### EFFECT OF REAL ESTATE PRICES ON THE PERFORMANCE OF

#### THE KENYAN ECONOMY

BY

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#### DECLARATION

This research project is my original work and has not been presented for a degree at any other university for examination.

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This research project has been submitted for examination with my approval as the University supervisor.

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### LIST OF ABBREVIATIONS

CPI	-	Consumer Price Index
GDP	-	Gross Domestic Product
KNBS	-	Kenya National Bureau of Statistics
OLS	-	Ordinary Least Squares
RPT	-	Real Property Gains Tax.
VECM	-	Vector Error-Correction Model

#### ABSTRACT

The real estate sector is vital to any nation intending to provide the structures for amble working places and residential places as it works towards improving the nations GDP. Real state sector is however composed of different players which makes it challenging for the buyers to get the real property pricing. The sector also encompases other sectors of the economy including the financial institutions, private sector and land brokers. This study sought to determine the effect of real estate prices on the performance of the Kenyan economy. The study used a descriptive research design. This study purely relied on secondary data. Secondary data on real estate values and prices was be obtained from Hassconsult quarterly reports. Data on real GDP, interest rates, exchange rates, money supply accessed from CBK and KNBS reports covering 10 years 2007-2016. Multiple linear regression for analyzing data as well as use of SPSS. Study findings found a positive and statistically significant association linking residential property index (RPI) and the real GDP. The results also found a positive and significant relationship between inflation (CPI), money supply (M3) and the real GDP but an insignificant negative association linking interest rates (INT) and the real GDP. The results also obtained that the correlation linking exchange rates and real GDP is direct but insignificant. The study concludes that residential property index (RPI), inflation (CPI), money supply (M3) have a significant effect on economic performance in Kenya. This study recommends that the government and policy institutions concerned with housing should develop strategic policies to improving housing since it significantly affects economic performance in Kenya.

#### **CHAPTER ONE: INTRODUCTION**

#### **1.1 Background of the Study**

The real estate sector is a vital sector to any nation intending to provide the structures for amble working places and residential places as it works towards improving the nations GDP (Gaspareniene, Venclauskiene & Remeikiene, 2014). The real estate industry performance is directly correlated to the financial as well as the real sector of economic development (Kazimoto, 2016). The prices in this sector are used as the predictors for performance of the economy. The changes in pricing in the sector helps the investors to diversify their investments accordingly to avoid suffering losses or minimize the losses. The federal government rely majorly on the prevailing property prices in setting the policies to ensure equilibrium in the country's macroeconomics (Jiang, Phillips & Yu, 2014).

Real estate investment is a term used to refer to the development of the working places, tourist sites, and residential areas as well as transport network facilities like railways and roads among other things (Kong, Glascock & Lu-Andrews, 2016). Real estate is categorized into residential and non-residential properties. Residential houses are those which house families (Makena, 2013). The non-residential properties encompass commercial properties which naturally fall into one of four categories: apartments, industrial properties, offices and retail properties (Ghysels et al., 2012). The sector is very significant to the country's economic progress as it helps bringing the economy into equilibrium through the principal of demand and supply (Stohldreier, 2012).

The country has over the past years experienced influx in investment and growth of the sector which many analysts predict it will continue in the coming years (Karoki, 2013). The real estate business in Kenya entails buying a house, and it is one of the safest ways to invest your money in Kenya. This is mostly due to the fact that assets like a land and houses in Kenya have tended to almost always appreciate. Also, real estate business in Kenya is fair well in the market because with growing population in Kenya, the demand for houses is on the rise (Juma, 2014). The ever increasing population growth and rural- urban migration has caused excees demand for housing especially in the urban areas where the inflation in the sector has always been on constant rise particularly over the last decade. The country has experienced political stability hence the cause for increased prices in the sector (Kibunyi et al., 2017).

#### **1.1.1 Real Estate Prices**

Price is defined as the amount that the seller gets for the goods sold or services provided (Salleh et al., 2015). It's the expression of a property in monetary terms which is a universally accepted mode of exchange (Verheye, 2007). Price in finance, is the valuation which an asset is believed to carry under the prevailing market conditions. Thus, price is the importance which the buyer places on the good sold or service provided (Verheye, 2007).

The market value of a property implies the pricing which is agreed upon between the buyer and seller under the concept of the willing buyer willing seller (Verheye, 2007). However, for the property to be sold or disposed at the prevailing market price, all the market conditions must hold (Igbinosa, 2011). Price is consideration for the benefit of space as a function of time and this time could be temporal as in rentals and transfers of leasehold interests or perpetual as in sales of freehold interest. Optimal price however is the highest price that intersects the affordable price for an effective buyer use a search-and bargaining model in a theoretical treatment of the optimal listing price (Oloke, Olawale & Oni, 2017).

In the properties market, the pricing imposed by the seller is reflective of the prevailing market pricing. The property pricing is a significant factor as many buyers consider it before committing to invest (Salleh et al., 2015). It's also used as a comparison with other similar assets in the market (Verheye, 2007). Proper pricing of real estate product is crucial to facilitating transaction in real estate market whether rental or outright sale, as it encourages investors and promotes activities in the construction sector (Oloke, Olawale & Oni, 2017). The important aspect in pricing is it helps the investors on deciding whether to purchase the property or not as this market is often characterized by assets whose returns are realized in the long run (Admidins & Zvanitajs, 2011).

#### **1.1.2 Performance of the Kenyan Economy**

Economic performance is the increased capability of the country to provide better living conditions for its citizens (Mohajan, 2013). When a nation's economy is performing well, it gives it an opportunity to focus on the long-term policies and projections. According to (Monogbe, 2015), the major factors, which affect the economic performance, are; supply of money, rates of interest, inflation rate, and the economic growth, which have effect on the assets value and returns. The proxy used to measure the performance of economy is the GDP and indicates the national income and output for a given country's economy (Berry, 2006).

The Kenyan economy is among the leading in the African continent as it ranks third in Africa and largest in Eastern Africa (Mohajan, 2013). Kenya has gone through numerous changes in the last decades in order to boost its economic growth and development. According to KNBS, the country's Gross Domestic Product increasing by 2 percent between the years 2013 to 2014 (Knight Frank Kenya, 2015).

The country's GDP increased from 5.4% to 5.7% in the year 2013 and 2014 respectively. Kenya's growth is forecasted to grow by 6.2 percent to 6.7 percent in the years 2016 and 2017 respectively (KPMG, 2017). Kenya experienced good performance during the period of the independence but started struggling from the early 80's. the country's GDP averaged 10% during the early periods after the country gained independence but it started to decline in the early 80's and was ever lowest in early 90's due to political instability experienced in the country and the trend continued till the new government took over power in the year 2002 when the economy started to improve (Thugge, Ndung'u & Otieno, 2009)

#### **1.1.3 Real Estate Prices and the Performance of the Economy**

The real estate industry is an integrate part of the economic development of the country and essential economic changes have directly on the sectors pricing. The pricing are the major factors that reflect the level of the economic development of towns and districts and the quality of living (Burinskienė, Rudzkienė & Venckauskaitė, 2011). When the prices are high it's an indication that the economy is going through a period of economic boom while low prices indicate that the country is experiencing economic slump. Higher pricing in this sector has direct effect on the economic performance as it means new job opportunities are created hence the level of unemployment among the citizens reduces which also reduces the dependency ratio which is a major challenge particularly in the developing nations (Omare, 2015).

The sector is vital to the economy for the part it plays in the country's not only for the physical structures but for the growth of the whole state and multiple economic (Sorina, 2014). The properties pricing are vital as they are used to predict the economic growth of the nation (Scatigna, Szemere & Tsatsaronis, 2014). They are also vital to other sectors of the economy especially the financial markets which put their collateral on the advanced funds to its clients on them in cases of default. They take huge percentage of the commercial banks total current assets. Many investors who are interested in diversifying their investments give the properties market the first priority as the sector is not associated with frequent fluctuations (Pashardes & Savva, 2009).

In their study, Kong, Glascock and Lu-Andrews (2016) on their research on the impact of properties market on economic performance in Asian content where their study findings revealed an existence of a significant and direct correlation among the study variables. Zhang, Wang and Zhu (2012) examined association linking real estate investment on GDP among the Asian countries where the study results revealed a strong direct association among the study variables.

A study by Ren (2016) analyzed the impact of property market investment on GDP and found that the study variables are directly correlated. Jackman (2010) carried out the analysis of the property market construction and GDP where he the results were umbigous. Sorina (2014) posits that real estate market strongly influence the entire economy. According to Gaspareniene, Venclauskiene and Remeikiene (2014) supports that the growth or decline of real estate sector considerably affects the general growth or decline of a country's economy

#### 1.1.4 Real Estate Price and Kenyan Economy

In Kenya, the real estate ranks among the top five major contributors of GDP. In the last couple of years particularly from 2000, the country has experienced immense expansion and has become one of the main contributor to the country economy. The sector has reported an average growth of 5 percent over the last 5 years from the year 2012 (Kibunyi et al., 2017). The sector has overtaken some of the country's major sectors to become one of the country's economic backbone which was previously associated with the agricultural sector (Knight Frank Kenya, 2015). The data by the KNBS in the year 2015 which revealed that the country's GDP was standing at 5.6 percent up from 5.4 in the preceding year was mainly contributed by real estate (Deloitte, 2016).

The country is faced with excess demand for housing which is mainly contributed by increased rural- urban migration especially among the youth (Mwathi & Karanja, 2017). The country also faces the challenge of poor housing conditions which are slums due to the high rental prices charged by the landlords (Thugge, Ndung'u & Otieno, 2009). The government is also heavily investing in this real estate industry in various ways such as the inclusion of the ministry of housing in the government body, availing of funds to the housing ministry; enforcement of laws to do urban planning, regulatory laws in license permits (Mwathi & Karanja, 2017).

The financial analysts forecast a growth of 6 percent in the country's GDP in the year 2016 up from 5.7 percent in the preceding year (Mwathi & Karanja, 2017). The real estate sector

has various subsectors ranging from residential houses to commercial properties (Omboi & Kigige, 2011). The pricing process is Kenya usually negotiated and the market is characterized by large transaction costs (Karoki, 2013).

#### **1.2 Research Problem**

The real estate sector is vital as it plays a vital role towards the growth of Kenya's economy. It also boosts the growth of other sectors in the economy (Zhang, Wang & Zhu, 2012). However, the performance of the sector not only depends in the economy but the quality of the materials and contractors involved (Nikolaos, Dimitra & Agapi, 2011). The real state sector is also is characterized by products which are correlated hence the buyers come under immense difficulty in getting the right pricing in properties market (Capozza, 2002). The sector also brings together many sectors in the economy ranging from financing, private sector as well as insurance (Davidovska et al., 2008).

In Kenya, the real estate sector is characterized by ever increasing prices. The reason behing the ever increasing prices is due to the excess demand for housing units in the country ranging from the residential to commercial houses (Kibunyi et al., 2017). However, the real estate sector is faced by the ever increasing slums particular in the urban areas (Koech, 2013). There are numerous factors like low income per capita, low disposable income as well as adverse macroeconomic risks hence majority of the population cannot afford houses in major urban centers in the country (Kibunyi et al., 2017), also undermines formal housing supply in Kenya. Such requires an investigation on real estate values and prices, the factors affecting them and their impact on the Kenyan economy.

Empirically, Hong (2014) examined on their research on the impact of properties market on economic performance in Asian content where their study findings revealed an existence of a significant and direct correlation among the study variables. Chen and Zhu (2008) examined association linking real estate investment on GDP among the Asian countries where the study results revealed a strong direct association among the study variables. However, real estate sector is heterogeneous thus real estate values and prices constantly fluctuate due to various factors of which some are not easy to measure their effects on the economy in different countries.

In their study, Kibunyi et al (2015) assessed the factors influencing pricing of properties in Nairobi and found that housing prices had a positive relationship to GDP. However, the study only focused on determinants of real estate prices. Juma (2014) examined impact of economic factors on real estate development in Kenya and concluded an existence of a significant direct correlation linking economic factors to real estate investment growth. Most of the empirical literature acknowledges that micro economic variables influence real estate values but real estate values and price proves ambiguous. Additionally, very few studies in Kenya have assessed the relationship between real estate values and prices and their impact on the Kenyan economic. This brings up the question of, what are the determinants of real estate prices and their impact on the Kenyan economy?

#### **1.3 Research Objectives**

To determine the effect of real estate prices on the performance of the Kenyan economy

#### **1.4 Value of the Study**

This study will be significant to real estate valuers and appraisers as it will establish the factors, which influence real estate values and prices. The study will help real estate investment firms to determine the factors, which affect real estate values and prices in Kenya and come up with effective investment decisions on real estate property. Property sellers and buyers can also use the findings to determine the appropriate time to purchase real estate property.

In addition, policymaking institutions like government ministries and survey institutions may use the study recommendations for policy generation purposes. This study is also aimed at providing additional knowledge on real estate values and prices, the factors affecting real estate values and the effect of real estate values on economic growth in Kenya.

#### **CHAPTER TWO: LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter highlights theoretical literature reviewed, a review of various studies as explored by several scholars, the conceptual framework and a summary of literature review.

#### **2.2 Theoretical Review**

#### 2.2.1 Theory of Price

The model was put forward by Friedman (1976). The model reveals that pricing is mainly influenced by the divergent forces. The divergent forces are the demand force which arises due to the utility while supply is influenced by the costs. The equilibrium is achieved when the demand forces which is the consumer equates with the utility of the seller which is the supply forces (Omboi & Kigige, 2011). The theory focuses on the conflicting interests of the buyer and the seller (Weber, 2012). The price theory assumes that purchasers have perfect information about the items they are purchasing, or that sellers convey such information, and buyers could absorb it without cost (Meese, 2003).

The theory reveals that the pricing of a commodity is mainly influenced by the demand side of the economy where increased demand causes rise in prices while the opposite causes price decrease (Weber, 2012). The theory also reveals an existence of an inverse correlation whereby price increament has an inverse impact to the performance of the economy while price decrease leads to improved performance of the economy (Laurentiu

& Anca-Teodora, 2008). Based on the pricing theory the properties market is free economy where the pricing is solely influenced by the forces of demand and supply.

#### 2.2.2 Economic Growth Theory

The model was developed by Harrod and Domar in 1950s based on the Keynesian approach. The economic theory emphasizes that the value of assets, including the value of real property, is influenced by many factors which determine the behavior of operators engaged in market transactions (Berry, 2006). The economic growth model also reveals that technological advancement and external factors in the economy like investment influence the level of economic growth. The growth theory states that development of the financing institutions improves the performance of the economy as it avails funds needed in the real estate sector as this sector is a capital intensive one (Monogbe, 2015).

This model reveals that the sector will play a key role in the growth of the country's economy in the long-term. The concept of the equilibrium asserts that for growth to be realized the sector has to collaborate with other sectors of the economy (Hongyu, Park & Siqi, 2002). According based on the economic growth theory, the prevailing properties market prices are directly associated with the improved disposable income among the Kenyan citizens. This indicated a direct correlation which exists between property pricing and economic performance (Berry, 2006).

#### 2.2.3 Structural Model of the Housing Market

The model of the housing market was pioneered by Pottow (2007). According to the theory, consumers are attracted to the sector due to the longevity of the structures which last over a long period. The characteristics of the properties market like instalment payment which

is catered for in the theory (Bajari et al., 2008). The theory also emphasizes that macroeconomic instability, weaker legal system and regulatory environments, inefficient collaterization of assets as well as lender affect housing sector (Akumu, 2014).

The model reveals that properties market achieves equilibrium aided by the financing institutions (Nobili & Zollino, 2012). According to the model, the transactional costs in the sector cause the buyer of the property to pay additional charges using the money intend to buy the property (Bajari et al., 2008). The model also presupposes the pricing of the housing units is dependent on various factors such as the locality of the property, financing options, personal earnings among other things (Nobili & Zollino, 2012).

#### **2.3 Determinants of Economic Performance**

#### 2.3.1 Inflation

Inflation is defined as the persistent increase in the prices of goods and services. Inflation tends to push up the price of commodities without a corresponding increase in their real value (San, 2013). Inflation is the term used to describe a rise of average prices through the economy. It means that money is losing its value. This is one of the major challenge facing federal governments around the globe. Inflation forces people to dig deeper into their pockets as the prices that were used to purchase items cost more hence reducing their disposable income (Mahalik & Mallick, 2011). Inflation has an inverse correlation to the investment in the properties market as increased housing prices leads to decreased demand for housing units (Monogbe, 2015). CPI is a proxy used in calculating Inflation rate.

#### **2.3.2 Exchange Rates**

Exchange rate is the amount of local or home currency exchanged with the international currency. The local currency may lose value compared to the international currencies a term referred to as depreciation (Omare, 2015). This factor not only affects the balance of payment but all the major sectors of the economy. Stable local currency boost economic growth through attracting investors to the country (San, 2013). This is mainly influenced by the price differences which exist in different states around the globe (Mahalik & Mallick, 2011).

#### 2.3.3 Money Supply

This simply refers to the measure of money. Money supply in the economy has a high propensity for the multiplier effects on all other sectors. Increased currency supply implies more money is chasing limited resources causing inflation which hampers economic growth (Mahalik & Mallick, 2011). Money growth impacts inflation developments in the long run as advocated by the quantity theory of money, according to which money growth precedes equal changes in the general price level rate of growth (Monogbe, 2015). Increased money supply causes inflation, which diverts funds from investment function to consumption function (Omare, 2015).

#### **2.3.4 Interest rates**

This is the cost the lender charges for the amount advanced which is usually a certain percentage which is repaid together with the full amount advanced (Omare, 2015). Interest rate can also be described as a price used to forecast whether there would be inflation or

not, as high interests are imposed by the federal banks to when the rate of inflation is high which is known to have an inverse association with the GDP (Mahalik & Mallick, 2011).

#### **2.4 Empirical Review**

Oloke, Olawale and Oni (2017) studied the factors that determine housing price and time it takes for firm to be quoted in the securities market. The researchers collected using structured close-ended questionnaires which were administered to 113 to property owners. The study revealed an existence of significant and direct correlation linking the variables under study.

Omare (2015) studied impact of macroeconomic factors on profitability of real estate industry in Kenya given they are key in the growth of the country's economy. The secondary data covered 15 years 2000-2014 and multiple regression was employed in analyzing collected data. The study found that GDP, Diaspora remittances, and rate of interests have a positive effect on real estate industry profitability. The study concluded that macro-economic variables should be carefully be considered by all investors in the real estate industry.

Borowiecki (2009) studied factors influencing housing prices in the Swiss housing economy through a vector-autoregressive model. The study considered several fundamental determinants among them income, financial institutions among other factors influencing housing prices. The paper found that real housing pricing increment are highly volatile due to the rapid population growth, whereas real GDP had only a minor impact in the short-term. The study also found that exogenous housing prices had short-term effect on the housing prices. Karoki (2013) investigated the determinants of residential real estate prices over 8 year period (2005-2012). The study used descriptive and multiple regression to analyze the collected data. The findings revealed existence of strong inverse association linking housing pricing to macroeconomic factors. The conclusions were, among all the macroeconomic factors, rate of interests have more impact on the housing pricing. The study also found an insignificant relationship between inflation and residential real estate prices.

Omboi and Kigige (2011) examined the correlation linking macroeconomic variables to meeting the excess demand for houses in Kenya. The research adopted an explanatory research approach and collected data through the use of questionnaires which were distributed to financial institutions across the Country. The study used the linear regression and to determine the correlation as well as the strength of the two variables under study. The results revealed an inverse correlation between macroeconomic variables and mortgage financing institutions.

Akinsomi and Mkhabela (2016) investigated the determinants of economic variables on the prices of real estate among countries in southern part of the African continent covering January 1996 to June 2008. The study adopted the VAR modeling. The results revealed that house price returns are influenced by most of the macroeconomic and financial variables specifically the real effective exchange rate, interest rate spread and manufacturing production positively impact on house price returns while the domestic interest rate, the dividend yield and expected inflation had a negative effect. The study also found that manufacturing production has a lagged effect on house price returns while the real effective exchange rate and domestic interest rate have a contemporaneous effect. Mikhed and Zemčík (2009) investigated the factors influencing the falling housing prices in the American market which are due to disposable income, securities market and financing option. The study employed panel data stationarity tests. The results revealed that the main factors influencing housing pricing are macroeconomic factors as the study reveals from the data collected from 1997- 2007. The study concluded that property market takes longer to move back to equilibrium when it fluctuates due to various macroeconomic factors.

San (2013) studied the economic variables on property pricing among the countries in Asian continent. The study used secondary data from various real estate departments of the countries studied in order to determine correlation linking variables under study. The results showed an inverse correlation linking locality and housing unit pricing, as well as the mortgage financiers which has direct correlation to house prices.

Gathuru (2014) investigated the effects on macroeconomic variables on effect value of real estate supply in Kenya. The study used a data covering five years from 2009 to 2013 obtained from government documents and real estate industry. Through a multivariate regression model the results found that there were positive relationships with GDP and value of real estates supplied, being the most significant, followed by Inflation, Cost of construction and Percentage of debt financing. However, the relationship between population growth rate and employment rates and the value of real estate could not be established. The study also found that the value of real estate supply had an upward trend.

Mahalik and Mallick (2011) examined the examined the impact of selected macroeconomic variables on the performance of residential housing properties in Kenya using quarterly

data from 2000 Q1 to 2010 Q4. The study used secondary data and tested three main issues to determine any linkages between the selected variables and housing property markets in Kenya. The findings revealed that the performance of the housing sector in Kenya is influenced significantly by changes in macroeconomic variables used in this study. The study also established that changes in gross domestic product, money supply and public debt positively impact on the house price returns whereas changes in domestic interest rates, Kenya shilling US dollar exchange rate, inflation, and rental income negatively affect house price returns.

#### **2.5 Conceptual Framework**

The aim of this study is to explore real estate values and prices, the factors affecting them and their impact on the Kenyan economy. Thus, rental estate prices will form the independent variable inflation, interest rates, exchange rates, money supply will form the control variables while real GDP will be used as the dependent variable as a proxy of the Kenyan economy. The conceptual framework is depicted by figure 2.1



**Figure 2.1 Conceptual Framework** 

#### 2.6 Summary of Literature Review

The chapter has reviewed several empirical studies on association linking real estate values and prices and also on the factors affecting real estate values and prices. Studies by Oloke, Olawale and Oni (2017); Omboi and Kigige (2011); Borowiecki (2009); Akinsomi and Mkhabela (2016); Karoki (2013) and Stohldreier (2012) studied the factors that determine housing prices. Studies by Omare (2015); San (2013) and Gathuru (2014) studied the correlation linking macroeconomic variables to house pricing. From the reviewed studies, it is evident that the factors affecting housing price have been extensively studied. However, studies on association linking economic growth to real estate values and prices remain scarce. This requires a study on the same to fill the empirical literature gap on economic growth and real estate values and prices specifically in Kenya.

#### **CHAPTER THREE: RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter contains the research design, defines the population of the research and the data collection procedure. The chapter also presents the data analysis method and the analytical model.

#### **3.2 Research Design**

Design is used to refer to the way in which data is to be collected and analyzed ((Kothari, 2004). This study sought to examine the effect of real estate prices on performance of Kenyan economy. To achieve this objective, the study used a descriptive research design. Descriptive studies are more formalized and typically structured with study objective being comprehensively stated (Kothari, 2004).

#### **3.3 Data Collection**

The study purely employed secondary data. Secondary data on real estate values and prices was be obtained from Hassconsult quarterly reports. Data on real GDP, interest rates, exchange rates, money supply obtained from CBK and KNBS quarterly reports over 10 years 2007-2016.

#### **3.4 Data Analysis**

Data analysis entails inspecting, transforming and modeling data with the goal of getting useful information that is important for decision-making process. Multiple linear regression and correlation were used to analyze data for the study using the Statistical Package for Social Sciences. Regression was used to establish association lining insurance development variables and economic growth while correlation to establish the strength and nature of the relationship.

#### **3.4.1 Analytical Model**

The multiple linear regression was adopted as analytical model for the study. The model was as follows

$$Y_{t} = \beta_{0} + \beta_{1}X_{1} + \beta_{2}X_{2} + \beta_{3}X_{3} + \beta_{4}X_{4} + \beta_{5}X_{5} + \epsilon$$

Where;

 $Y_t$  = Real GDP proxied by quarterly real gross domestic product

- X<sub>1</sub> = Real estate values and prices measured using the quarterly property index (Pi) by the HassConsult
- $X_2$  = Quarterly Consumer Price Index (CPI) as a measure of inflation
- $X_3 =$ Quarterly rates of interest as measure of interest rates

 $X_4 =$ Quarterly exchange rates

 $X_5 = M3$  as a measure of money supply

 $\beta_0 = \text{Constant}$ 

- $\beta_1$   $\beta_5$  = Coefficients of the regression equation
- $\epsilon$  = Probable error

# CHAPTER FOUR: DATA ANALYSIS, RESULTS AND INTERPRETATION

#### **4.1 Introduction**

This chapter presents the descriptive summary results, the correlations, multiple linear regression results and the interpretations of the research findings

#### **4.2 Descriptive Statistics**

Descriptive statistics were used to summarize the study data using the mean, standard deviation, minimum, maximum and other descriptive methods

	Real GDP	RPI	CPI	INT	EXCH	M3
N	40	40	40	40	40	40
Mean	824287.604	304.458	125.470	15.7877	83.8137	1513156.80
Std. Deviation	134419.58	74.8910	29.0350	2.0681	11.4926	691402.042
Skewness	.477	123	.007	.738	041	.341
Kurtosis	834	741	-1.210	277	673	905
Minimum	633710.00	175.30	78.46	12.87	62.65	557650.00
Maximum	1094567.00	436.86	175.18	20.34	103.89	2761800.00

#### **Table 4.1 Descriptive Statistics**

#### **Source: Research findings**

Table 4.1 indicates that the real GDP over the considered study period was 824287.604 whereas the mean value of the residential property index (RPI) was 304.458 while the average CPI over the period was 125.470 respectively. The table further shows that the average interest rates were 15.7877 whereas the average exchange rates were 83.8137

while the average amount of money supplied was 1513156.80 respectively. The study indicates that the data was normally distributed as the all the kurtosis and skewness values which lie between -1 and +1 thus the normality assumption was not violated.

#### **4.3 Correlation Analysis**

#### **Table 4.2 Correlations**

	Real GDP	RPI	СРІ	INT	EXCH	M3
Real GDP	1					
RPI	.600**	1				
CPI	.634**	.580**	1			
INT	.578**	.610**	.647**	1		
EXCH	.563**	.524**	.517**	.555**	1	
M3	.648**	.566**	.671**	.407**	.527**	1

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

#### **Source: Research Findings**

Table above indicates that the correlation between the residential property index (RPI), consumer price index (CPI), interest rates (INT), exchange rates (EXCH) and money supply (MS) and real GDP is strong and positive.

#### **4.4 Regression Analysis**

#### 4.4.1 Model Summary

#### Table 4.3 Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the	Durbin-Watson
				Estimate	
1	.959 <sup>a</sup>	.919	.907	.021227	1.317

a. Predictors: (Constant), M3, INT, EXCH, RPI, CPI

#### b. Dependent Variable: Real GDP Source: Research Findings

Table 4.3 indicates that the coefficient of determination statistic is 0.919, which indicates that 91.9% of the variations can be explained by the independent and control variables considered by the research. The correlation coefficient value of 0.959 indicates that there is a strong correlation linking the variables of the study. The study also shows there is no autocorrelation as shown by the Durbin Watson statistics of 1.317.

#### 4.4.2 Analysis of Variance

Table 4.4 shows the analysis of variance results

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	.173	5	.035	76.995	.000 <sup>b</sup>
1	Residual	.015	34	.000		
	Total	.189	39			

**Table 4.4 Analysis of Variance** 

a. Dependent Variable: Real GDP

b. Predictors: (Constant), M3, INT, EXCH, RPI, CPI

#### **Source: Research findings**

Table 4.4 shows that the generated regression equation was significant as indicate by the F statistic value of 76.995 and the p value 0.000 < 0.05. This indicates the adopted model is fit to explain the existing association among study variables.

#### **4.4.3 Regression Coefficients**

Model		Unstandardized		Standardized	Т	Sig.	Collinearit	ty
		Coefficients		Coefficients			Statistics	
		В	Std. Error	Beta			Tolerance	VIF
	(Constant)	4.188	.178		23.505	.000		
	RPI	423	.161	697	-2.627	.013	.149	6.711
1	CPI	.529	.196	.793	2.698	.011	.285	3.509
1	INT	051	.082	041	622	.538	.561	1.782
	EXCH	.003	.151	.003	.020	.984	.137	7.314
	M3	.280	.070	.872	3.978	.000	.203	4.926

**Table 4.5 Coefficients** 

a. Dependent Variable: Real GDP

#### Source: Research findings

The regression coefficients model generated the following equation

$$Y_t = 4.188 - 0.423X_1 + 0.529X_2 - 0.051X_3 + 0.003X_4 + 0.280X_5 + \epsilon$$

According to the results on the equation, existence of positive and statistically strong correlation linking the residential property index (RPI) and the real GDP. The results further indicate existence of significant direct correlation linking inflation (CPI), money supply (M3) and the real GDP but there is an insignificant inverse association linking interest rates (INT) and the real GDP. Finally, the results indicate that correlation linking exchange rates and real GDP is positive but insignificant. The tolerance and VIF values are above 0.2 and less than 10 respectively. This indicates that there is no multicollinearity among the study variables.

#### **4.5 Interpretation of the Findings**

The findings established that real gross domestic product is negatively and significantly affected by the residential property index (RPI). This implies that a strong negative correlation linking the residential property index (RPI) and economic performance in Kenya. In support of the finding, Kong, Glascock and Lu-Andrews (2016) found that real estate investment has a significant and direct impact on the performance of GDP. Jackman (2010) also found a bi-directional causality among the study variables. San (2013) however established fluctuations in house pricing doesn't influence gross domestic products.

The findings also indicate that the consumer price index (CPI) has a strong and direct relation with the real gross domestic product. This implies that there is a significant direct association linking inflation levels and economic performance in Kenya. According to Monogbe (2015) inflation leaves the citizens with less disposable income hence no enough cash to purchase assets which hampers growth of the economy.

The study further revealed strong direct correlation linking money supply and the real gross domestic product. This indicates an existence of strong direct association linking money supply and economic performance in Kenya. Mahalik and Mallick (2011) supports that excess money in the economy implies too much cash chasing limited resources which hampers economic growth. Omare (2015) also posits that money supply in the economy has a high propensity for the multiplier effects on all other sectors

The findings revealed an existence of an insignificant inverse correlation linking interest rates and the real gross domestic product. This implies that interest rate levels do not significantly influence economic performance in Kenya. However, according to San (2013)

exchange rates not only have impact on the balance of payments but the whole economy in general. They further affect the rate of interests which are major economic variable affecting growth of the economy.

The research found that the association linking exchange rates to GDP performance in Kenya was positive but insignificant. This implies that exchanges rates have no strong impact on performance of the Kenyan economy. Karoki (2013) however concluded that interest rates are first followed by GDP and level of money supply in terms of influence they have on housing pricing.

# CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### **5.1 Introduction**

This chapter entails the findings summary, conclusions and recommendations. The chapter also discusses the study limitations and unexplored areas, which may require additional investigation.

#### **5.2 Summary**

The study sought to explore the effect of real estate prices on the performance of the Kenyan economy. Thus, rental estate prices formed the independent variable inflation, interest rates, exchange rates, money supply formed the control variables while real GDP was used as the dependent variable as a proxy of the Kenyan economy. The study used a descriptive research design and purely relied on quarterly secondary data for 10 years 2007-2016. Multiple linear regression and correlation were used to analyze data for the study.

The summary statistics results revealed that the real GDP over the considered study period was 824287.604 whereas the mean value of the residential property index (RPI) was 304.458 while the average CPI over the period was 125.470 respectively. The result further found that the average interest rates were 15.7877 whereas the average exchange rates were 83.8137 while the average amount of money supplied was 1513156.80 respectively. The correlation analysis results found that the association linking residential property index

(RPI), consumer price index (CPI), interest rates (INT), exchange rates (EXCH) and money supply (MS) and real GDP is strong and positive.

The model summary established that 91.9% of the variation in the dependent variable (Real GDP) is explained by the independent (Residential property index) and control variables considered by the research. The overall correlation established an existence of significant association linking the study variables. The ANOVA results found that the regression equation was significant since the p value of 0.000 < 0.05. The regression coefficient results found a positive and statistically significant association linking the residential property index (RPI) and the real GDP. The results also found a positive and significant negative relationship with interest rates (INT). The results also obtained that the relationship between exchange rates and real GDP is positive but insignificant.

#### **5.3 Conclusions**

The findings established that real gross domestic product is negatively and significantly affected by the residential property index (RPI). Based on this finding the study concludes there is an existence of strong negative association linking the residential property index (RPI) and economic performance in Kenya. The findings also found that the consumer price index (CPI) had a strong direct relation with the real gross domestic product. The study based on this result concludes existence of significant positive association linking inflation levels and economic performance in Kenya. Furthermore, study findings revealed a significant and positive association linking money supply to the real gross domestic

product thus the conclusion that there is a significant direct association linking money supply and economic performance in Kenya.

The findings further established that there is an insignificant negative relationship between interest rates and the real gross domestic product. Based on this research finding the study concludes that interest rate levels do not significantly influence economic performance in Kenya. Finally, the research found that the association lining exchange rates and economic performance in Kenya was positive but insignificant. The study therefore concluded that exchanges rates have no significant effect on the performance of the Kenyan economy.

#### **5.4 Recommendations**

Based on the conclusion that an existence of negative association lining the residential property index (RPI) and economic performance in Kenya. This study recommends that the government and policy institutions concerned with housing should develop strategic policies to improving housing since it significantly affects economic performance in Kenya.

As per the study conclusion, that there is a significant direct association linking inflation levels and economic performance in Kenya. This study therefore recommends that the government and CBK should ensure that they control and mitigate inflation through various monetary policies to ensure the effects of inflation do not affect the performance of the Kenyan economy.

The research also concluded that there is a significant direct correlation linking money supply and economic performance in Kenya. Thus, this study recommends that the central

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bank of Kenya, which is in charge of currency supply, should ensure that there is adequate money in supply to since money supply significantly affects economic performance.

The study concluded that the levels of interest rates and exchange rates do not have a significant impact on the Kenyan economy. This study however recommends that the central bank of Kenya should ensure that interest rates and exchange rates are stable since they affect the performance of specific sectors of the economy.

#### 5.5 Limitations of the Study

The objective of this study was to establish the relationship between real estate prices and the performance of the Kenyan economy. Thus, the findings are based on the Kenyan context and the real estate sector in Kenya therefore the findings may not be applicable elsewhere and in other economic sectors. The study also relied on quarterly data and specific measures to measure the study variables but there are alternative measures of the variables, which may lead to different findings and conclusions.

#### **5.6 Suggestion for Further Research**

The study focused on real estate prices and economic performance in Kenya thus an additional research can be carried on impact of interest rates on residential real estate prices. Additionally, interest rates, inflation, money supply were incorporated as control variables but the study recommends an additional study on the effect of macroeconomic variables on real estate prices and values. The study can also investigate the casual relationship between real estate prices and economy growth to determine whether there is a bidirectional relationship.

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