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ABSTRACT

Purpose: The main purpose of this study was to establish the effects of construction cost on the growth in supply of real estate housing in Kenya.

Methodology: The study adopted a descriptive research design. The target population was 78 registered real estate companies in Kenya. The sample size was therefore 39 registered real estate companies in Kenya. Primary data was collected through the administration of the questionnaires

Results: The study found that finance cost, cost of building materials, cost of land and tax cost have a statistical and negative influence on the growth of supply of real estate housing. The study also concludes that increase in growth of real estate market despite the high interest rate could owe to the price inelastic demand for housing owing to economic disparity in the country. While low income earners, who are majority, are pushed away to less glossy and crowded homes where survival supersedes luxury, the upper middle income purchase of housing units is on the upward spiral.

Unique contribution to theory, practice and policy: The study recommended that the government should lower interest expenses so as to encourage the increase in supply of affordable real estate housing. The bank should also lower their interest rates so that the real estate firms can be able to increase the supply of housing. The study also recommends that investors should consider investing in the real estate market despite the erratic interest rates.

Key words: *Construction cost, supply, growth, real estate*

1.0 INTRODUCTION

1.1 Background of the Study

Title to real estate normally includes title to air rights, mineral rights, and surface rights which can be bought, leased, sold, or transferred together or separately (Geltner *et al.*, 2013). Real estate can be defined as the land and its permanent improvements. According to Harvey (1981), real estate refers to a particular type of good, land or resources that is not physically movable. Although real estate is a tangible asset, it can also be viewed as a bundle of intangible rights or privileges associated with the ownership and use of the site and improvements (Ling & Archer, 2008).

According to Ögütçü (2002) the real estate sector continues to grow immensely highlighting the rising demand and investor confidence in the entire sector. The investment seeks to provide current income and growth of capital (Chepsiror, 2013). The fund invests primarily in real estate investment trusts (REITs). The size and scale of the real estate market make it an attractive and lucrative market for many investors. Investors can invest directly in physical real estate or choose to invest indirectly through managed funds. Investing directly in real estate involves purchasing the residential or commercial property to use as an income producing property or for resale at a future time. Indirect ways to invest in the real estate market include investing in real estate investment trusts (REITs), real estate exchange traded funds (ETFs), coming led real estate funds (CREFs) and infrastructure funds. Due to the higher liquidity available in the market, the lower transaction costs and lower capital requirements, average investors prefer to indirectly invest in real estate.

However the growth of real estate industry is vital in the overall economic growth and development of nations as it increases the wellbeing of household by providing superior shelter and helping establish personal wealth that can be leveraged for creation of more wealth (Taylor, 2009). In addition, real estate industry development contributes to employment, the development in commercial banking and ultimately to the development of capital markets. Globally, the real estate market was initially dominated by institutional investors as individual properties were not bought and sold on a regular basis like stocks and bonds (Kohnstamm, 1995). As opposed to the well developed countries that use stocks and bonds, financing of real estate development in the less developed states like Kenya is predominantly through mortgage financing.

According to Davidoff (2006) while the growth of household numbers in formal settlements will generally be associated with a positive effect on demand for housing, the same cannot be said of the growth in household numbers in informal settlements. In addition, in Kenya the demand for houses has increased tremendously in the last 10 years but the supply has been inadequate and most of the houses being supplied to the market can only be afforded by the few high income earners despite the fact that the greatest need is in the low income earners, Word Bank (2011). Unless the causes of high house construction cost are identified and addressed the house prices and the growth of slums will continue rising. For example the number of households in Nairobi increased from 200,474 in 1979 to 985,016 in 2009. This represents an overall growth in housing in Kenya.

1.2 Problem Statement

The provision of affordable housing is one of the goals of achievement of vision 2030 (Omtatah, 2014). Affordable housing was also an important deliverable in the millennium

development goals. Every person would wish to own a house to avoid the burden of paying house rent every month. However the growth in supply in real estate has been poor. Access to adequate and decent housing units decreases with the increase in population, scarcity of fixed assets like land, escalating house prices and the rising cost of living. Kenya's real estate has been booming with the rising houses prices attracting more investors to the sector to tap the expected huge profits from the investment. However, according to Kiberenge (2012), Kenyan real estate industry would be on the verge of crisis following reports that many developers are unable to sell off houses due to unaffordable prices putting off prospective buyers.

Figuratively, the demand for housing has been 150, 000 per year as compared to 35, 000 housing units that are delivered in the market annually. The supply of housing in urban Kenya is biased towards the high income group market segment which enjoys a 60 per cent supply surplus while the upper middle, lower middle and lower income groups suffer 15 percent, 92 percent and 98 percent deficits respectively (GoK, 2007). Thus, the supply has fallen below target in this deficit has been a practical and policy problem that has led to the debate of what could be the cause of the slow growth in supply of real estate housing in Kenya. There has been high speculative property market and elevated demand for housing in Kenya. This has largely contributed to the escalating costs of residential property over the last 12 years especially on the rentals and on the market value (Ali & Daly, 2010). According to Moko and Olima (2014) the slow growth in real estate supply has been associated with high cost of construction which include cost of building materials, cost of land, tax costs and it has been noted that the higher the interest expenses the higher the cost of financing and the lower the supply of affordable real estate housing. This also conforms to the supply theory which states that costs are negatively related to supply.

1.3 General Objective of the Study

The main purpose of this study was to establish the effects of construction cost on the growth in supply of real estate housing in Kenya.

1.3.1 Specific Objectives of the Study

This study was guided by the following specific objectives:

- i.** To determine the effect of Finance Costs to the Growth in Supply of Real Estate
- ii.** To determine the effect of cost of building materials to the growth in supply of real estate housing in Kenya.
- iii.** To establish the effect of cost of land to the growth in supply of real estate housing in Kenya.
- iv.** To determine the effect of tax cost to the growth in supply of real estate housing in Kenya.

2.0 LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 The Classical Theory of Interest Rates

According to the theory, one side of the market are demand considerations based on marginal utility, while on the other side are supply considerations based on marginal cost. The theory therefore compares the supply of savings with the demand for borrowing. According to Glaeser et al. (2010), using supply and demand curves, the equilibrium rate is calculated by determining the curves intersection point. Thus if savings are greater than investments the

interest rate drops until they reach equilibrium and vice versa, if savings are less than investment the interest rate increases until the reward for savings encourages increased savings rates causing the market to again reach equilibrium.

The classical theory of interest rates however fails to account for factors besides supply and demand that may affect interest rates such as the creation of funds, the importance of income and wealth and changes in the primary borrowers in an economy (Krainer, 2009). Modern economic theory has stressed the key role that real interest rates play in economic behaviour, that real interest rates affect investment, which, in turn, affects the aggregate level of economic activity. In addition, monetary policy is given a central role in controlling the level of economic activity through its role in controlling interest rates. Monetary authorities are hypothesized to change nominal interest rates in response to a change in expectations concerning inflation so that the real interest rate adjusts in the desired way (Stiglitz, 1995). The fundamental aspects of this theory relevant to this study are that the theory compares the supply of savings with the demand for borrowing.

2.1.2 The Irrational Exuberance Theory

The irrational exuberance theory by Shiller (2000) analyzed speculative behavior of the market participants that repeatedly leads to stunning price movements in housing markets in which speculative demand for houses is influenced by heterogeneous expectations. Irrational exuberance is when investors are so confident that the price of an asset will increase they lose sight of its underlying value. They get into a bidding war, driving prices up to levels that cannot be supported by fundamentals. If everybody thinks that house prices will go up, house prices could go up only because more people try to buy now, expecting capital gains from owning a house. When house prices are increasing only because people expect prices to go up, and not because the fundamental drivers of house prices are changing, the increase is commonly called a bubble. When increases in house prices are a bubble, there is no reason for prices to stay at a higher level. If people suddenly start thinking that house prices will drop, house prices could actually drop. Shiller (2007) discusses a variety of factors that contribute to bringing about such irrational exuberance, including cultural and psychological factors. Piazzesi and Schneider (2009) survey evidence to analyze expectations used the Michigan Survey of Consumers, which is a useful data set for this purpose because it asks respondents about current and future house prices.

According to Piazzesi and Schneider (2009) study, the proportion of households that are optimistic about future house prices is about 9 percent, on average. However, what is more interesting is that they also find that the proportion of such optimistic households increased from 10 percent to 16 percent during a house-price boom. Motivated by this evidence, Piazzesi and Schneider (2009) proposed a theory whereby some households' expectations are driven by momentum. When house prices are increasing for a while for some reason, these momentum households can keep house prices going up for a bit longer, because they believe that house prices will keep increasing, based on their recent experience, and they behave like households with irrational exuberance.

Kahn (1987) had proposed a theory as to how house prices are linked to expectations. When the economy is growing faster, people's income increases faster, and thus, future rents rise faster. He assumed that house prices today reflect future rents because if you buy a house today, you don't need to pay higher rents in the future. Therefore, if income and thus rents are expected to grow faster, people try to buy rather than rent a house today. Consequently, house

prices go up today just because of a positive change in expectations about future income growth. According to Kahn's theory, expectations for sustained high income growth were the driving force for the increase in house prices.

2.2. Empirical Review

Muriuki (2013) investigated the effect of interest rates volatility on the growth of real estate market in Kenya. The research problem was analysed through the use of the regression model. The target population of this study was the real estate market in the country ranging from the large real estate developers to the small scale individual investors. Data for the purpose of the study was collected from KNBS and Hass Consulting firm from 2008-2012. Study findings indicated that the interest market has experienced low volatility. Thus, volatility in the interest market is predictable, at least in the short run. The evidence strongly indicates that the interest rate market is nonlinear. The study recommended that investors should consider investing in the real estate market despite the erratic interest rates. This study focused on interest rates as the only variable that affects growth of real estate. This presented a conceptual gap. The current focused on other variables which include cost of building materials, cost of land and tax cost.

Njiru and Moronge (2013) undertook a study of the factors affecting growth of mortgage Magutu (2015) conducted a study on populization of low cost building materials and technologies for urban housing in developing countries. The study was based on a literature review and an evaluation of practices that have been placed with respect to low cost building materials and technologies so as to lower costs and hence make the buildings, especially housing for the majority urban poor who have meager resources and hence cannot afford conventionally built houses. This study utilized both secondary data from the literature, and an empirical study of pilot projects that have been constructed in different regions of Kenya by utilizing traditional architectural research techniques akin to observational techniques in the social sciences, augmented by open-ended interviews and discussions with the different actors in the advocacy and use of low cost materials and technologies in building. This study found out that topmost of the constraints that hinder wider application and universalism for the alternative materials and technologies is largely due to both lack of standards and specifications, and also information by the general populace about them. This study focused on all developing countries thus presenting a geographical gap. The current study focused on Kenya only.

Andrews et al. (2011) badly designed housing policies played an important role in triggering the recent economic and financial crisis. This study investigated how housing policies should be designed to ensure adequate housing for citizens, support growth in long-term living standards and strengthen macroeconomic stability. Governments intervene in housing markets to enhance people's housing opportunities and to ensure equitable access to housing. These interventions include fiscal measures, such as taxes and subsidies; the direct provision of social housing or rent allowances; and various regulations influencing the quantity, quality and price of housing. Housing policies also have a bearing on overall economic performance and living standards, in that they can influence how households use their savings as well as residential and labor mobility, which is crucial for reallocating workers to new jobs and geographical areas. Indeed, as recent OECD analysis shows, effectively supervised financial and mortgage market development combined with policies that enhance housing supply flexibility are key for macroeconomic stability.

According to Skaburskis and Tomalty (2000) property taxes and development cost charges can have environmental impacts by changing the extent to which developers substitute land for buildings and, thereby, the density of the built form, the spread of cities, and the mix of land uses. The schedules of rates and fees can promote city spread directly by favoring less dense projects. Fiscal instruments can have indirect effects by changing the optimal timing of development that affects the conditions under which it takes place and therefore the density with which land is developed. The reliance on property taxes and development cost charges to finance local services may induce municipal officials to encourage developers of the low density projects that are thought, perhaps erroneously, to yield the greatest fiscal dividends. The substitution, timing and focalization consequences of property taxes and development cost charges are examined through interviews with Toronto and Ottawa area developers, municipal planners and finance officers. The article starts by describing the two financial instruments as they are used in Ontario. The expected consequences of the two instruments are presented next. The survey and interview methods are described, the context is set, and the findings and conclusions follow.

3.0 METHODOLOGY

The study adopted a descriptive research design. The target population was 78 registered real estate companies in Kenya. The sample size was therefore 39 registered real estate companies in Kenya. Primary data was collected through the administration of the questionnaires

4.0 RESULTS

4.1 Demographic Characteristics

Majority of the respondents who were 63% indicated that they were males while only 37% indicated that they were females. This implies that most managers of the registered real estate companies in Kenya are men. The respondents were asked to indicate their age. Majority of the respondents who were 38% indicated that they were 35 – 45 years, 33% indicated that they were 25 – 35 years, 21% indicated that they were above 45 years while only 8% indicated that they were below 25 years. This implies that most managers of the registered real estate companies in Kenya are middle aged people and thus have the potential to improve the growth of supply of real estate industry. The respondents were further asked to indicate the position they hold in the firm. Majority of the respondents who were 47% indicated that they were senior financial manager, 28% indicated that they were human resource managers while only 25% were real property administration managers. This implies that most people who responded to the questionnaires were senior financial managers. The respondents were further asked to indicate the duration they had worked in the firm. Majority of the respondents who were 53.6% indicated that they had worked for 1 – 5 years, 26.8% indicated that they had worked for 6-10 years, 13.4% indicated that they had worked for more than 10 years while only 6.20% indicated that they had worked for less than 1 year. This implies that most respondents had worked in the real estate for a long time and thus had good knowledge about the firm. The respondents were further asked to indicate the number of years they have been in operation. Majority of the respondents who were 59% indicated that their firm was between 5-10 years, 23% indicated that their firm was between 10 – 15 years, 11% indicated that their firm was above 15 years while only 7% indicated that their firm was below 5 years. This implies that most firms had been in existence for several years.

4.2 Descriptive Statistics

4.2.1 Finance Costs to the Growth in Supply of Real Estate

The first objective of the study was to determine the effect of finance costs to the growth in supply of real estate.

Trend Analysis

The results in figure 4.2 show the trend analysis of interest rates of real estate companies from 2011-2015. The results revealed that in the year 2011 the interest rates were 8%, in the year 2012 the interest rates were 11%, in the year 2013 the interest rates were 9%, in the year 2014 the interest rates were 12% while in the year 2015 the interest rates were 14%. This implies that the level of interest rates have been increasing over the years.

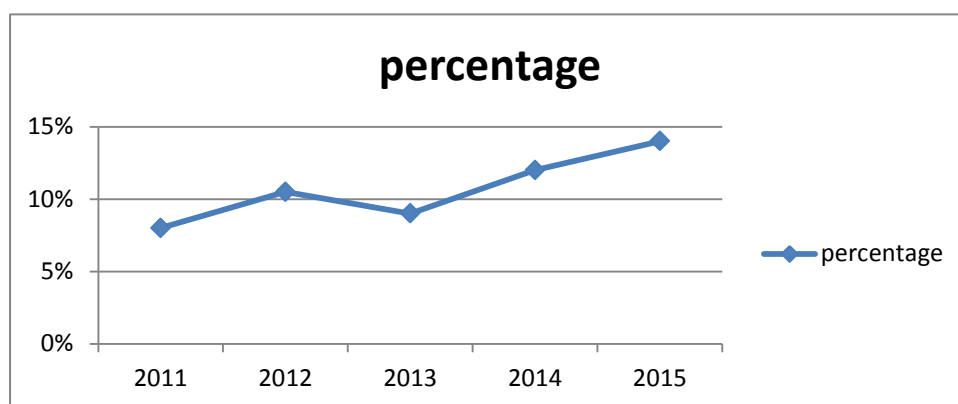


Figure1 : Trend Analysis

The respondents were further asked to respond to the statements on finance cost. Results in table 4.2 revealed that majority of the respondents who were 67.1% (48.6% + 18.6%) indicated that they agreed with the statement that bank charges high interests on loans. The results also showed that majority of the respondents who were 78.4% indicated that they agreed with the statement that the higher the interest expenses the higher the cost of financing and the lower the supply of affordable real estate housing. The results also showed that majority of the respondents who were 70.1% agreed with the statement that most real estate cannot afford the interest expenses charged by the bank. The results also showed that majority of the respondents who were 76.3% agreed with the statement that interest expenses affect house prices and thus most real estate retail borrowers and investors alike are forced to increase the house prices to cater for the cost of borrowing and to also break-even. The results also showed that majority of the respondents who were 75.3% indicated that they agreed with the statement that high interest expenses results to low supply of housing.

On a five point scale, the average mean of the responses was 3.76 which means that majority of the respondents were agreeing with most of the statements; however the answers were varied as shown by a standard deviation of 1.12

Table 1: Finance Costs to the Growth in Supply of Real Estate

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Dev
The bank charges high interests on loans	3.10%	18.60%	11.30%	48.50%	18.60%	3.61	1.09

The higher the interest expenses the higher the cost of financing and the lower the supply of affordable real estate housing	2.10%	14.40%	5.20%	52.60%	25.80%	3.86	1.03
Most real estate cannot afford the interest expenses charged by the bank	1.00%	17.50%	11.30%	48.50%	21.60%	3.75	1.11
Interest expenses affect house prices and thus most real estate retail borrowers and investors alike are forced to increase the house prices to cater for the cost of borrowing and to also break-even.	8.20%	10.30%	5.20%	50.50%	25.80%	3.75	1.19
High interest expenses results to low supply of housing	4.10%	17.50%	3.10%	40.20%	35.10%	3.85	1.20
Total						3.76	1.12

4.2.2 Effect of Cost of Building Materials to the Growth in Supply of Real Estate Housing in Kenya

The second objective of the study was to determine the effect of cost of building materials to the growth in supply of real estate housing in Kenya.

Cost of Building Materials

The results in table 2 showed the cost of building materials. The results showed that in the year 2011 the majority of the firms which were 62.70% indicated their cost of building materials to be between 11-15 million. The results further revealed that in the year 2012 majority of the firms which were 64.4% indicated their cost of building materials to be between 11-15 million. The results further showed that majority of the firms in the year 2013 which was 52.6% indicated their cost of building materials to be between 15-20 million. The results further revealed that in the year 2014 majority of the firms which were 66.0% indicated their cost of building materials to be between 15-20 million. The results further revealed that in the year 2015 majority of the firms which were 74.7% indicated their cost of building materials to be over 20 million.

Table 2: Cost Building Materials

Year	Less than 5million	5-10 million	11-15 Million	15-20Million	Over 20 Million
2011	10.30%	5.20%	62.70%	20.80%	1.00%
2012	6.20%	6.20%	64.40%	6.00%	7.20%
2013	7.20%	5.20%	16.50%	52.60%	18.60%
2014	6.20%	7.20%	4.10%	66.00%	16.50%

2015 3.10% 1.00% 9.30% 11.90% 74.70%

The respondents were further asked to respond to the statements on cost of building materials. The results in table 3 revealed that majority of the respondents who were 51.6% (46.4% + 5.20%) agreed with the statement that the cost of building materials is not affordable in the country. The results further showed that majority of the respondents who were 76.3% agreed with the statement that high cost of building materials results to decline in housing supply. The results further showed that majority of the respondents who were 77.3% agreed with the statement that there has been a general increase in the cost of building materials for the past five years. The results also showed that majority of the respondents who were 66.0% agreed with the statement that building materials contribute immensely to the quality and cost of housing. The results also revealed that majority of the respondents who were 74.2% agreed with the statement that Increase in cost of building materials has multiplier effect on housing development.

On a five point scale, the average mean of the responses was 3.66 which means that majority of the respondents were agreeing with most of the statements; however the answers were varied as shown by a standard deviation of 0.96.

Table 3: Cost of Building Materials to the Growth in Supply of Real Estate Housing in Kenya

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Dev
The cost of building materials is not affordable in the country	7.20%	6.20%	35.10%	46.40%	5.20%	3.36	0.95
High cost of building materials results to decline in housing supply	5.20%	5.20%	13.40%	60.80%	15.50%	3.76	0.96
There has been a general increase in the cost of building materials for the past five years	3.10%	6.20%	13.40%	59.80%	17.50%	3.82	0.90
Building materials contribute immensely to the quality and cost of housing	2.10%	17.50%	14.40%	53.60%	12.40%	3.57	0.99
Increase in cost of building materials has multiplier effect on housing development	1.00%	16.50%	8.20%	52.60%	21.60%	3.77	1.01
Total						3.66	0.96

Source Author (2016)

4.2.3 Cost of Land to the Growth in Supply of Real Estate Housing in Kenya

The third objective was to establish the effect of cost of land to the growth in supply of real estate housing in Kenya.

Cost of Land

The results in table 4.5 showed the cost of land. The results showed that in the year 2011 the majority of the firms which were 55.7% indicated their cost of land to be between 15-20 million. The results further revealed that in the year 2012 majority of the firms which were 63.9% indicated their cost of land to be between 15-20 million. The results further showed that majority of the firms in the year 2013 which was 50.9% indicated their cost of land to be between over 20 million. The results further revealed that in the year 2014 majority of the firms which were 66.8% indicated their cost of land to be between over 20 million. The results further revealed that in the year 2015 majority of the firms which were 82% indicated their cost of land to be over 20 million.

Table 4: Cost Building Materials

Year	Less than 5million	5-10 million	11-15 Million	15-20Million	Over 20 Million
2011	22.70%	3.10%	17.50%	55.70%	1.00%
2012	6.20%	5.20%	12.40%	63.90%	12.40%
2013	4.10%	3.10%	13.40%	28.50%	50.90%
2014	5.20%	6.20%	4.10%	17.70%	66.80%
2015	3.10%	1.00%	9.30%	4.60%	82.00%

The respondents were further asked to respond to the statements on cost of land. The results in table 5 revealed that majority of the respondents who were 77.3% (54.6% + 22.7%) agreed with the statement that the cost of land is not affordable in the country. The results further showed that majority of the respondents who were 84.5% agreed with the statement that high cost of land results to decline in housing supply. The results further revealed that majority of the respondents who were 79.4% agreed with the statement that the cost of land has been increasing in the past five years. The results also showed that majority of the respondents who were 80.4% agreed with the statement that the number of unit housing has declined in the past five years due to rise in the cost of land. The results also showed that majority of the respondents who were 77.3% agreed with the statement that land banking behavior is governed by economic conditions.

On a five point scale, the average mean of the responses was 3.94 which means that majority of the respondents were agreeing with most of the statements; however the answers were varied as shown by a standard deviation of 0.90.

Table 5: Cost of Land to the Growth in Supply of Real Estate Housing in Kenya

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Dev
The cost of land is not affordable in the country	3.10%	5.20%	14.40%	54.60%	22.70%	3.89	0.92
High cost of land results to decline in	3.10%	4.10%	8.20%	60.80%	23.70%	3.98	0.88

housing supply

The cost of land has been increasing in the past five years	5.20%	4.10%	11.30%	55.70%	23.70%	3.89	0.99
The number of unit housing has declined in the past five years due to rise in the cost of land	3.10%	4.10%	12.40%	54.60%	25.80%	3.96	0.91
Land banking behavior is governed by economic conditions	0.00%	5.20%	17.50%	50.50%	26.80%	3.99	0.81
Total						3.94	0.90

4.2.4 Effect of Tax Cost to the Growth in Supply of Real Estate Housing in Kenya

The fourth objective of the study was to determine the effect of tax cost to the growth in supply of real estate housing in Kenya.

Trend Analysis

The results in figure 4.4 show the trend analysis of tax cost of real estate companies from 2011-2015. The results revealed that in the year 2011 the tax cost were 10.1%, in the year 2012 the tax cost were 15.2%, in the year 2013 the tax cost were 13.5%, in the year 2014 the tax cost were 17.02% while in the year 2015 the tax cost were 19%. This implies that the level of tax cost have been increasing over the years.

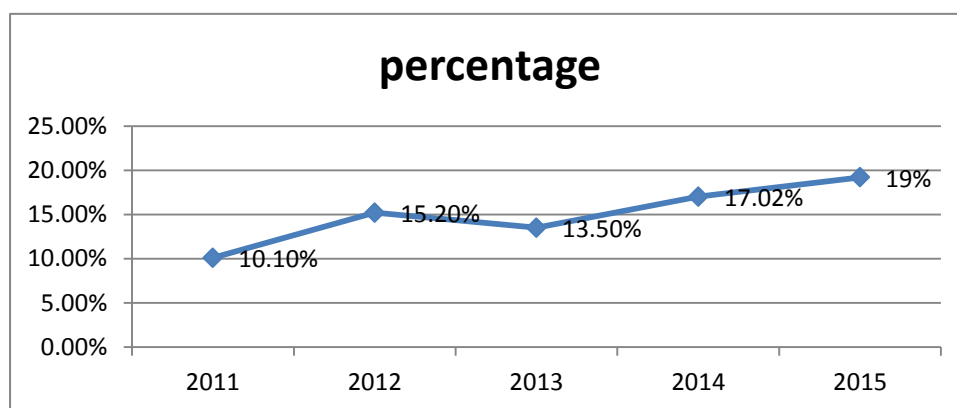


Figure 2: Trend Analysis

The respondents were further asked to respond to the statements on cost of land. The results in table 6 revealed that majority of the respondents who were 72.2% (49.5% + 22.7%) agreed with the statement that there has been decline in housing units supply in our firm due to unaffordable tax cost. The results further showed that majority of the respondents who were 78.4% agreed with the statement that high tax cost results to decline in housing supply. The results further showed that majority of the respondents who were 74.2% agreed with the statement that there has been increase in tax cost in the country over the last five years. The results further revealed that majority of the respondents who were 72.4% agreed with the statement that Taxes on real estate capital gains and transaction values are not suitable

measures to prevent excessive house price growth. The results further showed that majority of the respondents who were 69% agreed with the statement that higher taxes on capital gains exacerbate house price dynamics.

On a five point scale, the average mean of the responses was 3.83 which means that majority of the respondents were agreeing with most of the statements; however the answers were varied as shown by a standard deviation of 0.98.

Table 6: Tax Cost to the Growth in Supply of Real Estate Housing in Kenya

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Dev
There has been decline in housing units supply in our firm due to unaffordable tax cost	2.10%	7.20%	18.60%	49.50%	22.70%	3.84	0.93
High tax cost results to decline in housing supply	3.10%	2.10%	16.50%	55.70%	22.70%	3.93	0.87
There has been increase in tax cost in the country over the last five years	2.10%	6.20%	17.50%	51.50%	22.70%	3.87	0.91
Taxes on real estate capital gains and transaction values are not suitable measures to prevent excessive house price growth	6.20%	6.20%	15.50%	55.70%	16.50%	3.70	1.02
Higher taxes on capital gains exacerbate house price dynamics	5.20%	10.30%	15.50%	38.10%	30.90%	3.79	1.15
Total						3.83	0.98

4.2.5 Growth in Supply of Real Estate Housing in Kenya

The respondents were further asked to respond to the statements on Growth in Supply of Real Estate Housing in Kenya. The results in table 7 revealed that majority of the respondents who were 75.2% (47.4% + 27.80%) agreed with the statement that the firm supply of residential houses has been increasing over the past five years. The results further showed that majority of the respondents who were 75.2% agreed with the statement that the firm supply of residential houses has been increasing over the past five years. The results further showed that majority of the respondents who were 78.3% agreed with the statement that the firm supply of bungalow has been increasing over the past five years. The results further showed that majority of the respondents who were 74.2% agreed with the statement that the firm supply of offices has been increasing over the past five years.

On a five point scale, the average mean of the responses was 3.82 which means that majority of the respondents were agreeing with most of the statements; however the answers were varied as shown by a standard deviation of 1.13.

Table 7: Growth in Supply of Real Estate Housing in Kenya

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Dev
The firm supply of residential houses has been increasing over the past five years	8.20%	6.20%	10.30%	47.40%	27.80%	3.80	1.16
The firm supply of apartments has been increasing over the past five years	8.20%	7.20%	9.30%	41.20%	34.00%	3.86	1.21
The firm supply of bungalow has been increasing over the past five years	4.10%	14.40%	3.10%	40.20%	38.10%	3.94	1.17
The firm supply of offices has been increasing over the past five years	5.20%	8.20%	12.40%	62.90%	11.30%	3.67	0.97
Total						3.82	1.13

4.3 Inferential Statistics

Inferential analysis was conducted to generate correlation results, model of fitness, and analysis of the variance and regression coefficients.

4.3.1 Correlation Analysis

Table 8 below presents the results of the correlation analysis. The results revealed that finance cost and growth in supply are significant related and have a negative correlation ($r=-0.335$ $p=0.001$). The table further indicated that cost of building materials and growth in supply are significantly related and have a negative correlation ($r=-0.500$, $p=0.000$). It was further established that cost of land and growth in supply were significantly related and have a positive correlation. ($r=0.474$, $p=0.000$). Similarly, results showed that tax cost and growth in supply were significantly related and have moderately strong positive correlation ($r=0.414$, $p=0.000$). This implies that an increase in any unit of the variables leads to decrease in growth of supply of real estate housing.

Table 8: Correlation Matrix

Correlations		Growth in Supply	Finance Cost	Cost of Building	Cost of Land	Tax Cost
Growth in supply	Pearson Correlation	1.000				
	Sig. (2-tailed)					
Finance Cost	Pearson Correlation	-.335**	1.000			
	Sig. (2-tailed)	0.001				

cost of building materials	Pearson Correlation	-.500**	.858**	1.000		
	Sig. (2-tailed)	0.000	0.000			
Cost of land	Pearson Correlation	-.474**	0.199	.287**	1.000	
	Sig. (2-tailed)	0.000	0.05	0.004		
Tax Cost	Pearson Correlation	-.414**	.299**	.316**	.404**	1.000
	Sig. (2-tailed)	0.000	0.003	0.002	0.000	

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

4.3.2 Regression Analysis

In statistical modeling, regression analysis is a statistical process for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables (or 'predictors'). There are various assumptions for multiple linear regressions. First it needs the relationship between the independent and dependent variables to be linear. Secondly, the multiple linear regression analysis requires all variables to be normal. Thirdly, multiple linear regressions assumes that there is little or no Multicollinearity in the data.

The results presented in table 9 present the fitness of model used in the regression model to explain the study phenomena. Finance cost, cost of building materials, cost of land and tax cost have good fit in predicting changes growth in supply of real estate housing. This is supported by coefficient of determination also known as the R square of 68.8%. This means that Finance cost, cost of building materials, cost of land and tax cost explain 68.8% of the variations in the dependent variable which is growth in supply of real estate housing in Kenya. This results further means that the model applied to link the relationship of the variables was satisfactory.

Table 9: Model Fitness

Indicator	Coefficient
R	0.829
R Square	0.688
Adjusted R Squared	0.671
Std. Error of the Estimate	0.29546

In statistics significance testing the p-value indicates the level of relation of the independent variable to the dependent variable. If the significance number found is less than the critical value also known as the probability value (p) which is statistically set at 0.05, then the conclusion would be that the model is significant in explaining the relationship; else the model would be regarded as non-significant.

Table 10 provides the results on the analysis of the variance (ANOVA). The results indicate that the overall model was statistically significant. Further, the results imply that the

independent variables are good predictors of growth in supply of real estate housing. This was supported by an F statistic of 16.866 and the reported p value (0.000) which was less than the conventional probability of 0.05 significance level.

Table 10: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	16.368	4	4.092	16.866	.000b
Residual	22.321	92	0.243		
Total	38.689	96			

Table 11: Regression of Coefficients

	B	Std. Error	t	Sig.
(Constant)	-0.403	0.487	0.827	0.41
Finance Cost	-0.400	0.189	-2.114	0.037
Cost of building materials	-0.752	0.186	4.036	0.000
Cost of land	-0.284	0.091	3.11	0.002
Tax cost	-0.252	0.113	2.232	0.028

Source Author (2016)

4.3.2.1 Relationship between finance cost and growth in supply of real estate housing

Regression of coefficients results in table 11 shows that finance cost and growth in supply are negatively and significant related ($r=-0.400$, $p=0.037$). These findings agree with that of Muthaura (2012) whose findings indicated that housing finance cost negatively affect growth in supply. These findings also agreed with that of Njiru and Moronge (2013) who argued that finance cost of houses greatly affects the growth in supply of real estate. These findings also agreed with that of Muriuki (2013) also concluded that the growth of supply of real estate houses have been negatively affected by finance cost especially due to interest cost.

4.3.2.2 Relationship between Cost of Building Materials and growth in supply of real estate housing

Table 11 further indicates that cost of building materials and growth in supply are negatively and significant related ($r=-0.752$, $p=0.000$). These findings agree with that of Magutu (2015) who conducted a study on populization of low cost building materials and technologies for urban housing in developing countries. The study found that high cost of building materials has been negatively affecting the growth of real estate housing. The study findings also agree with that of Terry (2006) who found that decrease in supply of housing units can be directly attributed to increases in the cost of building materials and labor which account for nearly 82% of the total cost of a conventional housing unit.

4.3.2.3 Relationship between Cost of Land and growth in supply of real estate housing

Table 11 further established that cost of land and growth in supply were negatively and significantly related ($r=-0.284$, $p=0.002$). These findings agreed with that of Raymond (1998) who found that increase in cost of land has led to the decline in growth of real estate housing supply. The findings also agree with that of Quigley and Rosenthal (2005) who concluded

that cost of land have increased in Kenya and this has led to the decline in supply of housing units.

4.3.2.4 Relationship between Tax Cost and growth in supply of real estate housing

The results in table 11 further indicated that tax cost and growth in supply were also negatively and significantly related ($r=-0.252$, $p=0.028$). These findings agree with that of Aregger *et al.* (2013) who conducted a study on the transaction taxes, capital gains taxes and house prices and concluded that transaction cost negatively affects the growth in supply of houses. Andrews *et al.* (2011) also concluded that tax costs negatively affect the growth in supply of housing units. Skaburskis and Tomalty (2000) also found that property taxes are one of the factors that affect growth in supply of real estate housing units.

Thus, the optimal model for the study is;

$$\text{Growth in Supply of Real Estate Housing} = -0.403 - 0.400 \text{ Finance Cost} - 0.752 \text{ Cost of Building Materials} - 0.284 \text{ Cost of land} - 0.251 \text{ Tax Cost}$$

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In relation to the study findings the study concluded that finance cost, cost of building materials, cost of land and tax cost influence negatively the growth of supply of real estate housing. The study also concluded that the cost of land, interest rates, cost of building materials and tax cost have been increasing over the years.

The study also concludes that increase in growth of real estate market despite the high interest rate could owe to the price inelastic demand for housing owing to economic disparity in the country. While low income earners, who are majority, are pushed away to less glossy and crowded homes where survival supersedes luxury, the upper middle income purchase of housing units is on the upward spiral. The underlying reason is that Kenya is a hub for multinationals and international organizations like the United Nations whose staff often takes up executive apartments and stand-alone units, and have helped to push up not just demand, but prices too. Additionally, Kenya's middle class is among the fastest growing in Africa, buoyed by a rebound in earnings from a growing economy.

5.2 Recommendations

The study recommended that the government should lower interest expenses so as to encourage the increase in supply of affordable real estate housing. The bank should also lower their interest rates so that the real estate firms can be able to increase the supply of housing. The study also recommends that investors should consider investing in the real estate market despite the erratic interest rates.

The government should also regulate the cost of building materials so as to be affordable to the real estate firms so as to increase the supply of housing. Despite the increase in cost of building materials the real estate firms should build quality houses. The manufacturers of building materials should also make the building materials affordable to the real estate firms so as they can increase the supply of housing units.

The study also recommends that the government should regulate the cost of land so as to be affordable to the real estate firms so as to increase the supply of housing. The ministry of land should also ensure that there is no further increase in price of land over the years.

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