

**FOREIGN DIRECT INVESTMENT, EXTERNAL DEBT AND REAL ESTATE
INVESTMENT IN KENYA**

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REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF
SCIENCE IN ECONOMICS OF MASINDE MULIRO UNIVERSITY OF
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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance of Masinde Muliro University of Science and Technology a thesis entitled '**Foreign Direct Investment, External debt and Real estate Investment in Kenya**'

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DEDICATION

I dedicate this work to my entire families who have unwaveringly supported me during the time of study.

ACKNOWLEDGEMENT

I acknowledge with gratitude the invaluable advice and assistance given to me by various people during the entire duration of my study. It is not possible to mention all the people who have enormously contributed to this research thesis. I wish to however, mention the following individuals for their tremendous assistance. I wish to express my indebtedness to my dedicated supervisors, Prof. John Byaruhanga and Dr. Consolata Ngala for their guidance, encouragement, and positive criticisms during this study. Special regards also go to my fellow classmates, who challenged me to think out of the box. Also, I would like to thank the administrative staff of the Department of Economics of Masinde Muliro University of Science and Technology for giving me the opportunity to learn more about economics. I wish to sincerely appreciate my entire family and friends I salute you all for your encouragement and prayers.

ABSTRACT

Development of the real estate sector immensely contributes to the economic growth and development of the country through upgrading the living standards of the people by providing better infrastructural facilities, social amenities, telecommunication facilities and better housing. Kenya in recent years has experienced a surge in the growth of real estate in the suburbs of its major towns and cities. This has been brought about by the increasing pressure for modern housing units from the increasing number of the middle-income people and the general population at large. On the other hand increase of foreign direct investments in the real estate sector has been a contributing factor to the growth of the real estate sector in Kenya. However, other factors such as external debt, inflation, and institutional weaknesses such as corruption have been pulling this sector down. The main objective of this study was to examine the effect of macroeconomic aggregates on real estate investment in Kenya. The specific objectives were to: examine the effect of foreign direct investment inflows on real estate investment in Kenya, determine the effect of external debt on real estate investment in Kenya, establish the existence of long-term relationship between foreign direct investment inflows and external debt on real estate investment in Kenya and the moderating effect of urbanization on the relationship between Foreign Direct Investment inflows, external debt and real estate investment in Kenya. The study adopted analytical research design and a stochastic model using quarterly time series secondary data for 11 years from 2007-2017 sourced from Kenya National Bureau of Statistics economic surveys, World Bank and United Nations Conference on Trade and Development website. Augmented Dickey Fuller test for unit root revealed the presence of unit root that was corrected by first difference. Clemente-Montañés-Reyes Unit-Root test for 2 structural breaks revealed presence of structural breaks in (2010q3, 2011q3), (2010q4, 2013q2), (2013q3, 2015q3) for real estate, FDI and external debt respectively. Vector Inflation factor test for Multicollinearity coefficient was $1.62 < 10$ and Durbin Watson test for serial correlation coefficient was $1.912 < 2.5$ indicating the absence of Multicollinearity and serial correlation. Descriptive statistics of analysis showed absence of outliers in all the variables. Correlation analysis on the other hand revealed a positive and moderate relationship between FDI and Real estate (0.5394) and moderate negative relationship between external debt and real estate (-0.5105). Regression results indicated a positive significant effect of FDI on real estate investment (0.8813076, $p < 0.0500$) and negative effect of external debt on real estate investment in Kenya (-0.155869, $p < 0.0500$). Johansen test for cointegration showed that there were three cointegrating equations as indicated by (4.1035*) trace statistic which is greater than (3.76) at 5% critical values showing the presence of long run relationship. Vector error correction model (VECM) and the error correction term coefficients were (-0.477807, $p < 0.0500$), (-0.604642, $p < 0.0500$) and (-0.792045, $p < 0.0500$) respectively for the real estate investment, FDI and External debt respectively suggesting that there is a long term relationship running from Real estate investment, foreign direct investment and external debt. The results also showed that there was statistically significant negative moderating effect of urbanization on the relationship between FDI and external debt on real estate investment in Kenya (-0.043, $p < 0.0500$). The study recommends that; the government should encourage FDI through incentives, reduce external borrowing by protecting infant industries and promote real estate development in rural areas.

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LIST OF ABBREVIATIONS AND ACRONYMS

AGOA	African Growth and Opportunity Act
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributive Lag
CBK	Central bank of Kenya
CEIC	Census and Economic Information Centre
CIA	Central intelligence Agency
COMESA	Common Market for Eastern and Southern Africa
CPI	Consumer Price Index
EAC	East African Community
ECOWAS	Economic Community of West African States
ED	External Debt
EPZ	Export Processing Zones
ERS	Economic Recovery Strategy
EU	European Union
EXD	External Debt
FDI	Foreign Direct Investment
FKE	Federation of Kenya Employer
GDP	Gross Domestic Product
HIPCs	Highly Indebted Poor Countries
HQIC	Hanan-Quin Information Criterion
IMF	International Monetary Fund
IR	Inflation Rate
ISI	Import substitution Industrialization
JB	Jarque-Bera Test for Normality
KENSUP	Kenya Slum Upgrading Programme
KISIP	Kenya Informal Settlement Improvement Programme

KNBS	Kenya National Bureau of Statistics
LNK	Natural log capital
LNLAB	Natural log of Labor
LNy	Natural of output
MDGs	Millennium Development Goals
MMUST	Masinde Muliro University of Science and Technology
MNC	Multinational Corporation
MNE	Multinational Enterprises
MTP	Medium Term Plan
MUB	Manufacturing Under Bond
NACOSTI	National Commission for Science Technology and Innovation
NSSF	National Social Security Fund
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
RES	Real Estates
SADC	South African Development Community
SBIC	Swartz Bayesian Information Criterion
UNCTAD	United Nation Conference Trade and Development
URB	Urbanization
USA	United States of America
USD	United States Dollar
VAR	Vector Auto Regression
VEC	Vector Error Correction
WAMU	West African Economic and Monetary Union

OPERATIONAL DEFINITION OF TERMS

Real Estate Investment: In the context of this study investment in the real estate sectors is the growth in real estate sector measured by annual capital investment between the periods of 2007-2017.

Foreign Direct Investment: This study adopted the World Bank (2013) definition, Foreign direct investment is a net inflow of investment in order to acquire a long-term management interest (10 per cent or more of the voting stock) in an enterprise operating in an economy other than that of an investor.

External Debt: External debt is the long-term debt owed to non-residents repayable in foreign currency, goods or services (World Bank Database, 2016).

Urbanization: In the context of this study urbanization referred to the process by which people leave the countryside to live in the cities. It's measured by the ratio of urban population to the total population.

Lag Length: Time lapse that dependent variable change when the independent variable changes.

Structural Breaks: unexpected change over time in the parameters of regression models, which can lead to huge forecasting errors and unreliability of the model in general.

Moderating Variable: also called a moderator variable or simply **M**, is a variable that changes the strength or direction of an effect between two variables x and y . In other words, it affects the relationship between the independent variable or predictor variable and a dependent variable or criterion variable.

CHAPTER ONE

INTRODUCTION

1.1 Background

This section gives the information about the real estate at global regional and national level. Similarly, it elaborates how Foreign Direct Investments, external debt and urbanization relates to real estate development at global, regional and national level.

1.1.1 Real Estate

According to Brown & Matysiak (2000), Real estate is a property consisting of land and anything permanently fixed to it along with its natural resources such as crops, minerals or water. According to New York Times (2016), Real estate operations entail developing, renting, leasing and managing both commercial and residential properties. As demand for housing increases, there is an increase in housing prices as well as increased investment in real estate as firms attempt to capture the increased demand (Knight Frank Economic Report of 2011).

Globally there has been a rise in demand for real estate properties with cities in American and Asian continent recording tremendous growth of mega structures. North America comprises just 7 percent of the global population but 22 percent of all value-added residential properties. Europe tells a similar story, containing 11% of the world's population but 23% of residential property by value (New York Times 2016). Real

estate appears to have taken on a new role in global investment portfolios and has become increasingly popular as an income-generating asset, especially among funding organizations that need to provide pensions to aging investors in developed eco-friendly environments (Bardhan& Kroll, 2007).

In Africa the real estate sector has been ballooning in countries such as Nigeria, Egypt and Cameroon as a result of rapid growth in urban population. This has created pressure on the available infrastructural facilities, social amenities and housing units (Henderson, 2006) .As a result for instance in Nigeria and Cameroon the government through partnership with both local and foreign investors have resolved to increase fund in the development of sustainable modern housing and other social facilities to as to accommodate the needs of the future generations. This has brought a rise in development of real estate sector among those nations (Andrea, 2010). Similarly Tanzania has experienced rapid growth of in the real estate sector brought about by rapid urbanization in the suburbs of its major town as cities such as Arusha, Dodoma Dar salaam and Tanga (Kasidi& Said 2013)

Over the years the Kenyan economy has enjoyed several developments in terms of infrastructure. As a result, Kenya has attracted foreign capital and its real estate sector has become an area of interest to external investors (Kenyan Economic Report, 2013). The movement of expatriates into the country and inflow of businesses has led to increased demand for residential as well as commercial housing. This increased demand has further lead to developments in satellite and commuter town evidenced by Tatu City in Kiambu and Konza City in Machakos. Therefore in order to meet the expatriate

demand for housing, developers have resorted to developments that are geared towards the quality demanded by the expatriates. An example is Migaa gated community in Kiambu County which is a modern, developed, equipped project with commercial and retail space, hospital, museum and a golf course, (Kenyan Economic Report, 2013). Further investors in the real estate sector have been seen to explore alternative means of capitalizing on the promising sector through partnership with the government and financial institution (Kenyan Economic Report, 2013).

According to the Cytonn Investment Real Estate Report of the third quarter of 2015, the largest increase in the various sectors of the economy was posted by the construction sector and the property sector at 14.1 per cent ahead of agriculture, which reported 7.1 per cent and financial services at 10.1 per cent. However, according to the ministry of land and housing survey (2013), the housing demand in Kenya supersedes housing supply as evidenced by the fact that the country faces an annual house demand of 200,000units but only 30,000 units are supplied. Further Kenya Property developers and Hass Consultant (2019) reported that Nairobi County is suffering from middle income housing deficit attributable to high land prices, high cost of construction permit which has risen to 1.25% from the previous 0.006% of construction cost, high lending rates for those opting for mortgage use and high infrastructure costs accounting for 30% of construction. This high costs has contributed to slow growth of real estate sector in Nairobi amidst rising population.

1.1.2 Foreign Direct Investment (FDI) and Real Estate investment

According to Bjorvatvatn (2000) Foreign Direct investment is an investment made to acquire a long term investment in a foreign enterprise or nation with the view of having a voice in the enterprises management. FDI is a major contributor to investment in real estate and manufacturing sector , job creation, and foreign exchange stability in the host country,(Hayman and Godo, 2005). Therefore, countries have to work on developing favorable conditions to encourage foreign direct investment .Globally, Foreign Direct Investment (FDI) in real estate sector has grown considerably in both the developed and developing countries in recent years which has contributed immensely to the growth and development of real estate sector in many countries around the world. For example, FDI inflows to China's real estate market accounted for 10–15 per cent of total FDI from the mid-1990s to 2009 (He et al. 2009). In 2007, real estate ranked second only to India's computer software industry to attract FDI (Economist Intelligence Unit, 2008). Similarly, over a period of 8 years from 2000 to 2008, real house prices rose by 75% in Mexico, 78% in Hungary, 26% in China, 40% in Poland and 45% in Tunisia (Cordero and Paus, 2008). Based on the above statistics, it was observed that increase in FDI in Real Estate sector contributed to the rise in house prices in those recipient countries because of the improvement in the quality of housing unit into classic modern units. Economists and observers suggested that real estate prices were boosted by the FDI in real estate investment in certain developing economies (Cordero & Paus, 2008).

The African continent has been experiencing a drastic decline in FDI inflows from \$19 billion in 2001 to \$11 billion in 2012 in 23 countries out of the continent's 53 countries which adversely affected the growth of real estate sector in those respective countries

(World Bank, 2014). The North and West African countries amongst them Angola, Algeria, Chad, Nigeria and Tunisia received more than half of the FDI inflows in Africa in the year 2002- 2010 (UNCTAD WIR, 2003) which has largely contributed to the growth of the real estate sector through emergence of new infrastructural, telecommunication facilities and industries which have been set up to boost the economic welfare amongst those nations (Rusike, 2007). The FDI inflow to Africa in general has been declining due to perennial problems associated with underdeveloped nations such as political instability, war and institutional weakness (UNCTAD, 2009). On the other hand, inflows to sub-Saharan Africa improved from \$29 billion in 2010 to \$37 billion in 2011 which largely has contributed to the rise in the number of new infrastructures such as housing units both for commercial and domestic purposes (Esso, 2010).

The Kenyan parliament formulated Foreign Investment Protection Act and Investment Promotion Act of 2004 to ensure that there is a clear and well-articulated legal framework for FDI (Nganga & Abala, 2011). The Investment Promotion Act of 2004 contains the Kenya's investment code which guides on the administrative and legal processes to create a more attractive and conducive climate for trade and investment (Amondi, 2016). In the 1970's Kenya was one of the most favored destinations for FDI in East Africa. FDI flows were at \$10 million in 1970's and it increased to \$80 million in 1980s (Kinuthia, 2010). However, poor governance, poor economic policies, high tax burden coupled with corruption and inefficient service delivery in the public sector has made Kenya experience low FDI flows from early 1980s to date. This economic backdrop caused Kenya to be left out of the global surge in FDI flows that started in the

mid-1990s (UNCTAD, 2005). In 2018, Kenya received FDIs of 1.6 billion USD; this was a rise from 1.2 billion in 2017. The total stock of FDI stood at USD 14.4 billion in 2018. In recent years the ICT sector has attracted the most FDI due to the arrival of the fiber optics in 2009-2010 (KNBS, 2010).

Studies over the years have established that FDI can either have a positive or a negative impact on the economy (Sylvester, 2005). The FDI inflow in Kenya has had a significant influence on the development of the real estate sector (James, 2017). There has been an increased demand for housing in terms of residential and commercial property in Kenya (James, 2017). This increased demand for housing in Kenya has attracted foreign as well as local investors looking to capitalize on the increased demand (Amondi, 2016). With both investors seeking to profit from the increased demand, mortgage financing and investment in the real estate sector in Kenya has increased thereby affecting the real estate prices in the country (Salome, 2016).

1.1.3 External Debt and Real Estate investment

Most of the world's countries borrow funds to meet their financing requirements and reduce the budget deficit. Farjana (2003) classifies debt as internal or external debt. External debts are owed according to Patenio and Tan-Cruz (2007), to external creditors, such as the African Development Bank, the World Bank, the International Monetary Fund and bilateral creditors, largely governments of other countries and commercial creditors, (Ajisafe and Gidado, 2006).

Globally Debt ratio in OECD countries rose from 70% in the 1990s to almost 110% in 2012. It was projected to increase to 112.5% of GDP by 2014 and even rising higher in the years to follow. The trend is seen not only in countries with a past of debt problems like Italy, Japan, Belgium, and Greece - but also in countries where the debt ratio was low including the US, UK, France, Portugal and Ireland (World Bank, 2013). Many economists see this increased level of debt as being unsustainable in many countries which in the long run affects the economic expansion in terms of real estate development. Adepoju, et. al. (2014) point out that external debt has weak influence on the real estate sector in developed countries as opposed to developing countries.

With Tanzania's national debt forecast reaching alarmingly high levels by 2015 (World Bank, 2014), many countries in Africa are facing an increase in unrelated debt levels. According to numerous sources, Tanzania's debt rose steadily and was close to Tsh's 28 trillion by January 2015, a pattern that is predicted to remain against declining revenues (Kasidi & Said, 2013) In the recent IMF / World Bank economic forecast (2016), Tanzania's Gross Domestic Product (GDP) stood at Tsh's 52 trillion at current prices as of November 2013, which exceeds 50 percent. According to the IMF / World Bank report (2016), this was one of the variables responsible for the decline in growth in the real estate sector in Tanzania in the context of rising population growth. In the case of Rwanda, the Government recorded a debt-to - GDP ratio of 29.42% of the country's gross domestic product in 2013. Government debt to GDP in Rwanda averaged 65.78 per cent between 1995 and 2013, reaching an all-time high of 119.50 per cent in 1995 and a record low of 21.27 per cent in 2008. Rwanda's recent uptick in borrowing has

raised concerns about the country's ability to service its debt (Ogwuma, 2013). The overview of public debt as a percentage of GDP in East African countries is shown in Table 1.1.

Table 1. 1: Public Debts as a % of GDP in East African Countries, 2007-2014

country	2007	2008	2009	2010	2011	2012	2013
Kenya	46.0	45.6	47.5	49.9	48.5	47.2	45.3
Rwanda	26.9	21.4	23.0	23.2	24.0	25.8	24.3
Uganda	72.5	23.6	22.1	22.2	27	29.3	31.07
Tanzania	36.3	36.0	39.0	42.7	45.4	46.8	48.8

Source: World Bank (2015)

Kenya's total debt burden averaged(5.9%); from 2003-2007,(15.1%), from 2008-2012 and(21.3%), from 2017-2017 indicating that public debt has been growing at an increasing rate over the years as shown in the figure 1.1 below

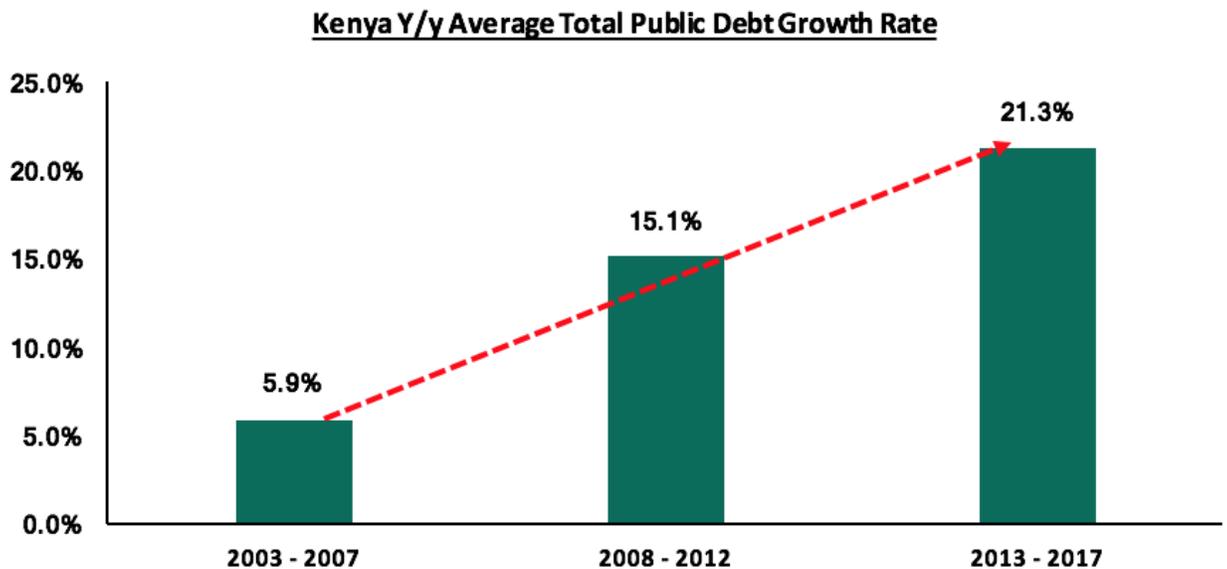


Figure 1. 1:Kenya Average Total Public Debt Growth Rate

Source: Kenya National Bureau Statistics (KNBS, 2017)

In the course of the years the government has embarked on infrastructural expenditure of projects likely to develop the country and to boost economic growth in the face of increasing government debt. This external debt has contributed to the expansion of the real estate sector in terms on infrastructural development like roads ,railways ,air and sea ports .For instance, key infrastructure facilities financed majorly through external debt have been constructed among them the Thika Super Highway, Mombasa Port Modernization, Lamu Port-South Sudan-Ethiopia-Transport (LAPSSSET) project and dredging, rehabilitation of airports and airstrips and rehabilitation and maintenance of key national and international trunk roads which tremendously influenced the rates of real estate development in Kenya (Anderson & Mwelu, 2013). Similarly, fiscal deficits, which currently stand at 7.9 percent of GDP, were reduced through both local and foreign borrowing, led to an increase of budget deficiencies in spite of the targets for the fiscal year 2020/21, which will reduce that deficit to 3.4 percent of GDP (Kaimenyi & Ndung'u, 2015). According to IMF/World Bank (2019) report on debt Sustainability analysis and international development association in Kenya, there has been a drop in the performance of real estate in Kenya which has been attributed to rising level of tax and interest rates by the government in order to raise revenue to service its ballooning public debts.

1.1.4 Urbanization and real estate investment

Urbanization is the growth in the proportion of a country's population living in urban centers (Sharmiladevi, 2018). Behera & Dash (2017) have defined urbanization as associated with a rise in urban populations due to social and economic changes or in

other words, a transition from rural to urban communities through migration from rural areas. From a demographic perspective, urban development level is measured according to the percentage of the urban population (Chao-Lin, 2003). In certain cases, urbanization is directly related to economic growth rates where industrialized countries have higher urbanization rates than in developing countries. The urbanization trend is only escalating and by 2030 there will be 96% of all urbanization in developing countries. The growing number of cities has an important connection with the growing worldwide number of megacities and municipalities (Daniel, 2013). In 1990, there were 10 megacities with a population of 153 million, and in 2014, 28 megacities of 453 million inhabitants, comprising of 12% of the world's urban population. The growth in the real estate sector has significantly contributed to urbanization throughout the world (Swerts & Denis, 2014). Asian megacities constitute 60 % of the global population in 2010 and the United Nations (2014) predicts that by 2030 there will be 41 metropolitan agglomerations or megacities. Since 1950 the global rural population has slowly grown and is expected to peak in a couple of years. According to UN (2014), the rural population now stands at around 3,4 billion, with a forecast decrease to 3,2 billion by 2050. This projection postulates that Urbanization affects the growth of real estate at major proportions as more infrastructural facilities such as roads, railways, airports and sea ports, will emerge in order to meet various needs of the growing population (Runde, 2015). Similarly housing units and other social amenities are likely to expand in order to provide essential services to the people. All these coupled together they tremendously expand the development of the real estate sector around the globe (Swerts& Denis, 2014).

Between 1970 and 2010, Eastern Africa urban population increased from 11,2 million to 77,2 million over the last 40 decades. During the same time, the urban proportion grew from 10 to 24 percent (UN-HABITAT & UNEP, 2009). The population for Kenya grew from 10.9 million in 1969 to 38.6 million in 2009, with annual intercensal average growth levels of 2,9% to 3.4%. The urban population as a share of the total population rose from 8.8% in 1960-70 to 20.9% in 2000–10 and is forecasted to be above 36% by 2030–2040 (KNBS 2014). Urban population grew at an average annual rate of more than 7.9% in the period 1970-80, with an annual aversion of around 4% over the period 2010 to 2040, and an annual average exchange rate of the urban percentage of around 3.3% in the 1960-70 period and an estimated average of 2% by 2040 (KNBS, 2014). The estimated yearly rate of urbanization change is the average cumulative rate of urban population growth in a single timeframe (UNDESA, 2010). In these, urbanization process has resulted to immense construction of social amenities, major infrastructural facilities among them the Thika Super Highway, Mombasa Port Modernization, Lamu Port-South Sudan-Ethiopia-Transport (LAPSSSET) project and dredging, rehabilitation of airports and airstrips and rehabilitation and maintenance of key national and international trunk roads which tremendously influenced the rates of real estate development in Kenya (Anderson & Mwelu, 2013).

1.2 Statement of the Problem

In order to formalize the real estate sector and to enable the construction of housing units that are modern, efficient and affordable to citizen in all social cadres, the government

needs to create policies and measures that positively affect the investors in this sector. To achieve this the government needs to partner with both local and foreign investors purposely to reduce the cost burden .Kenya has a 2.1 million-unit shortfall for small and medium-sized homes and almost 51% of residential households' lives in the slums. The state has not so far achieved its goal of officially increasing the supply of affordable housing to the citizens particularly those living in the slums. The initial target of the Kenya Vision 2030 medium-term plan (MTP I, 2009-2012) was to provide 200,000 housing units per annum at all income levels by 2012.However the outcome was dismal as only 3000 housing units were constructed the targeted 200,000 units. Similarly The fluctuations in the foreign direct investment inflows as a result of different economic and political situations in the country coupled with the recent surge in external borrowing to finance major development projects in the country has caused the debt to GDP ratio to rise posing a danger in debt sustainability of future generations and has also significantly affected the growth curve of real estate development in Kenya. In the coming generations, the problem of housing shortages will become more acute in Kenya as the rapid development and urbanization rates is not coupled with increasing development in the real estate sector .The state has identified affordable housing as a paramount pillar in the Big 4agenda geared towards transforming Kenya into a middle income economy. Therefore, this study seeks to help the government and the investors in solving this problem of inadequate housing by analysing the impact of foreign direct investment, external debt, and urbanization towards the realization of this agenda. It is apparent that many studies have been done on real estate investment in relation to macroeconomic variables like; GDP, exchange rate to name but a few. However, the studies have placed

little emphasis on foreign direct investment, external debt and the moderating effect of urbanization. Looking at these factors would fill the knowledge gap.

1.3 Objectives of the Study

The overall objective of the study was to examine the effect of macroeconomic aggregates in the development of real estate in Kenya from 2007 to 2017. Specifically, the study sought to:

- i. Examine the effect of foreign direct investment inflows on real estate investment in Kenya.
- ii. Determine the effect of external debt on real estate investment in Kenya.
- iii. Establish the long run relationship between foreign direct investment inflows and external debt on real estate investment in Kenya.
- iv. Find out the moderating effect of urbanization on the relationship between foreign direct investment inflows and external debt on real estate investment in Kenya.

1.4 Research Hypotheses

The study was guided by the following null hypotheses:

H₀₁: There is no statistically significant effect of foreign direct investment inflows on real estate investment in Kenya.

H₀₂: There is no statistically significant effect of external debt on real estate investment in Kenya.

H₀₃: There is no statistically significant long run relationship between foreign direct investment inflows and external debt on the real estate investment in Kenya.

H₀₄: There is no statistically significant moderating effect of urbanization on the relationship between foreign direct investments inflows and external debt on real estate investment in Kenya.

1.5 Significance of the Study

To other researchers and scholars, the outcomes of this research are fundamental source of literature material for future studies on economic development and some of the macro-economic factors that trigger the development of the real estate sector. This study will enable scholars identify other areas of further research through the suggestion for future researchers. Furthermore, the study findings are also valuable to both local and international investors by providing them with relevant information on some of the macro-economic indicators that may create an enabling environment for their investments in real estate. Finally, the Government of Kenya will find it useful especially in the development of policies and regulations to attract more investors in the real estate sector for economic prosperity and achievement of housing pillar in the big 4 agenda.

1.6. Scope of the Study

The study limits itself on macroeconomic determinants of real estate investment in Kenya for a period of 11 years starting from 2007 to 2017. The eleven years was good enough to cater for any structural changes that had occurred on the real estate sector. The choice of 2007 to 2017 for analysis was influenced by the fact that it was the time during which Kenya started experiencing tremendous structural breaks in the real estate sector. Kenya experienced post-election violence in 2007 that had huge effects on foreign direct investment inflows in the real estate sector and that is the reason for choosing 2007 as the starting period. Similarly many structural changes occurred in Kenya between 2007 and 2017 that had impact on real estate development in Kenya. Amongst them is the constitutional change in 2010 which guaranteed investors favorable business environment and government support through Public Private Partnership (PPP) agreements. The inception of Flagship projects including the Standard Gauge Railway (SGR) in (2013) Mombasa Port Modernization (2015) Lamu Port-South Sudan-Ethiopia-Transport (LAPSSET) project (March 2012), rehabilitation of airports and airstrips (2015) tremendously influenced the rates of real estate development. The study also sought to establish also how the 2017 general elections would influence the development of the real estate, FDI inflows and external borrowing. That is the reason for choosing 2017 as the end year. Lastly, updated data for the period under study was available hence giving accurate result for the study.

1.7 Limitations of the Study

The study relied on secondary data from numerous sources, Kenya National Bureau of Statistics (KNBS), World Bank, United Nation Conference Trade and Development (UNCTAD), Central Bank of Kenya (CBK) and Internal Monetary Fund (IMF).

Different sources gave contrasting data on the same variable. This posed a challenge in identifying the correct data. To ensure that the data obtained was reliable, the researcher through triangulation method chose internationally recognized sources, World Bank and KNBS. The data obtained were compared and found to agree.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Introduction

In this chapter, pertinent literature related to the study is reviewed. Section 2.2 deals with theories about concepts and relationships. The empirical literature pertaining to FDI, external debt and real estate is reviewed in section 2.3. Section 2.4 discusses the conceptual model showing the relationships between the study variables.

2.2 The Theoretical Literature

This study is anchored on Neo-classical theory of investment; Debt overhung theory and Modernization theory. These theories explain how Real estate investment is affected by FDI inflows, External debt, and Urbanization, respectively. These theories are further explained in the following sub-sections.

2.2.1 Neoclassical Theory of investment

Neoclassical theory of investment by Cockcroft and Riddell (1991) states that the inflow of investment into a country is guided by the factors such as macroeconomic policies and taxation and how these policies and factors affect a firm expected rate of return. The theory argues that FDI inflow increases the capital growth in an economy both directly and indirectly through research and development, technology transfers and introduction of new forms of human capital, growth in industries and the real estate investments.

When a country has in place suitable policies such as tax incentives, ease of obtaining licenses and starting businesses and improved infrastructure, Multi National Enterprises will be drawn to these countries leading to increased investment and employment in the host country (Cadman, 2015) .When employment rates of a country increase, the income per capita of the host country increases which means that more people will seek better living standards through better housing and other necessary social facilities such as better education ,recreation and health centers (Casson, 1990) These needs translates in the long run to increased investments in the real estate sector (Bloomstrom& Kokko 2003). Taking the example of Kenya, through the announcement of corporate tax deduction of 20 percent in 2013 from the previous 30 per cent in previous years for the developers who develop more than 1000 houses in a year (GoK, 2014), foreign real estate developers were drawn into the country in attempt to capitalize on the tax incentives and promising real estate sector which led to a boom in the construction and real estate sector. According to Real Estate Report by Cytonn Investment (2013) of the third quarter of 2013, the highest growth in different sectors of the economy was reported by construction and Real sector at 14.1% ahead of agriculture which reported 7.1% and financial service which reported 10.1%. Additionally, as these firms expand their operations into the host country, they bring along new ways of doing business like the income real estate investment by Stanlib in the case of Kenya which local firms such as NSSF are considering imitating following its success (Masron & Nor , 2016).Kenya has an open and active relationship with their external foreign investors and therefore using concepts of Neo classical theory of investment, the study will bring out the role that Foreign Direct Investment Inflows is playing in influencing the rates of real estate development in Kenya.

2.2.2 Debt –Overhung Theory

According to Krugman (1988), debt overhang model postulates that if a prospective debt is more likely than the repayment capacity of the country, expected debt-service costs are likely to diminish further domestic and foreign investment because the expected return on productive investment projects is very low, which is a major share of economic support. This will ultimately decrease domestic and foreign investment and thus reduce economic growth (Wamboye, 2012). This argument is represented in the debt "Laffer curve" in Figure 2 below, which demonstrate how larger debt stocks tend to be associated with lower probabilities of debt repayment.

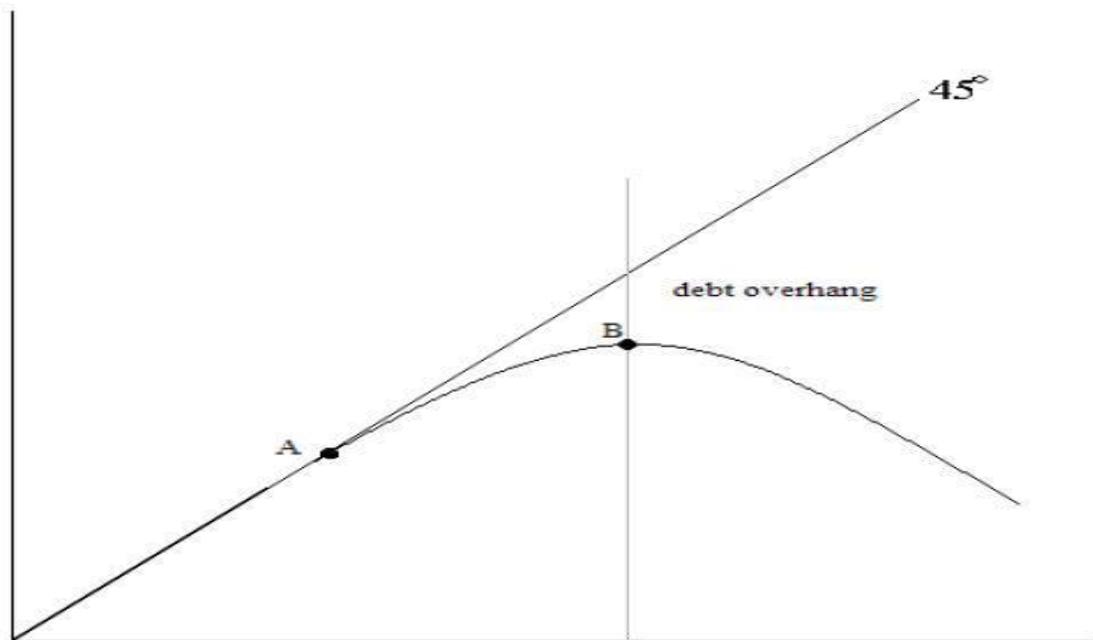


Figure 2. 1: Debt Laffer curve

Source: IMF Quarterly Magazine – Finance & Development (2013)

The increase in debt factor, which is upward or "good" in the curve, is linked with an exponential rise in expected debt refund, while the increase in debt reduces expected debt repayment in the downside or downward side of the curve. In his research in Ethiopia on external debt and economic growth Jonse G. Leta (2002) noted that a proper use of external loans would lead to both structural and industrial development economic growth. Likewise, Krugman (1988) notes that if a certain likelihood exists for potential debt to be greater than that of the country, the projected cost of debt servicing would prevent further domestic and foreign investment, as the anticipated return on successful investment projects would be very small to sustain the economy. This will eventually discourage further domestic and foreign investment (Kiprotich ,2015).

This study finds relevance in debt overhung theory in its focus to describe and explain the effects of external debt on the growth of different economic sectors such as the real estate sector. The theory is instrumental to this study in identifying connections that exist between the ability of the country to repay its debts and the effects it has on external investment in the real estate sector.

2.2.3 Modernization Theory

The theory asserts that urbanization results from the introduction of new things and innovations within the society through industrialization, real estate development, technological application, information penetration and cultural diffusion (Smith, 2006). Considering urbanization through the lens of modernization, first, it is common to see elements of modernization (new things) in every society that has moved from the

primitive era (Stone Age) to a new or modern pattern of doing things (Sahu, 2013). The present state of urbanization and development in the world today cannot be separated from its initial state at the onset of modernization .Thus, the application of technology is seen as the main driving force of urbanization in the society today (Sharmiladevi, 2018).According to Behera &Dash (2017) Urbanization has been the driving force for real estate development around the world. This study finds relevance in modernization theory as it describe and explain the origin of urbanization which is linked to industrialization, real estate development and technological transfers .The theory is instrumental to this study in identifying connections that exist between urbanization in relation to the growth of real estate sector in Kenya and how specifically urbanization affects Foreign Direct Investment Inflows in Kenya.

2.3 Empirical Literature Review

There are a number of prior empirical researches, which analyzed Real Estate investments in different countries and used a wide variety of estimation methodologies utilizing different potential determinants variables. This research focused on previous studies in which external debt and FDI were considered as explanatory variables in the Real Estate investments

2.3.1 FDI and Real Estate investments

The effect of FDI on regional economic growth in Spain was evaluated by Bajo-Rubio et al . (2010). Their results support the important role played by FDI as a vehicle of transferring technology, and its connection with productivity growth, based on data for

17 Spanish regions from 1987 to 2000. Woo (2009) studied Japan from 1970-2000 the FDI's effect on overall productivity factor (TFP) growth. The results showed that the FDI's TFP growth in Japan is having a positive and direct impact. The longitudinal approach was employed in the above study does not vividly bring out the FDI impact on individual economic segments of a country. This study intends to analyze how FDI in particular has contributed to the investment of real estate sector in Kenya within 10 years (2007-2017) using time series data as opposed to panel data used in the previous study.

Alfaro (2004) Using cross-country data, between 1975 and 1995, shows that FDI is only currently in well-developed financial markets playing a significant role in contributing to South Africa's economic growth. Baharumshah and Almasaied (2009) also concluded that, in the presence of well-educated human resources and developed financial markets, FDI had a positive and substantial impact on economic development. The above studies have assessed the impact of FDI on economic growth and macroeconomic determinants using panel data which does not depict the true picture of an individual country as most of the recommendations and conclusions are generalized. This study used the quarterly time series data for the period under study in order to clearly depict the Kenyan scenario.

Huang et al . (2014) examined whether or not FDI influxes have an important impact on real estate prices in Shanghai, China's openest and fastest-growing city. This study used the Autoregressive Distributed Lag (ARDL) approach to cointegration monthly data for Shanghai from 2003 to 2010. The principal conclusion is that the FDI property in

Shanghai has no significant effect on real estate prices, housing prices as well as office prices, in the short term. It affects the office price of Shanghai only on the long term. Therefore, that study concluded that real estate FDI is a scapegoat even though many people and the media treat it as a culprit and believe that it is responsible for the surges in housing and office prices in Shanghai. However, despite the findings in that study, the author used real estate as a percentage of GDP as explanatory variable and FDI as the explained variable. Similarly the study used OLS method and the Autoregressive Distributed Lag (ARDL) approach to cointegration which only captures the short run causality. This current study used the used Vector error correction model (VECM) which captures both the long run and short run causalities. More so, the study was done in China and therefore the need to do it in Kenya.

Everlyne (2016) sought to establish the effect of FDI on the performance of the real estate sector in Kenya. The study adopted a descriptive research design where secondary data was used and the analysis was done using SPSS software. The study used both descriptive and inferential statistics to analyse the collected data. Inflation and interest rates were used as controlling variables. The study concluded that foreign direct investment had a positive effect on the performance of the real estate sector while inflation and interest rates were established to have a negative effect on the performance of real estate sector. Test of significance at p-value of 0.004 and F test value of 6.89 with a confidence level of 0.05 indicated that multiple regression model was significant in explaining the relationship between FDI and investments in the real estate sector in Kenya. The study recommended that national government ought to create a conducive

environment to encourage more investments in the Kenyan Real estate Sector from both local and foreign investors. Despite the findings in that study, the researcher used both primary and secondary data which may not give accurate results as the data are sourced from very different sources. Similarly, the study focused on the effects of FDI, inflation and interest rates on real estate performance. To the contrary, this study adopted analytical research design using secondary data from world bank and Kenya national bureau of statistics which gives similar data when compared .In addition this study sought to establish the effects of foreign direct investment inflows, external debt and urbanization on the investments in the real estate sector in Kenya with Urbanization as the moderating variable.

Salome (2016) examined the effect of foreign direct investment on the growth of real estate in Kenya. The study adopted a descriptive research design. For that study, the target population consisted of the 80 real estate companies in Kenya. The study purposively selected one finance manager from each of the 80 Real estate companies in Kenya. Both primary and secondary data were used for analysis. Primary data collection involved self-administration of a questionnaire. Quantitative data was analysed using descriptive analysis like frequency, mean, percentages and standard deviation, using SPSS as a tool for the analysis. Content analysis was used in analysing qualitative data. Here the opinion of the respondent was presented in a prose form. From the regression analysis, the study found out that foreign direct investment positively influences growth of the real estate's sector in the country. The study recommended that the government should enhance implementation of the various policies that will attract foreign direct

investment in Kenya which will be of benefit on the real estate progress in the Kenyan industry to a great extent. However, that study did not use the VECM method to depict the long run and the short run causalities in the real estate. In contrary this study brings out the long run and the short run causality in the real estate investment with the use of the VECM method and employed analytical research design as opposed to descriptive research design in that previous study.

2.3.2 External debt and Real Estate Investment

According to Chinedu Okonkwo (2013) who used data from 1970 to 2007 on selected West African states and using the Granger Causality Error Correction Model found out that external debt had specific effects in the real estate sector in different countries due to structural differences and appears to have significant immediate impacts. Although few studies have attempted to investigate external debt-growth relationships using a non-linear model, some have found the relationship to be insignificant, such as Adegbite et al (2008) for Nigeria and Schclarek (2004) for both developing and developed countries. However, the study findings in the above two similar study are different. This raises concern about the Kenya situation hence this study investigated how external debt specifically affects real estate development as a unit of economic growth in Kenya. This study contributes a body of knowledge to the already existing research on this topic.

Ezeabasili (2011), using Nigerian External Debt Causality Tests from Granger, found that the link is adverse between economic growth and Nigeria 's current extent of external debt. Furthermore, the Pairwise Granger Causality Test has shown that there is

a uni-direct causality between international debt service payments and 10% economic growth. In addition, Granger's economic growth was found to have a 1% importance of external debt service payment. However, the above study employed non-linear models to depict the relationship between the variables which does not consider the long run relationship between the study variables and only focused on effects of external growth on economic growth in general. In contrast, this study used the Vector Error Correction Model (VECM) to depict the long run causality in the real estate development in Kenya and focused on the effects of external debt on the real estate development as an individual unit in the general economic growth in Kenya.

According to Kamau B. (2006), using a simultaneous equation models, finds a negative relationship between debt-servicing and economic growth rate. Ndungu P. (2002) in his study finds that there exists a "crowding out" effects (effects of huge external debt stock) although the study failed to confirm the presence of debt "overhang" effects (effects of external debt service payments) on Private investment in Kenya. Similarly, Kuria K.B. (2001), using linear and quadratic models, finds that external debt has negative impact on economic growth. The study finding generalizes the impact of external debt on the economic growth without pointing out how it affects individual units in the economy and how they contribute to the growth of the economy. This current study expounded clearly how External debt affects real estate in particular as a unit in economic growth using a time series data and analytical research design.

Were(2001) used a regression and Granger causality models to identify the relationship between Kenya's External debt, debt service, economic growth and investment, she found out that external debt accumulation has a negative impact on economic growth

and private investment which confirmed the existence of Debt overhang in Kenya at that time. In addition, the study posits that Debt servicing does not appear to affect growth adversely but has some crowding-out effects on private investment. Despite the findings, the researcher did not consider the moderation effects of technology, globalization or urbanization which affects the relationship between external debt and economic growth. This study incorporates the moderation effects of urbanization between the selected dependent and independent variables of the study.

2.3.3 Urbanization on Real estate investment, FDI and External debt-growth

Ji-Zeng (2013) used time series from 1984-2010 in Jiangxi, conducted co-integration and causality tests in Granger, analyzing the relationship between 3 indicators (FDI, urban prices, industrial and real estate structure) and their influencing factors using a simultaneous equation model. It concluded that: first, the major means of urbanization is industrialization; second, the size of the market, and market openness is the principal cause of attracting FDIs; third, urbanisation is reverse in FDIs. Similarly, Xiu-Yu and Hong-Quan (2009) used panel unit root test, co-integration and error correction models in FDI relations with urbanization of Guangdong Province, the result shows a reciprocal relationship of causation between FDI and urbanization in the long term, but FDI is not a factor of urbanization in the short term. The study focuses on China as an developed country and, thus, on the effect of urbanisation on the production of properties in Kenya and the effects on the FDI inflows and the growth of external debt.

The Japanese FDI (1978-2011), urbanization rates and economic growth in the context of the VAR models, were analyzed by Lin Ji and Lai-Ke (2013). The study showed that there is a long-term equilibrium relationship between FDI, urbanization and economic growth in real estate development . The study found that FDI is a major cause of economic growth and can successfully encourage real estate development, but economic growth is not the cause of FDI. The study also found that economic growth increases the degree of urban development. Similarly, urbanization has been shown to have a negative impact on economic growth in the short term, but has had a positive impact on economic growth in the long term. Premised on the timing data of the Jiangxi Province from 1984 to 2010, Ji-Zeng (2013) considered industrialization to be the primary means of promoting urbanization; market size and market openness are the main reason for attracting FDI; promoting urbanization on FDI inflows has a reverse effect; the original power of economic growth is urbanization and regional investment.

Daniel (2007) examined the relation between urbanization and economic growth in 28 least-developed countries between 1950-2000, using co-integration and causality tests, and found that urbanization and property development have long-lasting and stable links. Granger's causality tests indicate that Granger's urbanization produces immovable development for developing countries, while developed countries do the opposite. The causal link between the two variables therefore depends on the status of a country's economic growth. The study used panel data which may not clearly bring out the situation on individual countries hence the need to investigate the impact of urbanization

on the real estate development of an individual nation such as Kenya which has been the motivation for this study.

Abdel Rahman et al . (2006) stated, however, that the connection between urbanisation and economic growth in Kenya was not straightforward. The per capita per capita revenue of urbanization is not immediately increased, and the effectiveness of the urbanizing cycle to induce economic growth depends on eliminating obstacles to rural urban migration, support policies, market facilitation and infrastructural investment (Turok and McGranahan, 2013). The study however exhibits different findings from the other studies in other parts of the continent hence the need to thoroughly investigate the effects of urbanization on FDI inflows and external debt in influencing the growth of the real estate sector in Kenya.

2.4. Summary of Research Gaps

The study reviewed the research from other scholars and the following gaps which emerged from the reviewed studies were addressed. The table 2.1 below shows a summary of the identified research gaps.

Table 2. 1: Summary Table of the Empirical Review Gap

Author/Year	Topic/Research Question	Research Design	Research Findings	Critique/Research gaps
Salome (2016)	The effect of foreign direct investment on the growth of real estate in Kenya.	- secondary data -Regression analysis -Descriptive	$P > t = 0.000$ 1 unit change in FDI = 0.895 unit change in Real estate	-Did not consider a moderating variable -No structural breaks

		research design	growth, -, a buoyancy of 0.252 an elasticity of 0.309	
Ezeabasili (2011)	“Relationship between economic growth and the present level of external debt in Nigeria ”	-Cross – sectional -Secondary data -Regression analysis	-there exists a negative between external debt and economic growth- - $P > t = 0.002$ -external debt service Granger cause economic growth at 1 % level of significance	-Did not consider the long run relationship between the study variables -employed non-linear models to -Not focused on economic growth of individual economic units such as real estate sector.
Were M. (2001)	“Relationship between Kenya’s External debt, debt service and economic growth in terms of real estate development”.	-Cointegration and granger- causality test analysis -Cross –sectional Regression	-Existence of Debt overhang in Kenya during time under study. external debt accumulation has a negative impact on economic - (1%) change in External debt causes a decline of -0.019 (-1.9%) economic growth	- the researcher did not consider the moderation effects of technology, globalization and urbanization which affects the relationship between external debt and economic growth

Continuation of Table 2.1: Summary of the empirical review gap

Author/Year	Topic/Research Question	Research Design	Research Findings	Critique/Research gaps
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Alfaro (2004)	The role FDI in economic growth of South Africa. 'How does foreign direct investment affect economic growth in South Africa'	-Cross-sectional -secondary data -. Ordinary Least Square technique	- FDI inflows has positive impact on economic growth in South Africa - $P > t = 0.000$ -(1%) change in FDI inflows causes a 1.4% change in economic growth	-did not consider other factors that influence the decision on where to invest a foreign which includes real estate development business taxation, exchange rates and urbanization - Not focused on how FDI inflows affects Real estate development
Ji-Zeng (2013)	'The relationship between FDI, urbanization rate, industrial and real estate structure in China	co-integration test and Granger causality test -Fully modified ordinary least squares (FMOLS) - Panel data	- the driving force of real estate development is the urbanization $P > t = 0.001$ 1 unit change in URB = 1.895 unit change in Real estate growth	- China which is a developed nation hence the need to investigate the effect of urbanization on real estate development in Kenya -Panel data give generalized information -Recommendations not tailored to meet the needs of the least developed countries

Source: Author (2020)

2.5. Conceptual Framework

This is an analysis tool with various contexts and variations. It is used to separate concepts and to organize ideas. Strong conceptual frameworks capture something real

and do it in an easy way. The developed conceptual model of this study as shown in figure 2.2 portrays the expected relationship between the study variables.

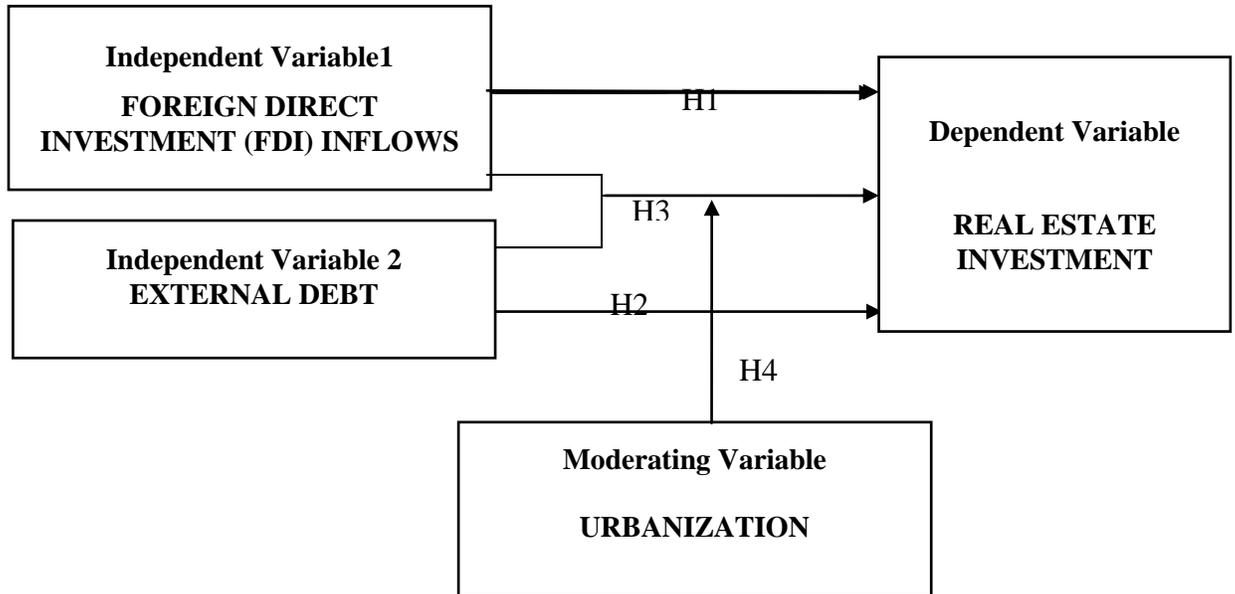


Figure 2. 2: Conceptual Framework

Source: Author (2020)

The conceptual framework above shows how the moderator and the independent variables interact to influence the dependent variable. Independent variables either influence the dependent variable in a positive or negative way. Meaning that, the variance of a dependent variable is accounted for by the independent variables therefore, giving a causal relationship between the two variables. Foreign Direct Investment (FDI) inflows and External debt are independent variables influencing Real estate investment which is a dependent variable. Urbanization is the moderating variable enhancing or hindering the relationships between the mentioned independent variables (Foreign Direct Investment inflows and external debt) and dependent variable (Real estate investment).

H1 portrays the effect of FDI inflows on Real estate investment, H2 shows the effect of external debt on real estate investment. H3 shows the long run effect FDI inflows and external debt on real estate investment. Similarly H4 shows the moderating effect of urbanization on the relationship between FDI and external debt on real estate investment.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodological base that was employed in this study. Specifically, the following were addressed; Research design, study area, data collection methods and the data analytical techniques which include model specification and diagnostic tests.

3.2 Research Design

According to Burns and Grove (2013) research design is “a set of methods and procedures used in setting and analyzing measures of variables as specified in the problem of research”. A design of a study defines the study type, research problem, methods of data collection and statistical analysis (Polit, 2017). This study used the analytical research design. Vector Error Correction Model (VECM), regression and correlation methods were employed to analyze the quarterly time series data captured over ten period (2007-2017) under study. Granger causality test was then used to test causality relationship between Real estate development and the macroeconomic aggregates under study. This research design provided empirical evidence suggesting two or more variables were related and also the direction of relationship (Burns & Groove, 2013). Similarly the analytical research design was used in order to gain a better understanding and a more insightful interpretation of the results.

3.3. Study Area

The study was conducted in Kenya located approximately between latitudes 5°N and 4.5°S, and Longitude 34°E and 42°E. Kenya has a total area of 582646Km² of which 2.3% of the total area is occupied by water surface and it is the largest economy in East Africa. The practical considerations that dictated the choice of the study area are as follows; firstly, there are few comparable studies and inadequate information concerning the effect of foreign direct investment and external debts on real estate investment in Kenya. Secondly, Kenya's economy is one of the largest and fastest growing economies in the East African region and geographically stands at a very strategic location in the region. It serves five landlocked countries that are relatively resource-rich (Ethiopia, South Sudan, Uganda, Rwanda, and Burundi) hence the need to investigate how its real estate sector is affected by foreign direct investments and the external debt because Its comparative advantage depends on the improvement of its port facilities, road and railway networks, and transit airports as trade routes for these five countries (Kimenyi and Ndung'u, 2015).

3.4 Data collection methods

Data for this study were exclusively collected from secondary sources. The study used time series data from Kenya National Bureau of Statistics (KNBS) publications as well as economic surveys and World Bank website. FDI which is a net flow of investment measured as a percentage of GDP was obtained from UNCTAD and World Bank data bases for the period 2007 to 2017 and World Bank website. External debt and real estate

investment data was sourced from published economic surveys by KNBS. Data on urbanization was collected from World Bank website and KNBS data base, both were collected for every year from 2007 - 2017.

3.5 Analytical Techniques

According to Cox and Hassard (2010) data analysis technique is the process through which a researcher summarizes raw data in a way that makes sense and meaning. The study data which were quantitative in nature were analyzed using descriptive as well as inferential statistics. Descriptive statistics included frequency distributions, mean, standard deviation and percentages. Inferential statistics included the estimation of multivariate regression analysis. The inferential statistics were used to evaluate the relationship between the FDI, External debt and real estate. Data was analyzed by use of statistical software known as E-views (version 10) and STATA. These two software were chosen because they have the ability to analyze time series data.

3.5.1 Economic Model Specification

The study adopted a stochastic model as shown in equation 3.2 below. Real estate investment is influenced by variation of capital stock and output in the country. Economic theory and literature review analyzed established that real estate was affected by real exchange rate, inflation, institutional quality, tax rate, gross domestic product, political stability and labor costs, trade balance, GDP growth rate, wage rate, urbanization and incentives by the government to attract real estate investments.

However, this study has introduced FDI and External debt as new factors and used the most recent data.

The model was modified as;

$$RES_t = f(FDI_t, EXD_t) \dots \dots \dots 3.1$$

In expansion equation 3.1 becomes

$$RES_t = \beta_0 + \beta_1 FDI_t + \beta_2 EXD_t + \varepsilon_t \dots \dots \dots 3.2$$

Where, RES_t is the real estate, β_0 is the intercept, FDI_t is the foreign direct investment, EXD_t is the external debt, ε_t the stochastic error term, t is the time, β_1, β_2 , are the regression estimate parameters. Testing the moderation effect of urbanization on the relationship between foreign direct investment and real estate is illustrated by equation 3.3 whereas equation 3.4 illustrate the moderation effect of urbanization on the relationship between real estate and external debt. On the other hand equation 3.5 illustrates the moderation effect of urbanization on the relationship between FDI and external debt on the real estate development

$$RES_t = \beta_0 + \beta_1 FDI_t + \beta_2 EXD_t + \beta_3 URB_t + \beta_4 (FDI * URB)_t \dots \dots \dots 3.3$$

$$RES_t = \alpha_0 + \alpha_1 FDI_t + \alpha_2 EXD_t + \alpha_3 URB_t + \alpha_4 (EXD * URB)_t \dots \dots \dots 3.4$$

$$RES_t = \gamma_0 + \gamma_1 FDI_t + \gamma_2 EXD_t + \gamma_3 URB_t + \gamma_4 (FDI * URB) + \gamma_5 (EXD * URB) \dots 3.5$$

$$RES_t = \gamma_0 + \gamma_1 FDI_t + \gamma_2 EXD_t + \gamma_3 URB_t + \gamma_4 (FDI * URB) + \gamma_5 (EXD * URB) + \gamma_6 (FDI * EXD * URB) \dots \dots \dots 3.6$$

$\beta_2, \alpha_2, \gamma_3, \gamma_4, \gamma_5,$ and γ_6 measures the moderation effect of urbanization on the relationship between foreign direct, external debt on real estate.

This study used vector error correction estimation technique after testing for stationarity and cointegration. These pretests were undertaken to ensure that the coefficients are Best Linear Unbiased Estimators. Further, this model is flexible, easy, and successful to use in these series analysis and hence justification for its use (Greene, 2008).

3.5.2. Description and Measurement of the Variables

Table 3. 1: Description and Measurement of Variables

Variable	Description	Measurement	Prior-Expected Sign
Real estate	This is the growth of real estate investment	Annual capita investment in it as a percentage of GDP	+/-
FDI	These are net inflows of investments	As percentage of GDP	+/-
External Debt	This is the long-term debt owed to non-residents repayable in foreign currency, goods and services	As percentage of GDP	+/-
Urbanization	This is a process by which people leave the countryside to live in the cities	Measured by the ratio of urban population to the total population	+/-

Source: Author (2020)

3.5.3:Pre-Estimation Tests

In this section, descriptive statistics which includes the mean, minimum, maximum and standard deviation was discussed. Unit root tests, determination of the optimum lag length selection and Johansen test for cointegration test are also discussed.

3.5.3.1 Descriptive Statistics

Descriptive statistics were computed before estimation to have a general view of data summary and also to remove outliers in the data before carrying out analysis (Wigginton, and Abecasis, 2005).

3.5.3.2 Unit Root Tests

Time series data are trending in nature and therefore prior to undertaking estimation the trending effect must be removed. The conventional way of de-trending a non-stationary time series separates the trending from the cyclical component and removes the unit root (Wasal and Saunders 2000). Stationarity refers to a case where the mean of the data is time independent. Unit root test was thus used to detect non stationarity in all the variables. Testing for stationarity or non-stationarity on the study data was an important factor because it could influence the behavior of variables Ansari *et al.*, (2011).

3.5.3.3. Augmented Dickey-Fuller

The Augmented Dickey-Fuller test was used to check for stationarity (integration of order 1) or non -stationarity (integration of order 0) of the variables. The Augmented

tests were applied because of its robustness. The hypotheses for Augmented Dicker Fuller test are:

H_0 : Series is non-stationary versus alternative hypothesis H_1 : Series is stationary

The null hypothesis is rejected if the time series data is integrated of order $I(0)$ and the alternative hypothesis is accepted. The null hypothesis of non-stationary is rejected if the ADF test statistic is greater than the Mac-Kinnon's critical values. Therefore, the decision is taken, and null hypothesis is rejected if the test statistic in absolute terms is greater than the critical value at different levels of significance as 1%, 5% and 10%. In this study the variables were found to be non-stationary at level therefore first difference was carried out to make them stationary.

3.5.3.4 Clemente-Montañés-Reyes Unit Root Test with Two Structural Breaks

Clemente-Montañés-Reyes (1998) unit root test was applied to check for unit root with structural breaks. This test had the following representation of the null hypothesis that is, H_0 and alternative hypothesis that is H_1 .

$$H_0: Y_t = Y_{t-p} + \psi_1 DTB_{1t} + \psi_2 DTB_{2t} + \varepsilon_t \dots \dots \dots 3.7$$

$$H_1: Y_t = \mu + \omega_1 DU_{1t} + \omega_2 DTB_{2t} + \varepsilon_t \dots \dots \dots 3.8$$

In equation (3.7) and equation (3.8), DTB_{1t} is the pulse variable equivalent to 1 if $t = TB_i + 1$ and zero if otherwise. Moreover, $DU_{it} = 1$ if $TB_i < t (i = 1, 2, \dots)$ and if this assumption is violated then it is equal to zero. The modification of the mean is

represented by the time periods TB_1 and TB_2 . Further, it is simplified with the assumption that $TB_i = \psi_i T (i = 1, 2)$ where $1 > \psi > 0$ while $\psi_1 < \psi_2$ Clemente-Montañés-Reyes (1998).

3.5.3.5 Determining the Optimum Lag Length

Models that are used to determine economic relationship between macro-economic variables are sensitive to the number of lags (Greene, 2008). The first criterion that was used to determine the optimum number of lags was Akaike Information Criterion. The model chooses the maximum number of lags to minimize the following equation.

$$AIC_p = \ln \nu \sum_p^n + 2 \frac{M(p^2+1)}{M} \dots\dots\dots 3.9$$

Where; AIC is Akaike information criterion, M is the number of parameters in all the equations in the VAR model.

The second method of obtaining the optimum number of lags in the model was Schwarz Bayesian Information Criterion and takes the following form of equation as proposed by Schwarz (1978).

$$SBIC = \ln \nu \sum_p^n + (lnT) \frac{M(p^2+1)}{T} \dots\dots\dots 3.10$$

In this case SBIC is Schwarz Bayesian Information criterion, M is the number of parameters in the model.

The third criterion applied was Hanan-Quinn Information Criterion (HQIC) which chooses to minimize the following form of equation;

$$HQIC = 2\ln[ln[n]]k - 2\ln[L_{max}] \dots\dots\dots 3.11$$

The last criterion applied was Final Prediction Error (FPE) and it minimizes the following form of equation;

$$FPE = \left(\frac{T+M_p+1}{T-M_p-1} \right)^m \vee \dots \dots \dots 3.12$$

The model form for single series that was used in each of the above information criteria is as follows:

$$IC_{(p)} = \left(\frac{\varepsilon_t' \varepsilon_t}{T-p-K^1} \right) + (p + K) \left(\frac{A^T}{T-p-K^1} \right) \dots \dots \dots 3.13$$

The model form for multivariate series for each specification above was as follows:

$$IC_{(p)} = \log \left(\frac{1}{T} \sum_{t=1}^T \varepsilon_t \varepsilon_t' \right) + (KM^2 + M) \cdot \frac{c(T)}{T} \dots \dots \dots 3.14$$

3.5.3.6 Co-integration Test

Co-integration in time series analysis is described as the existence of long-term relationship between economic variables. The study utilized Johansen – Juselius to test for co-integration to test for long run relationship between the dependent variable and the independent variables. This is justified by the fact that it solves the problem of losing information through de-trending and differencing according to Odedokun (1993). However, Johansen test for co-integration heavily relies on asymptotic properties and results from small samples are hardly understood.

Johansen test for co-integration takes the following form;

$$y_t = \mu + Ay_{t-1} + \dots + A_p + y_{t-1} + \varepsilon_t \dots \dots \dots 3.15$$

In this case y_t is $n \times 1$ vector of variables that I (I and ε_t is error term at time t ,

Co-integration test has the null hypothesis that the trace statistic that the number of co-integrating vectors $r = r * k$ while the alternative hypothesis is that $r = k$ in null

hypothesis, the maximum eigen value test is as for trace test and the alternative hypothesis is given as $r = r * +1$ according to Hanninen (2012).

3.5.3.7 Vector Error Correction (VEC) Model

Given a VAR (p) of X_t 's (ignoring the constants)

$$X_t = \varphi_1 X_{t-1} + \dots + \varphi_p X_{t-p} + \text{valignl} \dots \dots \dots 3.16$$

There always exists an error correction representation of the form

$$X_t = X_{t-1} + \Delta X_t \dots \dots \dots 3.17$$

$$\Delta X_t = \Pi X_{t-1} + \sum_{i=1}^{p-1} \Delta X_{t-i} + \varepsilon_t \dots \dots \dots 3.18$$

Where Π and are the functions of the φ 's

$$\varphi_j^1 = -\sum_{i=j+1}^p \varphi_i, \text{ where } j = 1, \dots, p-1$$

$$\Pi = -(I - \varphi_1 - \varphi_p) = -\varphi(1) \text{ Where } I \text{ is the identity matrix}$$

If $\Pi = 0$, then there is no Co-integration. Non stationarity of $I(1)$ type vanishes by taking difference

If Π has full rank, k , then X_t becomes stationary $I(1)$. The long run relationship in the equation 3.18 can be obtained by setting $\Delta X = 0$. The equation $\Pi X^1 = 0$ can be written as:

$\Pi X^1 = \alpha(\beta' X^1) = 0$. In the case $0 < \text{Rank}(\Pi) = \text{Rank}(\alpha) = m < k$ the number of equations of this system of linear equations which are different from zero is m

$$\beta' X^1 = 0$$

The long run relation does not hold in (t-1). There is some deviation, an error

$\beta' X_{t-1} = \varepsilon_{t-1} \neq 0$. The adjustment coefficients in α multiplied by the errors $\beta' X_{t-1}$ induces adjustment. They determine ΔX_t , so that the X_t 's move in the correct direction in order to bring the system back to equilibrium.

3.5.4 Testing for OLS assumptions

The following diagnostic tests were carried out; Jarque-Bera test for normality, auto-correlation test, test for Multicollinearity, test for heteroscedasticity and model stability condition.

3.5.4.1 Jarque-Bera Test for Normality

Jarque and Bera (1987) have proposed a test for normality based on the skewness and kurtosis of a distribution. The test Jarque-Bera test was used to check the pair of hypotheses; H_0 : E the test statistic that was used is as follows;

$$JB = \frac{T}{6} \dots\dots\dots 3.19$$

Where T is the number of observations and JB is Jarque-Bera.

This statistic has an asymptotic $\chi^2(2)$ distribution if the null hypothesis is correct (Jarque and Bera (1987)).

3.5.4.2 Auto-correlation Test

Auto-Correlation means a case in which the mistake term has to do with its previous value. However, the presence of autocorrelation does not affect the impartiality of estimates but makes it inapplicable to test hypotheses. Most of the time series data show auto-correlation. The reason for this is that such data take on a certain trend with changes in time. The impartiality, linearity and asymptotic character of the estimators do

not affect autocorrelation. The only problem is that it violates the Ordinary Least Square (OLS) Best property, which results in a mistaken hypothesis testing. Breusch Godfrey 's test was used in this study to check for the serial correlation of data experience (Gujarati, 2004). In time series analysis, serial correlation is a frequent problem. Different factors, such as an omitted variable or the wrong functional form, may produce residues that interrelate. The problem is solved by improved model specification in the event of a serial correlation (Kleiber et al., (2008), Asteriou et al . , (2011).

3.5.4.3 Test of Multicollinearity

Multicollinearity is described as state of high inter-correlation among study variable under study. If the data has high Multicollinearity the statistical inference made may not be reliable Lauren's (2018). Presence of Multicollinearity is observed through by observing of variation inflation factor (VIF) with the aid of tolerance factor and reciprocal. Multicollinearity may arise as a result of inclusion of a variable which is computed from other variable in a dataset during analysis. The estimated equation for VIF is given as;

$$VIF_k = 1/(1 - R_k^2).....3.20$$

Where VIF_k the variance inflation is factor for variable k , and R_k^2 is the coefficient of multiple determinations for variables. The decision rule is that if the VIF values is less than 10 it is concluded that there is no Multicollinearity whilst if the VIF factor is more than 10 then it is concluded than there is presence of Multicollinearity (O'Brien, 2007).

3.5.4.4 Model Stability Condition

Model stability condition is an important feature of the *VAR* models. For a model with r cointegrating relationships, the companion matrix has $K - r$ unit eigenvalues (Lutkepohl, 2005; Lutkepohl and Kratzik, 2004). For stability, the moduli of the remaining eigenvalues should be strictly less than unity and lie inside a unit circle (Lutkepohl, 2005).

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of descriptive statistics and inferential statistical analysis. The analysis examines the link that exists between Real estate investment in Kenya and the selected macroeconomic variables of the study (Foreign Direct Investment FDI and the external debt with urbanization as the moderating variable). The results are reported in sections beginning with Preliminary data findings of the descriptive statistics and correlation analysis to complex time series data analysis such as Unit root tests, Optimum lag length, Johansen test for cointegration, Vector error correction model and regression analysis. Lastly Tests for Moderating effect of urbanization and the diagnostic tests performed.

4.2 Descriptive Statistics

The study determined the descriptive nature of the data in order to check the presence of outliers. Various statistical measures namely; mean, standard deviation, minima and maxima values were used to describe the data. Mean is used to locate the center of the relative frequency distribution while the standard deviation measures the spread of a set of observations. The results presented in table 4.1 shows that Real estate investment (RES) and the Foreign Direct Investment (FDI) had a mean of (6.7636) and (1.3853) respectively. The respective standard deviations were (1.3103) and (1.0468).

Table 4. 1: Summary of Descriptive Statistics

Variable	Observation	Mean	Std. Dev	Min	Max
RES	44	6.7636	1.3103	4.35	8.59375
FDI	44	1.3853	1.0468	0.2663	3.77058
EXD	44	26.4	4.4742	21.4	37.8843
URB	44	24.42355	1.328426	22.27816	26.73556

Source: Researcher, (2020)

External debt measured as percentage of total debt had a mean of (26.4) and standard deviation of (4.4742). External debt was widely spread than other variables in the study as it registered the highest standard deviation of (4.4742) which indicated that majority of the values lie away from its mean value. The range of data, which is the difference between the maximum value and minimum value was a huge gap which demonstrates fluctuations in this economic variable. Urbanization as a percentage of the people living in urban area to the total population had a mean of 24.42 percent and a standard deviation of 1.32. This implies that approximately a quarter of Kenya’s population live in urban areas.

4.3 Correlation Matrix Analysis

The pair wise correlation done between dependent variable (Real Estate) and the explanatory variables (Foreign Direct Investment and external debt). Correlation

between Real Estate investment (RES) and itself is (1.000). Real estate investment had a positive and moderate relationship with foreign direct investment (0.5429) as shown in table 4.2. This is a clear indication that foreign investors seeking to invest in a country would preferably choose to invest more in real estate because of the high demand caused by population pressure.

Table 4. 2: Results for Correlation Matrix Test

Variable	RES	FDI	EXD	URB
RES	1.0000			
FDI	0.5429	1.0000		
EXD	-0.5105	-0.1650	1.0000	
URB	0.7009	-0.1147	0.9048	1.000

Source: Researcher, 2020

Real estate investment had a moderate negative relationship with external debt as shown by the coefficient value of -0.5105. This is because external loans from external lenders are likely to discourage investors because the government will tend to increase tax on land and other viable construction materials as it tends to increase the revenue in order to service its loans. The results further agree with the findings of Were (2001), Ezeabasili (2011) and Salome (2016) who found out that real estate had a positive and moderate relationship with FDI but negatively and moderately related with the external debt. Urbanization and real estate showed a strong positive correlation with coefficient of 0.7009.

4.4 Unit Root Tests

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

4.4.1 Dickey-Fuller Unit Root Test Results

Estimating time series variables that contain unit root leads to a spurious regression results. Using more than one-unit root test, Dickey-Fuller test was used in order to have consistency and efficiency (Gujarati, 2004).

Table 4. 3: Dickey-Fuller Unit Root Test

Number of observations = 42						
At Levels						
Variables	Z(t)	Prob > t	Critical values			Conclusion
			1%	5%	10%	
RES	-1.154	0.6930	-3.6280	-2.950	-2.6080	Unit root
FDI	-2.031	0.2731	-3.628	-2.950	-2.6080	Unit root
EXD	3.237	0.9989	-3.628	-2.950	-2.6080	Unit root
URB	62.268	1.0000	-3.628	-2.950	-2.6080	Unit root

Source: Researcher (2020)

Table 4.3 shows the results of the Augmented Dicker Fuller test. The null hypothesis for ADF test states that series have unit root against alternative hypothesis that the time series data are stationary. The variables exhibited unit root at levels, RES (p-value 0.6930 > 0.0500), FDI (p-value 0.2731 > 0.0500), EXD (p-value 0.9989 > 0.0500), and URB (p-value 1.0000 > 0.0500). This implied that the null hypothesis was accepted and the alternative hypothesis rejected. This showed that the variables contained unit root at levels. However, upon first difference, they all became stationary as shown by the probability values in the table 4.3.1. All the variables had (p-values < 0.0500.)

Table 4.3. 1Dickey Fuller Unit root test at first difference

Number of observations = 42						
First difference						
Variables	Z(t)	Prob > t	Critical values			Conclusion
			1%	5%	10%	
RES	-3.676	0.0045	-3.634	-2.952	-2.610	<i>I(1)</i>
FDI	-3.903	0.0147	-3.634	-2.952	-2.610	<i>I(1)</i>
EXD	-3.643	0.0281	-3.534	-2.952	-2.610	<i>I(1)</i>
URB	-6.027	0.0000	-3.641	-2.955	-2.611	<i>I(1)</i>

Source: (Author, 2020)

From table 4.3.1 it is evident that all the variables with (p-values < 0.0500) that the series were stationary at first difference denoted as *I(1)*. Therefore the null hypothesis of series having unit root was rejected in favor of alternative hypothesis that the series contain no unit root and it was therefore concluded that the series were stationary at first difference denoted as *I(1)*.

4.4.2 Clemente-Montañés-Reyes Unit-Root Test with Two Structural Breaks.

Clemente-Montañés-Reyes Unit-Root Test is used to show the structural breaks in a data set which indicates change in a particular trend caused by either calamity like earthquake, famine, disease outbreaks, war, and change in government policies or a certain government directives. (Perron, 2008) The table 4.4 below shows, the structural breaks that occur among the study variables within the period under study.

Table 4. 4: Clemente-Montañés-Reyes Unit-Root Test with Structural Breaks

Variables	Breaks	Coef	T-Stat	P-Value	OptimalBreak Point
RES	<i>D1</i>	1.30714	4.1010	0.0000	2010q3
	<i>D2</i>	1.23462	4.890	0.0000	2011q3
FDI	<i>D1</i>	2.05747	7.783	0.0000	2010q4
	<i>D2</i>	1.9216	-7.0940	0.0000	2013q2
EXD	<i>D1</i>	4.91923	7.2105	0.0000	2013q3
	<i>D2</i>	5.09000	6.633	0.0000	2015q3

Source: Researcher, 2020

D1&D2 represent the first and second structural breaks respectively.q1, q2, q3, q4 represent the quarters of the respective years. From the results in table 4.4, it is shown that Real estate had two significant structural breaks (2010q3 and 2011q3). In this case, Kenya had adopted a new constitution that guaranteed every citizen a right to accessible, adequate and affordable housing with reasonable standard of sanitation (Kenya Constitution, 2010).This resulted to increase in the number of housing units in Kenya as the government guaranteed to subsidies the prices of cement and other vital materials for

construction. (GoK, 2010). Similarly VAT on cement reduced as a strategy in attracting more investors in real estate sector .In addition Kenya partnered with international institutions such as World Bank and African Development bank to acquire loans to develop slum upgrading programs for instance, Kenya Informal Settlement Improvement Program (KISIP) and Kenya Slum Upgrading Program (KENSUP) in major towns (Anderson & Mwelu, 2013).

FDI had two significant structural breaks. The first structural break occurred in 2010q4 (p-value $0.000 < 0.0500$). According to the information by Government of Kenya (2011),this structural break was associated with the implementation of the first Medium Term Plan, 2008–12 and promulgation of the new constitution in 2010 that brought in more contractors from foreign nations in bid for construction of new government structures and housing units ,roads and other telecommunication structures . However, the second structural break experienced in 2013q2 which was also significant at 5 percent confidence interval (p-value $0.000 < 0.0500$) resulted to a drastic drop in the number of investors from within and abroad who were willing to invest in the real estate sector. This was as a result of uncertainties of the impending 2013 general elections. It was also observed that external debt (EXD) recorded a significant structural break in 2013q3 and 2015q3 (p-value $0.000 < 0.0500$). This Structural break is explained by huge government borrowing to finance key projects such as expansion of major trunk roads in all over the country, and construction of standard gauge railway (Anderson & Mwelu, 2013). Clemente-Montañés-Reyes Unit-Root Test with Two Structural Breaks Is graphically presented in figure 4.1.

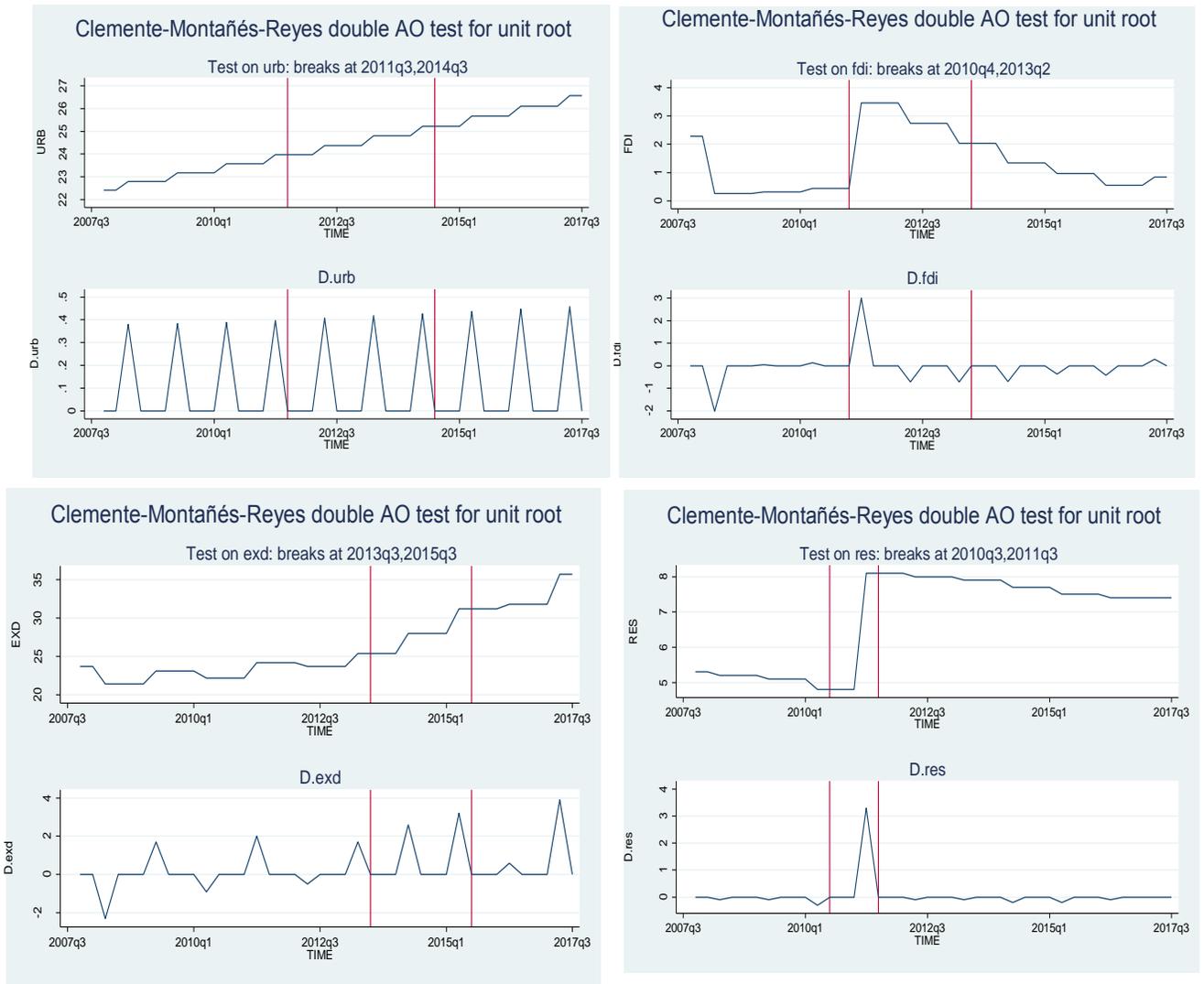


Figure 4. 1: Structural Breaks

Source: Author (2020)

The graphs above shows the structural breaks in the data set that occurred within the study period. Each data set has two graphs .The first graph represent the structural break before stationarity and the second graph shows the result after first differencing. For the real estate, the first structural break occurred in 2010q3 and 2011q3 as shown by the structural break lines on the graph. FDI had two structural breaks at 2010q4 and 2013q2. Similarly external debt experienced two structural at 2013q3 and 2015q3.These breaks

are as a result of major changes in the national policies and government directives as explained in the previous section.

4.5 Determination of Optimum Lag length

Before estimating Vector Autoregressive (VAR) or Vector Error Correction Model (VECM), it is important to identify lag length of unrestricted VAR order and VEC order. To tests for the number of tests for cointegration ranks or fit cointegrating in the VECM model lag length must be specified. Tsay (1984) and Paulsen (1984), Nielsen (2001) shows that several methods can be used to select lag length for a VAR model with stationary variables. From the output on table 4.5 the maximum number of lags used was four lags for this multivariate model because the Hannan–Quinn information criterion (HQIC) method, Schwarz Bayesian information criterion (SBIC) method, and sequential likelihood-ratio (LR) test all chose four lags, as indicated by the “*” in the output. This is according to (Winkelmann, 2008) that four lags should be selected when dealing with quarterly data.

Table 4. 5: Determination of Optimum Lag Length

Selection – order		Number of observations = 39						
Sample 6-44								
Lag	LL	LR	DF	P	FPE	AIC	HQIC	SBIC
0	535.304				0.0048	3.1771	3.2230	3.3510
1	603.181	135.75	16	0.000	1.2e-18	29.9067	-29.6006	29.0536
2	612.665	18.968	16	0.270	1.7e-18	-29.572	-29.0216	-28.037
3	617.312	9.2935	16	0.901	3.4e-18	-28.990	-28.1945	-26.7723
4	671.271	107.92*	16	0.0000	5.5e19*	-30.97*	29.8963*	-28.036*

Source: Author computation, 2020. (*Note* *- indicates lag order.)

Table 4.5 shows the estimation of lag length of various criteria used in lag length determination. Final prediction error (FPE), Akaike's Information Criterion (AIC), Schwarz's Bayesian information criterion (SBIC), and the Hannan and Quinn information criterion (HQIC) lag-order selection statistics for a series of vector auto regression of order. A sequence of likelihood-ratio test statistics for all the full VARs of order less than or equal to the highest lag order is also reported. FPE are more appropriate when observations are less than 60, the Hannan-Quin is preferred when the number of observations is more than 120 according to Liew (2004) and (Lutkepohl, 2005). It is important to determine the appropriate lag length in estimating the VAR and VECM model. Lutkepohl (1993) postulates that selecting a higher order lag increases the mean square variance of residuals. On the other hand, small lag order generates autocorrelation problem (Ozcicek, 1999).

In the post estimation the maximum lag and estimation options are based on the model just fit or the model specified in estimates. Nielsen (2001) postulates the lag-order selection statistics discussed here can be used in the presence of stationary variables. From the results in table 4.6, log likelihood ratio, Final Prediction Error, Akaike Information Criterion, Hanan-Quin Information Criterion, Schwartz Bayesian information Criterion indicated the lag order at 4 (as indicated by "*" in the table 4.5). This is in tandem with (Ozcicek, 1999) who argued that vector autoregressive (VAR) and Vector Error Correction Models (VECM) are estimated using symmetric lags, which is the same lag length, is used for all variables in all equations of the model. According

(Ozcicek, 1999) there is no economic justification that all criteria should indicate the same lag length.

4.6 Johansen's Cointegration Test

Two or more variables are said to co-integrate if they have a long run equilibrium or relationship between them (Gujarati 2004). Johansen's Cointegration Test was chosen because it is applicable where we have multivariate relationships as opposed to Engle-Granger technique that applies to bivariate relationships (Lutkepohl, 2005; Hamilton, 1994). Johansen's technique also has advantages over other cointegration methods because it does not suffer from a normalization problem and is robust to departures from normality (Nyongesa, 2013). Having established that the individual time series were integrated of order one, $I(1)$, it was necessary to carry out the Johansen Test for cointegration. It is a common phenomenon for economic variables to be cointegrated (direct long-run equilibrium relationship between economic variables). Johansen cointegration test procedure involve use of two test statistics, first, trace statistics and second, maximum Eigen value statistics as shown in the table below (Cameron and Trivedi, 2005). From the results presented in the table 4.6 below it was concluded that there exist three cointegrating equation. In the output above, the null hypothesis of no cointegration was strongly rejected in favor of the alternative hypothesis that there exists more than one cointegrating equation.

Table 4. 6: Result for the Johansen Test for Cointegration

Trend :constant			Number of observation = 42		
Sample: 3-44			lags = 4		
Maximum rank	Parms	LL	Eigenvalue	Trace Statistic	5%Critical alue
0	3	.56562044		31.9215	29.68
1	8	8.5769987	0.31716	15.8988	15.41
2	11	14.474664	0.24485	4.1035	3.76
3	12	16.526391	0.09308		

Source: Author (2020)

The results in table 4.6 shows the Johansen Test for cointegration. At the top of the table is the number of observations in the study period, the type of trend in the study data and the number of lags. Johansen's cointegration test involves use of test statistics, trace statistics and maximum Eigen value statistics (Cameron and Trivedi, 2005). At rank zero, it means there is no co-integration relationship and if the rank is more than one it means there is one co-integration equation. It is indicated that the trace statistic at maximum rank of 0 is (31.9215) which is greater than its critical value at 5% percent (31.9215 >29.68) and therefore at maximum lag of 0 the null hypothesis of no cointegration is rejected. At maximum rank of 1 the critical value is also less than trace statistic (15.8988 >15.41) and the null hypothesis of utmost one cointegration is rejected again. It was also found out that at maximum rank of 2 the critical value was less than its trace statistic (4.1035 >3.76) and the null hypothesis of no cointegration was rejected in favour of alternative hypothesis of atleast 3 cointegrating equation. It was therefore

concluded from Johansen test for cointegration that there is cointegration among the variables which implies long term association among the variables in the study.

4.7 Results from OLS assumptions tests

4.7.1 Normality Test

Normality test helps to determine how likely it is for a random variable underlying the data sets to be normally distributed. The study carried a skewness kurtosis test. Skewness is a measure of symmetry of the probability distribution of a random variable about its mean. It represents the amount and the direction of skew. On the other hand, kurtosis represents the height and of the central peak relative to that of the standard bell curve.

Table 4. 7: Test for Skewness and kurtosis

Equation	pr(skewness)	pr(kurtosis)	Adj.Chi2	Prob>chi2
D_res	0.2780	0.7654	2.63	0.0962
D_fdi	0.4374	0.1638	3.52	0.1941
D_exd	0.5116	0.8973	1.34	0.2623

Source: Author's Computation based on STATA 2020

From table 4.7 above it was established that the probability chi2 value of skewness and kurtosis were above 0.05 for all variables. This is an indication that the direction of

distribution of variables around their means was asymptotically normally distributed for both skewness and kurtosis of the data. Hence the null hypothesis H_0 - Data follows asymptotic normal distribution was accepted and the alternative hypothesis H_1 - Data does not follow asymptotic normal distribution was rejected.

4.7.2 Multicollinearity

To test for Multicollinearity, Variance Inflation Factors (VIF) was examined. For VIF values greater than 10, Multicollinearity is deemed to be present (Nachtsheim, 2004).

The VIF are calculated as shown below. Variance Inflation Factors

$VIF = 1/(1-R^2)$, Where VIF= variance inflation factor, R^2 = coefficient of determination

$1/VIF$ = tolerance, The VIF values are shown in table.

Table 4. 8: Test for Multicollinearity using Variance Inflation Factor

Variable	VIF	1/VIF
D foreign direct investment	1.61	0.633066
D external debt	1.61	0.665643
	1.62	

Source: Author (2020)

Multicollinearity results in table 4.8 above showed that there was no Multicollinearity between first difference of foreign direct investment and external debt. This is because all the variables had a VIF of less than 10.

4.7.3 Test for serial correlation /Auto correlation

Autocorrelation occurs in time series data when the error term occurring at one period crosses over into another period. It may also occur when the error term relating to any observation is influenced by the error term relating to any other observation. The error term in the linear regression requires that successive values of the error term be sequentially independent (Mukras, 1993). This study used Durbin Watson statistics test to check for the presence of autocorrelation. The Durbin Watson statistics was found to be (1.915158) which lie between 1.5 and 2.6 hence no presence of autocorrelation

4.7.4 Test for heteroscedasticity

Heteroscedasticity takes place when the variance of the error term keeps changing for all the values of independent variables. The error term can vary from one observation to another meaning the variance of error term is dependent on the magnitude of the independent variables. The unbiased character of the OLS estimator is not affected by the presence of heteroscedasticity though it renders it inefficient. This is because in small samples OLS estimator we will not have the minimum variance among the class of unbiased estimators and in large samples it will be asymptotically inefficient. This study used the Breusch-Pagan test to check for the presence of heteroscedasticity (Gujarati, 2012).

The result obtained is shown in table 4.9.

Table 4. 9 : Breusch- Pagan / Cook-Weisberg test for Heteroscedasticity

Chi 2 (1)	3.10
Prob > chi 2	0.0782
Ho: Constant variance	
Variables: fitted values of Dltxr	

Source: Author's Computation based on STATA 2020

Heteroscedasticity is checked by observing the Prob> chi 2 value. If it is less than 0.05 then the null hypothesis (H_0 - error variance are equal) is rejected and the alternative hypothesis (H_1 -error variance are multiplicative of one or more variables) is accepted. From the table 4.9 it can be observed that the Prob > chi 2 value is 0.0782 which is greater than 0.05 therefore indicating that heteroscedasticity is absent hence the null hypothesis is accepted and the alternative hypothesis is rejected.

4.7.5 Test of Model Stability

From the Eigen value in the table 4.10 below it is shown that the values lie inside the unit circle and it was concluded that the model is stable and is therefore suitable for analysis.

Table 4. 10: Test for Model Stability

Eigen value	Modulus
1	1
1	1
1	1
-0.994661i	0.994661
-0.495153i	0.495154
-0.262598i	0.262599
-0.170775i	0.170775
-0.045364i	0.045364

Source: Author's Computation based on STATA 2020

Thus, VECM generates stationary time series with time-invariant means, variances and covariance structure. In this study, model stability condition was carried out by use of Eigen stability values. The results in Tables 4.10 shows that the moduli of the eigenvalues are less than one and all fitted the unit circle. The stability condition of the model is confirmed by Figure 4.2 whose results indicate that no root lies outside the unit circle

4.7.6 Model Stability Test by Use Graph Method

Similarly, Figure 4.2 shows that all the values lie inside the circle and this confirms that indeed the model used for analysis was stable

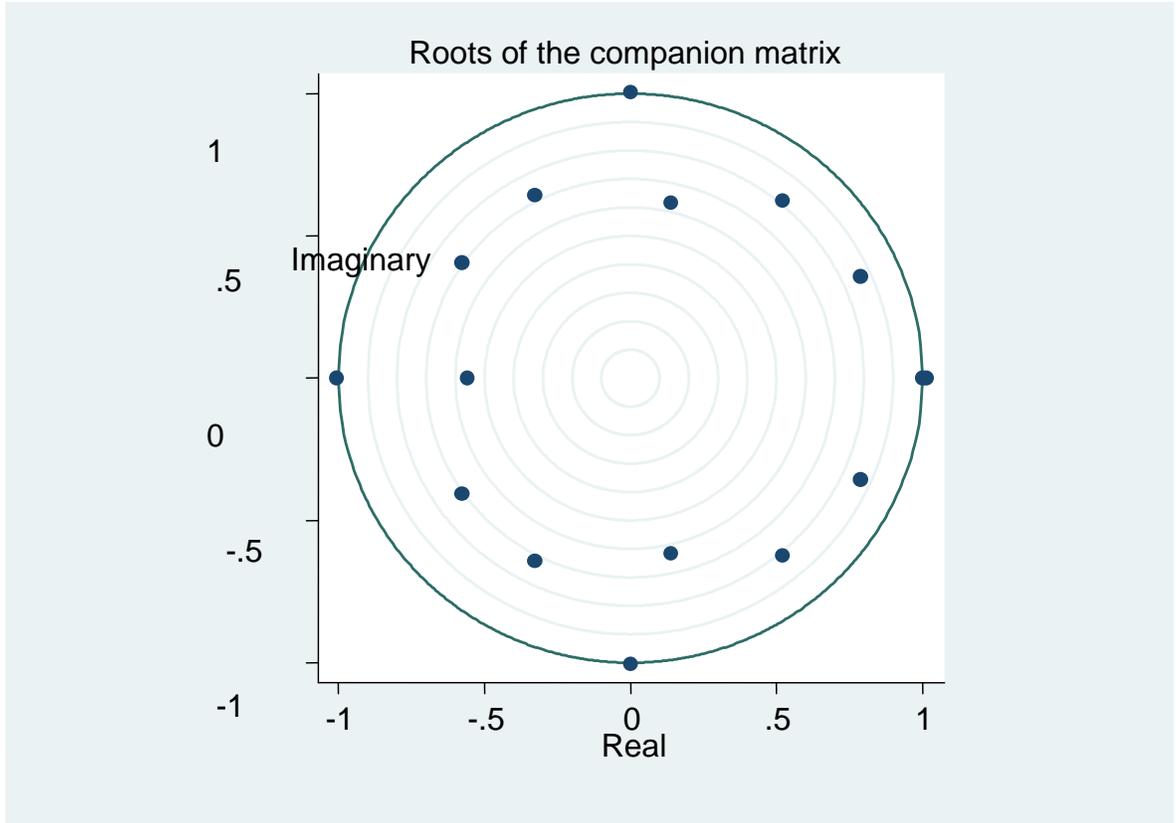


Figure 4. 2: Graph of Model Stability

Source: (Researcher, 2020)

From the figure above it is clear that all the dotted values lie inside the unit circle and it was concluded that the stochastic model used was stable and was therefore suitable for analysis.

4.8 Results and Discussions as per study objective

The overall objective of the study was to examine the effect of macroeconomic aggregates on real estate investment in Kenya from 2007 to 2017. Macroeconomic aggregates of concern were FDI and External debt treated as independent variables, real estate investment treated as dependent variable whereas urbanization was treated as the moderating variables. The necessary diagnostic tests of the time series variables were carried out and the data subjected to analysis in line with the study objectives.

4.8.1 The effect of Foreign Direct Investment (FDI) inflows on Real estate investment in Kenya.

Descriptive, correlation and Regression analysis were done to examine the effect of foreign direct investment inflows on Real estate investment in Kenya. Descriptive statistics showed Real estate investment (RES) and the Foreign Direct Investment (FDI) had a mean of 6.7636 and 1.3853 respectively with standard deviations 1.3103 and 1.046 respectively (refer to table 4.1). This shows that since the variance standard deviation is small implies that the overall distribution of the data is around the mean. These results consent with the Cytonn investment report (2015) which showed that The real estate sector in Kenya experience slow growth of 2.5% between 2007q4 and 2008q4 following the post-election violence of the 2007 general elections which slowed the economic expansion in terms of real estate development .However the growth in real estate investment steadily rose from 2.5% in previous quarters to 6.178% from 2009q1 to 2012q2. This is attributed to the onset of Thika superhighway construction in 2009q1

to 2012q4, constitutional change in 2010 which guaranteed real estate investors favorable business environment and government support through Public Private Partnership (PPP) agreements and the onset of Lamu Port-South Sudan-Ethiopia-Transport (LAPSSET) project in 2012q1 which led to massive development in roads, ports and railway rehabilitation. The growth drops by 1.91% to 5.268% in 2012q3 and q4 following the unpredictable outcomes of the 2012 general elections but rose steadily to 6.431% from 2013q1 to 2016q4 following massive investments in infrastructural sector with key flagship projects including the SGR (Standard gauge Railway) in 2013q2 aimed at modernizing Kenya Railway system (Barnes,2015). Phase 1 of this project was completed in 2017q2 from Mombasa to Nairobi with phase 2 from Nairobi to Naivasha set to begin in May 2018. According to Hass real estate performance report (2019). Other key projects that led to rise in real estate investments included the expansion of Jomo Kenyatta International Airport in 2015q2 aimed at boosting trade and cementing its status as a regional commercial hub, Construction of Major malls with grade one offices in what has been characterized as Public Private partnership including the Garden city completed in July 2017 and TRM (Thika Road Mall) on Thika Superhighway, Construction Two Rivers mall along the Northern And southern Bypasses which its ground breaking begun in 2015q2 and phase 1 completed in 2017q1. However the growth dropped drastically to 5.4% between 2017q2 and q4 following the fear of losing properties generally associated with general elections in Kenya coupled by annulment of the 2017 Presidential vote by the country's Supreme Court (Hass consultant , 2019)

For the FDI, the standard deviation (1.3853) was close to its mean (1.046) indicating that the FDI inflows in Kenya within the study period did not experience wider fluctuations. This is attributed to Exploitation of Mineral wealth with major discoveries in Gold, oil in 2012, coal, and Rare earths resulting to hundreds of billions of shillings pumped into this project by investors from the region and abroad to boost the exploration (UNCTAD, 2015). The advent of Devolution with 47 county governments in 2013 has thrust Kenya into one investment destination with individual Counties competing to bring investors within their borders and across the sea (Jamesa, 2017). Major flagship projects including the standard Gauge Railway in 2013, Rehabilitation and expansion of roads, railways and airports by the government in 2014 to 2016 has caused much foreign income to be pumped into these projects in order to facilitate them (Salome, 2016). This public projects coupled with other major private projects like the two river mall, Thika road mall has resulted to much investment in this sector from foreigners who are attracted into Kenya as it is a regional economic block in East Africa (World Bank,2018). The table below show the regression analysis.

Table 4. 11: Results from Regression Analysis

Findings from correlation analysis indicated that there was a positive and moderate relationship ($r = 0.5394$) between foreign direct investment and real estate investment in Kenya (refer to table 4.2). An indication that as foreign investment increases real estate investment also increases but moderately. Results from regression analysis on the other hand revealed a positive and significant effect of FDI on real estate investment (0.8813076 , $p < 0.0500$) refer to table 4.11. This indicated that a one percent increase in foreign direct investment will result to increase in real estate investment by 0.88 percent holding external debt constant. The study therefore rejected the null hypothesis that there is no statistically significant effect of Foreign Direct Investment (FDI) inflows on Real estate investment in Kenya.

DRES	Coefficients	Std. Err.	z	P> z	[95% Conf. Interval]
DFDI	.8813076	.0859198	10.26	0.000	.7076572 -.1.054958
DEXD	-.155869	.0509283	-3.06	0.004	-.2587995-.0529397
Constant	.1423108	.0333107	4.27	0.000	.0749874.-2096342

Number of observations = 43 F (2 , 40) = 61.21R- squared = 0.8195
Adjusted R-squared = 0.8033Prob> f =0.000Root MSE = .1835

Source: Researcher (2020)

In 2013 the government launched a \$ 14.5 billion project that was to transform the country Konza Techno City master plan. According to Barnes infrastructure and construction Report (2015), this led to increase of foreign investors who sought to get a share in the benefits that accrue from the construction and development of the city including the development of buildings and housing units for commercial and residential

purposes. Similarly In 2015 the government of Kenya embarked on a multibillion infrastructural projects including the expansion of its main airport aimed at boosting trade and cementing its status as a regional commercial hub which amounts to US\$653 million, the construction of a new US\$13.8billion railway in 2014 that will eventually link its Indian Ocean port of Mombasa with Uganda, Tanzania, Rwanda and Southern Sudan. These projects according to Hass real estate investments reports (2019) attracted many foreign direct investors into the country who sought to invest in Infrastructural development that came along with investment in real estate as more people were employed creating demand for housing especially in the urban centers. These projects were the main contributors to the growth of real estate sector in Kenya from 4.7% in 2015 to 5.2% in 2016 and 5.1% in 2017 (World Bank,2018).

According to Knight Frank Global Cities Report (2018), Kenya has from 2014 rolled out massive road annuity infrastructure program that would together see construction and/or rehabilitation of 10, 000km of roads. The project has already started and both local and international contractors are participating in the roads annuity project. In addition, with the demand for a live-work-play lifestyle, master planned communities are increasing with areas such as Kiambu and Machakos counties becoming hotspots. Notable master planned communities are the likes of Konza City, Tatu City, Migaa and Cytonn's Newtown which have been majorly facilitated by hundreds of billions of Kenya shillings from foreign direct investment inflows as asserted by Kenya Property developers and Hass Consultant (2019)

These findings are in line with Neoclassical Theory of investment which argues that FDI inflow increases the capital growth in an economy both directly and indirectly through research and development, technology transfers, development of real estate, industries and introduction of new forms of human capital. The results further agree with the findings of Bajo-Rubio et al. (2010) in Spain and Alfaro (2004) in South Africa who found a significant and positive relationship between FDI inflows and Real estate development in their Respective Study areas. Similarly, Everlyne (2016) and Salome (2016) in their study on the impact of Foreign Direct Investment on Real estate performance in Kenya found out that FDI positively impacts the growth of real estate sector in Kenya. These findings, however, contradicts earlier studies for instance Huang *et al.*, (2014) who found that FDI does not have a significant effect on real estate in the short run.

4.8.2. The Effects of External Debt on Real Estate Investment in Kenya.

The second objective of the study was to examine the effect of external debt on Real estate investment in Kenya from 2007 - 2017. Descriptive, correlation and Regression analysis were done to examine the effect of external debt on Real estate investment in Kenya. Descriptive statistics showed that external debt measured as percentage of total debt had a mean of (26.4) and standard deviation of (4.4742). External debt was widely spread than other variables in the study as it registered the highest standard deviation of (4.4742) which indicated that majority of the values lie away from its mean value. The range of data, which is the difference between the maximum value and minimum value was a huge gap which demonstrates fluctuations in this economic variable. Findings

from correlation analysis indicated there was a negative and moderate relationship ($r = -0.5105$) between external debt and real estate investment in Kenya (refer to table 4.2). An indication that as external debt increases real estate investment decreases but moderately. Regression analysis on the other had revealed a significant negative effect (-0.155869 , $p < 0.0500$) of external debt on real estate investment in Kenya (refer to table 4.11). This showed that for a percentage increase in external debt, real investment decreases by -0.155869 holding FDI constant. The null hypothesis was therefore rejected and alternative accepted that there is a statistically significant effect of external debt on real estate investment in Kenya. This study concluded that high external debt implies that finances will be diverted from other development projects to pay the debt. Barnes (2015) asserts that 15 percent of the government projects funds balance came from loans provided by consortia of local and foreign banks.

According to KNBS (2018), Kenya's total debt burden has been rising steadily. From 2013 – 2017, Kenya's total debt burden was 21.3%, up from the 2008-2012 5-year average of 15.1%, indicating that public debt has been growing at an increasing rate over the years when compared with GDP growth, which has been growing by 5.9% on average over the last 7-years. This has raised much concern to investors in real estate sector and resulted to decline in the development of real estate sector as investor fear the depreciation of the Kenya currency against other currencies particularly the dollar which may have huge impacts on yearly yields from their investments. As a result the real estate sector has continued to record a slowdown in its activity. In 2018, KNBS released their August issue of The Leading Economic Indicators (LEI), highlighting that the

value of building plans approved by Nairobi City County between January and July 2017 decreased by 18.4% to Kshs 149.5 billion from Kshs 183.2 billion between January and July 2016. The value of residential approvals during the same period declined by 17.4% to Kshs 88.5 billion in 2017 from Kshs 107.2 billion in 2016, while the value of commercial approvals declined by 15.1% to Kshs 61.0 billion from Kshs 76.1 billion during the same period in 2017 and 2016, respectively. According to the study findings, these decline is mainly due to (i) increase in tax duty levied on construction materials as a strategy by the KRA to raise more revenue to service the external loans (Centum, 2019) (ii) reduced credit to the private sector by banks as a result of the enactment of the Banking Amendment Act 2015 that has seen concessional credit growth on real estate sector decrease to 1.6% in August 2017 compared to 5.4% in August 2016 and (iii) the wait and see attitude adopted by real estate investors during the electioneering period (Kiprotich, 2015). Consequently, Foreign debt from commercial banks, which is largely non-concessional, has been rising steadily from 20.3 in March 2015 to 30.7% in September 2017 while largely concessional multilateral loans on Real estate investment have been declining steadily due to the rising debt to GDP ratio that has scared the external lenders doubting the ability of Kenya to repay the loans in due time, (Hass consultant, 2018). According to Knight Frank Global Cities Report (2018) should the Debt to GDP ratio continue to rise, the concessional loans on real estate sector are going to decrease further and this will have a huge negative effect on housing units constructed yearly. These findings concur with Debt-Overhung Theory which argues that if there is some likelihood that in the future, debt will be larger than the country's repayment ability, expected debt-service costs will discourage further domestic and foreign investment because the expected rate of return from the productive

investment projects such as the real estate and manufacturing will be very low to support the economy. This eventually will further reduce both domestic and foreign investments and hence downsize the growth of economic units such as the real estate sector, Manufacturing, exportation and industrialization. The results further agree with the findings of Were (2001) and Ezeabasili (2011) who found a negative relationship between external debt and Economic growth in terms of real estate investment. These findings however, contradicts the findings of Adegbite et al (2008) and Schclarek (2004) who found the relationship between external debt and real estate growth to be insignificant .poor financial condition of a country and that clearly indicates a relatively unfavorable environment for foreign investment in real estate sector as many people resolves to live in rural or slums due unaffordability of modern housing units due to joblessness brought by poor performance of different economic sectors. This is attributed to high interest rates and taxes as government seeks to raise more revenues to service its external debts.

The study estimated a regression equation of the form:

$$\mathbf{DRES = 0.1423108 + 0.8813076DFDI_t - 0.155869DEXD_t \dots\dots\dots 4.1}$$

Where DRES is the first difference of Real estate ,DFDI the first difference of foreign direct investment and DEXD the first difference of external debt whereas t = Time series data. The above estimated model shows that if FDI and external debt are held constant, the annual Real Estate Investment will be (0.1423108) as a percentage of GDP. Further results revealed that the models goodness of fit and overall significance was $R^2= 0.8195$ with a p value of 0.0000. This means that 81.95% of the variation in Real estate investment is explained by the variations in FDI and external debt. Probability value of p

= 0.0000 implies that the variables in the model are jointly significant in explaining Real estate investment at 5% level of significance (refer to table 4.11)

4.8.3 The long run relationship between Foreign Direct Investment (FDI) inflows and External Debt on real estate investment in Kenya.

The third objective of the study was to establish the existence of long run relationship between foreign direct investment and external debt on real estate investment in Kenya. The Vector error correction model (VECM) model was purposely applied to determine the dynamics in the short run and long run relationships and to show the speed of adjustment (the speed at which the dependent variable changes with a changes in the independent variables) of the error correction term towards its long-term adjustment path or to the point of convergence as a result of a temporary shocks. The coefficients of the variables represent the short run elasticities in the VECM model (Lutkepohl, 2005; Lutkepohl and Kratzik, 2004). The p value close to zero indicates the model is significant. ‘*_ce1*’, ‘*_ce2*’ and ‘*_ce3*’ represent the three cointegrating equations. To show the long-term relationship among the variables the cointegrating equations must have a negative and significant sign attached to it at 5% level of confidence (refer to table 4.12).

Table 4. 12: Results of Vector Error Correction Estimates

Sample 4-44

No. of obs = 40

R-Square = 0.7048

	Coef.	Std. Err	Z	P > z	(95% Conf. Interval)	
D_RES						
_cel L1	-.477807	.0219691	-2.17	0.030	.0908394- 047219	
_cel L2	-.604642	.0198161	-3.05	0.002	-0.6092	-0.3563
_cel L3	-.792045	.0328631	-2.41	0.0000	1.8398	-
					.0147941	
RES						
LD	1.3714	0.3556	3.8600	0.0000	0.6744	2.0683
L2D	1.3714	0.3556	3.8600	0.0000	0.6744	2.0683
L3D	1.3714	0.3556	3.8600	0.0000	0.6744	2.0683
FDI						
LD	1.0645	0.3313	-3.2100	0.0010	-1.7138	-0.4152
L2D	1.0645	0.3313	-3.2100	0.0010	-1.7138	-0.4152
L3D	1.0645	0.3313	-3.2100	0.0010	-1.7138	-0.4152
EXD						
LD	-0.3731	0.1137	3.2800	0.0010	0.1502	-0.5961
L2D	-0.3731	0.1137	3.2800	0.0010	0.1502	-0.5961
L3D	-0.3731	0.1137	3.2800	0.0010	0.1502	-0.5961

Source: Author (2020)

The Vector error correction model (VECM) estimated the error correction term of the first cointegrating equation equals to -0.477807 suggesting that there is a long term relationship running from Real estate investment to foreign direct investment and external debt. This also indicated that previous years' errors or deviations from the long run relationship are corrected within current year at a convergence speed of 47.78 percent. The absolute value showed that 47.78 percent of long-run disequilibrium is adjusted from lagged period of error shocks. It also indicated that the past values of the variables affected the present values in the short run (Maddala, 2002). The coefficient of error correction term also indicated that real estate investment is highly sensitive to its deviation from long-term original path.

The second cointegrating ($_ce2$) equation was found to be significant (p-value $0.002 < 0.05$) indicating that it takes one year for 48.27 percent of previous years' error terms to be corrected. The third cointegrating equation ($_ce3$) is statistically significant (p-value $0.000 < 0.05$). Based on these result of the cointegrating equations it is evident that there is a significant long-term relationship between Real estate investment and foreign direct investment and External debt. Therefore the null hypothesis of no long run relationship between real estate, foreign direct investment and external debt was rejected.

Furthermore, to examine the short-term causality between variables as shown by the individual lag coefficients and p values for each independent variable, the second part of VECM model explains how the lagged values of foreign direct investment and external

debt affects real estate investment in Kenya. Table 4.12 shows that the lagged coefficient of the first, second and third lagged difference of foreign direct investment is 1.0645 which is statistically significant at 5 percent ($p\text{-value } 0.0010 < 0.050$). This implies that a one percent change in the lagged difference of FDI leads to 1.0645 increase in the current real estate investment whereas one percent change in the lagged difference of the external debt will lead to 0.3731 unit decrease in real estate investments.

According to the findings in table 4.12 above one percent change in the lagged difference of foreign investment will lead 1.0645 unit increases in real estate investment in the long run. This shows that heavy foreign direct investment inflows in flagship projects has a long run effect on the real estate sector as asserted Cytonn investment reports (2018) . For instance the Foreign investment inflows of Ksh.32 billion for the construction of Thika Superhighway from 2009q1 to 2014q4 resulted to transformation of Thika town into a highly industrious and urbanized center due to accessibility .Population has consequently rose in this town attracting more investors in residential and commercial housing units resulting to a continuous growth of real estate sector in Thika Town and its suburbs (Amondi,2016).Similarly completion of phase 1 of the Standard Gauge Railway (SGR) flagship project in 2017 that costs US\$3.6 billion has resulted to increased number of foreign investments inflows in residential, shopping malls and recreational facilities leading to a boom in the growth of real estate sector and spillover effect in the growth of other sectors in the economy (UNCTAD,2015).

On the other hand external debt negatively affects the real estate sector in the long run .According to the study findings above one percent change in the lagged difference of the external debt will lead to 0.3731 unit decrease in real estate investments in the long-run. The Rising debt to GDP ratio particularly in developing nations like Kenya weakens the currency of the host country against the dollar which scares away investors as they doubt about the annual turnover from their investments making it difficult to convince them to invest in the countries real estate sector, (World Bank, 2014) .This in the long run will weaken the growth of the real estate sector and its contribution to the country's GDP. According to KNBS (2018), Kenya's total debt burden has been rising steadily. From 2013 – 2017, Kenya's total debt burden rose to 21.3%, up from the 2008-2012 5-year average of 15.1%, indicating that public debt has been growing at an increasing rate over the years when compared with GDP growth, which has been growing by 5.9% on average over the last 7-years. The Leading Economic Indicators (LEI), highlighting that the value of building plans approved by Nairobi City County between January and July 2017 decreased by 18.4% to Kshs 149.5 billion from Kshs 183.2 billion between January and July 2016. The value of residential approvals during the same period declined by 17.4% to Kshs 88.5 billion in 2017 from Kshs 107.2 billion in 2016, while the value of commercial approvals declined by 15.1% to Kshs 61.0 billion from Kshs 76.1 billion during the same period in 2017 and 2016, respectively. According to the study findings, this decrease in the real estate sector mainly attributed to rise in debt to GDP ratio limits the expansion of the real estate and in the long run affects the GDP growth

These results are similar to the findings of Ezeabasili (2011) and Salome (2016) who established that foreign direct investments and external debt have a significant long run relationship in the economic growth in terms of real estate development. A long run relationship between the study variables implies that successful issuance of external debt when utilized properly for bigger projects such brings in Long-term interest in the construction and infrastructure sector. Issuance of the bond boosted the government's ability to finance infrastructure developments (Barnes, 2015)

4.8.4The moderating effect of urbanization on the relationship between Foreign Direct Investment inflows (FDI) and external debt on Real estate investment

The last objective of the study sought to find out the moderating effect of urbanization on the relationship between foreign direct investment and external debt on real estate investment. Ordinary least square regression for four models were estimated (refer to table 4.13).

Model 1 presents the results for the direct effects of the independent variables on the dependent variable including the moderator. According to Barron and Kenney (1986), it is important to test or establish the significance of the interactive variable (moderator) to the model. In Correlational analysis, a moderating variable (Z) according to Baron and Kenny (1986) is a third variable which could affect the amount of correlation and or change the direction of the dependent (Y) and the independent variable (X). The effect of a moderator can be shown via the interaction of X and Z (Kang et al., 2015), Pivato and Misani (2008) and WU and KO (2013).

Table 4. 13: Testing Moderation Effect

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	-19.778*** [1.740]	-9.072** [3.693]	-28.642*** [10.579]	-30.820*** [8.849]	-0.983 [0.733]
FDI	0.717*** [0.051]	-5.334*** [1.8904]	0.690*** [0.061]	-7.522*** [1.940]	-11.176*** [3.712]
EXD	-0.143*** [0.029]	-0.045 [0.048]	0.253 [0.466]	1.124*** [0.440]	2.805*** [1.203]
URB	1.200*** [0.098]	0.648*** [0.194]	1.538*** [0.410]	1.427*** [0.343]	10.220 [7.361]
FDI*URB		0.255*** [0.080]		0.344*** [0.081]	119.906*** [36.955]
EXD*URB			-0.015 [0.018]	-0.043*** [0.016]	-28.098*** [11.549]
FDI*EXD*URB					1.33e-4*** [3.69e-5]
F-Statistic	172.524	161.895	128.673	151.214	39.075
Prob.>F	0.000	0.000	0.000	0.000	0.000
R-Squared	0.928	0.943	0.929	0.952	0.8867
Adj. R-Squared	0.922	0.937	0.922	0.946	0.845

Source: Researcher, 2020

* represents significant at 10%, ** represents significant at 5%,***represents significant at 1%.Value in [] are standard errors. Is the differenced value

Model 2 presents the moderation effect of urbanization on the relationship between FDI and real estate investment whereas model 3 presents the moderation of urbanization on the relationship between external debt and real estate investment. Model 4 presents result of moderation effect of urbanization on the relationship between foreign direct investment and external debt on real estate investment. The (Prob.>F =0.000) indicates that the significance of the estimated models. The value for R-squared has changed from (0.928) in model 1 to (0.943) in model 2. This signifies that the variation explained by variables after inclusion of moderation effect (interaction FDI*URB) of urbanization on

the relationship between FDI and real estate investment had improved by 0.015 (0.943-0.928). Furthermore, the R-squared also increased by 0.023 (0.952-0.929).

The results for model 5 are used to test moderating effect of urbanization when interacted with FDI and external debt. The coefficient for FDI*EXD*URB is positive and significant at 5 percent significance level ($t > 1.96$ that is, $t = 1.33e-4/3.69e-5 = 3.52$). The significance implies that the fourth hypothesis is rejected and concluded that urbanization moderates the relationship between foreign direct investment, external debt and real estate Kenya. This implies economically that when people move to urban centers, government tend to improve infrastructure such as roads, railway line, water, sanitation. The government needs to promote urban migration by planning interventions in the cities and demonstrate how urban development impacts healthy growth and quality of life. It is based on the premise that growth and development of a city need to be managed in such a way that the quality of spaces and places are retained, accentuating their intrinsic characteristics, promoting social cohesion, and enhancing live ability. Urban development in Kenya must balance vertical and lateral growth and proposes possible directions of change in managing urbanization and development. This leads to attraction foreign investors and in returns leads to growth of real estate development.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings contained in the preceding chapter. Based on the findings a number of conclusions were drawn and recommendations made. Areas for further research were also suggested.

5.2 Summary of the Findings

The purpose of the study was to examine the effect of macroeconomic aggregates in the development of real estate investment in Kenya with key interest on foreign direct investment inflows and external debt and urbanization as a moderation variable. The study adopted an analytical research design and a stochastic model. Descriptive statistics were computed to check for any outliers and describe general characteristics of the sample. The study found that relationship between foreign direct investment and real estate investment was positive and moderate whereas relationship between external debt and real estate investment was negative and moderate. Urbanization which was treated as a moderating variable had a positive and strong relationship with real estate investment.

Argumented Dickey Fuller (ADF) test carried out to check for unit root among the variables indicated the presence of unit root for, real estate, foreign direct investment external debt and urbanization but upon first differencing became stationary. Post Diagnostic checks were performed on the estimated model. Jarque-Bera test for normality showed that data was normally distributed., Durbin Watson test for residual autocorrelation revealed that there is no autocorrelation at the specified lag length of four, heteroscedasticity test showed absence of heteroscedasticity, VIF test for Multicollinearity showed absence of Multicollinearity and further the unit circle showed that all the values lie inside the circle and this indicated that indeed the model used for regression analysis was stable.

Further, unit root tests with two structural breaks were performed in association with various economic occurrences in Kenya. Johansen test for cointegration was further carried out to find out for cointegration and the results showed that the variables were cointegrated hence VECM model was estimated. Regression analysis was also done to find out the coefficients and the statistical significance of the explanatory variables in relation to the dependent variable. The summary of the findings per the objectives are briefly discussed.

5.2.1 Effects of Foreign Direct investments on real estate investment

The results revealed that foreign direct investment positively and moderately correlates with real estate investment. FDI inflows also positively affect the real estate development in Kenya as indicated by a positive and significant coefficient of (0.8813076) in the regression model. Major changes in FDI inflows occurred in (2010q4 and 2013q2). In the first structural break (2010q4) there was increase in FDI inflows due to favorable government policies in the new constitution which resulted to increase in real estate development whereas in the second structural break (2013q2) there was a reduction in FDI inflows majorly attributed to political instability in 2013 general elections

5.2.2 Effects of External debt on Real Estate investments

From the findings External debt negatively correlates with real estate development and was also found to negatively affect the real estate development as indicated by a coefficient value of (-0.155869) in the regression model. Significant structural changes in the external debt occurred in (2013q3 and 2015q3). This Structural break is explained by huge government borrowing to finance key projects such as expansion of major trunk roads in all over the country, and construction of standard gauge railway.

5.2.3 The long run relationship between Foreign Direct Investment inflows and external debt on real estate investment

The study findings revealed that there exists a long-term relationship between FDI inflows and external debt on real estate investment as indicated by the negative and

significant VECM coefficient of -0.477807 and -0.604642 respectively. It was established from the vector error correction model that foreign direct investment and external debt were significant determinants of real estate investment in Kenya.

5.2.4 The moderation effect of urbanization on the relationship between FDI and external debt on real estate investment

The finding indicated that there was a statistically significant moderating effect of urbanization on the relationship between Foreign Direct Investment Inflows and Real estate investment as indicated by the coefficient 0.344 $t = 4.235$, $p = 0.000$ and the standard error of 0.081. Moreover, there was a statistically significant moderating effect of urbanization on the relationship between external debt and real estate with negative coefficient of -0.043 and $p = 0.0112$.

5.3 Conclusion

From the results and subsequent discussions, there is a link between foreign direct investment (FDI) inflows and external debt on real estate investment. This finding indicates that foreign direct investment exhibited a statistically significant positive relationship with real estate investment, whereas the external debt negatively influenced real estate investment in Kenya for the period of time under the study. Therefore, the null hypothesis that states that FDI, external debt and urbanization have no statistical significant effect on Real estate investment was rejected. Further the study concluded

that urbanization which is the percentage of people moving to urban centers significantly moderates the relationship between foreign direct investment and external debt on real estate growth in Kenya.

In conclusion for the Kenya government to achieve its agenda 4 on affordable housing in its big 4 agenda and the vision 2030, major investments in the real estate sector needs to be undertaken which can be achieved through partnership with both foreign and local investors. Therefore the government need to adopt public private strategy (PPP) to attract more investors, provide incentives on the building materials, and reduce taxes on land and other vital resources associated with construction industry. Similarly, Interest on mortgage loans should be reduced in order to allow more people to buy their own homes. This will stimulate investors in this sector to construct more housing units at affordable prices.

5.4 Recommendations

The study findings established a statistically significant relationship between the Foreign Direct Investment Inflows and real estate investment. Foreign Direct Investment inflows was found to positively and moderately affect the real estate investment in Kenya. Therefore the study recommends that the government of Kenya should encourage foreign direct investment inflows in real estate sector by reviewing the policies surrounding development and management of real estate sector. This can be achieved by first putting in place incentives such as tax free holidays, providing free lands for

potential investors and reducing industrial tax so as to attract more foreign investors particularly in the real estate sector. Similarly, the government should also ensure that the citizens are provided with mortgage loans at low interest rates. This would attract more people to buy homes hence boosting the growth rate of real estate sector investment in the country

The study further showed that there is a statistically significant negative and moderate effect of external debt on real estate investment in Kenya .Therefore based on these findings the study recommends that the government should reduce the appetite for external borrowing by encouraging the Kenya Revenue Authority to improve revenue collection mechanisms to maximize the amount collected in revenue, which will lead to a narrowing budget deficit and reduced total borrowing. Building an export-driven economy by encouraging growth in the manufacturing sector to increase the value-added exports and hence increasing the value of our exports vis-à-vis imports, leading to an improved current account deficit. This will attract more investors into different economic sectors particularly the real estate due to increased demand for modern housing from the rising middle-income class. Lastly, external commercial borrowing should be limited to development projects with high financial and economic returns, a move that will ensure the expensive debt is invested in projects that yield more returns.

The study established a significant long run relationship between the FDI inflows and external debt on Real estate investment in Kenya .From the findings it was evidenced

that FDI inflows had a positive long-term effect whereas external debt exhibited a negative long-run effect on real estate development in Kenya. Based on the findings, this study therefore recommends that the government through its central bank should restructure the debt mix to ensure a larger percentage of foreign borrowing is concessional. This will ensure less is borrowed from external sources and the borrowed loans are effectively invested in sectors with high returns like real estate. Similarly as per the Draft of 2018 Budgetary Policy Statement (BPS), the government should also plan on adopting a deliberate approach in diversifying currency structure so as to hedge against exchange rate risks especially for new loan commitments. This will help to reduce the debt to GDP ratio hence attracting more investors in real estate sector by painting a good picture of Kenya's ability to manage her debts.

Lastly the study established that there is a statistically significant moderating effect of urbanization on the relationship between FDI inflows and external debt on real estate development in Kenya. Based on these conclusions the study recommends that the government should promote urbanization in all parts of the country in order to ensure sustainable growth of real estate investment country wide in its quest to achieve its big 4 agenda especially the pillar regarding provision of decent and affordable housing.

5.5 Suggestions for Further Research

From the scope and limitations of the study the following areas are suggested for future research: First, this study suggests that there is need for future research to incorporate other variables not covered in the study namely exchange rates, inflation and corruption index to find out their effects on real estate investment in Kenya.

This study is only limited in Kenya. A similar study can be done in other countries particularly East African Countries so as to expand knowledge and compare the result of the findings for a concrete conclusion and recommendation of policies amongst the East African Countries.

The study has used time series analysis and Vector Error Correction Method of estimation. A similar study can be done using panel data analysis and compare data from different countries as opposed to one country as is the case in this study.

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APPENDICES

APPENDIX I: MODERATION TEST RESULTS

Regression Results for Model 1

Dependent Variable: RES
Method: Least Squares
Date: 05/25/20 Time: 12:52
Sample: 2007Q1 2017Q4
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	0.717421	0.051150	14.02572	0.0000
EXD	-0.142743	0.029003	-4.921615	0.0000
URB	1.200333	0.098352	12.20451	0.0000
C	-19.77820	1.740400	-11.36417	0.0000

R-squared	0.928261	Mean dependent var	6.763636
Adjusted R-squared	0.922880	S.D. dependent var	1.310344
S.E. of regression	0.363889	Akaike info criterion	0.902571
Sum squared resid	5.296599	Schwarz criterion	1.064770
Log likelihood	-15.85655	Hannan-Quinn criter.	0.962722
F-statistic	172.5244	Durbin-Watson stat	1.915158
Prob(F-statistic)	0.000000		

Regression Results for Model 2

Dependent Variable: RES
Method: Least Squares
Date: 05/25/20 Time: 12:53
Sample: 2007Q1 2017Q4
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	-5.334519	1.890431	-2.821854	0.0075
EXD	-0.045253	0.040124	-1.127828	0.2663
URB	0.647818	0.193970	3.339783	0.0019
FDI_URB	0.255353	0.079740	3.202307	0.0027

C	-9.071523	3.693013	-2.456402	0.0186
R-squared	0.943197	Mean dependent var		6.763636
Adjusted R-squared	0.937371	S.D. dependent var		1.310344
S.E. of regression	0.327925	Akaike info criterion		0.714581
Sum squared resid	4.193855	Schwarz criterion		0.917329
Log likelihood	-10.72077	Hannan-Quinn criter.		0.789770
F-statistic	161.8946	Durbin-Watson stat		1.744807
Prob(F-statistic)	0.000000			

Regression Results for Model 3

Dependent Variable: RES
Method: Least Squares
Date: 05/25/20 Time: 12:54
Sample: 2007Q1 2017Q4
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	0.689802	0.060759	11.35304	0.0000
EXD	0.252503	0.466169	0.541655	0.5911
URB	1.538384	0.409990	3.752249	0.0006
EXD_URB	-0.015057	0.017724	-0.849518	0.4008
C	-28.64232	10.57946	-2.707352	0.0100
R-squared	0.929564	Mean dependent var		6.763636
Adjusted R-squared	0.922340	S.D. dependent var		1.310344
S.E. of regression	0.365161	Akaike info criterion		0.929690
Sum squared resid	5.200368	Schwarz criterion		1.132438
Log likelihood	-15.45317	Hannan-Quinn criter.		1.004879
F-statistic	128.6734	Durbin-Watson stat		1.983636
Prob(F-statistic)	0.000000			

Regression Results for Model 4

Dependent Variable: RES

Method: Least Squares

Date: 05/25/20 Time: 12:56

Sample: 2007Q1 2017Q4

Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	-7.522306	1.939983	-3.877511	0.0004
EXD	1.124425	0.440372	2.553353	0.0148
URB	1.426696	0.343371	4.154972	0.0002
FDI_URB	0.344315	0.081311	4.234531	0.0001
EXD_URB	-0.043265	0.016230	-2.665699	0.0112
C	-30.81191	8.849070	-3.481938	0.0013
R-squared	0.952145	Mean dependent var		6.763636
Adjusted R-squared	0.945849	S.D. dependent var		1.310344
S.E. of regression	0.304923	Akaike info criterion		0.588607
Sum squared resid	3.533159	Schwarz criterion		0.831906
Log likelihood	-6.949356	Hannan-Quinn criter.		0.678834
F-statistic	151.2142	Durbin-Watson stat		1.880710
Prob(F-statistic)	0.000000			

Regression Results for Model 5

Dependent Variable: DRES

Method: Least Squares

Date: 06/15/20 Time: 13:31

Sample (adjusted): 2007Q2 2017Q4

Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	-11.17553	3.712198	-3.010488	0.0047
EXD	2.805158	1.203098	2.331613	0.0254
URB	10.21953	7.360926	1.388349	0.1736
FDI_URB	119.9061	36.95487	3.244663	0.0025
EXD_DURB	-28.09817	11.54898	-2.432956	0.0201
FDI_EXD_URB	0.000130	3.69E-05	3.523631	0.0012
C	-0.982621	0.732590	-1.341297	0.1882
R-squared	0.866888	Mean dependent var		0.048474
Adjusted R-squared	0.844703	S.D. dependent var		0.360927
S.E. of regression	0.142233	Akaike info criterion		-0.914798
Sum squared resid	0.728290	Schwarz criterion		-0.628091
Log likelihood	26.66816	Hannan-Quinn criter.		-0.809069
F-statistic	39.07484	Durbin-Watson stat		0.862479
Prob(F-statistic)	0.000000			

APPENDIX II: RESEARCH DATA Table A.1: Data Collected (2007-2017)

YEAR	RES	FDI	EXD	URB
2007Q1	5.3375	3.488058219	25.4375	22.27815625
2007Q2	5.3125	2.597567531	24.1125	22.37259375
2007Q3	5.2875	1.835994656	23.0375	22.46721875
2007Q4	5.2625	1.203339594	22.2125	22.56203125
2008Q1	5.2375	0.699602344	21.6375	22.65703125
2008Q2	5.2125	0.324782906	21.3125	22.75221875
2008Q3	5.1875	0.078881281	21.2375	22.84759375
2008Q4	5.1625	0.038102531	21.4125	22.94315625
2009Q1	5.16875	0.283095063	22.86875	23.03859375
2009Q2	5.13125	0.300241438	23.13125	23.13465625
2009Q3	5.08125	0.322600188	23.23125	23.23103125
2009Q4	5.01875	0.350171313	23.16875	23.32771875
2010Q1	4.35	0.054177531	22.084375	23.4239375
2010Q2	4.5	0.158671281	22.040625	23.5215625
2010Q3	4.875	0.551585406	22.178125	23.6198125
2010Q4	5.475	1.124564844	22.496875	23.7186875
2011Q1	7.39375	2.910861781	23.840625	23.81834375
2011Q2	8.00625	3.430670969	24.184375	23.91840625
2011Q3	8.40625	3.717244594	24.371875	24.01903125
2011Q4	8.59375	3.770582656	24.403125	24.12021875
2012Q1	8.0375	3.005643125	23.54375	24.22165625
2012Q2	8.0125	2.826526875	23.55625	24.32409375
2012Q3	7.9875	2.648191875	23.70625	24.42721875
2012Q4	7.9625	2.470638125	23.99375	24.53103125
2013Q1	7.953125	2.293878125	24.621875	24.63584375
2013Q2	7.921875	2.117881875	25.103125	24.74090625
2013Q3	7.884375	1.942661875	25.640625	24.84653125
2013Q4	7.840625	1.768218125	26.234375	24.95271875
2014Q1	7.775	1.545415938	26.93125	25.0593125
2014Q2	7.725	1.392178563	27.61875	25.1666875
2014Q3	7.675	1.259371313	28.34375	25.2746875
2014Q4	7.625	1.146994188	29.10625	25.3833125
2015Q1	7.559375	1.113217969	30.40625	25.4925625
2015Q2	7.515625	1.018432781	31.04375	25.6024375
2015Q3	7.478125	0.920809406	31.51875	25.7129375
2015Q4	7.446875	0.820347844	31.83125	25.8240625
2016Q1	7.421875	0.599740125	31.059375	25.9358125
2016Q2	7.403125	0.540525375	31.415625	26.0481875
2016Q3	7.390625	0.525395625	31.978125	26.1611875
2016Q4	7.384375	0.554350875	32.746875	26.2748125
2017Q1	7.384375	0.627391125	33.721875	26.3890625
2017Q2	7.390625	0.744516375	34.903125	26.5039375
2017Q3	7.403125	0.905726625	36.290625	26.6194375
2017Q4	7.421875	1.111021875	37.884375	26.7355625

Source: KNBS Survey and World Bank Website

APPENDIX IV: APPROVAL OF RESEARCH



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

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Directorate of Postgraduate Studies

Ref: MMU/COR: 509099

Date: 24th May, 2019

Hutton Ndombi Wanyama,
ECO/G/04/15,
P.O. Box 190-50100,
KAKAMEGA.

Dear Mr. Ndombi,

RE: APPROVAL OF PROPOSAL

I am pleased to inform you that the Directorate of Postgraduate Studies has considered and approved your Masters proposal entitled: "*External debt, Real Estate and Foreign direct Investment in Kenya, 2007 -2017*" and appointed the following as supervisors:

1. Prof. John Byaruhanga - SOBE, MMUST
2. Dr. Ngala Consolata - SOBE, MMUST

You are required to submit through your supervisor(s) progress reports every three months to the Director Postgraduate Studies. Such reports should be copied to the following: Chairman, School of Business and Economics Graduate Studies Committee and Chairman, Economics Department. Kindly adhere to research ethics consideration in conducting research.

It is the policy and regulations of the University that you observe a deadline of two years from the date of registration to complete your Masters thesis. Do not hesitate to consult this office in case of any problem encountered in the course of your work.

We wish you the best in your research and hope the study will make original contribution to knowledge.

Yours Sincerely,


Prof. John Obiri
DIRECTOR, DIRECTORATE OF POSTGRADUATE STUDIES

APPENDIX IV: RESEARCH PERMIT

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 710868	Date of Issue: 12/December/2019
RESEARCH LICENSE	
	
This is to Certify that Mr. HUTTON WANYAMA of Masinde Muliro University of Science and Technology, has been licensed to conduct research in Kakamega on the topic: EXTERNAL DEBT, REAL ESTATE AND FOREIGN DIRECT INVESTMENT IN KENYA (2007-2017) for the period ending : 12/December/2020.	
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