EFFECTS OF MONEY SUPPLY ON RESIDENTIAL REAL ESTATE PRICING IN NAIROBI COUNTY.

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DECLARATION

Student Declaration:

I hereby declare that this research project is my original work and has not been presented for a degree by myself or any other person from any other institution known or unknown to me.

Signed:..... Date:.....

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Supervisor Declaration:

This research project has been submitted with my approval as university supervisor.

Sign:..... Date:.....

Dr. Cyrus I. Mwangi

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DEDICATION

I dedicate this project to my family members for the love, tolerance, encouragement and enduring support they have given me in pursuit of education. May this be an inspiration to you all to strive for even greater things in life.

Thank you and God bless you abundantly.

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ABBREVIATIONS

ACCRONYM	MEANING
CBD	Central Business District
CBK	Central Bank of Kenya
CBR	Central Bank Rate
CEE	Central Eastern Europe
CMA	Capital Market Authority
CPI	Consumer Price Index
GDP	Gross Domestic Product
GIS	Geographic Information System
GOK	Government of Kenya
KNBS	Kenya National Bureau of Statistics
NSE	Nairobi Securities Exchange
OECD	Organization for Economic Cooperation and Development
RBCI	Residential Building Cost Index
REITS	Real Estate Investment Trusts
SPSS	Statistical Package for Social Sciences
UK	United Kingdom
UN – HABITAT	United Nations Human Settlement Programme
USA	United States of America

ABSTRACT

Residential properties are properties that serve as housing or a dwelling and encompass single-family, duplexes and other multi-family homes. It is known to have a dramatic multiplier effect and is a key economic indicator. The real estate market has experienced significant growth in the last decade w ith many countries experiencing house price fluctuations. The Kenyan real estate market has been experiencing a boom in the past ten years and the latest findings have shown that the trend will continue into the foreseeable future. In Nairobi real estate industry has played a key role in the growth of the economy due to its high multiplier effect through increased investments in production and marketing of building materials, employment generation and wealth creation. In Nairobi real estate market, little has been done to check the set of forces behind the housing prices. As such the study sought to investigate the effects of money supply on residential real estate prices in Nairobi. In this study a quantitative approach was followed. The researcher used data for the main players in the financial sectors which are mainly concerned with the regulation of the real estate industry. The study used secondary data which were largely quantitative and descriptive in nature. Data analysis was carried out by use of simple mean, standard deviations, percentages, regression and correlation analysis by use of Statistical Package for Social Sciences (SPSS) Version 22. A multivariate regression model showing the relationship between residential real estate prices and various variables was tested. The study found that the level of money in supply and GDP growth rate have significant negative relationship with the growth in real estate prices. We also observed that real estate prices growth rate has positive relationships with inflation and Commercial Bank lending rates. Further, the trend also indicates an overall increase in property prices with time hence the real estate market in Kenya is expected to continue to grow. Even without significant changes in the variables, the effect of time is that house prices increase. This also indicates that the real estate market is significantly stable.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

According to Daily Nation (January 26th, 2016) the real estate market performance in the second quarter of 2016 follows three years of shifts upwards in real estate prices. The demand and supply market dynamics have not experienced major changes over the period. The supply has been in response to the broad demand characteristics in the market. The new units being put up are mainly targeting the middle-end of the market, with the lower-end experiencing supply constraints arising mainly from the tendency of developers inclining more towards renting than selling. Nairobi is the first area to experience the heat of the market. Investors in several neighbourhoods in the capital are continuously experiencing pressure from a slump in property prices and rentals as an obvious excess supply is creating new market conditions. With prices remaining stagnant in some areas and other areas like Kilimani producing negative results as selling prices have dropped by more than five per cent since last June, the property market dynamics are challenged.

According to Brueggeman and Fisher (2005), real estate is used to refer to a special case of real property, which is composed of any designated portion of land, permanent and semi-permanent structures and other improvements plus the rights that comes with the title of use and enjoyment of that land and all its elements. Real estate is an asset or a liability, which may be tangible or intangible over which a person or business has legal title (owned) and is comprised of land and the buildings on it, as well as the natural resources of the land, including plants and animals, water, air and mineral deposits. Real estate can be grouped into two; residential and non-residential

(commercial, industrial and land) properties. Residential real estate is made up of houses and apartment buildings — places where people reside or dwell and may contain from a single to a multifamily units that are available for living or for non-business purpose such as apartments or flats, townhouses, condominium, duplexes, mobile homes, houseboats e.t.c.. While non residential real estate includes any income generating real estate that is used purely for business purposes, such as retail shops, office space, hotels and restaurants, strip malls, restaurants, manufacturing building and property, storage facilities e.t.c.

Theoretically, according to Alfred Marshall Principles of Economics (1890), the law of supply and demand is one of the basic principles governing an economy. It states that when supply of goods and services increase the price will tend to drop and vice versa, there is an inverse relationship between supply of an item and its price. While, as the demand of a product or service increases the price will tend to also increase and vice versa. The real estate price is the existing price at which a real estate asset can be acquired or sold. This theory argues that the market price congregates at a point where the forces of real estate supply and real estate demand touch. Residential real estate prices are therefore guided by this relationship between the two forces; supply and demand.

Unless a swift and major investment in housing is achieved, many of the cities that are already unable to deal with the theatrical levels of urbanization be completely flooded with unplanned informal settlements and slums areas. Current statistics indicate urban residents living in informal settlements as; 93% of Central African Republic's of the urban population dwell in slums; Chad 88%, Nigeria 50%, Somalia 74%, in Ethiopia

74%, Djibouti 66%, in Burundi 58%, in Kenya, 56% and in Republic of South Sudan a staggering 96% (African Development Bank, 2013). According to World bank Kenya Economic update 2016, Kenya's real estate industry remained afloat in 2016, though it grew at a slower rate in the same year, at 7.6 percent in the first three quarters of 2016 as is the normal trend on an election year in comparison with 9.8 percent over the same period the previous year. These could be a reflection of a slowing private sector credit growth.

Nairobi is the capital city of Kenya and one of the major cities in Africa. Founded in 1899 by the colonial authorities in British East Africa, mainly its appealing environment, Nairobi is popularly referred to as the Green City in the Sun. According to the 2009 Census Nairobi has a population of 3.5 million people living within an area of 696km2, while the metropolitan area has a population of 6.5 million people (World Population Prospects, 2017). Nairobi is a regional hub for business, finance, transport, regional co-operation and economic development connecting eastern, central and southern African countries.

1.1.1 Money Supply

According to Liow, Ibrahim and Huang (2005) disproportionate increase in money supply may lead to an inflationary situation that might affect investments as investors require higher discount rates. Money Supply is a standard measure of money in the economy. Increase in money supply has a direct adverse effect on real estate market as it gives rise to greater inflation uncertainty. According to economics, money supply is the whole reserve of currency and cash equivalent instruments circulating in a

country's economy at a specific period. Money supply which is also known as money stock, includes monetary asset such as currency, printed notes, money in checking and savings accounts and in the form of other liquid assets held as short term investments. Money is anything that can be used as a medium of exchange, a ready store of value and as a unit of account.

Representing almost 10% of the GDP, the property market has engaged large amounts of cash. Due to the fact that there was a turnover and the market was vibrant with a quite reasonable balance of trade between construction, purchases and sales, things were moving. At the macro level, real estate is directly allied to real and financial sector. Its trend coincides with the economic expansion trend. According to Mwangi (2002), real estate investment is considered for its capability to provide returns in form of income, capital, income and any other intangible benefits. The maximization of the returns is actualized when there is full market rent, good physical location of the property and filled tenancy. Real estate offers business investors an established basis of earnings through expected sharing of underlying rental income. Over the long period, the bulk of real estate proceeds originate from rental proceeds which is generally less unpredictable than capital returns as rents are almost guaranteed as under a lease/rental agreement. Real estate investment is still a fairly emerging venture that enables individuals to own pieces of land commonly known as a “plot” and build residential homes in the urban and peri-urban locale.

1.1.2 Residential Real Estate Pricing

Real estate is a key player in provision of job opportunities, homes, alleviating poverty and enhancing income sharing. Real estate market is a key element of the economy. Like other markets, real estate market is excessively influenced by its environments and immediate geographic area; hence the well-known real-estate maxim, "location, location, location." With the exception of a harsh global recession/depression, real estate prices in particular are influenced mainly by local factors, such as the economy, economy, availability and cost of credit, the area's employment rate, crime rates, transportation facilities, government fiscal and monetary policies, other municipal services, quality of schools and property tariffs and fees.

According to Hilbers et al. (2001) the pricing process of any item is usually negotiated and the markets are characterized by such large transaction costs. The prices of an asset should theoretically be equal to the sum of the discounted present value of the anticipated flow of future income. This depends on anticipated increase in income, taxes, expected interest rates, fees and other operational factors. The forces of supply and demand should equilibrate at the equilibrium in a well operational market.

1.1.3 Money Supply and Real Estate Pricing

According to Murugi (2005), in the post-independence era, provision of housing to the public within the urban emerging towns was the responsibility of the government. The government ensured housing schemes that provided housing needs of the urban residents. In the early 1990s, the government declined its role in the urban shelter due to the maintenance challenges of the housing financing schemes. However, currently

both Government and private sector have established partnership arrangements in the provision of affordable housing to the urban dwellers. The private sector engagement in housing is through the real estate development, land and property purchase in Kenya. The Government has been on the forefront of ensuring good conducive environment to encourage private sector investors in the housing industry. The private real estate developers buy and sell land and construct affordable homes for sale to individuals and the construction of apartments for residence. The ever increasing need for land in the peri-urban areas of Nairobi City County has contributed to the rise of prices. The needs for occupying land and demand for the putting up of housing units influence the increase in land value. The movement of people from rural to urban areas in search for industrial jobs and service industry like hotels and entertainment industry increases the demand for land inform of plots, thus the rise of price for land. The cost of land in also swayed by macroeconomic aspects and other more elusive and confined aspects including; convenience for access, relationship between the adjacent areas to urban areas and the related transport network.

Lynn (2007) argues that most Governments in Africa have accepted the reality of partnership with the private sector in meeting the housing needs of the urban areas. In Kenya, the private land developers are leading in constriction of housing units for rent. The real estate actors acquire land in the periphery of Nairobi City County, plan it then construct houses for their clients from different social and economic status (Abraham, 2009). The real estate actors started as land speculators but over time became property and housing developers, thus revamping the housing industry in Kenya's urban areas like Nairobi.

According to Messa (2011), the real estate in Kenya like other across the globe functions in sequences that set off after general elections and end with the next general election. The market for real estate is contributes to money supply and is varied in terms of geographical location, types of housing units and the income of the clients. Kenya is a diverse nation from the Coastal line consisting prime beach housing units, to the underneath mineral reserves to the Northern Kenya within the arid and semi-arid regions and to the highlands dotted with small and large farms for both commercial and domestic consumption. The existing property categories include industrial properties in towns, cities and emerging urban areas, office, retail and residential properties. The major catalyst of the real estate market consist of government regulatory and policy environment, changing lifestyle behaviors, demographics, income, availability and the cost of credit facilities.

The retail business sector has been on growth with several malls being established across Kenya leading to increase in money supply. The experience in the retail market growth is largely driven by increased urbanization and the devolved system of governance that has ensured development of County headquarters and several sub-County urban centres (African Development Bank, 2013). There has been an upward middle class with established purchasing power and the associated changing consumer patterns leading to the surge for the retail activities. The plea for retail space has made Kenya to be the foremost target for retail market in Africa. The market for office space like the retail interest has witnessed increased supply. The interest for office space is influenced by the growing service industry across all urban centres in Kenya. The key stakeholders in the vibrant service sector include Non-Governmental Organisations, financial institutions, professional organisations, Government, regional

and international institutions like the European Union, Inter-Governmental Authority on Development(IGAD), East African Community (EAC), African union (AU) and the foreign governments' missions.

The disposable income and availability of credit determines the performance of residential housing units. On average, the Kenya's household disposable income has been on upwards growth which implies that the households have the capacity to spend more financial resources on housing and other basic needs. However, the increase of disposable income has in same measure increased the price for rent and actual sale of housing units. Mortgage holders had a huge relief in 2016 following CBK capping of interest rates and have reduced the borrowing cost. However, the capping of interest rates has made financial institutions become less attractive to lending because of better returns in Government than households. The Government has invested heavily in the improvement of the business environment through infrastructure development like railway, sea port construction, road, clean energy investment and review of business registration bureaucracy.

1.1.4 Real Estate Markets in Nairobi County

Like the rest of the country, Nairobi residential sector performance is heavily dependent on household disposable income and availability of credit. On average Kenya's household disposable income has been on upward trajectory. This means households are able to spend more on shelter and other basic needs. On the other hand the price of (both rent and sale) has also been on upward trend mainly because the

middle and low income segments of the residential market have been having a huge supply deficit (Kagendo, 2011).

Investment in real estate consists of the acquisition, possession, administration, leasing land and sale of real estate aimed at profit making. It contributes to the provision of employment activities, provision of household shelter, attractive earnings circulation and thus alleviating poor living among the population. The concept of real estate in Kenya consist of various categories of property ranging from shopping malls, retail and wholesale outlets, warehousing, residential homes, office space, agricultural and commercial land (Masika, 2010). All the occupants of Nairobi need shelter. CFC Stanbic bank in partnership with Hass Consultants (2010) carried out a study on real estate market in Kenya and established that the sector been booming since early 2000. The study showed that Kenya achieved higher capital gains compared to the gains United Kingdom and United States of America individually realized through properties. A report by the Kenya National Housing Cooperation (2012) indicates that the country has acquired 50,000 units out of 200,000 new units as envisioned in Vision 2030. According to the Kenya National Bureau of Statistics (2015), real estate has been largely contributing to the Gross Domestic Product. Real estate accounted for Ksh 108 million in 2008, in 2009 was a contribution of Ksh 116 million and there has been an increase of between Ksh 10 to 26 million annually in contribution to GDP since 2010 to 2015.

1.2 Research Problem

The emerging cities and urban areas all over the globe have been faced with scarcity of adequate and decent housing for the increasing population. The scarcity of adequate housing is more pronounced in moderate and low level income households particularly in Less Developed Countries. The situation has become worse due to the limited facilities with and increased urban population (International Housing Coalition, 2008). According to African Development Bank (2013), by 2030 the urban rates of growth are estimated to be 5% per year. An expected new population of more than 290 million new residents in cities and major urban areas by 2050. The deficits of the current housing scarcity can be mitigated against through an estimate of at least 6,000 units in a day (Geoffrey, 2011). However, there is only a small percentage of the required housing units being developed across the African continent. Therefore there is an urgent need to increase funding on real estate investment in urban areas.

Several studies have been undertaken in this area including Makena (2012), determinants of residential real estate pricing in Nairobi. The first determinant she considered is real estate demand. Driven by factors like the desire to own individual home by Kenyans, the movement from rural to urban areas and increase in remittances from diaspora. Thus the increase in demand will lead increase in real estate pricing in real estate. The development of key infrastructure is roads (Thika super high way construction and Mombasa road expansion) and railway transport systems have contributed to the increase of real estate pricing of properties in Nairobi. The demand for the real estate housing units outstrips the supply. Given that her findings were

more than half a decade ago, I believe there is reason to reexamine and update with current information

Another study was conducted by Majtenyi (2010), where he examined the developments of real estate sector in Nairobi area. He observed that the reality is the influence of real estate in land values that has negatively affected some of the clients mainly the low income group that may not manage to afford the market value. The low financial capability among the low income earners makes the access and possession of land and property difficulty for most of the people. In Nairobi, an attempt by real estate developers to purchase large chunks of land denies sellers opportunity to own land. Upon acquiring land, the real estate developer's normally partition it into smaller pieces know as "plots" for sale at high prices to a low income earner. The development pattern of the emerging real estates does not necessarily conform to land use planning expectation depending in location of the land in line with the tenure system. The cost for the real estate has been on the increase for the past one decade. His focus was mainly on demand for land that lead to increase in housing prices, but this concept can be challenged given the increase in residential apartments titles thus reducing significantly the demand to own land title.

Expected demand for real estate is reflected in the prices which serve as predictors of economic growth (Masika, 2010). A study carried out by Hass Consultants with CFC Stanbic Bank(2010), established that the real estate market in Kenya has been vibrant between 2000 and 2010. The study further revealed that the capital gains made from the real estate was far much greater than the remittances and the property investment gains made from the property market in United Kingdom and the United States of

America (Mwithiga, 2010). However, this view is expected on short and medium term investments as in the long-term the property market tends to perform much better.

According to the Kenya Bureau of Statistics (2016), real estate significantly contribute to the Gross Domestic Product (GDP). In 2008, the sector contributed 108 million and in 2010 contribution to GDP was 123million. The low contribution to GDP in 2008 is attributed to the post-election violence that affected the investment in real estate market. The real estate sector remained on the growth trajectory that started in 2012 to record a 8.9 per cent in 2015. The financial services real estate sub-sector also gained from the impressive performance exhibited by the construction sector in the same period. Loans and advances to building and construction activities registered a substantial increase from Kes 80.4 billion in 2014 to Kes 106.3 billion in 2015.

According to Kagendo (2011) who carried out a study to identify the determinants of real estate property prices on the case of Kiambu township. Kagendo in his research, he established that realtors and location are critical determinants affecting real estate prices in Kiambu. He also found that real agents play an important role in real estate value determination in Kiambu where a lot of the home owners acquired property through them. On the other hand, an assessment of the connection between property values and credit facilities in Kenya show that shifts in property values are significantly and positively linked to long-term development of mortgage credit. This finding assumes that future house purchases be financed by credit, however recent information shows that on a small percentage (less than 20%) acquire property using credit facilities and therefore the effects on prices is not as strong as Kagundo portrayed.

Clearly, a relationship does exist between money supply and real estate pricing, therefore for the purpose of this study we try and answer the question what are the effects of money supply on real estate pricing in Nairobi County?

1.3 Research Objectives

The overall objective of this study is to determine the effects of money supply in real estate pricing on Nairobi City County.

1.4 Value of the Study

The study is important not only for investor in the real estate but also to potential future homeowners. It would help each and every one them grasp the tactical practices and how this knowledge can help different and diverse investors to arrive at a prudence decision on the right property to invest in. The study has enabled the investor to know the affordable way to buy real estate assets and also highlight other important relationships that require further research. The study would also help many future home owners to determine the best method to apply in acquiring a real estate derivative, which would help them make some savings from the transactions.

It is expected that this study has added to the wealth of knowledge that already existence in real estate field and also form a basis for future research in the field of real estate. As such, the study did make a contribution to the literature on determinants of residential real estate prices and also effects of money to real estate prices.

The study has contributed to the policy formulation in the development of real estates. The findings at the end of the study offer policy recommendations on means of governing elements of real estate in order to sustain future investment growth. It has also provided a foundation for future research in the field. Therefore, it had contributed to the literature on determinants of residential real estate prices.

The findings from this study have also contributed to government departments and other policy making organizations charged with housing. Through this research they would appreciate the housing market better and thus guide in the delivery of desired products to the right people at the optimal time. If there is a surplus of money supply, the government offices would formulate interventions and policies to stabilize the sector that can be beneficial to the real estate market.

CHAPTER TWO: LITERATURE REVIEW

2. Introduction

In this chapter, the researcher discussed the literature review and conceptual framework. The literature review examines various studies that have been conducted focusing of money circulation and real estate pricing. This chapter did show how the study belongs to and did build on the existing available knowledge on the study topic. The literature is covered in 5 themes that include introduction, theoretical review, determinants of real estate pricing, empirical review, then conceptual framework is discussed showing the relationship of the variables and thereafter a conclusion of the chapter.

2.2 Theoretical Review

In this section the study reviewed theories that have been formulated to predict, explain and understand phenomena and, in many cases, extend existing knowledge and challenge existing assumptions within the critical limits.

2.2.1 Decision Theory

According to Lehmann (1950), decision theory is the study on how human beings make judgment and how choices are made. They argue that judgments and choices are made based of loss and probability based approaches through statistical representation of judgments that are made on future prospects for investment. The decision theory do focus on the process of making decision in relation to the previous decisions and the probability of future decisions for an investment based on thought process. This theory is applicable in the property development using the appraisal for a particular project

for investment by analyzing the potential business risks, existing opportunities and the various approaches by competitors through napping exercise of the investment models of the competitors (Bell, Raiffa and Tversky, 1988). Based on such analysis, an investor makes a deliberate choice to make property investments as a decision over a thought process in making various assessments and future investment forecast. This theory is relevant for the study topic since the investment in real estate housing units is based on various sector analyses and thought processes that inform individuals on the kind of decisions to make and the kind of investment to venture.

2.2.2 Rational Choice Theory

According to Adam Smith (1700), the rational choice theory is an approach used to understand the human behaviour and their actions. The theory has long been associated with economic paradigm though more widely used in social sciences in analyzing the choices that people make (Neumann, 1956). The theory is linked to the works of Cesare Beccaria in the 18th century. Other social science theorists have advanced this theory to examine the choice that people make. According to (Parker, 2016), the theory begins with choice behaviour consideration for individuals and group of individuals in decision-making. The rational choice theorists presume that individual decision is often a reflection of large group like the consumers and sellers in a particular market environment.

Once and individual and group behaviour is established, the analysis moves on to examine how individual choices interact to produce outcomes. In the case of the real estate, the individual investors make deliberate choice by assessing rationality to

invest in housing units. The mode of financing the property development is based on the rational choice made by the individuals. The same applies to the pricing of the housing units that is made based on rational choice in relation to other factors like the Gross Domestic Product, inflation and credit growth. This theory is relevant to the study topic because of the decisions that are made on the real estate pricing based on rationality.

2.2.4 Portfolio Choice to Money Theory

Developed by Harry Markowitz, this theory shows that the demand for money is founded on individuals wealth (persons permanent income). According to Hume and Cantillon, inflation is about the value of money and it is directly linked with the demand for it, and this correlation informs the monetary policies (Laidler 2003). Nevertheless, the shift in of money supply is not always a substance of inflation, but it is to say that inflation is a matter of variations in demand and supply of money.

According to Laidler (2003), the shifts in interest rate did not have a vast effect on the demand for money, mainly because any increase in return from the raise of interest rate did lead to an increase in the return on money. Inflation is seen as a result of cost-push and demand-pull influence and the velocity and demand for money can be forecasted.

In real estate, the market price would normally respond to shifts in the money supply, and that the extent of that change would be dependent on the degree to which those changes had been predicted in the beginning, but it accounts for the fact that prices

change with the simple examination that this was necessary to maintain markets cleared". This can be translated to mean that any un anticipated shift on the inflation rate did affect the outputs in the real estate market not have a real value and also affect negatively the money supply. This also follows Fishers effect, "transmission mechanism", that interest rates are associated with money supply, therefore, the more the money in real estate market e.g. through credit facilities cause a persistent increase in real estate prices.

2.3 Determinants for Real Estate Pricing

In the past couple of decades, real estate sector has been on an upward trajectory, with the growth push being determined by factors such as gross domestic products, the state of the economy and money supply, credit growth and interest rates, inflation, demographics and location and government real estate legislations and policies, all this influence the value of property in the country differently. Below we examined how this factors affect real estate pricing;

2.3.1 Gross Domestic Product

Gross Domestic Product (GDP) growth is one of the determinants of real estate pricing. According to Collynsand Senhadji (2003), the real estate investment is largely attached on the demand side by the society that include the level if GDP growth. GDP is another determinant of real estate pricing. It captures the size of the population and the aggregate level of the per capita income (Cuervo and Ho, 1999). An increase in the GDP would also translate in an increase in the real income of the general population in

an economy, hence leading to increased demand for the real estate which increases the price for housing units and greater rental prices.

2.3.2 Money Supply

The level of economic productivity affects the demand for money circulation through various economic activities including the real estate pricing (Chin, Dent and Roberts, 2006). They further argue that the economic productive structure that affects positively the economic ability to attract both foreign and domestic real estate sector. The growth of GDP, level of unemployment and inflation signify the composite real estate property returns (Hoskins, Higgins and Cardew, 2004).The real interest rate is also another key determinant for housing prices. A reduction in the real interest rates does equally lead to a growth in price of real estate because of the reduction of the borrowing costs. Quasi money supply or highly liquid assets other than cash is the transaction currency (that is the total currency in circulation together with deposits), savings deposits and time deposits. Money supply is the source of factors influencing the price level.

2.3.3 Interest Rate

Koh et al (2005) argues that studies show that an increase in credit growth contributes to the pricing of real estates. In his studies, he used financial arbitrator through option based approach that found the borrower easily tempted to default if the price of principal asset is lower than the balance of a loan, thus placing the collateral into the arms of the financial institution. In such circumstances, these financial institutions that act as intermediaries may be placed in a difficult position when forced to hold large

too much stock of desirable real estate properties that in a bear market may only be sold off at costs that are significantly less than the amount it was initially collateralized for. According to Kamau (2011), banking financial system is the most central means for financial access in Kenya and most of East Africa, where the bonds and equity market are fairly underdeveloped. Credit facility growth, capital repatriation from outside the country by the investors greatly influences the pricing of housing units across the world.

Wong (2001) sites the growth of Thailand's property market, powered in 1990s buy the engagement if private sector in the capital inflows. For instance, as a consequence of the passage of the Bangkok International Banking Facilities in 1992 which provided great opportunities for the national financial organisations to borrow from foreign sources at low interest rates and in turn increased the money circulation among the local real estate property developers. This approach led to surge of real estate housing need and in turn the increase of housing prices. Due to the readily available housing financing, the developers completed the housing units on time than the normal rate of the market absorption. However, the late 1990s Asian economic crisis lead to the collapse of the real estate markets in Thailand as the demand was driven by the existing growth in GDP at the time. The rise of actual GDP realized increased the population estimate being wealthy and thus contribute to the discretionary incomes. The realized income can be invested in real estate market assets like housing units whose cost is based on the construction lags.

According to Bardhan et al (2003) stock market also has an impact on the real estate sector through the stock equity case of the positive effect of stick equity on the private

housing property investors in Singapore. Another determinant of real estate pricing is interest rates. About 12% of Kenya's real estate is acquired through asset finance by Hass Consulting ltd. This is a significant percentage of real estate, if one is considering to acquire a mortgage in order to procure a home it is prudent to research on the interest rates as this did indicate the affordability or not of the mortgage. Therefore any changes in interest rates can greatly hinder an individual's capability to procure a residential property. This is due to the fact that the higher interest rates are, the higher the cost to obtain a housing credit facility to acquire a home be, which leads to a lower demand for real estate properties, which again pulls prices down.

2.3.4 Inflation

In addition, inflation determines the real estate pricing in the housing property industry. It accounts for about half of the different disparities in the prices of housing units across the world (Debelle, 2004). Debelle argues that the effect of inflation on pricing of housing units is about 80% of the overall price disparities in a quarter prospect of the year and decreases to about two thirds over a one calendar year quarter prospect. This is especially true when determining the housing prices in real relations because of the twofold nature utility of residential real estate as investment tool and consumption good. In this context, households with housing units often use the inflation as the key hedge against the risk of wealth erosion due to inflation in the short term.

The housing property is attractive in this respect because it is financed by the nominal debt. In the event of persistence of inflation, then the effects on the housing price are

realized in the long-term perspective. The higher the improbability levels concerning the future predictable proceeds from investments in equities and bonds connected with extraordinary inflation similarly subsidize to the appeal of real estate as means for long-term investments. Another aspect is the effect of inflation on the price of mortgages and largely proposes that greater inflation would have undesirable bearing on prices of housing units.

The housing sector in Kenya has been measured by low level of urbanized home tenure, insufficiency of reasonably priced and descent housing, far-reaching, unsuitable residence units, including squatter and informal settlements.

2.3.5 Demographics

Demographics are data that describe the structure of a population, such as race, income, age, gender, population growth and migration patterns. Shifts in population trends are the main drivers for demand together with a growth in the number of persons living a specific location, the attractiveness of a specific area in terms of persons choosing to be a part of the area also raises its value. With the evolution of technology, many sectors have had to evolve with the changing times and real estate sector has not spared, there has been an evolution of Home Offices. We live in a technologically advanced era where it has permitted people to work partially or completely in their homes. With free lancers occupations, fax machines, computer networks, and advanced communications there has been a reduction in requests for office space in many urban areas plus there has been a drift toward less and less work

space per person than ever before and an increase in demand for residential property that serve this purpose.

2.3.5 State Legislations

Government legislation and policies is another factor that has a direct impact on property prices and demand. Zoning plans, major development plans, subsidies, tax incentives and deductions are examples of ways the government can momentarily increase demand for real estate for as long as they are endorsed. Being aware of current government incentives can help you identify potentially false trends and determine changes in supply and demand. An example, is in 2006 the government announced it would set up a technopolis in the Konza plains fashioned after the US' Silicon Valley. This news triggered a wave of excitement among land speculators. And since then Konza City project has so far resulted in over 2000% increase in land price since the announcement, a period of less than 10 years. Back in 2006, an acre would go for Sh25,641 while recent figures show prices as high as Sh3m per acre, a price that go even higher as Konza takes shape.

2.4 Empirical Literature Review

In developed economies, real estate market is seen as an efficient way of involving money and portfolio diversification (Case et al, 2000). On the other hand the market is closely connected to the general economic cycles. Therefore there is necessity to analyze the market and to find tools for predicting its development in the money circulation. In his study on Ukraine's real estate development, Hilbers et al (2001) affirms that economic progress and increase in income level enlarge purchasing

capacity that induces demand for real estate and thus lead to high price. Thus there is expectation of a direct relationship between housing process and households incomes.

In another study by Colander et al, (2008) on the relationship of real estate investment and the government policies, argues that the existing government policies contribute to the level of real estate investments by both local and international property developers. The government is a key player in the residential housing unit. The government has the capability to enforce taxes on real estate on the basis of the income that irritate the interested and the existing investors. It has the enforcement mechanisms of the Laws and policies on real estate investments and the real income of the working class. Colander also argues that government as a regulatory authority has the Laws like the permits for the use of land, planning regulations, title deed form land ownership and the guidance that the investors adhere to like registration of the property development business. The use of fiscal policies in the short term such as tax cuts and subsidies may initially create some growth in real estate industry, in the long term, this is normally eroded as only a few investors do qualify for to take advantage of this and also has potential of abuse.

Turner (2013) in his article on the real estate sector in Kenya, he argued that the sector was robust in Kenya due to its response to the emerging middle. The access to disposable income creates opportunity for the middle class to pay back their mortgages. From his analysis, the disposable income becomes a source of empowerment demand for the housing units. The demand for quality standard of housing with great compound and finishing contributes to the pricing of real estate. He further argues that quality of the nature of the real estate is paramount to the emerging class of the working class. Some of the conditions for the real estate

investment for the emerging middle class in Kenya include safe and secure locations which culminates the willingness for paying premium prices of their choice. Nairobi has continued to attract commercial investments and thus the increase in demand for the office space by international institutions and Non Governmental Organisations and the business service and commodity space. As strong as his assumptions might be, they are only applicable in a perfect market that would not be affected by other variables e.g. foreign real estate investments for example through Diaspora Remittance did have a direct impact on real estate's prices.

According to Kigigi (2011) in his study on the real estate pricing in Meru, he argues that security is one factor in potential investors, both domestic and international property developers to decide on the location of the property development. Most people prefer to choose areas for residence where they are safe together with their investment assets. The safety of the housing units does increase the price of real estate due to the increase in demand for residing and investing in such areas. However this cannot be reviewed in isolation, as these areas tend to attract more persons with the intention to enjoy such benefits and this normally leads to erosion of such benefits in the long-run.

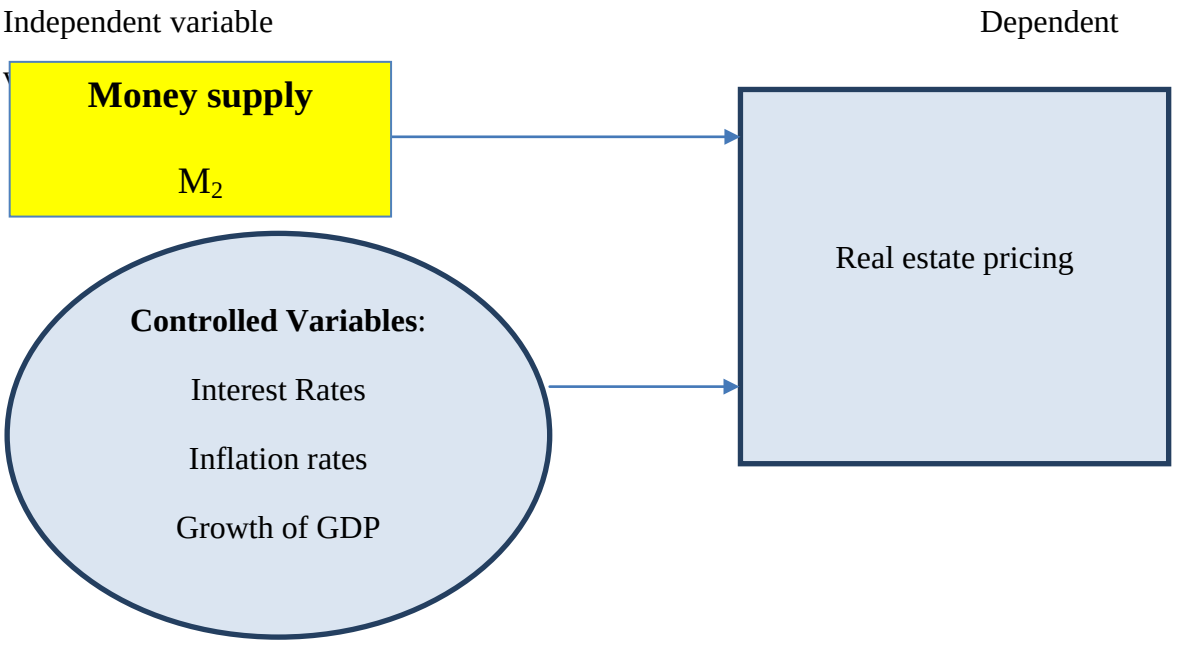
On other hand, Kamau (2011) in his study on the investment in Nairobi's real estate, he assets that the physical properties in the area affects the level of investments and the pricing element. The appearance and quality of the property asset is linked to the structure itself and the design of the property.

The National housing and population census in 2009 states that most people prefer to reside in highly convenient and accessible areas, leading to an increase in the housing units within such areas. The housing demand leads to the increase in the prices of the housing units. The poor area with low level of developed infrastructure like peri-urban areas attracts few investors and the middle class people, hence low housing prices. The availability of amenities and facilities like schools, hospitals, market centres contribute to the price of the properties. The access to these facilities attracts an increase in the price of the property. Such property becomes expensive because of the competition level. Turner (2013) argues that high Unemployment rate makes few people to afford descent housing that reduce the level of demand. The high level of unemployment attracts people to reside in low income areas that are characterized by scarcity of the basic services like proper housing, access to food, water and sanitation services.

2.5 Conceptual Frame Work

The conceptual framework illustrates the relationship that exists between the independent and the dependent variables. In this case, real estate is seen as the dependent variable while money supply is seen as the major independent variable which consists of growth of GDP, inflation and interest rate level.

Conceptual Framework



2.6 Summary of Literature Review

In this chapter, this study has discussed the introduction followed by the theoretical review that consist of decision theory and rational choice theory which argue that individual and group preferences are based on the decisions that are made and to greater extent the rationality thinking for each choice that is made. Determinants of real estate pricing are discussed that include GDP, economic activity, money supply, credit growth, Empirical review is also discussed and finally conceptual framework that link the relationship of variables.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology used in the study to conduct the research and analyse the data that has been collected. The researcher review the research design, population of the study, the sample design, data Collection techniques, diagnostic tests and finally the data analysis.

3.2 Research Design

The design for this study is a case study as it is a thorough examination of a subject of study (the *case*) and also its connected contextual conditions. Chandran (2004) states that the selection of a research design is determined by a few deliberation e.g.; categories of data sources, the research purpose, data needed and the price factor. Kothari (2004) explains that descriptive research is used in a study which is concerned with identifying the characteristics of a particular person and group of persons. For the purpose of this study, descriptive design was used to enlighten un on the relationship existing between the variables of money supply examined and the prices of real estate. Coper and Schindler (2003) asserts that a descriptive research defines and reports the way things are and tries to explain such things as attitudes, possible behavior, characteristics and values. This study applies the statistical technique of correlation to ascertain the relationship between the dependent and independent variable and co-integration in together with Granger causality to validate the effects of money supply on real estate prices. Secondary data sources are used with the main data being

quantitative. For the sake of this study, qualitative and quantitative data was used. Quantitative research is a formal, systematic and objective procedure used to explain and test. Archival research design also be used since data is collected over a period of ten years on a quarterly basis from the year 2006 Q1 to 2015 Q4 therefore making the study longitudinal approach which be supplemented by cross-sectional comparison.

3.3 Data Collection Techniques

Data collected through quantitative techniques provide the study with a organized and controlled means of analysis, based on quantitative data, for achieving predetermined goals and targeting a specific case study. Data that has been collected via quantitative techniques are believed to yield more accurate and objective information because they were collected concentrating on numerical aspects, data and facts connected with the problem. Quantitative data can be replicated since we use standardized methods, and, distinct from qualitative data which cannot be reviewed using sophisticated mathematical techniques. Following this point of view, for this case study, quarterly secondary data for a period of 10 years be collected from; commercial bank average lending rates regarding interest rates from CBK , and level of money supply from Kenya National Bureau of Statistics; and Hass Consulting Ltd regarding Residential Real Estate Prices.

3.4 Data Analysis

Data analysis was carried out by use of averages or simple mean, median and standard deviation. The mean or average is a common statistics used to describe the centre of data set and is the summation of all data sets and then halved. While the median is the

middle value of the data set, where half the data are less than the median and half are greater. Standard deviation did show the average difference between each individual data point and the mean. If all data points show a larger spread to the mean then the standard deviation is large, showing that there is large difference between values and vice versa.

We mainly used the support of Statistical Package for Social Sciences (SPSS) in analyzing regression and correlation to identify the degree to which independent variables affect the dependent variable. A multi regression analysis was used to come up with the model expressing the relationship between the dependent variable (Residential Real Estate Prices) and the macroeconomic variables namely, Level of money supply. A simultaneous regression analysis was also be applied where a particular internal attribute measure may have a considerable impact in a multivariate context.

3.4.1 Diagnostic Test

For this study used Pearson Correlation Analysis to examine the strength and direction of the linear relationship between the random variable and the controlled variables. Correlation was then be used to check the overall strength to establish regression model and individual significance of the independent variables. We tested for multi-collinearity between the variables.

Given that source of data is from different time series and also a variety of properties in Nairobi we shall test for heteroscedasticity in our regression analysis. To support

that the variances are not homogeneous (a representation of the residuals against the explanatory variables may reveal heteroscedasticity), we will therefore perform a test for heteroscedasticity.

3.4.2 Analytical Model

The multi-regression function or equation includes all the independent variables and dependent variable for this study was calculated as follows:

$RREP = \beta_0 + \beta_1 LMS + \beta_2 INTR + \beta_3 INFR + \beta_3 GDPGR\ \varepsilon$

Where;

RREP = Residential Real Estate Prices

β = Regression Coefficient

LMS = Level of Money Supply

INTR = Commercial bank lending rates

INFR = Inflation Rate

GDPGR= Gross Domestic Product Real Growth Rate

ε = is the error term.

After collecting, data presentation is by use of descriptive statistic using tables as appropriate summarized and/or quoted from various reports reviewed. Some of the dat is in absolute figures but was converted into ratios using logarithms. For this case study, quarterly secondary data for a period of 10 years was collected from; commercial bank average lending rates regarding interest rates and level of money supply from CBK; GDP growth rate and Inflation rates from Kenya National Bureau of Statistics; and Hass Consulting Ltd regarding Residential Real Estate Price index.

The multiple regression function was used to examine the effect of each of the independent variable on the dependent variable. Regression coefficients of β_1 and β_2 be the degree of the effects on RREP and a positive or negative sign show the direction of the relationship. The higher the value of β for a specific variable, the higher the effect of that particular variable on RREP.

3.4.3 Test of Significance

There are two questions which we examined about the hypothesized relationship between the dependent and independent variable:

1) What are the chances that the relationship exists?

2) If it does, how strong is the relationship?

First we tested for statistical significance which was address the probability that what we think is a relationship between two variables is just a chance occurrence.

Once data has been gathered through the study, statistical inference allows analysts to assess evidence in favor of the population from which the data has been drawn. For this study we conducted both t- test which gives an indication of the separateness of two sets of measurements, and is thus used to check whether two sets of measures are essentially different. F-test was used to test if the standard deviations of two populations are equal. Chi-test as a test of goodness-of-fit (comparing frequencies of one attribute variable to theoretical expectations) and as a test of independence (comparing frequencies of one attribute variable for different values of a second

attribute variable). A 5% level of significance level and 95% level of confidence be sorted.

A content analysis was then performed on the data to allow for an in-depth understanding of issues in the case. Based on the data analysis and presentation, interpretation was made on the findings of the study.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

The findings of data analysis are clearly indicated in this section. The researcher collected secondary data using data collection sheet. The collected data was coded into SPSS software and the analysis was done using both descriptive and inferential statistics. The data was gathered from Central Bank of Kenya (CBK) data source, Kenya National Bureau of Statistics and Hass Consult Limited. Other sources of data include Kenyan National Housing Corporation, Ministry of Lands and Physical Planning, Ministry of Finance and Nairobi City County Planning Department. The data obtained was fed into the Statistical Package for Social Sciences (SPSS) version 22.0 and used to calculate the ratio used as proxy to appraise the factors that influence residential real estate prices in Nairobi County. The chapter presents descriptive, regression and Pearson Correlation analyses. The findings are also discussed.

4.2 Diagnostic Tests

The diagnostic tests employed in this study were Multi-Collinearity, Normaility and Autocorrelation Test. These tests are clearly indicated in subsequent sections.

4.2.1 Multicollinearity

This was detected by Variance Inflation Factor VIF. Usually VIF between 1 and 10 shows no multicollinearity while VIF less than 1 or greater than 10 indicates presence of Multicollinearity.

Table 4.1: Multicollinearity

	Collinearity Statistics	
	Tolerance	**VIF**
Level of money supply	.069	1.562
Commercial Bank Lending Rate	.487	2.054
Inflation Rate	.148	6.754
Real GDP growth Rate	.148	6.756

From the findings, level of money supply had VIF of 1.562, Commercial Bank Lending Rate had 2.054, inflation rates had 6.754 and real GDP growth rates had 6.756. As all the values of VIF are between 1 to 10, this shows that there was on multicollinearity in the data set. Therefore, the researcher proceeds with data analysis.

4.2.2 Autocorrelation

It was tested using Durbin Watson Statistics. Normally, Durbin-Watson statistic is always between 0 and 4. A value of 2 means that there is no autocorrelation in the sample while values approaching 0 indicate positive autocorrelation and values toward 4 indicate negative autocorrelation.

Table 4.2: Autocorrelation

Model	**Durbin-Watson**
1	1.824

The value for Durbin Watson was 1.824. This shows that there was no Autocorrelation in the data set. Therefore, data analysis proceeds.

4.2.3 Normality Test

Normality test was done using Skewness and Kurtosis. In a normal distribution, observations in the data set are deviates towards the centre. Wheeler (2010) defined Skewness as a measure of a dataset's symmetry – or the lack of it. A result of 0 shows a

perfectly symmetrical data set. The normal distribution has a skewness of 0. It investigates the amount of probability in the tails. The results are matched up to to the kurtosis of a normal distribution, which is equal to 3. If kurtosis is higher than 3, then the dataset has heavier tails than a normal distribution (more in the tails).

Table 4.3: Normality test using Skewness and Kurtosis

	N	Skewness		Kurtosis	
	Statistic	**Statistic**	**Std. Error**	**Statistic**	**Std. Error**
Quarterly Price	40	-.308	.374	-.860	.733
Level of money supply	40	-.142	.374	-1.245	.733
Commercial Bank Lending Rate	40	.647	.374	-.486	.733
Inflation Rate	40	1.058	.374	-.210	.733
Real GDP growth Rate	40	.049	.374	1.380	.733

From the findings, quarterly price show Skewness of -0.308 and Kurtosis of -0.860. Level of money supply had -0.142 and -1.245, commercial bank lending rate had 0.647 and -0.486, inflation rate had 1.058 and -0.210 while Real GDP growth rate had 0.049 and 1.380 as Skewness and Kurtosis respectively. If the skewness is between -0.5 and 0.5 as the case of Real Estate pricing, level of money supply and real gdp growth rate, the data is considered fairly symmetrical. When the skewness is between 0.5 and 1 or between – 1 and - 0.5, as the case of commercial bank lending rate then the data is considered moderately skewed. When the skewness is less than -1 or greater than 1, the data are highly skewed as the case of inflation rate.

When the kurtosis is less than zero as the case for our data except Real GDP growth rate then the distribution is light tails and is called a platykurtic distribution. Real GDP growth rate has a kurtosis that is higher than zero, which means the distribution has a

heavier tail and is called a leptokurtic distribution.We therefore conclude that the dataset was normal distribution and therefore suitable for analysis.

4.2 Descriptive Statistics

To establish the relationship between independent variables and real estate prices (dependent variable) a descriptive analysis was done. The study collected quarterly data over a period of ten years, i.e. from year 2007 to year 2016. The researcher used means and standard deviations to describe relationship between the variables of the study. Means and Standard deviations were used.

Table 4. 3: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev
Quarterly Price	40	-.02	.05	.019	.019
Level of money supply	40	5.75	6.37	6.092	.193
Commercial Bank Lending Rate	40	13.07	20.21	15.776	1.995
Inflation Rate	40	4.03	16.83	8.254	3.894
Real GDP growth Rate	40	.20	12.40	5.385	2.332

From the findings, quarterly real estate price composite index had a minimum value of -0.02, maximum of 0.05, mean of 0.019 and standard deviation of 0.019. Money supply had a minimum of 5.75, maximum of 6.37, mean of 6.092 and standard deviation of 0.193. Interest rate had a minimum of 13.07, maximum of 20.21, mean of 15.776 and standard deviation of 1.995. Inflation rate had a minimum of 4.03, maximum of 16.83, mean of 8.254 and standard deviation of 3.894. Real GDP rate had a minimum of 0.20, maximum of 12.40, mean of 5.385 and standard deviation of 2.332.

From the findings therefore, inflation was the most risky macroeconomic variable as determined by standard deviation. On the other hand, interest rate had most of its observations centered in the entire data set.

4.3 Correlation Analysis

The researcher carried out correlation analysis to establish relationship between the variables. Pearson correlation coefficient indicated the strength of the relationship while the p values showed significance of the relationship, The correlation coefficient can range in value from −1 to +1 and 0 shows no linear relationship. The findings are indicated in Table 4.5.

Table 4. 4: Correlation Analysis

		Residential Real Estate Price	**Level of Money Supply**	**Commercial Bank Lending Rate**	**Inflation Rate**	**GDP Real Growth Rate**
Residential Real Estate Price	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	40				
Level of Money Supply	Pearson Correlation	-.311	1			
	Sig. (2-tailed)	.051				
	N	40	40			
Commercial Bank Lending Rate	Pearson Correlation	-.098	.583	1		
	Sig. (2-tailed)	.547	.000			
	N	40	40	40		
Inflation Rate	Pearson Correlation	-.064	.895	.341	1	
	Sig. (2-tailed)	.695	.000	.031		
	N	40	40	40	40	
GDP Real Growth Rate	Pearson Correlation	-.415	.920	.480	.848	1
	Sig. (2-tailed)	.008	.000	.002	.000	
	N	40	40	40	40	40

There was an inverse relationship between level of money supply and residential real estate price (r=-0.311, p=0.051). The study established an inverse relationship between commercial banks lending rates and residential real estate price (r=-0.098, p=0.547). The findings of the study indicated an inverse relationship between inflation rate and residential real estate price (r=-0.064, p=0.695). There was an inverse relationship between GDP real growth rates and residential real estate price (r=-0.415, p=0.0.008<0.05).

The findings above therefore indicate only GDP real growth had significant influence on residential real estate price with p value less than 0.05. The relationship was inverse indicating that a reduction in GDP real growth would result into increase in residential real estate price.

4.4 Regression Analysis

The researcher conducted multiple regression analysis to establish relations:

Table 4. 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.782[a]	.612	.567	.01289

From the findings, the coefficient of determination R square is 0.612 showing that 61.2% change in residential real estate price is explained by the independent variables of the study while other factors explain 38.8%. These other factors should be examined by future studies.

Table 4.6: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	.009	4	.002	13.773	.000
Residual	.006	35	.000		
Total	**.015**	**39**			

The ANOVA findings at 5% indicate an F calculated value of 13.773 while F critical (d.f $F_{(4, 35)}$ is 2.641. Since F calculated is greater than F critical, i.e. 13.773>2.641, this shows that the overall regression model was a significant predictor of the relationship between the study variables.

Table 4. 7: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.675	.219		3.080	.004
Level of money supply	-.125	.041	-1.233	-3.067	.004
Commercial Bank Lending Rate	.005	.001	.500	3.310	.002
Inflation Rate	.008	.001	1.652	6.033	.000
Real GDP growth Rate	-.008	.002	-.922	-3.367	.002

From the coefficients above, the following equation is formulated:

RREP = 0.675 -0.125LMS +0.005INTR + 0.008INFR-0.008 GDPGR

Where;

RREP = Residential Real Estate Prices

LMS = Level of Money Supply

INTR = Commercial bank lending rates

INFR = Inflation Rate

GDPGR= Gross Domestic Product Real Growth Rate

The possible value of residential real estate prices all factors held constant is 0.675. A unit decrease in the level of money supply other factors held constant would result into 12.5% increase in residential real estate prices. A unit increase in commercial bank lending rate with other factors held constant would lead to 0.5% increase in residential real estate prices. A unit increase in inflation rate with other factors held constant would lead to 0.8% rise in residential real estate prices. A unit decrease in real GDP

growth rate holding other factors constant would led to 0.8% increase in residential real estate prices.

In terms of significance level for p values at 5% and t values at 1.96, the findings indicated that level of money supply ($p=0.004<0.05$; $t=-3.067>1.96$), commercial bank lending rate ($p=0.002<0.05$, $t=3.310>1.96$), inflation rate ($p=0.000<0.05$; $t=6.033>1.96$) and real GDP growth rate ($p=0.002<0.05$; $t=-3.367>1.96$). Therefore, the p values of the independent variables were less than 0.05 while t values were greater than 1.96. Therefore, the variables had significant effect on residential real estate prices. In other words, they were critical factors affecting residential real estate prices.

4.5 Discussion of the Findings

From correlation analysis, only GDP real growth rates had significant influence on residential real estate price ($r=-0.415$, $p=0.0.008<0.05$). This indicator was inversely related with residential real estate price showing that a decrease in one variable increases the other variable. This contradicts findings from Makena (2010), who observed that there was a positive relationship between GDP growth rate and residential real estate pricing.

From regression results, at 5% for p values and 1.96 for t values, the findings indicated that level of money supply had p value=0.004 which is less than 0.05 with t value t=-3.067 which is greater than 1.96. This indicates that the level of money supply significantly affected residential real estate price. Contrary to Hilbers et al (2001) findings that that economic progress and increase in money supply level enlarge

purchasing capacity that induces demand for real estate and thus lead to high price. In our case, the increase in level of money supply had an inverse reaction to growth in real estate prices.

For commercial bank lending rate, the p value was p=0.002 which is less than 0.05 while t value was t=3.310 which is greater than 1.96. This therefore indicates that commercial bank lending rate significantly influenced residential real estate price. This finding does agree with Turner (2013), the access to disposable income creates opportunity for the middle class to pay back their mortgages. From his analysis, the disposable income becomes a source of empowerment demand for the housing units.

In view of inflation rate the p value p=0.000 which is less than 0.05 while t value t=6.033 which is greater than 1.96. This indicates that inflation rate had significant effect on residential real estate price.

The p value for real GDP growth rate p=0.002 which is less than 0.05 while t value t=-3.367 which is greater than 1.96. This clearly indicates that real GDP significantly affected residential real estate price. This agrees with Colander et al, (2008) findings on the relationship of real estate pricing and the growth in gross domestic product, where he observed that an improvement in Gross domestic product has an overall positive effect on all industry in the economy. Thus it will lead to both an increase to the level of real estate investments by both local and international players.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The overall objective of the study was to determine the effects of money supply in real estate pricing in Nairobi City County. After identifying the study problem in beginning chapter, literature review was done showing knowledge gaps in the second chapter. The third chapter provided explanation on the data collection methods and the fourth chapter provides analysis of the data that was obtained during the research work. In this chapter, the researcher provides summary of the findings, conclusions and recommendations of the study and also suggestions for areas to be considered for further studies.

5.2 Summary of the Findings

The study found that the average level of money in supply in 2007 was Ksh 619.6 billion, in 2008 was Ksh 728.9, the amount of money supply in 2009 was Ksh 813.9 billion, in 2010 the supply of money was Ksh 1,041.5 billion, during 2012, the money supply was Ksh 1,373.8 billion, in 2013 was Ksh 1,593.3 billion, the 2014 money supply was Ksh 1,882.3 billion, the 2015 was Ksh 2.15 trillion and in 2016 the level of money supply was Ksh, 2.3 trillion. The mean over the ten years time was 1,416.3 billion and the deviation from the mean was at 517.8 billion.

The research also established that the money in supply data can provide information to the financial analysts and economists a better and clear knowledge and understanding on the real estate market environment and the effect on the real estate pricing. From

the study, the researcher found the highest interest rate at 20.22% which was recorded in 2012 and the lowest interest rate was 13.07% recorded in 2007. The study also established that besides interest rates and level of money supply, inflation played a key role in the real estate pricing at both residential and commercial level. From the findings, year 2009 realized the highest rate of geometric inflation rates recorded at 16.8 % and the lowest was recorded at 4.03% in 2010. In year 2011, it recorded 14%, the year 2013 had 9.8% and became third, and 2009 was fourth in this order at 9.4%. It was followed by the year 2016 at 7%. The year 2012 had 5.3%, 2014 had 4.9%, the year 2007 had 4.3%. In addition, the Growth Domestic Product (GDP) was found to be a determinant of the real estate pricing. On average GDP growth in year 2007 recorded the highest growth at 7.0%, year 2010 followed at 5.8%, in 2015 was recorded at 5.6%, in 2014 at 5.3% and 2016 at 5.0%. In year 2012, it was 4.6%, in 2011 at 4.4%, then 2009 at 2.7% and the lowest GDP growth in 2008 at 1.5%.

From the findings, it was clear that there was relationship between residential real estate prices and various factors studied. Money supply level showed a negative correlation with residential real estate prices as shown by a correlation figure of -0.311. It was also clear that there was a relationship, though weak between interest rate and the residential real estate prices that was at -0.098 coefficient. There was also correlation between inflation rate and residential real estate prices with correlation value of 0.1874. There was also a strong positive correlation between residential real estate prices and the GDP growth with a correlation value of 0.6258. The five independent variables that were studied, explain only 61.2% of the residential real estate prices as represented by the R2.

Following the regression equation established above, Keeping all other variables constant (level of money supply, Commercial banks lending rate, inflation rate, Real GDP growth rate), the residential real estate prices composite index would be 0.675. The data Findings analyzed also shows that taking all other independent variables at zero, a unit increase in level of money supply would lead to 0.125 decrease in the residential real estate prices composite index; a unit increase in commercial bank lending rate would lead to a 0.005 increase in residential real estate prices composite index; a unit increase in inflation rate will lead to a 0.008 increase in residential real estate prices composite index; while lastly a unit increase in real gross domestic product growth rate would lead to a 0.008 decrease in residential real estate prices composite index.

5.3 Conclusions

According to the study findings and the summary, the researcher concludes that the money supply level information can provide information to the financial analysts and economists and provide a better and clear knowledge and understanding on the real estate market environment and the effect on the real estate pricing. The real estate price increase is supported by the national economic environment that consists of money supply among other factors. It controls the price of commodities and the real estate depending on its abundance in circulation. The housing units' prices are greatly subjective by the rate of interest. The housing units prices may increase with a contraction of liquidity environment related to stricter national economic condition. The level of inflation has a direct influence on the pricing of housing units for both

commercial and residential real estate. The higher the rate of inflation, the higher the price of residential real estate.

5.4 Recommendations

From the research findings and the study conclusion, the increase in real estate price is justified by the available good macroeconomic environment including the GDP. The stability pricing is realized by following the actual market value and the demand. There is need for investors to look at the supportive macroeconomic environment for investment in residential real estate. It is vital for the economists and the financial analysts to create awareness among their clients for more real estate investment in the County Governments like Nairobi's middle level residential housing units. The financial institutions should develop new and affordable packages for clients to invest in real estate.

5.5 Limitations of the Study

The researcher did encounter several limitations that did hinder access to information. First limitation was the limited information regarding house prices where as the researcher, I had to depend on data from Hass Consult Limited in Kenya regarding residential real estate prices. Information from other sources were even more limiting and covering a shorter period i.e. from 2012 which is a shorter period for a significant analysis including government institutions responsible for housing. However, the researcher did establish that Hass Real Estate Company does collect data from over 20 other institutions and compiles a composite index. Hence the data is assumed to be reliable. The study further sought to increase the reliability and accuracy by stretching

the period of study to 10 years and using quarterly data hence establishing 40 data points. It would also be interesting to see how the results would be if the sample included other counties.

Written information required for this study was confidential to respective organizations like the regulator and the property management agencies. Literature review was scanty. Likewise, information regarding number of properties per period to establish demand was not available. The researcher countered the limitation by analyzing the determinants by considering the factors determining real estate prices and by extension the mindset in real estate residential properties in Nairobi. As such the results would help design interventions to address the determinants of residential real estate prices in Nairobi.

5.6 Suggestions for Further Research

The findings of this study set a ground for further research in a number of areas. First, the research covered the geographical area of Nairobi County where data was available for analysis. It is recommended there is room for a much broader analysis to cover the country as a whole. There are very limited research done covering Kenya at large and therefore really important insights can be gained from this.

With the introductions of interest rate capping by the Central bank of Kenya since 2016 where the act placed restrictions on the rate which banks offer on loans and deposits. This offer grounds to study further the impact of placing a cap on interest rates on mortgages and consequently on real estate pricing in the country.

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APPENDICES

Appendix 1: Residential Real Estate Prices Growth Rates

Year	Quarter	Hass Consultant House Prices Quarterly % Change
2007	Q1	0.0380
2007	Q2	0.0400
2007	Q3	0.0200
2007	Q4	0.0480
2008	Q1	0.0370
2008	Q2	0.0170
2008	Q3	0.0460
2008	Q4	0.0410
2009	Q1	0.0230
2009	Q2	-0.0140
2009	Q3	-0.0210
2009	Q4	0.0040
2010	Q1	0.0180
2010	Q2	0.0050
2010	Q3	0.0260
2010	Q4	0.0390
2011	Q1	0.0440
2011	Q2	0.0190
2011	Q3	-0.0100
2011	Q4	-0.0070
2012	Q1	0.0130
2012	Q2	0.0130
2012	Q3	0.0510
2012	Q4	0.0170
2013	Q1	0.0050
2013	Q2	0.0230
2013	Q3	-0.0150
2013	Q4	-0.0100
2014	Q1	0.0190
2014	Q2	0.0060
2014	Q3	0.0310
2014	Q4	0.0240
2015	Q1	-0.0040
2015	Q2	0.0220
2015	Q3	0.0390
2015	Q4	0.0360
2016	Q1	0.0420
2016	Q2	0.0360
2016	Q3	0.0120
2016	Q4	0.0010

Source: Hass Consultant Ltd

Appendix 2: Quarterly Level of Money Supply, M2

Year	Quarter	Money supply (M2) Millions	Level of Money Supply $\log_{10}$
2007	Q1	576,280.8	5.7517
2007	Q2	605,549.8	5.7717
2007	Q3	631,141.4	5.7953
2007	Q4	666,874.6	5.8123
2008	Q1	697,121.8	5.8392
2008	Q2	715,968.4	5.8591
2008	Q3	736,325.2	5.8611
2008	Q4	766,393.1	5.8792
2009	Q1	780,512.7	5.8869
2009	Q2	812,055.1	5.9032
2009	Q3	849,209.5	5.9227
2009	Q4	898,09,9.4	5.9460
2010	Q1	959,004.5	5.9721
2010	Q2	1,033,704	6.0000
2010	Q3	1,078,277	6.0234
2010	Q4	1,099,234	6.0380
2011	Q1	1,145,003	6.0529
2011	Q2	1,183,864	6.0661
2011	Q3	1,232,807	6.0832
2011	Q4	1,253,958	6.0948
2012	Q1	1,276,403	6.0986
2012	Q2	1,339,470	6.1186
2012	Q3	1,409,821	6.1418
2012	Q4	1,469,399	6.1632
2013	Q1	1,488,026	6.1701
2013	Q2	1,565,359	6.1923
2013	Q3	1,636,529	6.2038
2013	Q4	1,683,159	6.2212
2014	Q1	1,775,280	6.2422
2014	Q2	1,850,586	6.2619
2014	Q3	1,907,150	6.2765
2014	Q4	1,996,316	6.2934
2015	Q1	2,060,438	6.3088
2015	Q2	2,154,507	6.3265
2015	Q3	2,150,997	6.3347
2015	Q4	2,252,750	6.3465
2016	Q1	2,281,572	6.3522
2016	Q2	2,353,413	6.3665
2016	Q3	2,340,196	6.3674
2016	Q4	2,360,202	6.3716

Source: Central Bank of Kenya

Appendix 3: Quarterly Commercial Bank Lending Rate

Year	Quarter	Commercial Bank Interest Rates (%) (INTR)
2007	Q1	13.6600
2007	Q2	13.2833
2007	Q3	13.0667
2007	Q4	13.3167
2008	Q1	13.8933
2008	Q2	13.9933
2008	Q3	13.7400
2008	Q4	14.4400
2009	Q1	14.7733
2009	Q2	14.8833
2009	Q3	14.7633
2009	Q4	14.7967
2010	Q1	14.9200
2010	Q2	14.4767
2010	Q3	14.1500
2010	Q4	13.8900
2011	Q1	13.9567
2011	Q2	13.9033
2011	Q3	14.4167
2011	Q4	17.9200
2012	Q1	20.0533
2012	Q2	20.2133
2012	Q3	20.0033
2012	Q4	18.3233
2013	Q1	17.9000
2013	Q2	17.4300
2013	Q3	16.9467
2013	Q4	16.9600
2014	Q1	17.0000
2014	Q2	16.6767
2014	Q3	16.4033
2014	Q4	15.9767
2015	Q1	15.6200
2015	Q2	15.5733
2015	Q3	16.0833
2015	Q4	17.3467
2016	Q1	17.9267
2016	Q2	18.1467
2016	Q3	16.5400
2016	Q4	13.6867

Source: Central Bank of Kenya

Appendix 4: Quarterly Inflation Rates

Year	Quarter	Inflation Rate (INFR)
2007	Q1	5.5400
2007	Q2	4.5400
2007	Q3	4.5800
2007	Q4	4.4000
2008	Q1	5.3800
2008	Q2	8.6267
2008	Q3	11.9233
2008	Q4	15.2167
2009	Q1	16.8333
2009	Q2	15.9200
2009	Q3	13.3933
2009	Q4	10.3000
2010	Q1	7.8500
2010	Q2	5.8667
2010	Q3	4.7067
2010	Q4	4.0333
2011	Q1	4.1567
2011	Q2	6.0133
2011	Q3	9.0200
2011	Q4	12.7767
2012	Q1	15.8267
2012	Q2	16.2900
2012	Q3	14.2967
2012	Q4	10.6967
2013	Q1	7.2567
2013	Q2	5.0433
2013	Q3	4.5633
2013	Q4	5.3867
2014	Q1	6.2033
2014	Q2	6.8267
2014	Q3	7.2367
2014	Q4	6.9767
2015	Q1	6.6667
2015	Q2	6.6567
2015	Q3	6.3900
2015	Q4	6.4367
2016	Q1	6.8533
2016	Q2	6.6000
2016	Q3	6.4900
2016	Q4	6.4233

Source: Kenya National Bureau of Statistics

Appendix 5: Quarterly Gross Domestic Product Growth Rates

Year	Quarter	Real GDP growth Rate at market prices (GDPGR)
2007	Q1	7.1000
2007	Q2	8.3000
2007	Q3	6.3000
2007	Q4	6.4000
2008	Q1	1.1000
2008	Q2	2.2000
2008	Q3	2.6000
2008	Q4	0.2000
2009	Q1	6.2000
2009	Q2	1.9000
2009	Q3	1.9000
2009	Q4	1.2000
2010	Q1	7.3000
2010	Q2	8.2000
2010	Q3	8.7000
2010	Q4	12.4000
2011	Q1	7.6000
2011	Q2	6.7000
2011	Q3	5.8000
2011	Q4	4.4000
2012	Q1	4.7000
2012	Q2	4.3000
2012	Q3	4.5000
2012	Q4	4.7000
2013	Q1	6.0000
2013	Q2	7.0000
2013	Q3	6.4000
2013	Q4	3.5000
2014	Q1	5.2000
2014	Q2	6.0000
2014	Q3	4.6000
2014	Q4	5.6000
2015	Q1	5.8000
2015	Q2	5.6000
2015	Q3	6.1000
2015	Q4	5.5000
2016	Q1	5.3000
2016	Q2	6.3000
2016	Q3	5.7000
2016	Q4	6.1000

Source: Kenya National Bureau of Statistics