and determines if the variables are positively or negatively related one a relationship is established. The correlations of the variables are shown in the table below.

Table 4.24: Correlation

	Housing Price Index	FDI % of GDP	Interest Rate	Inflation Rate	GDP Growth Rate
Housing Price Index	1	-.586	-.036	-.608	.436
FDI % of GDP	-.586	1	.301	.011	.004
Interest Rate	-.036	.301	1	.091	.097
Inflation Rate	-.608	.011	.091	1	-.735*
GDP Growth Rate	.436	.004	.097	-.735*	1

From the correlation analysis, the study established that inflation is negatively and significantly correlated to GDP growth. The residential real estate prices are negatively

but not significantly correlated to foreign direct investment while inflation is negatively but not significantly correlated to the residential real estate prices.

4.2.2 Regression Analysis

The housing price index was examined against foreign direct investment, interest rate, GDP growth rate and inflation. The table below displays the results of the regression analysis. The correlation coefficient shows the extent to which variations in the dependent variable (housing price index) are explained by variations in our independent variable (foreign direct investment, interest rate, inflation rate and GDP growth rate).

Table 4.25: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.866 ^a	.751	.551	.23463

a. Predictors: (Constant), GDP Growth Rate, FDI % of GDP, Interest Rate, Inflation Rate

The above table indicates that the R^2 is 0.751 meaning the independent variable foreign direct investment, interest rate, inflation rate and GDP growth account for 75.1% of the changes in residential real estate prices. The remaining 24.9% is influenced by variables not included in the model.

Table 4.26: ANOVA

Model	SS	dof	Mean Square	F-stat	Sig.- Level
1 Regression	.829	4	.207	3.763	.089
Residual	.275	5	.055		
Total	1.104	9			

The analysis of variance is used to check if the regression model was a good fit for the data. The regression model for this study is significant at a 10% level of significance as indicated in the table above with an F value of 3.763, which is higher than the critical F value of 3.52020.

Table 4.27: Coefficients

Variable	Unstandardized Coefficients		Standardized Coefficients		P.
	Coefficient	Std. E	Coefficient	t-Stat	
(Constant)	1.863	.647		2.880	.035
FDI % of GDP	-0.188	.068	-.648	-2.762	.040
Interest Rate	.036	.038	.230	.948	.387
Inflation Rate	-.037	.018	-.687	-2.021	.099
GDP Growth Rate	-.016	.063	-0.89	-.261	.804

a. Dependent Variable: Housing Price Index

The multiple regression equation therefore becomes:-

$$Y = 1.863 - 0.188X_1 - 0.036X_2 - 0.037X_3 - 0.016X_4 + \epsilon$$

Constant = 1.863, means that when interest rate, inflation rate, FDI and GDP growth are zero, the residential house prices will be 1.863. A unit increase in foreign direct investment would result in a decrease in the residential house prices by 0.188 while a unit increase in inflation rate would result in a decrease of residential house prices by 0.037. A unit increase in GDP growth rate on the other hand would lead to a decrease in residential house prices by 0.016 while a unit increase in interest rates would result in an increase in residential house prices by 0.036.

4.3 Interpretation of Findings

Based on the regression analysis, foreign direct investment negatively and significantly affects residential real estate prices. With a beta coefficient of -0.1863, residential real

estate prices decrease by 1.863 with every unit increase in foreign direct investment. This coefficient was established to be significant at a 95% confidence level.

Inflation rate also negatively but insignificantly affects residential real estate prices. With a beta coefficient of -0.037 , residential real estate prices decrease by 0.037 with every unit increase in inflation rate. As established in the study by Sabal (2005), inflation is negatively correlated with residential real estate prices. The study noted that high inflation can result in decreased demand for housing and hence a fall in prices as disposable income is diverted to consumables reducing the portion of income available for investment.

GDP growth negatively but insignificantly affects residential real estate prices. With a beta coefficient of -0.016 , a unit increase in GDP growth rate results in a unit decrease in residential real estate prices. The findings are consistent with the findings in studies conducted by Mathenge (2017) and King'ori (2017) which established that real GDP growth and residential real estate prices are negatively correlated. The findings however contradict findings by Makena (2012) who established that there is a positive relationship between GDP growth and residential real estate prices.

From the regression, the study established that interest rates positively but insignificantly affect residential real estate prices. A unit increase in interest rates results in an increase in residential real estate prices by $.036$ as represented by the beta coefficient. These findings are in line with findings by King'ori who established a positive relationship between interest rate and real estate prices.

The output of the regression model reveals that a linear relationship exists between the independent variable (residential real estate prices) and the independent variables –

foreign direct investment, inflation rate, interest rate and GDP with 75% of the changes in the independent variable been explained by changes in the dependent variables.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter outlines the summary of findings, conclusions from our study, limitation of the study as well as recommendations and suggestions for further research.

5.2 Summary of Findings

The study was carried out to establish the effect of foreign direct investment on residential real estate prices. The study explored the effect of foreign direct investment, interest rate, inflation rate and GDP on residential real estate prices. A housing price index was developed using secondary data on house prices and characteristics collected across a period of ten years using the hedonic regression method.

The study revealed that a linear relationship exists between the independent variable (residential real estate prices) and the independent variables – GDP, foreign direct investment, interest rate and inflation rate as indicated by the correlation coefficient $R = 0.776$. The study also established that collectively, foreign direct investment, interest rates, inflation rate and GDP positively affect residential real estate prices. The coefficient of determination, $R^2 = 0.602$ further indicates that changes in the four independent variables account for 60.2% of the changes in residential real estate prices.

The study further established that foreign direct investment, GDP and inflation rates have a negative coefficient while interest rate has a positive coefficient. This means that an increase in foreign direct investment, inflation or GDP will result in a decrease in residential real estate prices while an increase in interest rates will result in an increase in residential real estate prices. Of the four variables, FDI had the greatest effect on

residential real estate prices with a coefficient of -0.188 followed by inflation rate with a coefficient of -0.37, interest rate with a coefficient of 0.36 and GDP has the weakest effect with a coefficient of -0.16.

The study established that inflation negatively but significantly affects residential real estate prices, at a confidence level of 90%. With a beta coefficient of -0.037 , residential real estate prices decrease by 0.037 with every unit increase in inflation rate. As established in the study by Sabal (2005), inflation is negatively correlated with residential real estate prices. The study noted that high inflation can result in decreased demand for housing and hence a fall in prices as disposable income is diverted to consumables reducing the portion of income available for investment.

GDP growth negatively but insignificantly affects residential real estate prices. With a beta coefficient of -0.16, a unit increase in GDP growth rate results in a decrease in residential real estate prices by 0.16.

5.3 Conclusions

The study established that foreign direct investment, interest rate, inflation and GDP account for 75% of the changes in residential real estate prices. There exists a strong positive relationship between foreign direct investment, interest rates, inflation and residential real estate prices.

The individual variables however have either a positive or negative correlation with residential real estate prices. In the case of foreign direct investment, an increase in FDI results in a decrease in residential real estate prices. The same applies for inflation and GDP growth where an increase in inflation or GDP growth was established to result in a decline in residential real estate prices. Interest rates on the other hand were

established to a positive effect on residential real prices where an increase in interest rates was established to result in an increase in residential real estate prices.

Of the four independent variables, only the influence of FDI was established to be statistically significant. The study therefore concludes that foreign direct investment data can be useful in predicting residential real estate pricing. The other variables, interest rate, GDP and inflation can also be useful in predicting and managing real estate pricing in the market.

5.4 Recommendations

The study recommends that the government ought to put in place policies to boost FDI in order to lower the cost of housing for its population. This can be done through tax incentives including tax holidays and tax exemptions and public private partnerships especially in the provision of low cost housing. The government should encourage foreign investors to invest in housing with the aim of reducing the price of housing in order to make it affordable.

The study also recommends that lenders especially commercial banks should be engaged to ensure interest rates remain affordable for both home developers and buyers. The study established that a rise in interest rates results in a rise in residential real estate prices. Accessibility to cheap credit facilities is therefore key to delivering affordable housing for the populations.

The study recommends that the banking industry regulator ought to put in place strong fiscal and monetary policies that ensure interest rates and inflation rates are kept under check as they influence residential real estate prices. Keeping interest rates, in particular, stable can assist in stabilizing residential real estate prices to ensure housing is made affordable to the population.

5.5 Limitations of the study

The study involved use of data from both central sources and diverse sources. Data on interest rate, inflation rate, GDP and FDI were collected from central sources including Central Bank, KNBS and UNCTAD. The research employed multiple linear regression model, which has its shortcomings such as misleading results especially when the predictor variable changes. This made generalization of findings from the study difficult to make. This means that the researcher could not generalize findings with certainty.

Information on residential real estate prices was limited in the market as only Hass Consult and Kenya Bankers Association had developed housing price indices. The study therefore involved developing a housing price index which was time consuming as it involved collecting data from multiple sources including developers, valuers and real estate agents. Data on twenty properties sold per year across Nairobi had to be collected and compiled from the various sources before analyzing to develop the housing price index. Due to the amount of data required and limited resources available, the study used annual data as opposed to quarterly data.

Most of the developers, valuers and property agents were not willing to share information on actual sale prices and house characteristics as this information was confidential. The study therefore relied on asking prices for many properties as opposed to actual selling prices, which sometimes differ from the asking prices. In some cases, property characteristics for the same house shared from different sources differed and the researcher had to make reasonable assumptions for those characteristics based on standard characteristics of houses in Nairobi.

5.6 Suggestions for Further Research

This study was carried out to establish the effect of foreign direct investment on residential real estate prices in Kenya. The study focused on four variables namely; foreign direct investment, interest rates, inflation rates and GDP. The study employed secondary data and involved development of a housing price index.

Further studies should be carried out to establish the effect of FDI on pricing of other real estate properties including commercial and industrial properties in Kenya. Additionally studies should also be carried out to establish the effect of other macroeconomic variables such as exchange rate on housing prices in Kenya.

The study focused on housing prices of properties within the Nairobi metropolitan region. Further studies should be carried out to establish the effect of FDI on properties in Nairobi. Research should also be carried out to establish the effect of FDI on properties across different market segments such as high end properties and low income properties

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APPENDIX 1: DATA COLLECTION SHEET

Year	FDI Inflows (as a % of GDP)	GDP Growth Rate (%)	Annual Weighted Interest Rate (%)	Annual Average Inflation Rate (%)
2008	1.36	1.50	14.87	26.24
2009	4.03	2.70	14.76	9.24
2010	2.99	8.40	13.87	3.96
2011	3.46	6.10	20.04	14.02
2012	2.74	4.60	18.15	9.38
2013	2.03	5.90	16.99	5.72
2014	1.34	5.40	15.99	6.88
2015	0.97	5.70	18.30	6.58
2016	0.56	5.90	13.66	6.30
2017	0.84	4.90	13.64	7.98

APPENDIX 2: DATA COLLECTION SHEET - HOUSE PRICES

Year 0 - 2008

House No	Location	House Type	Selling Price (KShs)	Plinth Area (sm)	Number of Bedrooms	Number of Floors	Ensuite	Presence of balcony	Presence of DSQ	Presence of swimming pool	Presence of parking
1.	Lavington	Apartment	8,500,000.00	134	3	5	N	Y	N	Y	Y
2.	Westlands	Triplex	12,500,000.00	280	4	10	Y	Y	N	N	Y
3.	Kilimani	Apartment	9,500,000.00	115	2	5	N	Y	N	Y	Y
4.	Kilimani	Apartment	9,000,000.00	80	1	5	N	Y	N	Y	Y
5.	Upperhill	Duplex	10,000,000.00	110	3	10	N	Y	N	N	Y
6.	Kileleshwa	Apartment	9,000,000.00	166	3	4	N	Y	N	Y	Y
7.	Kilimani	Apartment	9,000,000.00	120	2	5	N	Y	N	Y	Y
8.	Kilimani	Apartment	7,500,000.00	85	1	5	N	Y	N	Y	Y
9.	Westlands	Maisonette	13,000,000.00	155	4	2	N	Y	N	N	Y
10.	Loresho	maisonette	11,000,000.00	187	4	3	N	Y	Y	N	Y

11.	Outering	Maisonette	7,500,000.00	130	3	2	N	Y	N	N	Y
12.	Eastlands	Bungalow	5,000,000.00	79	3	1	N	N	N	N	Y
13.	Kahawa	Bungalow	4,500,000.00	110	3	1	N	N	N	N	Y
14.	Donholm	Bungalow	4,600,000.00	120	3	1	N	N	N	N	Y
15.	South B	Maisonette	7,600,000.00	165	3	2	Y	Y	Y	N	Y
16.	Buruburu	Bungalow	4,800,000.00	67	2	1	N	N	N	N	Y
17.	Eastlands	Bungalow	4,000,000.00	79	3	1	N	N	N	N	Y
18.	Kahawa	Bungalow	4,500,000.00	110	3	1	N	N	N	N	Y
19.	Donholm	Bungalow	5,200,000.00	138	3	1	N	N	N	N	Y
20.	Buruburu	Bungalow	5,000,000.00	76	3	1	N	N	N	N	Y

Year 1 – 2009

House No	Location	House Type	Selling Price (KShs)	Plinth Area (sm)	Number of Bedrooms	Number of Floors	Ensuite	Presence of balcony	Presence of DSQ	Presence of swimming pool	Presence of parking
1.	Westlands	Duplex	16,000,000.00	238	3	10	Y	Y	N	N	Y
2.	Westlands	Triplex	18,000,000.00	280	4	10	Y	Y	N	N	Y
3.	Kilimani	Duplex	17,000,000.00	180	4	4	Y	Y	Y	Y	Y
4.	Kileleshwa	Apartment	11,000,000.00	154	3	4	N	Y	N	Y	Y
5.	Lavington	Apartment	9,000,000.00	134	3	5	N	Y	N	Y	Y
6.	Kileleshwa	Apartment	10,500,000.00	150	3	5	Y	Y	Y	N	Y
7.	Kilimani	Apartment	12,000,000.00	119	3	5	N	Y	Y	N	Y
8.	Kileleshwa	Apartment	13,500,000.00	171	3	4	N	Y	Y	N	Y
9.	Kilimani	Apartment	14,000,000.00	222	3	4	Y	Y	Y	N	Y
10.	Kileleshwa	Apartment	10,000,000.00	180	3	4	N	Y	N	N	Y

11.	Athi River, Mavoko	Maisonette	7,000,000.00	120	3	2	N	Y	Y	N	Y
12.	South B	Maisonette	8,500,000.00	165	3	2	Y	Y	Y	N	Y
13.	Nairobi West	Maisonette	8,000,000.00	94	3	2	N	Y	N	N	Y
14.	South C	Maisonette	10,000,000.00	129	4	2	N	Y	Y	N	Y
15.	Outering Road	Maisonette	7,850,000.00	130	3	2	N	Y	N	N	Y
16.	Langata	Maisonette	8,500,000.00	130	4	2	N	Y	Y	N	Y
17.	South C	Maisonette	10,500,000.00	194	4	2	N	Y	Y	N	Y
18.	Westlands	Maisonette	15,000,000.00	155	4	2	N	Y	N	N	Y
19.	South B	Maisonette	9,500,000.00	136	4	2	N	Y	Y	N	Y
20.	Langata	Apartment	7,000,000.00	145	3	5	N	Y	N	N	Y

Year 2 – 2010

House No	Location	House Type	Selling Price (KShs)	Plinth Area (sm)	Number of Bedrooms	Number of Floors	Ensuite	Presence of balcony	Presence of DSQ	Presence of swimming pool	Presence of parking
1.	Kileleshwa	Apartment	12,000,000.00	196	3	5	N	Y	Y	N	Y
2.	Kileleshwa	Apartment	12,000,000.00	152	3	5	Y	Y	N	N	Y
3.	Kileleshwa	Apartment	10,000,000.00	145	3	4	N	Y	N	N	Y
4.	Lavington	Apartment	11,000,000.00	148	3	5	N	Y	N	Y	Y
5.	Kilimani	Apartment	14,500,000.00	194	3	5	N	Y	N	Y	Y
6.	Kilimani	Apartment	10,000,000.00	151	3	6	N	N	N	N	Y
7.	Lavington	Apartment	12,000,000.00	153	3	6	N	Y	N	N	Y
8.	Upperhill	Apartment	12,500,000.00	139	3	10	N	Y	N	N	Y
9.	Kilimani	Apartment	14,000,000.00	210	4	5	Y	Y	N	Y	Y
10.	Kilimani	Maisonette	13,500,000.00	163	3	2	N	Y	N	N	Y
11.	Kileleshwa	Maisonette	18,000,000.00	323	4	3	Y	Y	Y	N	Y

12.	Donholm	Maisonette	7,500,000.00	139	3	2	N	N	Y	N	Y
13.	Langata Road	Maisonette	12,500,000.00	168	5	2	Y	Y	Y	N	Y
14.	Langata	Maisonette	9,500,000.00	139	3	2	N	Y	Y	N	Y
15.	Donholm	Maisonette	6,000,000.00	126	4	2	N	N	Y	N	Y
16.	Donholm	Maisonette	8,000,000.00	152	4	2	N	N	Y	N	Y
17.	Ngumo	Maisonette	9,000,000.00	98	3	2	N	N	N	N	Y
18.	South B	Maisonette	8,000,000.00	126	3	2	N	N	Y	N	Y
19.	Syokimau	Maisonette	7,000,000.00	166	3	2	N	Y	N	N	Y
20.	Kiambu Road	Maisonette	6,000,000.00	86	3	2	N	N	N	N	Y

Year 3 – 2011

House No	Location	House Type	Selling Price (KShs)	Plinth Area (sm)	Number of Bedrooms	Number of Floors	Ensuite	Presence of balcony	Presence of DSQ	Presence of swimming pool	Presence of parking
1.	Kilimani	Apartment	17,000,000.00	206	3	8	N	Y	Y	N	Y
2.	Kilimani	Apartment	16,000,000.00	210	4	5	Y	Y	N	Y	Y
3.	Parklands	Apartment	14,000,000.00	225	4	3	N	Y	N	N	Y
4.	Lavington	Apartment	16,000,000.00	142	3	5	N	Y	N	Y	Y
5.	Kileleshwa	Apartment	15,000,000.00	200	3	7	N	Y	Y	N	Y
6.	Lavington	Masionette	35,000,000.00	300	4	2	Y	Y	Y	N	Y
7.	Karen	Villa	35,000,000.00	359	4	2	Y	Y	Y	N	Y
8.	Karen/ Langata Road	Maisonette	35,000,000.00	417	5	2	Y	Y	Y	N	Y
9.	loresho	Masionette	32,000,000.00	334	3	3	Y	Y	Y	N	Y

10.	Woodley	Masionette	21,000,000.00	132	4	2	N	N	Y	N	Y
11.	Embakasi	Apartment	6,000,000.00	120	3	5	N	N	N	N	Y
12.	Mombasa Road	Apartment	6,500,000.00	96	3	4	N	Y	N	N	Y
13.	City Park	Apartment	9,000,000.00	180	3	4	N	Y	N	N	Y
14.	City Park	Apartment	9,000,000.00	122	3	5	N	Y	N	N	Y
15.	Embakasi	Apartment	6,200,000.00	95	3	4	N	N	N	Y	Y
16.	South B	Masionette	11,000,000.00	126	3	2	N	Y	Y	N	Y
17.	Madaraka	Masionette	10,000,000.00	120	3	2	N	Y	Y	N	Y
18.	South B	Masionette	11,000,000.00	147	4	2	N	Y	Y	N	Y
19.	South C	Masionette	12,000,000.00	148	4	2	N	N	N	N	Y
20.	BuruBuru	bungalow	7,000,000.00	78	3	1	N	N	N	N	Y

Year 4 – 2012

House No	Location	House Type	Selling Price (KShs)	Plinth Area (sm)	Number of Bedrooms	Number of Floors	Ensuite	Presence of balcony	Presence of DSQ	Presence of swimming pool	Presence of parking
1.	Kilimani	Apartment	16,000,000.00	191	3	5	N	N	Y	Y	Y
2.	Kilimani	Apartment	17,000,000.00	205	3	4	N	Y	Y	N	Y
3.	Westlands	Apartment	17,000,000.00	120	3	5	Y	Y	Y	N	Y
4.	Ngong Road	Apartment	15,000,000.00	75	2	5	N	Y	N	N	Y
5.	Lavington	Apartment	13,500,000.00	134	3	5	N	Y	N	Y	Y
6.	City Park	Apartment	6,500,000.00	58	1	4	N	N	N	N	Y
7.	Westlands	Apartment	26,000,000.00	330	4	5	Y	Y	Y	N	Y
8.	Kilimani	Maisonette	24,000,000.00	262	4	2	N	Y	Y	N	Y
9.	Kiambu Road	Maisonette	35,000,000.00	283	4	2	N	Y	Y	N	Y
10.	Rossllyn	Maisonette	45,000,000.00	446	5	2	Y	Y	Y	N	Y
11.	Embakasi	Apartment	6,500,000.00	120	3	4	N	Y	N	Y	Y

12.	Nairobi West	Apartment	6,500,000.00	63	2	6	N	Y	N	N	Y
13.	Kiambu Road	Apartment	6,180,000.00	73	2	4	Y	Y	N	N	Y
14.	Mombasa Road (syokima)	Apartment	7,000,000.00	70	2	4	Y	Y	N	N	Y
15.	Mombasa Road	Apartment	6,000,000.00	69	2	4	N	Y	N	N	Y
16.	Embakasi	Maisonette	7,500,000.00	113	3	2	N	N	N	N	Y
17.	Ruiru	Maisonette	6,500,000.00	249	4	2	N	Y	N	N	Y
18.	Donholm	Bungalow	6,000,000.00	90	3	1	N	N	N	N	Y
19.	Ruiru	Maisonette	9,000,000.00	217	4	2	N	N	N	N	Y
20.	Langata	Maisonette	10,000,000.00	118	3	2	N	N	Y	N	Y

Year 5 - 2013

House No	Location	House Type	Selling Price (KShs)	Plinth Area (sm)	Number of Bedrooms	Number of Floors	Ensuite	Presence of balcony	Presence of DSQ	Presence of swimming pool	Presence of parking
1.	Riverside	Apartment	15,000,000.00	100	3	4	N	Y	N	Y	Y
2.	Riverside	Apartment	18,000,000.00	120	4	4	N	Y	N	Y	Y
3.	Kileleshwa	Apartment	13,000,000.00	120	3	8	N	Y	N	Y	Y
4.	Lavington	Apartment	17,500,000.00	200	3	4	Y	Y	Y	Y	Y
5.	Kilimani	Apartment	17,000,000.00	150	3	7	N	Y	Y	Y	Y
6.	Upperhill	Apartment	28,000,000.00	153	3	8	N	Y	N	Y	Y
7.	Riverside	Apartment	8,500,000.00	60	1	1	N	Y	N	Y	Y

8.	Ruaka	Apartment	6,650,000.00	86	2	5	N	Y	N	N	Y
9.	Ruaka	Apartment	7,750,000.00	103	3	5	N	Y	N	N	Y
10.	Kiambu Road	Apartment	6,450,000.00	73	2	4	N	N	Y	N	Y
11.	Kiambu Road	Apartment	8,300,000.00	120	3	4	N	N	Y	N	Y
12.	Limuru Road	Apartment	8,900,000.00	115	3	7	N	Y	N	Y	Y
13.	Limuru Road	Apartment	12,500,000.00	127	3	7	Y	Y	Y	Y	Y
14.	Syokimau	Apartment	6,000,000.00	105	3	5	N	N	N	N	Y
15.	Ruaraka	Apartment	7,100,000.00	115	3	4	N	Y	N	N	Y
16.	Kiambu Road	Masionette	12,000,000.00	165	3	2	N	N	Y	N	Y

17.	Mavoko	Masionette	8,500,000.00	185	4	2	Y	N	Y	N	Y
18.	Ruiru	Masionette	8,950,000.00	120	3	2	Y	Y	Y	N	Y
19.	Ruiru	Masionette	10,350,000.00	140	4	2	N	Y	Y	N	Y
20.	Dandora	Masionette	13,000,000.00	140	4	2	N	Y	N	N	Y

Year 6 – 2014

House No	Location	House Type	Selling Price (KShs)	Plinth Area (sm)	Number of Bedrooms	Number of Floors	Ensuite	Presence of balcony	Presence of DSQ	Presence of swimming pool	Presence of parking
1.	Parklands	Apartment	13,000,000.00	180	3	4	N	N	N	N	Y
2.	Parklands	Apartment	16,500,000.00	184	3	5	N	Y	N	N	Y
3.	Kilimani	Apartment	21,500,000.00	185	4	5	Y	Y	Y	N	Y
4.	Kilimani	Apartment	22,000,000.00	190	4	8	Y	Y	Y	N	Y
5.	Kilimani	Apartment	22,700,000.00	150	4	4	Y	Y	N	N	Y
6.	Kilimani	Apartment	25,000,000.00	130	3	5	Y	Y	N	Y	Y
7.	Parklands	Maisonette	18,000,000.00	161	3	2	N	Y	N	N	Y
8.	Lavington	Townhouse	60,000,000.00	345	4	3	Y	Y	Y	N	Y
9.	Lavington	Townhouse	55,000,000.00	394	4	3	Y	Y	Y	N	Y
10.	Karen	Townhouse	55,000,000.00	466	4	2	Y	Y	Y	N	Y
11.	Langata Road	Apartment	11,500,000.00	135	3	5	N	Y	N	Y	Y

	(Nairobi West)										
12.	Riruta	Apartment	12,000,000.00	90	3	5	N	Y	N	N	Y
13.	Syokimau	Apartment	6,500,000.00	90	3	6	N	Y	N	N	Y
14.	Syokimau	Apartment	4,500,000.00	53	2	6	N	N	N	N	Y
15.	Riruta	Apartment	5,500,000.00	78	2	5	N	Y	N	N	Y
16.	Ruiru	Maisonette	12,000,000.00	213	3	2	Y	Y	N	N	Y
17.	Kasarani	Maisonette	10,000,000.00	200	4	2	N	Y	Y	N	Y
18.	Athi River	Maisonette	9,500,000.00	149	3	2	N	Y	Y	N	Y
19.	South C	Bungalow	15,500,000.00	189	4	1	Y	N	Y	N	Y
20.	Kikuyu	Maisonette	16,000,000.00	250	4	2	N	Y	Y	N	Y

Year 7 – 2015

House No	Location	House Type	Selling Price (KShs)	Plinth Area (sm)	Number of Bedrooms	Number of Floors	Ensuite	Presence of balcony	Presence of DSQ	Presence of swimming pool	Presence of parking
1.	Kileleshwa	Apartment	30,000,000.00	220	4	9	Y	Y	Y	Y	Y
2.	Kileleshwa	Apartment	48,000,000.00	400	4	9	Y	Y	Y	Y	Y
3.	Westlands	Apartment	19,500,000.00	120	2	8	Y	N	Y	Y	Y
4.	Chalbi Drive	Villas	42,000,000.00	250	4	3	Y	Y	Y	Y	Y
5.	Chalbi Drive	Villas	45,000,000.00	300	5	3	Y	Y	Y	Y	Y

6.	Runda Paradise	Townhouse	25,000,000.00	192	4	2	Y	Y	Y	N	Y
7.	Mombasa Road	Apartment	8,000,000.00	53	1	11	N	N	Y	Y	Y
8.	Mombasa Road	Apartment	14,000,000.00	100	2	11	N	N	Y	Y	Y
9.	Mombasa Road	Apartment	18,000,000.00	135	3	11	Y	N	Y	Y	Y
10.	Kamiti Road	Apartment	9,100,000.00	105	2	5	Y	N	Y	Y	Y
11.	Kiambu Road	Apartment	8,900,000.00	73	2	4	Y	N	Y	N	Y
12.	Kiambu Road	Apartment	10,450,000.00	80	2	4	Y	N	Y	N	Y
13.	Kiambu Road	Apartment	11,900,000.00	108	3	4	Y	Y	Y	N	Y

14.	Kiambu Road	Apartment	13,300,000.00	120	3	4	Y	Y	Y	N	Y
15.	Kiambu Road	Apartment	14,700,000.00	148	4	4	Y	N	Y	N	Y
16.	Kiambu Road	Villa	22,900,000.00	147	3	2	Y	Y	N	N	Y
17.	Kiambu Road	Villa	24,800,000.00	157	4	2	Y	Y	N	N	Y
18.	Kiambu Road	Villa	29,500,000.00	205	4	2	Y	Y	N	N	Y
19.	Athi river	Bungalow	18,400,000.00	150	4	0	N	Y	N	N	Y
20.	Athi river	Bungalow	22,600,000.00	180	4	1	Y	Y	N	N	Y

Year 8 – 2016

House No	Location	House Type	Selling Price (KShs)	Plinth Area (sm)	Number of Bedrooms	Number of Floors	Ensuite	Presence of balcony	Presence of DSQ	Presence of swimming pool	Presence of parking
1.	Westlands	Apartment	27,000,000.00	186	3	7	Y	Y	N	N	Y
2.	Parklands	Apartment	27,000,000.00	256	4	9	Y	N	N	N	Y
3.	Kileleshwa	Apartment	17,000,000.00	152	3	4	N	Y	N	N	Y
4.	Kileleshwa	Apartment	18,500,000.00	170	3	5	N	Y	Y	Y	Y
5.	Kileleshwa	Apartment	17,000,000.00	180	3	5	N	Y	N	N	Y
6.	Lavington	Maisonette	25,000,000.00	199	4	2	N	Y	Y	N	Y
7.	Redhill	Maisonette	25,000,000.00	245	4	3	Y	Y	Y	N	Y
8.	Westlands	Maisonette	45,000,000.00	210	4	3	N	Y	Y	N	Y
9.	Kileleshwa	Maisonette	27,000,000.00	220	4	2	N	N	Y	N	Y
10.	Kiambu Road	Maisonette	28,500,000.00	228	4	2	N	N	Y	N	Y
11.	Imara Daima	Apartment	8,800,000.00	137	3	5	N	Y	Y	N	Y

12.	Ruaka	Apartment	11,000,000.00	103	3	5	N	Y	N	N	Y
13.	Uthiru	Apartment	8,500,000.00	98	3	4	N	Y	N	N	Y
14.	Kikuyu	Apartment	11,000,000.00	146	3	5	N	Y	Y	N	Y
15.	Imara Daima	Apartment	9,000,000.00	130	3	10	Y	N	N	N	Y
16.	Buruburu	Bungalow	7,000,000.00	65	2	1	N	N	N	N	Y
17.	Langata	Maisonette	14,500,000.00	113	3	2	N	N	Y	N	Y
18.	Buruburu	Bungalow	9,000,000.00	105	2	1	N	N	Y	N	Y
19.	Mbs Road	Maisonette	12,500,000.00	132	3	2	N	Y	Y	N	Y
20.	Langata	Maisonette	13,500,000.00	95	3	2	N	N	N	N	Y

Year 9 - 2017

House No	Location	House Type	Selling Price (KShs)	Plinth Area (sm)	Number of Bedrooms	Number of Floors	Ensuite	Presence of balcony	Presence of DSQ	Presence of swimming pool	Presence of parking
1.	Lavington	Apartment	10,890,000.00	80	2	7	N	Y	N	Y	Y
2.	Lavington	Apartment	11,440,000.00	84	2	7	N	Y	N	Y	Y
3.	Lavington	Apartment	11,770,000.00	88	2	7	N	Y	N	Y	Y
4.	Lavington	Apartment	13,200,000.00	95	3	7	N	Y	N	Y	Y
5.	Lavington	Apartment	14,630,000.00	105	3	7	N	Y	Y	Y	Y
6.	Lavington	Apartment	15,180,000.00	109	3	7	N	Y	Y	Y	Y
7.	Lavington	Apartment	16,720,000.00	120	3	7	N	Y	Y	Y	Y
8.	Lavington	Apartment	17,380,000.00	125	3	7	N	Y	Y	Y	Y
9.	Lavington	Apartment	21,450,000.00	150	4	7	N	Y	Y	Y	Y
10.	Lavington	Apartment	24,200,000.00	155	4	7	N	Y	Y	Y	Y
11.	Sigona	Townhouse	11,500,000.00	131	4	2	N	Y	Y	N	Y

12.	Komarock Road	Apartment	6,500,000.00	90	3	6	N	Y	N	Y	Y
13.	Kamiti Road	Apartment	9,500,000.00	105	2	5	N	Y	N	Y	Y
14.	Kiambu Road	Apartment	14,300,000.00	108	3	4	Y	Y	Y	N	Y
15.	Kiambu Road	Apartment	10,890,000.00	73	2	4	Y	Y	N	N	Y
16.	Kiambu Road	Apartment	12,500,000.00	80	2	4	Y	Y	N	N	Y
17.	Limuru Road	Apartment	9,500,000.00	85	2	7	N	Y	N	Y	Y
18.	Ridgeways	Apartment	6,000,000.00	78	2	6	N	Y	N	N	Y
19.	Ridgeways	Apartment	9,800,000.00	120	3	6	N	Y	N	N	Y
20.	Ridgeways	Apartment	7,800,000.00	102	2	6	N	Y	N	N	Y