# THE EFFECT OF SELECTED MACROECONOMIC VARIABLES ON RENTAL PRICES IN KENYA

**BY**

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# DECLARATION

This research project is my original work and has not been submitted to any other university for academic award.

Sign……. Date……

**GILBERT KIPKIRUI CHERUIYOT**
**D63/70925/2014**

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

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# DEDICATION

I dedicate this project to my lovely wedded wife Lilian and my new born son Damien. They gave me the reason to strive to excel in this research and my field of study so that I may be a Husband and a Dad who will be able to provide for his family.

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# LIST OF ABBREVIATION AND ACRONYMS

**APR -** Annual Percentage Rate

**CBK** - Central Bank of Kenya

**CBR** - Central Bank Rate

**CPI** - Consumer Price Index

**GDP** - Gross Domestic Product

**KBRR** - Kenya Banks' Reference Rate

**KNBS** - Kenya National Bureau of Statistics

**Kshs -** Kenya Shillings

**SPSS** - Statistical Package for Social Sciences

# ABSTRACT

Housing is of vital importance to a country and as such a research on the effects of selected macroeconomic variables on rental prices. In Kenya, most of the research has been done on the determinants of real estate property prices unlike those that determine rental prices.

This study investigated the effect of selected macroeconomic variables on rental prices in Kenya. Precisely, the study sought to establish whether Inflation, Real Gross domestic product (GDP) and Lending interest rates affect rental prices in Kenya. The study was based on secondary data obtained from the Central Bank of Kenya (CBK), the Kenya National Bureau of Statistics (KNBS) and HassConsult Limited.

Descriptive study was used to demonstrate relationship between the macroeconomic variables of interest and rental prices. Quarterly average percentage change in secondary data from January 2010 and December 2014 of rental prices, real GDP, inflation and lending interests rates were input and analysed using SPSS.

This study found out that there was a positive relationship between rental prices and real GDP. However, a negative relationship was established between both inflation and lending interest rates. Lending interest rates affected the rental prices more significantly as compared to inflation rates. For 1% increase in inflation and lending interest rates would result to 8% and 4.1% reduction in rental prices, respectively. This may reduce the tenants' purchasing power hence lower rental prices will be preferred. A percentage increase in real GDP would result to 0.9% increase in rental prices. The benefits that come with economic growth and increased output includes high consumption of goods and services, hence the increased demand pushes the rental prices higher.

It will also provide guidance to policy makers on the Macroeconomic factors useful in safeguarding housing affordability and development of real estate in Kenya. Government should put in place measures to sustain growth in real GDP so as to favour returns to real estate investors. It should also put in place policies to ensure stability in inflation and lending interest rates to retain steadiness in the citizen's purchasing power to afford rental properties of choice.

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the study

Kenya is going through rapid growth in population in relation to limited household resources and restricted land supply. Rental housing is growing as few citizens can afford to build or buy their own homes. Walley (2011), in his study on developing Kenya's mortgage market, noted that the rental system needs to be developed to protect both tenants and landlords. It also added that housing supply was a constraint due to high cost of housing and cost of mortgages, with the mortgages being available to a small percentage of the population.

The mortgage rates have put buying of houses out of reach for all except those on the very highest salaries in Kenya. This results in more tenants as compared to House owners. From the sharp interest rate rises of 2011, the average monthly repayments to purchase an apartment have stayed above Ksh140, 000 a month, despite the subsequent near halving in the Central Bank of Kenya's base rate, The Hass Property Index (2014).

HassConsult, a market leader in the Kenyan Real Estate sector, in their quarter four report 2014 suggested that the rental prices rose in quarter 3, 2014. The strongest rent upsurges were in the apartments market, up 5.1 per cent on the previous quarter 2 2014 and 10.4 per cent on a year earlier. Subsequently, rents for detached houses rose by 3.8 per cent on the three months earlier, and semi-detached houses by 2.9 per cent. The Hass property index also highlighted that the rents had increased by 3.43 times since 2001.

In a perfect competitive market, the market prices are expected to be determined by interactions of supply and demand. Changes in Economic variables may affect the performance of an Economy either positively or negatively. Tenancy in rental housing in Kenya is a very complex. According to Mwangi (1997), it is driven by market forces in the private sector but by heavy subsidies in the public housing sector. Ervin (2002) suggested that many factors could influence the rental movement. He added that

economic activity like changes in aggregate output, the employment rate, the index of stock market and interest rates could affect rent prices.

Inflation is not entirely a monetary phenomenon in developing countries. Factors related to fiscal imbalances such as higher money growth and exchange rate depreciation rising from a balance of payments crisis control the inflation level in developing countries, Sergent & Wallace (1981). When investors in real estate make their investments decisions they have to think on how inflation may affect their returns; which in turn affect the available houses for rent.

The supply of funds allocated to mortgage lending by the financial institutions is determined by the returns and the risks of the debts and the investment opportunities. As they make their decisions to borrow or lend, the borrowers and the lenders must be convinced that the interest rate commitments are sufficiently high to compensate for any expected loss in the purchasing power during the period that the investment or loan is outstanding, Brueggerman and Fisher (2011).

### 1.1.1 Selected Macroeconomic Variables

Macroeconomics emphasizes on the performance of the entire economy rather than that of an individual, Schiller (2006). In the short-run, Macroeconomics focusses on maximizing output and minimizing unemployment. In the long run, the focus is on growing the economy thereby raising future living standards. The factors used to measure macroeconomic performances are referred to as macroeconomic variables. They include GDP, unemployment rate, inflation rate which is commonly measured by Consumer Price Index (CPI).

Mankiw and Taylor (2010) added that Macroeconomics was the study of economic-wide phenomena, including Economic growth, Unemployment and Inflation. GDP measures the total income of everyone in the economy and the total expenditure on the economy's output of goods and services. GDP is a good measure of economic well-being as people prefer higher to lower incomes. Real GDP utilizes in reference to constant base-year prices to value the economy's output. Inflation refers to change in the price index from the preceding period. GDP deflator can also be used to measure Inflation other than the

CPI. GDP deflator is nominal GDP over real GDP times 100. Nominal GDP is defined as the production of goods and services at current prices. Inflation affects economic variables. Nominal interest rates when corrected for the effects of inflation results in real interest rates. Nominal interest rates are the rates that the banks pay and they have already factored in inflation.

### 1.1.2 Rental Prices

Brueggerman and Fisher (2011) suggested that market rents for properties depend on the economic base as well as the supply and market forces for space by tenants. He also mentioned that market rent depends on changes in the demand for space as well as expected changes in the supply of space. The investor must weigh how changes in the market rental rate due to changes in supply and demand can affect the income prospects of a possible investment as well as the volatility in income. He went ahead to define market rent as the price that must be paid by a potential tenant to use (lease) a particular type of space under the current market conditions.

Among the factors cited, by Brueggerman and Fisher (2011), that may affect rent include the outlook for the national economy, the economic base of the area in which the property is located, the demand for the type of space provided by the property in the location being analysed and the supply of similar competitive space. Thus, this study will seek to establish the effect of macro-economic variables on rental prices in Kenya. Precisely, the study will seek to establish whether Inflation, real Gross domestic product (GDP) and lending rates affect rental prices in Kenya.

### 1.1.3 Effect of Selected Macroeconomic Variables on Rental Prices

All investors make their decisions by considering how inflation will affect their investment returns. The lenders and investors must be persuaded that the interest rate commitments are sufficiently high to compensate for any expected loss in purchasing power during the period that the investment or loan is outstanding, Brueggeman and Fisher (2001). This affects the level of investments in real estate property. The availability of housing affects the pricing due to forces of demand and supply.

The society's standard of living depends on the economic output- its ability to produce goods and services. The variations in the standard of living among countries are as a result of large differences in income. Richer countries have more cars, better nutrition and even safer housing. The growth of real GDP is a good measure of economic progress, Mankiw and Taylor (2010).

Barro (1996), in his research on Inflation and growth, cited that business and households are thought to perform poorly when inflation is high and unpredictable. Quigley and Raphael (2004) added that increase in inflation will result to increase in nominal interest rates and house prices, which offsets any increases in nominal wages, hence making housing less affordable.

### 1.1.4 Real Estate Industry in Kenya

The real estate sector in Kenya has been greatly affected by fluctuating interest rates. Housing is an investment which requires huge capital. Hence banks come in to finance the cost of construction of the real properties or purchase of the same, Muthaura (2012). Walley (2011), in his study on developing Kenya's mortgage market, noted that the rental system needs to be developed to protect both tenants and landlords. It also added that housing supply was a constraint due to high cost of housing and cost of mortgages, with the mortgages being available to a small percentage of the population. Mankiw and Taylor (2010) cited that Interest rates are affected by inflation.

The Hass property index (2014) pointed out that buy-to-let buying currently dominates the Kenyan property market and the majority of the new buildings are expanded to supply properties for rent. The mortgage rates have put buying of houses out of reach for all except those on the very highest salaries in Kenya. The average monthly repayments to purchase an apartment have stayed above Ksh140, 000 a month, despite the subsequent near halving in the Central Bank of Kenya's base rate.

## 1.2 Research Problem

Housing takes a large part of the expenditure item in the budgets of most families and individuals. These high proportions propose that small percentage changes in housing prices and rents will have large impacts on non-housing consumption and household

well-being, Quigley and Raphael (2004). The issue of housing affordability has often been described in terms of rent burden or owner cost burden, Kutty (2005). Kutty also clarified that housing expenditures have caused many homes, both tenants and owner-occupants, to reduce their overheads for food, clothing, health care, education, and other human capital investments. There is little empirical study on the effects of the selected macroeconomic factors on rent prices in Kenya. Additionally, the study will offer insight on the effects of the selected macroeconomic factors on rental prices in Kenya and help in policy making by the Government to ensure house affordability.

The Hass property index (2014) noted that over half of detached houses, semi-detached houses and three-quarters of apartments are being bought to rent out. It also noted that the rental prices continued to rise in 2014 as compared to the recent years, up 4% from quarter 3, 2014. This spells an issue of rental prices affordability. Kenya National Bureau of Statistics, Leading Economic Indicator (2014) , showed that average lending rates for commercial banks reduced from 17.02% to 16.99% and month to month inflation from 7.67% to 6.02%, for the period July 2014 to December 2014. In contrast, the average letting prices for all properties increased from Kshs 126,240 to Kshs 132,202, in the same period. Similarly, the rebased rates of real GDP showed an erratic movement from an annual average of 8.4% in 2010 to 4.5% in 2012, then a rise to 5.7% in 2013. Rental prices of all properties have not followed the same trend with the average prices rising from Kshs 99,013 in December 2010 to Kshs 106,122 in December 2012 and finally to Kshs 126,724 in December 2014. This shows the need for analysis on the effect of Macroeconomic factors selected on letting prices for a longer period.

Further, from the empirical review, studies already conducted on Real estate have predominantly focused on the determinants of real estate property prices, the effect of macroeconomic variables on the prices of residential real estate properties and investment decisions on Real estate. There is inadequate evidence of research on factors driving rent prices in Kenya.

Swazuri and Lucian (2012) affirmed that inflation and GDP growth had little effect on rental value trends. Ombati (2014) did not find evidence to suggest that the movement in interest rates causes changes in commercial rent. In contrast, Ling and Naranjo (2015), by

comparing long term leases verses short term leases like those of apartment, noted that higher realized inflation was expected to be reflected in rental rates, in the long term. Golob, Bastic & Psunder (2012) also found that there was a positive correlation among interest rates, higher prices and growing real estate transactions. Declining economic growth does have an impact on declining real estate transactions. Barksenius and Rundell (2013) could not justify the reasons the positive effect from bank lending rates on real estate prices.

The studies done on real estate property prices in Kenya had conflicting findings. Makena (2012) suggested that inflation had the least effect as compared to population growth and interest rates. Mwololo (2014), however, found out that inflation had significant positive influence on residential housing prices. While Muli (2013) suggested that GDP growth contributed the most to the growth in real estate. Inflation growth and interest rates correlated negatively to real estate investments, unlike GDP which had a positive relation; population had insignificant effect, though relating negatively to Real estate investment. Akumu (2014) also agreed that variations in gross domestic product positively impact on the house prices while changes in inflation negatively affect house prices.

It's noticeable that the findings by various researchers both locally and internationally on factors affecting real estate prices and rental prices are inconsistent. Most have dealt on the factors that affect real estate prices and minimal done on those that affect rental prices in Kenya. The question of this study was; what is the effect of macroeconomic variables on rental prices in Kenya?

## 1.3 Research Objective

The general objective of this study was to establish the effect of selected macroeconomic variables on rental prices in Kenya.

The specific objectives of this study were:

i. To examine the impact of real GDP on rental prices in Kenya.
ii. To determine the contribution of Lending rates on rental prices in Kenya.
iii. To determine the extent at which Inflation affect the rental prices in Kenya

## 1.4 Value of the Study

The results and findings from this research will form a basis for Government monetary policy formulations on ways of managing the effects of the selected macroeconomic variables so as to sustain house affordability as a human need.

The study would also help in the interaction between the banking sector regulator, CBK, and the commercial banks in a bid to enhance private sector credit and mortgage finance supply in Kenya. As a result, there will be more houses to rent which will provide more choices and possible reduction in rental rates.

The realtors will also benefit from immense knowledge that will come out of the study in a bid to understand factors that may affect rental income, which is the expected return for their investments in real estate.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

There is a significant amount of literature available on real estate market in Kenya. Different studies have been done on different concepts that affect the real estate market. This chapter will give an insight on the several theories that affect real estate. Selected empirical studies will be also be emphasized.

## 2.2 Theoretical Review

The study relating to the effect of selected macroeconomic variables on rental prices cannot be exhausted without considering the underpinning theories behind it. The macroeconomic theories reviewed and that will guide this study include; The Theory of Inflation, The Theory of Interest Rates and the Quantity Theory of Money.

### 2.2.1 Theory of Inflation

Romer (2012) defined inflation as an increase in the average price of goods and services in terms of money. He went ahead to suggest that there are many potential sources of inflation. The Price level can rise as at a result of increases in the money supply, increases in interest rates, decrease in output and decreases in money demand for a given real income and nominal interest rate.

Brueggeman and Fisher (2001) explained that all investors make their decisions by considering how inflation will affect their investment returns. The lenders and investors must be persuaded that the interest rate commitments are sufficiently high to compensate for any expected loss in purchasing power during the period that the investment or loan is outstanding. Samuelson and Nordhaus (2010) noted the effects of inflation as redistribution of income and wealth among different groups and distortion in the relative prices and outputs and employment for the economy. This study will strive to establish whether inflation distorts the renting prices.

Friedman (1956) proposes that the demand for money is a stable function of certain variables. Given permanent income and other variables, the demand for money is inelastic with respect to interest rates. The demand for and supply of money may both be affected by a rise in nominal income. An increase in demand for money leads the banking sector to increase its planned supply of money. This theory was based on the principle that a person's demand for money is controlled by his or her resources and is determined by equating at the margin the returns on money holdings with the returns on alternative assets.

Demand-Pull inflation results happens when there is increase in the prices levels resulting from an excess of total spending beyond the economy's capacity to produce, McConnell, Brue and Flynn (2009). When aggregate demand exceeds aggregate supply at full employment level, inflation gap increases. The increase in the gap between aggregate demand and aggregate supply leads to more rapid inflation, Keynes (1936).

Cost-push inflation is caused by wage rises required by labour unions due to profit increases by employers or firms. This type of inflation has been a gradual evolution, as Lord Beveridge, the father of the British social security system, foresaw the dilemma between full employment, stable prices and free markets as suggested by Samuelson (1976). He argued that unless profit margins can be squeezed indefinitely, wage cost increases must be accompanied by price rises. As employers raise prices of the products, higher wages enable workers to buy as much as before. Consequently, the rise in prices pushes the unions to demand even for higher wages leading to cost-push inflation. As Samuelson and Nordhaus (2010) points out, cost-push inflation often leads to economic slowdown and to a syndrome called stagflation.

### 2.2.2 Theory of interest rates

Rate of interest is the per cent of premium paid on money at one date in terms of money to be in hand one year later. Therefore, the rate of interest is at times called the price of money; and the market in which present and future money are traded for that price, or premium, is called the money market, Irving(1930). He also investigated the effects of inflation on interest rates. He went ahead to define nominal rate as a function of the real rate of interest and expected rate of inflation.

Keynesian inflation gap model accounted that inflation would cause the nominal interest rates to rise in response to money market disequilibrium. The nominal rate was affected by the change in the price level rather than the rate of inflation.

Financing of real estate is expensive. Investors desiring financing usually pledge or hypothecate their ownership of real estate as a condition for obtaining loans. The lending rates could be fixed or flexible. Demand and supply of mortgage funds are considered in determining the interest rates on mortgage loans. What borrowers are willing to pay for the use of funds over a specified period of time and what the lenders are willing to accept in the way of compensation for the use of such funds establishes the market rate of interest on mortgage loans. The demand for mortgage loans is determined by the demand for real estate, Brueggeman and Fisher (2001).

The Kenyan banking environment regulator, CBK, has enhanced the effectiveness and transparency of monetary policy formulation and implementation through regular interaction with stakeholders in the financial sector and real sectors. It regulates the interest rates movements. To enhance transparent credit pricing in commercial bank's lending rates, the regulator introduced the use of Kenya Banks' Reference Rate (KBRR) and Annual Percentage Rate (APR) frameworks in July 2014, (Central bank of Kenya, Thirteenth Bi-Annual Report of the Monetary Policy Committee, October 2014).

The Thirteenth Bi-Annual Report of the Monetary Policy Committee, October 2014 defined KBRR as base rate for all commercial bank's lending, which is an average of the Central bank rate (CBR) and the weighted two-month average of the 91-day Treasury bill rates in Kenya. The use of KBRR and APR frameworks were also meant to enhance private sector credit and mortgage finance supply in Kenya. CBR is the lowest rate that the CBK charges on overnight loans to commercial banks. The financial institutions use it as a reference rate.

### 2.2.3 Quantity Theory of Money

Quantity theory of money asserts that changes in the general level of general prices are determined primarily by changes in the quantity of money in circulation, Totonchi (2011). Lucas (1980) presented two implications of the theory; that a given change in the

rate of change in the Quantity theory of money induces an equal change in the rate of inflation and an equal change in nominal rates of interest.

## 2.3 Determinants of Rental Prices

Brueggerman and Fisher (2011), in his book on Real estate finance and investments, suggested that market rents for properties depend on the economic base as well as the supply and market forces for space by tenants. He also mentioned that market rent depends on changes in the demand for space as well as expected changes in the supply of space. Factors that may affect rent include the outlook for the national economy, the economic base of the area in which the property is located, the demand for the type of space provided by the property in the location being analysed and the supply of similar competitive space.

### 2.3.1 Real GDP

Moynihan and Titley (2000) suggested that economic growth refers to the increase in the quantity of goods and services the whole economy can produce over and above what was produced the prior year. This implies increase in real output of the economy over time. Citizens' demands for better living standards make governments strive to achieve faster rates of growth. Economists prefer to measure the rate of economic growth by how much national income had increased each year, in a country. The benefits that come with economic growth and increased output may include high level of consumption of goods and services that includes more houses being rented and even extra money buys essential niceties of life. This comes with increased income.

As Lipsey and Chrystal (2011) would add that with a higher level of income from growth, provision for the basic requirements for food, clothing and housing of a large majority of the people is assured. However, expenditure on new houses is both large and unpredictable hence exerts a major impact on the economy. As most houses are purchased through mortgage financing, interest rates form much of the mortgage payments and hence may exert considerable effect on the demand for housing.

### 2.3.2 Lending Interest Rates

In determining of lending rates, banks have to consider a number of factors. The cost of funds is a significant factor. Banks take into account the demand for loans and deposits while setting lending interest rates. The interest rate on loan facilities is influenced positively by real GDP and inflation. Conversely, the interest on deposits is negatively affected buy real inflation and GDP. The cost of lending/ credit that includes appraisal fees, monitoring, administration and legal fees have positive effect on interest rates on loan facilities. Also, the riskier the project funded, the higher the interest rate. Policy changes, interest rate volatility also influence interest rates setting. Monetary policy easing leads to a reduction of the market interest rates and vice versa. High volatility in the money market rates would increase lending interest rates, Gambacorta (2008).

The Kenyan banking environment regulator, CBK, regulates the interest rates movements. To enhance transparent credit pricing in commercial bank's lending rates, the regulator introduced the use of Kenya Banks' Reference Rate (KBRR) and Annual Percentage Rate (APR) frameworks in July 2014, (Central bank of Kenya, Thirteenth Bi-Annual Report of the Monetary Policy Committee, October 2014).

### 2.3.3 Inflation

Inflation is an increase in the average price of goods and services in terms of money, Romer (2012). The lenders and investors must be persuaded that the interest rate commitments are sufficiently high to compensate for any expected loss in purchasing power during the period that the investment or loan is outstanding, Brueggeman and Fisher (2001). Inflation can arise as at a result of increases in the money supply, increases in interest rates, decrease in output and decreases in money demand for a given real income and nominal interest rate, Romer (2012). Barro (1996), in his research on Inflation and growth, cited that business and households are thought to perform poorly when inflation is high and unpredictable.

## 2.4 Empirical Review

Researches already conducted on Real estate have predominantly focused on the determinants of real estate property prices, the effect of macroeconomic variables on the

prices of residential real estate properties and investment decisions on Real estate. There is inadequate evidence of research on factors driving rent prices in Kenya.

### 2.4.1 International Empirical Review

Barth, Lea & Li (2012) undertook a research on whether the decade of rapid growth in home prices in fact represents a housing bubble in China for a period 2000 to 2012. The study suggested that the Chinese housing market and economy was cautiously positive. Increased interest rates three times in 2011 reduced the demand for mortgages. The houses prices started to fall in some but not all the regions of the Republic of China. The real estate developers faced with reduced credit financing had to produce fewer units.

Golob, Bastic & Psunder (2012) did an analysis of impact factors on the Real estate market in Slovenia. The study obtained observations on the subject under investigation through structured survey questionnaires on the stakeholders. They included investors, real estate owners, tenancy right holders, real estate users, administrators, managers, tenants, real estate agencies and companies, design and construction companies, as well as other persons across Slovenia, with varying work experience and varying education levels. The primary data covering the period 2007 to 2009 were analysed with statistical computer software. Declining interest rates and inflation influenced the rise in real estate transactions. There was a positive correlation among interest rates, higher prices and growing real estate transactions. Also, declining economic growth does have an impact on declining real estate transactions.

Swazuri and Lucian (2012) reviewed rental values of five selected commercial properties owned by two pension funds in Tanzania over a period of six years from 2003 to 2009. In the study, he assessed the historical trend of rental value movements over time relative to inflation and GDP by use of Pearson correlation coefficient, ANOVA, regression analysis and Granger causality tests. The study suggested that inflation and GDP growth had little effect on rental value trends. As a result, for the period under study, rental prices were expected to be stable or change marginally in the short term to medium term.

Barksenius and Rundell (2013) undertook a study to investigate what drives Swedish real Estate price changes in general and whether or not Swedish real estate was overvalued. Quarterly data from 1987 to 2011 was examined to explain the Swedish real estate prices. Bank lending rates, financial wealth, disposable wealth, unemployment and money supply were the critical factors that affected house prices and their price changes. In the long run, the study suggested that lending rates had a positive effect on real estate. However, the study could not justify the reasons the positive effect from bank lending rates on real estate prices.

Ling and Naranjo (2015) examined the U.S public and private commercial real estate returns at the aggregate level and by the four major property types (multifamily, office, industrial, and retail) over the 1994-2014 time period. They noted that apartments have lease terms of one year and less, unlike those of industrial and retail that could range to 25 years or more with options of renewal. Their study explained that the present value of the long term leases were highly sensitive to unexpected inflation, leading to highly negotiated lease rates. However, apartment leases required marginal inflation premium while being set. As a result, higher realized inflation was expected to be reflected in rental rates.

### 2.4.2 Local Empirical Review

Makena (2012) conducted a research the determinants of residential real estate prices in Nairobi. The secondary data obtained was input into SPSS version 21.0 to compute the ratios used as proxies to measure determinants of real estate prices between 2007 and 2011. The study identified that interest rates had the most significant and long run effect on real estate property price. This may rise with the tightening of liquid conditions related to stricter macroeconomics. The increase in money supply drove the prices of properties higher. It was concluded that increased employment growth contributed more to property prices rise. This variable was followed by population growth and the level of money supply, with inflation contributing the least.

Muthaura (2012) used a simple user cost model to assess the relationship between interest rates and real estate investments in Kenya. The data analysed was drawn from 18

mortgage lending banks having mortgage products running from 2007 to 2011. The finding highlighted that interest rates do affect house prices and most real estate retail borrowers would be forced to increase house prices to cover the cost of borrowing and also to break-even

Muli (2013) researched on factors affecting the growth in Real estate investment in Kenya for the years between 1998 and 2012. The parameters studied included interest rates, inflation rate, population growth and GDP. The study suggested that GDP growth contributed the most to the growth in real estate. Inflation growth and interest rates correlated negatively to real estate investments, unlike GDP which had a positive relation. Population had insignificant effect, though relating negatively to Real estate investment.

Mwololo (2014) investigated empirically the effects of rate of unemployment, inflation, real GDP growth and lending rates on the residential real estate property in Kenya. Hypothesis testing and Regression analysis of independent and dependent variables revealed that commercial bank's lending rates had a significant negative effect on housing price index. Unemployment, real GDP and inflation had significant positive influence on residential housing prices. Rise in the lending rates was expected to dampen the property prices. Increase in real GDP, inflation and unemployment was expected to drive the residential housing prices up.

Akumu (2014) studied on the impact of GDP, lending interest rates, inflation, Kenya shilling US dollar exchange rate, rental income, money supply and public debt on the performance of residential housing in Kenya. The period under review was quarter 1 of 2000 to quarter 4 of 2010. Using multiple linear regression model to determine the causation and relationship, considering the prices of newly constructed houses in Kenya, the study concluded that variations in gross domestic product, money supply and public debt positively impact on the house prices. Changes in domestic interest rates, Kenya shilling US dollar exchange rate, inflation, and rental income negatively affect house prices.

Ombati (2014) studied the effects of interest rates on commercial real estate prices in Nairobi. In the study, he collected 50 commercial leases within commercial zones of Nairobi County between January 2007 and December 2013. Using Toda and Yamamoto method, the results suggested that there was a causal relationship between interest rates and commercial rates, that is, the movement of commercial rental prices causes changes in interest. However, the study did not find evidence to suggest that the movement in interest rates causes changes in commercial rent. He expounded that due to rigid structure of commercial lease legislation in Kenya, the rent prices did not respond to movement in interest rates.

## 2.5 Summary of the Literature Review

The studies done so far in real estate have dealt so much on the determinants of real estate property prices, the effect of macroeconomic variables on the prices of residential real estate properties and investment decisions on Real estate. Minimal information has been researched on the effect of the selected macroeconomic variables on the rental prices as the earlier studies reviewed spent much research on property prices.

Studies done had conflicting findings. Swazuri and Lucian (2012) suggested that inflation and GDP growth had little effect on rental value trends in Tanzania from his study between 2003 and 2009. Ombati (2014) studied the effects of interest rates on commercial real estate prices in Nairobi. The study did not find evidence to suggest that the movement in interest rates causes changes in commercial rent. In contrast, Ling and Naranjo (2015) by comparing long term leases verses short term leases like those of apartment noted that higher realized inflation was expected to be reflected in rental rates, in the long term. Declining interest rates and inflation influenced the rise in real estate transactions. Golob, Bastic & Psunder (2012) also found that there was a positive correlation among interest rates, higher prices and growing real estate transactions. Declining economic growth does have an impact on declining real estate transactions. Barksenius and Rundell (2013) could not justify the reasons the positive effect from bank lending rates on real estate prices.

The studies done on real estate property prices in Kenya also had conflicting findings. Makena (2012) in her research on the determinants of residential real estate prices in

Nairobi suggested that inflation had the least effect as compared to population growth and interest rates. Mwololo (2014), however, found out that inflation had significant positive influence on residential housing prices. While Muli (2013) suggested that GDP growth contributed the most to the growth in real estate. Inflation growth and interest rates correlated negatively to real estate investments, unlike GDP which had a positive relation; population had insignificant effect, though relating negatively to Real estate investment. Akumu (2014) also agreed that variations in gross domestic product positively impact on the house prices while changes in inflation negatively affect house prices.

The inconclusiveness of the studies shows the existing gaps in determinants of macroeconomic variables which affects the rental prices. From an overview of empirical review, both International studies and local studies have differed on the relationship of the macroeconomic variables on real estate pricing. This show the need to shed more light in this area of research by evaluating the effect of inflation, real GDP and lending rates on rental prices in Kenya..

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter deals with the research method that was adopted and the analysis of the data collected. The researcher involved a descriptive survey design. This section discusses the research design, the population set that comprise of the Kenya property market, data collection and analysis used.

## 3.2 Research Design

Mugenda and Mugenda (2003) points out that descriptive study is a process of collecting data in order to test hypotheses or to answer questions concerning the current status of the subjects in the study. In this research, descriptive study was employed to ascertain the effects of Inflation, Real Gross domestic product (GDP) and Lending rates on the rental prices in Kenya. This method was chosen as it offered a chance for analysis of the characteristics of letting prices in relation to the selected macroeconomic variables of interest.

## 3.3 Population

Forza (2002) defined population as the entire group of people, firms, plants or things that the researcher wishes to investigate. The population of this study comprised of the three types of residential properties rented between middle and upper sections of the market only in Kenya. They include detached, semi-detached, apartments, regarded as all properties as constituted in the Hass Property Index as at December 2014. Hass Property Index has list of the mix adjusted average house letting prices for the middle and upper sections of the market only in Kenya. The letting prices on the Hass Property Index are measured on a monthly basis, published quarterly. HassConsult Limited derives the letting prices data from its sales data of rented properties at true prices, as at transaction date. It also sources rental prices data from other estate agencies in Kenya, to verify its prices position and develop a composite price series of average offer rental prices for

specifically the detached, semi-detached, apartments in the middle and upper sections of the market in Kenya.

## 3.4 Data Collection

Secondary data collection method was employed for the study. This will be done through data analysis and review of published and unpublished research works. Data for analysis was based on secondary data of letting prices and selected macroeconomic variables namely; Lending interest rates, Inflation rates and Real GDP for the period 2010 to 2014, obtained from the HassConsult Limited, Central Bank of Kenya (CBK) and the Kenya National Bureau of Statistics (KNBS), respectively.

## 3.5 Data Analysis

According to Mugenda & Mugenda (2003) data must be cleaned, coded and properly analysed in order to obtain meaningful information. Secondary data was input into a spreadsheet format and analysed using Statistical Package for Social Sciences (SPSS) to obtain statistical information to answer to the questions concerning study; the effect of the selected macroeconomic variables on rental prices in Kenya.

### 3.5.1 Analytical Model

The analysis of data used statistics to assess and ascertain the effects of Inflation, Real GDP and Lending rates interest rates on the rental prices in Kenya. This study used Multivariate regression to determine the relationship between the independent and dependent variables.

The multivariate regression model was as below;

$$Y= \beta_0+\beta_1X_1+ \beta_2X_2+ \beta_3X_3 + \varepsilon$$

Where Y= Rental prices weighted average measured by a percentage quarterly change of letting prices as listed in the Hass Property Index.

$X_1$= Commercial banks' weighted average lending interest rates measured as a percentage change quarterly obtained from the Central Bank of Kenya Monetary Policy Committee database, 2015.

$X_2$= Inflation as measured as a percentage quarterly change of Consumer Price Index, obtained from the Kenya National Bureau of Statistics database, 2015.

$X_3$= Average Real gross domestic product rates, a measure of percentage quarterly change of real output, obtained from the Kenya Facts and Figures, 2015, Kenya National Bureau of Statistics.

$\varepsilon$ = Error term

$\beta_0$=Constant term

$\beta_i$ = Co-efficient of variable i that measures the responsiveness of a unit change in Y for a unit change in i

Rental prices were made the dependent variable while Lending interest rates, Real GDP and Inflation rates formed the independent variables.

The model was run using the SPSS model to determine the relationship between the variables.

Since the data was secondary, the researcher did not collect any unreliable or invalid data

and as a result it was not necessary to conduct tests of validity and reliability.

### 3.5.2 Test of Significance

The researchers sought to use Pearson product moment correlation coefficient (R) and coefficient of determination ($R^2$) to establish the association between the variables (Rental prices and real GDP, inflation and lending interest rates) of the data set. Analysis of variance (ANOVA) was used to test the significance of the findings.

# CHAPTER FOUR

# DATA ANALYSIS, RESULTS AND INTERPRETATION

## 4.1 Introduction

This chapter presents data analysis, results and interpretation of the findings. The objective of this research was to establish the effect of the selected macroeconomic variables on rental prices in Kenya; specifically, the effect of real GDP, inflation and lending rates on rental prices in Kenya. The population of this study comprised of the three types of residential properties rented specifically between the middle and upper sections of the market in Kenya. The properties included the detached, semi-detached and apartments, regarded as all properties as constituted in the Hass Property Index as at 31 December 2014. The secondary data was obtained from HassConsult Limited, the Central Bank of Kenya (CBK) and the Kenya National Bureau of Statistics (KNBS).

## 4.2 Descriptive Statistics

The results in table 4.1 below give the mean and the standard deviation of the variables that were included in the model.

**Table 4.1 Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|---|
| | Statistic | Statistic | Statistic | Statistic | Statistic | Statistic | Std. Error | Statistic | Std. Error |
| Rental prices | 20 | -2.73 | 4.66 | 1.8805 | 1.8083 | -.692 | .512 | .746 | .992 |
| Real GDP | 20 | -57.35 | 62.07 | 2.3265 | 26.7746 | .008 | .512 | 1.017 | .992 |
| Inflation rates | 20 | -18.98 | 27.12 | 1.1730 | 11.8831 | .419 | .512 | -.144 | .992 |
| Lending interest rates | 20 | -2.68 | 10.93 | .1890 | 2.6913 | 3.630 | .512 | 14.922 | .992 |
| Valid N (list wise) | 20 | | | | | | | | |

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

The data used was the selected variables measured by finding their average quarterly percentage change for the period 2010 to 2014.

The descriptive statistics showed that all the variables had a positive mean increase over the period under review. The rental prices had a mean increase of 1.88% and a standard deviation of 1.81, with a minimum and a maximum -2.73% and 4.66%. This meant that the increase and variation among the rental prices was present but not wide apart from the proceeding period. This variation was the least as compared to that of real GDP, inflation and lending interest rates. Rental prices had a skewness and kurtosis of -0.692 and 0.746, respectively. This pointed to a negatively skewed and a lowly peaked distribution.

Real GDP rates had wide variations of 26.77 given a minimum of -57.35 and a maximum of 62.07. This was evident given the erratic real GDP rates from 12.4% in quarter 4, 2010 to a low of 2.9% in quarter 4, 2013. The mean quarterly increase in real GDP was 2.33%. Real GDP rates had skewness and kurtosis of 0.008 and 1.017, respectively. This depicted a positively skewed and a moderately peaked distribution.

Inflation rates had wide variations 11.88, given a minimum of -18.98 and a maximum of 27.12. It was evident that Month-to-month inflation in the period was uneven. The highest month-to-month an inflation rate was 19.72% in November 2011 which reduced to 3.2% as at December 2012. The mean quarterly increase in inflation rates were 1.17%. Inflation rates had skewness and kurtosis of 0.419 and -0.144, respectively. This depicted a positively skewed and a lowly peaked distribution.

Lending interest rates had a standard deviation of 2.69, given a minimum of -2.68 and a maximum of 10.93. The highest monthly average lending interest rates was 20.34% in March 2012 while the lowest was 13.85% in October 2010. The mean quarterly increase in lending interest rates was 0.189%. Lending interest rates had skewness and kurtosis of 3.63 and 14.922, respectively. This depicted a positively skewed and a highly peaked distribution.

## 4.3 Inferential Statistics

Inferential statistics was used to reach conclusions from the data input and analysed in SPSS model. The inferential statistics used include correlation analysis, regression

analysis and analysis of variance (ANOVA). Regression analysis was used to determine the relationship between the variables; dependent and independent variables. Correlation coefficient and coefficient of determination was utilised to determine linear association between the selected variables (Rental prices and real GDP, inflation and lending interest rates). Analysis of variance (ANOVA) was used to test the significance of the findings in the study.

### 4.3.1 Correlation Analysis

The study conducted the Pearson correlation analysis to establish whether there is a linear association between variables. Correlation matrix was utilized as an indicator of the linear association of the explanatory variables and to determine the strength of the model. The Pearson correlation coefficient (R) may take a range between +1 and -1. A measure of Zero (0) means there is no association between variables. The research findings were as detailed below;

**Table 4.2: Correlations**

| | | Rental prices | Real GDP | Inflation rates | Lending interest rates |
|---|---|---|---|---|---|
| Pearson Correlation | Rental prices | 1.000 | .190 | -.294 | -.194 |
| | Real GDP | .190 | 1.000 | -.095 | -.319 |
| | Inflation rates | -.294 | -.095 | 1.000 | .128 |
| | Lending interest rates | -.194 | -.319 | .128 | 1.000 |
| Sig. (1-tailed) | Rental prices | . | .211 | .104 | .206 |
| | Real GDP | .211 | . | .346 | .085 |
| | Inflation rates | .104 | .346 | . | .296 |
| | Lending interest rates | .206 | .085 | .296 | . |
| N | Rental prices | 20 | 20 | 20 | 20 |
| | Real GDP | 20 | 20 | 20 | 20 |
| | Inflation rates | 20 | 20 | 20 | 20 |
| | Lending interest rates | 20 | 20 | 20 | 20 |

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

From the above findings, there was a negative correlation between the rental prices inflation rates of -0.294. It was also inferred that there was a negative correlation -0.194 between rental prices and lending interest rates. In contrast, there was a positive correlation of 0.190 between the rental prices and real GDP. However, the significance of the correlation among the variables was not that strong. The inflation rates had the highest significance of -0.294, followed by lending rates at -0.194 as related to rental prices. Real GDP had the least, though positive of 0.190 correlations to rental prices.

### 4.3.2 Regression Analysis

Regression analysis involves statistical techniques that pinpoint the relationship between variables; dependent and independent variables. The analytical model specified in chapter three was estimated using the secondary data of the selected variables. The model was of the form;

$$Y= \beta_0+\beta_1X_1+ \beta_2X_2+ \beta_3X_3 + \varepsilon$$

Whereby Y was the rental prices, $X_1$ was Commercial banks' weighted average lending interest rates, $X_2$ was the inflation (CPI), $X_3$ was Real gross domestic product rates, $\varepsilon$ was the Error term, $\beta_0$ was the Constant term and $\beta_i$ was the Co-efficient of variable i that measures the responsiveness of a unit change in rental prices for a unit change in i.

The model summary was as presented in table 4.3 below. The model had a correlation value of 0.355 which depicted a moderately strong linear relationship. The model also had a $R^2$ value of 0.126 which was adjusted for errors to $R^2$ of -0.38. This meant that the selected predictor variables could explain 12.6% variations in rental prices.

**Table 4.3: Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .355[a] | .126 | -.038 | 1.84223 | .126 | .769 | 3 | 16 | .528 |

a. Predictors: (Constant), Lending interest rates, Inflation rates, Real GDP

b. Dependent Variable: Rental prices

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

### 4.3.3 Analysis of Variance

To test the significance of the findings, analysis of variance (ANOVA) was used and the findings detailed in the table 4.4 below;

**Table 4.4: ANOVA[b]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 7.827 | 3 | 2.609 | .769 | .528[a] |
| | Residual | 54.301 | 16 | 3.394 | | |
| | Total | 62.128 | 19 | | | |

a. Predictors: (Constant), Lending interest rates, Inflation rates, Real GDP

b. Dependent Variable: Rental prices

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

The results in table 4.4 above show that the model was significant owing to the F-test value of 0.769 at the significant value of 0.528. This depicted that the research model used was good.

## 4.3.4 Correlation of Determination

Table 4.5 shows the multiple linear relationship coefficient estimates including the intercepts and the significant levels.

**Table 4.5: Coefficients [a]**

| Model | Unstandardized Coefficients | | Standardized Coefficients | | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | t | Sig. | Tolerance | VIF |
| 1 (Constant) | 1.923 | .418 | | 4.603 | .000 | | |
| Real GDP | .009 | .017 | .127 | .514 | .614 | .895 | 1.1177 |
| Inflation rates | -.041 | .036 | -.267 | -1.132 | .274 | .980 | 1.020 |
| Lending interest rates | -.080 | .167 | -.119 | -.481 | .637 | .888 | 1.126 |

a. Dependent Variable: Rental prices

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

From the above analysis in table 4.5, the following regression equation was established;

$Y= 1.923+0.009\ X_1-0.041X_2-0.080X_3 + \varepsilon$

From the regression equation above, when all the variables are at zero, the rental price increase will be 1.923. From the model, it was revealed that for every unit increase in real GDP, inflation and lending interest rates would result to a return in rental prices by 0.009, -0.041 and -0.080, respectively.

## 4.4 Interpretation of the Findings

This section provides the discussion and interpretation of the research findings from the analytical model applied above. The objective of this study was to establish the effect of real GDP, inflation and lending interest rates on rental prices in Kenya. Secondary data on real GDP, inflation and lending interest rates and their relationship with rental prices was analysed.

From the analytical model, it could be interpreted that a coefficient value of 1.923 growth in rental prices was independent of the changes in real GDP, inflation and lending interest rates. Also, for a percentage increase in real GDP would result to 0.9% increase in rental prices. This finding showed a positive effect of the real GDP on rental prices in Kenya,

holding the selected variables constant. This finding supports Moynihan and Titley (2000) suggestion that an increase in real output of the economy over time would cause the Citizens' demands for better living standards. Their study had also mentioned that the benefits that come with economic growth and increased output may include high level of consumption of goods and services that includes more houses being rented and even extra money buys essential niceties of life. As a result of the increase in real GDP, the demand for rental houses increases pushing the rental prices higher. This was associated to the opinion that that market rents for properties depend on the economic base as well as the supply and market forces for space by tenants, Brueggerman and Fisher (2011).

The findings on running the analytical model showed a negative effect of the increase in inflation and lending interest rates on rental prices in Kenya. Holding all variables used in the model constant, a percentage increase in inflation rates would result in 4.1% reduction in rental prices. Similarly, 1% increase in lending interest rates would result in 8% reduction in rental prices. The findings imply that as inflation and lending interest increase, tenants would wish to pay lower rental prices. This could be attributed to the tight liquidity the tenants are experiencing due to increased lending rates and much of the income being used to cater for the household consumption when the prices of goods rise. This could suggest that the tenants may have to do with lower rental prices to endure the increase in the two economic variables conditions. Hence, the landlords have to consider their rental pricing to keep the tenants.

The research findings of this study were consistent with those of Muli (2013) which opinioned that inflation growth and interest rates correlated negatively to real estate investments, unlike GDP which had a positive relation. However, the findings contradicts those of Ombati (2014) who studied the effects of interest rates on commercial real estate prices in Nairobi; his study found out that the movement of commercial rent prices caused changes in interest rates but did not find evidence to indicate that changes in interest rates affected commercial rental prices.

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# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

This chapter presents summary of the findings, conclusion, recommendation, limitation of the study and suggestions for further research. The factors that may affect rental prices analysed included real GDP, inflation and lending interest rates. The aim of the study was to establish the effect of real GDP, inflation and lending interest rates on rental prices in Kenya.

## 5.2 Summary

The study examined how real GDP, inflation and lending interest rates affect rental prices by use of an analytical model stated in chapter three and four above. The secondary data of the said independent and dependent variables were input into a spreadsheet format and analysed using Statistical Package for Social Sciences (SPSS) to obtain statistical information to answer to the questions concerning study.

From the research findings, inflation and lending interest rates were negatively correlated to rental prices. The correlation values were -0.294 and -0.194, for inflation and lending interest rates to rental prices, respectively. In contrast, there was a positive correlation of 0.190 between the rental prices and real GDP. The inflation rates had the highest negative significance followed by lending rates. Real GDP had the least, though positive correlations to rental prices.

From the resulting regression equation, it was determined that for every unit increase in real GDP would result a positive increase in rental prices. Consequently, a unit increase in inflation and lending interest rates would affect the rental prices negatively. Lending interest rates affected the rental prices more negative as compared to inflation rates. The all the selected variables and analysed had mean increases for the period 2010 to 2014. The highest mean percentage increase quarterly was that of real GDP at 2.3265%,

followed by rental prices at 1.8805%, inflation (CPI rates) at 1.1730% and lastly 0.1890%.

## 5.3 Conclusion

The aim of the study was to establish the effect of real GDP, inflation and lending interest rates on rental prices in Kenya. The study concluded that the rental prices have been on the rise with a mean increase of 1.8805%, quarterly for the period 2010 to 2014. The research findings indicated that an increase in real GDP would lead to an increase in rental prices. Subsequently, an increase in both inflation and lending interest rates would lead to a reduction in rental prices. The coefficient estimates of the model adopted also depicted that the negative effect of lending interest rates was more significant on rental prices as compared to that of inflation rates.

As Moynihan and Titley (2000) had suggested, the benefits that come with economic growth and increased output may include high level of consumption of goods and services that includes more houses being rented and even extra money buys essential niceties of life. As a result of the increase in real GDP, the demand for rental houses increases pushing the rental prices higher. The research findings showed that increase in inflation and lending interest rates effect the rental prices negatively. This may be due to reduction in the purchasing power of the citizens, hence lower rental prices will be preferred by the tenants.

## 5.4 Recommendation for Policy and Practice

From the discussion of the research findings of this study, certain policy recommendations need to be instituted. The selected macroeconomic variables were found to affect the rental prices in Kenya. As real GDP increases so does the rental prices expected to increase. This will benefit the rental property investors as they would achieve more returns with increase in the output in the economy. This is as a result of tenants being able to afford the subsequent increase in rental prices. Therefore, the Kenya Government should put in place measure to sustain growth in real GDP so as to favour the growth of real estate investments in the country. This will also ensure that the citizens have the purchasing power to afford the rental properties of their choice.

The study findings depicted that increase in inflation and lending interest rates negatively affect the rental prices. The two macroeconomic factors reduce the tenants purchasing power hence the tenants would seek for cheaper rental units, which may influence the rental prices down to ensure house occupancy due to the laws of demand and supply. The Kenyan government should monitor the inflation rates and lending interest rates keenly and ensure there is stability in the rates so at that the rental prices may not be affected.

## 5.5 Limitations of the Study

The study had several limitations. Foremost, it is possible that the nature of data used impacted the results in an unanticipated manner or limits the power of the tests to detect associations. This may have been created by variation of statistical figures illustrating the key variables measurements.

Secondly, the research was not in a position to isolate all the available variables that may affect rental prices. Among the factors may affect rent include the outlook for the national economy, the economic base of the area in which the property is located, the demand for the type of space provided by the property in the location being analysed and the supply of similar competitive space, Brueggerman and Fisher (2011). However, the researcher used diagnostics in SPSS to minimize these effects. The use of control variables is generally done to check observed relationship between two variables if a direct one or indirect with intervening. The investigation did not use control variable specifications as specified by Richardson et al (2002). It is thus possible that lack of inclusion, cause alterations in interpretation.

Finally, the time limitation for this study could not allow a detailed analysis of more effects of real GDP, inflation and lending interest rates on rental prices in Kenya. At the same time the findings were based on a relatively small sample of detached, semi-detached and apartments in the middle and high sections of the Market in Kenya. That may have influenced the nature of results that were obtained.

## 5.6 Suggestions for Further Research

The time limit for this study did not allow in-depth analysis of many of the factors that could be responsible for the variations in rental prices in Kenya. The sample could be

increased to include rental properties in the high, middle and low sections of the market. There is need therefore to expand on the sample size and carry out similar research for the rental prices of all sections of the real estate market in Kenya.

The research was not in a position to isolate all the available variables that may affect rental prices. Further studies that will include the establishing of the effect of other factors that may affect rental prices like the economic base of the area in which the property is located, the demand for the type of space provided by the property in the location being analysed and the supply of similar competitive space may be done.

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# APPENDICES

Appendix 1: Real GDP Rates of Kenya Obtained from the Quarterly Gross Domestic Product and Balance of Payment Reports 2015 (Constant year= 2009).

| Year | Quarter | Quarterly real GDP rate | Annual average of real GDP rate | Quarterly % change in real GDP rate |
|---|---|---|---|---|
| 2010 | 1 | 7.3 | | 0 |
| | 2 | 8.2 | | 12.33% |
| | 3 | 8.7 | | 6.10% |
| | 4 | 12.4 | 9.2 | 42.53% |
| 2011 | 1 | 7.6 | | -38.71% |
| | 2 | 6.7 | | -11.84% |
| | 3 | 5.8 | | -13.43% |
| | 4 | 4.4 | 6.1 | -24.14% |
| 2012 | 1 | 4.7 | | 6.82% |
| | 2 | 4.3 | | -8.51% |
| | 3 | 4.5 | | 4.65% |
| | 4 | 4.7 | 4.6 | 4.44% |
| 2013 | 1 | 6 | | 27.66% |
| | 2 | 7 | | 16.67% |
| | 3 | 6.8 | | -2.86% |
| | 4 | 2.9 | 5.7 | -57.35% |
| 2014 | 1 | 4.7 | | 62.07% |
| | 2 | 6 | | 27.66% |
| | 3 | 5.2 | | -13.33% |
| | 4 | 5.5 | 5.4 | 5.77% |

**Source:** ***Kenya National Bureau of Statistics***

Appendix II: Commercial Banks' Weighted Average Interest Rates (%)

| Year | Month | Lending Interest rate | % Change | Quarterly average % change |
|---|---|---|---|---|
| 2009 | DEC | 14.76 | 0 | |
| 2010 | JAN | 14.98 | 1% | |
| | FEB | 14.98 | 0% | |
| | MAR | 14.8 | -1% | 0.1% |
| | APR | 14.58 | -1% | |
| | MAY | 14.46 | -1% | |
| | JUN | 14.39 | 0% | -0.93% |
| | JUL | 14.29 | -1% | |
| | AUG | 14.18 | -1% | |
| | SEP | 13.98 | -1% | -1.0% |
| | OCT | 13.85 | -1% | |
| | NOV | 13.95 | 1% | |
| | DEC | 13.87 | -1% | -0.3% |
| 2011 | JAN | 14.03 | 1% | |
| | FEB | 13.92 | -1% | |
| | MAR | 13.92 | 0% | 0.1% |
| | APR | 13.92 | 0% | |
| | MAY | 13.88 | 0% | |
| | JUN | 13.91 | 0% | 0.0% |
| | JULY | 14.14 | 2% | |
| | AUG | 14.32 | 1% | |
| | SEP | 14.79 | 3% | 2.1% |
| | OCT | 15.21 | 3% | |
| | NOV | 18.51 | 22% | |
| | DEC | 20.04 | 8% | 10.9% |
| 2012 | JAN | 19.54 | -2% | |
| | FEB | 20.28 | 4% | |
| | MAR | 20.34 | 0% | 0.5% |
| | APR | 20.22 | -1% | |
| | MAY | 20.12 | 0% | |
| | JUN | 20.3 | 1% | -0.1% |
| | JULY | 20.15 | -1% | |
| | AUG | 20.13 | 0% | |
| | SEP | 19.73 | -2% | -0.9% |
| | OCT | 19.04 | -3% | |

| | | | | |
|---|---|---|---|---|
| | NOV | 17.78 | -7% | |
| | DEC | 18.15 | 2% | -2.7% |
| 2013 | JAN | 18.13 | 0% | |
| | FEB | 17.84 | -2% | |
| | MAR | 17.73 | -1% | -0.8% |
| | APR | 17.87 | 1% | |
| | MAY | 17.45 | -2% | |
| | JUNE | 16.97 | -3% | -1.4% |
| | JULY | 17.02 | 0% | |
| | AUG | 16.96 | 0% | |
| | SEP | 16.86 | -1% | -0.2% |
| | OCT | 17 | 1% | |
| | NOV | 16.89 | -1% | |
| | DEC | 16.99 | 1% | 0.3% |
| 2014 | JAN | 17.03 | 0% | |
| | FEB | 17.06 | 0% | |
| | MAR | 16.91 | -1% | -0.2% |
| | APR | 16.7 | -1% | |
| | MAY | 16.97 | 2% | |
| | JUN | 16.36 | -4% | -1.1% |
| | JUL | 16.91 | 3% | |
| | AUG | 16.26 | -4% | |
| | SEP | 16.04 | -1% | -0.6% |
| | OCT | 16 | 0% | |
| | NOV | 15.94 | 0% | |
| | DEC | 15.99 | 0% | -0.1% |

**Source:** ***Central Bank of Kenya***

Appendix III: To Let (Asking Prices)-All Properties (i.e. Detached, Semi-detached and Apartments of Middle and High Sections of the Market in Kenya)

| | | KSH.s Asking Price | INDEX 2000 Dec = 100 | Quarterly % Change |
|---|---|---|---|---|
| | 2009 Oct | 92,350 | 239.8 | 0.4% |
| | 2009 Nov | 91,424 | 237.4 | -1.01% |
| 2009 Q4 | 2009 Dec | 91,345 | 237.2 | -1.92% |
| | 2010 Jan | 91,294 | 237.0 | -1.14% |
| | 2010 Feb | 90,922 | 236.1 | -0.55% |
| 2010 Q1 | 2010 Mar | 88,855 | 230.7 | **-2.73%** |
| | 2010 Apr | 88,758 | 230.4 | -2.78% |
| | 2010 May | 88,521 | 229.8 | -2.64% |
| 2010 Q2 | 2010 Jun | 88,700 | 230.3 | **-0.17%** |
| | 2010 Jul | 89,511 | 232.4 | 0.85% |
| | 2010 Aug | 90,101 | 233.9 | 1.78% |
| 2010 Q3 | 2010 Sep | 90,982 | 236.2 | **2.57%** |
| | 2010 Oct | 92,062 | 239.0 | 2.85% |
| | 2010 Nov | 92,549 | 240.3 | 2.72% |
| 2010 Q4 | 2010 Dec | 93,578 | 243.0 | **2.85%** |
| | 2011 Jan | 94,526 | 245.4 | 2.68% |
| | 2011 Feb | 94,111 | 244.3 | 1.69% |
| 2011 Q1 | 2011 Mar | 94,671 | 245.8 | **1.17%** |
| | 2011 Apr | 94,543 | 245.5 | 0.02% |
| | 2011 May | 94,474 | 245.3 | 0.39% |
| 2011 Q2 | 2011 Jun | 94,760 | 246.0 | **0.09%** |
| | 2011 Jul | 94,263 | 244.7 | -0.30% |
| | 2011 Aug | 94,480 | 245.3 | 0.01% |
| 2011 Q3 | 2011 Sep | 94,549 | 245.5 | **-0.22%** |
| | 2011 Oct | 95,044 | 246.8 | 0.83% |
| | 2011 Nov | 95,507 | 248.0 | 1.09% |
| 2011 Q4 | 2011 Dec | 95,684 | 248.4 | **1.20%** |
| | 2012 Jan | 96,985 | 251.8 | 2.04% |
| | 2012 Feb | 98,548 | 255.9 | 3.18% |
| 2012 Q1 | 2012 Mar | 100,140 | 260.0 | **4.66%** |

| | | | | |
|---|---|---|---|---|
| | 2012 Apr | 100,864 | 261.9 | 4.00% |
| | 2012 May | 101,877 | 264.5 | 3.38% |
| 2012 Q2 | 2012 Jun | 102,435 | 266.0 | **2.29%** |
| | 2012 Jul | 104,168 | 270.5 | 3.28% |
| | 2012 Aug | 105,168 | 273.1 | 3.23% |
| 2012 Q3 | 2012 Sep | 106,635 | 276.9 | **4.10%** |
| | 2012 Oct | 108,238 | 281.0 | 3.91% |
| | 2012 Nov | 109,887 | 285.3 | 4.49% |
| 2012 Q4 | 2012 Dec | 110,963 | 288.1 | **4.06%** |
| | 2013 Jan | 111,891 | 290.5 | 3.38% |
| | 2013 Feb | 112,432 | 291.9 | 2.32% |
| 2013 Q1 | 2013 Mar | 113,024 | 293.5 | 1.86% |
| | 2013 Apr | 114,253 | 296.6 | 2.11% |
| | 2013 May | 114,621 | 297.6 | 1.95% |
| 2013 Q2 | 2013 Jun | 115,350 | 299.5 | 2.06% |
| | 2013 Jul | 115,358 | 299.5 | 0.97% |
| | 2013 Aug | 116,636 | 302.8 | 1.76% |
| 2013 Q3 | 2013 Sep | 116,899 | 303.5 | 1.34% |
| | 2013 Oct | 117,591 | 305.3 | 1.94% |
| | 2013 Nov | 119,056 | 309.1 | 2.07% |
| 2013 Q4 | 2013 Dec | 120,372 | 312.5 | 2.97% |
| | 2014 Jan | 121,516 | 315.5 | 3.34% |
| | 2014 Feb | 121,451 | 315.3 | 2.01% |
| 2014 Q1 | 2014 Mar | 123,197 | 319.9 | 2.35% |
| | 2014 Apr | 123,146 | 319.7 | 1.34% |
| | 2014 May | 124,690 | 323.7 | 2.67% |
| 2014 Q2 | 2014 Jun | 126,576 | 328.6 | 2.74% |
| | 2014 Jul | 126,240 | 327.8 | 2.51% |
| | 2014 Aug | 126,442 | 328.3 | 1.40% |
| 2014 Q3 | 2014 Sep | 127,113 | 330.0 | 0.42% |
| | 2014 Oct | 129,074 | 335.1 | 2.24% |
| | 2014 Nov | 130,249 | 338.2 | 3.01% |
| 2014 Q4 | 2014 Dec | 132,202 | 343.2 | 4.00% |

**Source:** ***HassConsult Ltd***