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**THE INFLUENCE OF MACROECONOMIC FACTORS ON THE MORTGAGE
MARKET IN KENYA**

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**Submitted in partial fulfilment of the requirements for the Degree of
Bachelor of Business Science, Financial Economics, at Strathmore University**

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ABSTRACT

The paper tries to study the relationship between the value of the mortgage market and key macroeconomic factors namely, Exchange rates, Inflation and GDP per capita. The real estate sector in the country is booming and is one of those industries that thrive in the country. As such, trying to further understand the factors that affect mortgages in the country is of great importance. After the model estimation, it is found that GDP per capita and exchange rates are significant in the model in explaining the variation in mortgage market value. It is also found that they have a positive relationship with mortgage market value. It is however found that inflation is not significant in the Kenyan context in explaining the variation in the mortgage market value.

ABBREVIATIONS

FDI – Foreign Direct Investment

CBK – Central Bank of Kenya

INF – Inflation

FX - Exchange Rate

GDP – Gross Domestic Product per Capita

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1. INTRODUCTION

1.1 BACKGROUND

Shelter is one of the basic needs to human kind, however it is not available freely, hence there arises a need to find financial means to acquire said shelter. One way of acquiring a home is through a mortgage. The etymology of the term “mortgage” is derived from the old French to mean “dead” (mort), “contract” or “pledge” (gage). (Kama Ukpai, 2013). Mortgages, just like other ordinary loans, have a fixed term to maturity, a date by which the loan must be fully repaid. Consequently, in the event of a default, the pledged property (in those days, land) was taken over or seized from him and thus considered “dead” to him (mortgagor). If the incurred debt (loan) was repaid, then the land pledged was dead to the mortgagee; hence the term mortgage. The contract (gage) is considered over (mort). (Kama Ukpai, 2013).

Mortgage affordability is the amount of money a mortgage borrower can pay on a monthly basis towards a mortgage he/she has taken out based upon their monthly income, expenses and the proposed monthly payment. (Estate, 2016). Mortgage affordability can also be understood as the continuing costs of a mortgage or rents relative to income, problems of accessing affordable housing (e.g., first home ownership), not being able to afford housing costs after meeting other expenditures, or a problem of too low an income or too high housing prices. (O’Neill, 2008)

There however rises a problem in truly and properly defining mortgage affordability especially in practice (Bramley, 1990), but for the purpose of this study it is defined as the ability to afford to pay the monthly mortgage payments relative to monthly income. (Estate, 2016). Analyses of affordability typically adopt a ratio approach by measuring the relationships between household incomes and housing costs. A ratio approach usually uses a benchmark average or percentile levels of incomes and costs to assess the extent of variability between places or household types and/or assessing changing circumstances over time (Hulchanski, 2007)

Mortgage lending is an important mechanism for increasing financial development, financial stability, and financial inclusion in emerging economies at the same time, providing that the development of housing price bubbles can be avoided (MUTISYA, 2016). As such, it is of importance to analyse the various determinants of mortgage affordability in the country.

According to (Kariuki, 2011), the factors that influence mortgage affordability and uptake include property prices, interest rates, level of income, costs of operations, the mortgage process as well as the size of the bank. Macroeconomic factors are those that are pertinent to a broad economy at the regional or national level and affects a large population rather than a few select individuals. Examples of such factors include economic output, unemployment, inflation, savings and investment among others. (World Bank, 2012)

Housing is a major purchase requiring long-term financing, and the factors that are associated with well-functioning housing finance systems are those that enable the provision of long-term finance. It is evident that countries with stronger legal rights for borrowers and lenders through collateral and bankruptcy laws, credit information systems that are well informed, and a stable macroeconomic environment have more developed housing finance systems. (V. C Warnock, 2008). These factors also help explain the variation in housing finance across emerging market economies such as that in Kenya. (Oriri, 2010)

A lot of studies on the influence of economic variables on the mortgage market have focused on inflation and exchange rate stability (Boamah, 2009); Boleat, 2003 and Fisher, 1933). These studies have however been largely been cross-sectional, cutting across different countries. This one however takes data just from Kenya, our case study.

1.2 PROBLEM STATEMENT

A large gap exists between the demand and supply of housing finance. (Musyoka, 2012) Critical analysis and clear understanding of the money market and the current financial system in the country is required to effectively relate housing finance and house delivery. The purchase or construction of housing in many countries is inhibited because individuals cannot borrow funds. The available loans are channelled to high and middle-income families. The problem is

how do we avail the loanable funds to the low income earners? Finding measures to address this problem and subsequent implementation will provide for adequate affordable housing for the low-income earners. (Oriri, 2010)

Highlights of a report by World Bank, (2011) released indicate that less than one in every 10 Kenyans can afford a mortgage. The total commercial bank mortgage loan book in the country was only 20,000 accounts, while the total value of mortgage loans, as at the end of December last year was Sh133.6 billion (CBK, 2015). The local housing market faces myriad challenges among them the yawning deficit now estimated to stand at an annual demand of 300,000 housing units against supply of a paltry 60,000. (Kariuki, 2011). This just goes to further highlight the fact that there is a huge problem in Kenya concerning the real estate sector, more so the mortgage market. Therefore there arises the need to study the mortgage market so as to further understand its determinants. This study takes it upon itself to study the macroeconomic factors, specifically exchange rates, inflation and GDP per capita.

1.3 RESEARCH OBJECTIVES

- i. To investigate the relationship between exchange rates and the value of mortgage market in Kenya
- ii. To investigate the relationship between GDP per capita and mortgage market value in Kenya
- iii. To investigate the relationship between inflation and mortgage market value in Kenya

1.4 RESEARCH QUESTIONS

- i. Is there a relationship between exchange rates and mortgage market value?
- ii. Is there a relationship between GDP per capita and mortgage market value?
- iii. Is there a relationship between inflation and Mortgage market value?

1.5 SIGNIFICANCE OF THE RESEARCH

The research is relevant due to the current problem in Kenya involving a huge demand for low income housing especially in Nairobi. According to (Estate, 2016), Githurai is the most affordable mortgage market with a household requiring a median income of between Ksh 25,000 – Ksh 50,000 to purchase a house using a mortgage. Nyari, Karen, Runda, Muthaiga and Kitisuru are the most unaffordable mortgage markets with households requiring a minimum of Ksh 3.1 Million to purchase. Looking at these statistics it is clear there is a problem of mortgage affordability in Kenya, forcing most middle income and low income earners to buy houses only in the satellite towns like Athi, Kikuyu, Kitengela and Buruburu just to name a few.

Bearing this mortgage affordability problem, it follows that it is also important to analyse the factors that affect mortgage uptake and affordability in Kenya, especially the macroeconomic factors. Kenya's mortgage market has witnessed an impressive growth in the last decade but the numbers of loans are still very low mainly due to scanty information available to potential buyers. (MUTISYA, 2016). However, high interest rates because of a stringent monetary policy being pursued by the Central Bank of Kenya in an effort to fight high inflation have dampened the market (Kinyanjui, 2013). In addition, despite a high demand for residential and commercial houses in Kenya the growth rate in mortgage loans has grown steadily at 14% annually but the mortgage loan portfolio in the banks remains small (Makori, 2015). Kenya's mortgage market is the largest in East Africa however outstanding mortgages to GDP only stand at 2.5%, well below top performing South Africa and Namibia where outstanding mortgages to GDP stand at 26.4% and 19.6% respectively (Arvanitis, 2013).

In Kenya, mortgage lending is predominantly done by commercial banks. There are 43 banks and one Mortgage Finance Company in the Kenyan banking system, 25 of them have mortgage portfolios of differing sizes. While some of the banks offer mortgage facilities to their members of staff. Central Bank of Kenya authorises two types of lenders, the ordinary banks and the mortgage companies. Similar regulations with regards to mortgage financing apply to the two types of lenders. According to the Central bank Survey, the largest lender as at 2010 was Kenya Commercial Bank (KCB) following its acquisition of Savings & Loans, followed by HFCK (CBK, 2015)

The paper would go a long way in benefitting the numerous stakeholders of Real estate in Kenya such as the government and in general, all investors in the real estate market: both direct investors and indirect (through funds or Real Estate Investment Trusts).

CHAPTER 2. LITERATURE REVIEW

2.1 MORTGAGE MARKETS

The mortgage market in Kenya is the largest in the region and is likely the third largest in sub-Saharan Africa after South Africa and Namibia. By comparison, the average mortgage debt to GDP level in European countries is in the region of 50 percent, whilst in the US it reaches 72 percent. (World Bank, 2011)

There is a considerable amount on literature that touches on the mortgage topic and the effect of macroeconomic variables on the mortgage market and uptake. Macroeconomic variables include inflation, GDP (per capita as well), interest rates, exchange rates, employment and also the informal finance sector as well.

Kenya's mortgage industry has been on a growth path and is becoming even more competitive. Although growing, mortgage lending is still low, as of December 2012 it stood at 3.7% of Kenya's GDP compared to 70% and 50% in the US and UK respectively. A number of factors have been identified as retarding the growth of mortgage accounts, they include; affordability and insufficient housing supply plus a lack of understanding about mortgage among Kenyans. (Oriri, 2010)

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Kenya's mortgage market has been described as dynamic; it is growing rapidly and becoming increasingly competitive. Out of the 44 commercial banks only 30 offer mortgage loans to customers, however, it is a common practice for banks to advance mortgages to their employees. According to the (CBK, 2015), 71% of mortgage lending in Kenya is done by five institutions: Kenya Commercial Bank (KCB) is the market leader with 30% of the market share, Housing Finance Company of Kenya with 19% of market share, Standard Chartered Bank, CFC Stanbic Ltd and the Cooperative Bank of Kenya take on the remaining share. There

has been tremendous growth in the mortgage market with every passing year; the Central Bank puts forward that this may be partly attributed to an increase in property prices. (Oriri, 2010)

2.2 MACROECONOMIC FACTORS

Macroeconomic variables such as interest rates, inflation and exchange rates play a vital role in the economic performance of any country. (Antwi, 2013). They are the factors that affect the economy on a broader level. The economy in general is divided into macroeconomics and microeconomics. Macroeconomics is the branch of economics that gives a broader outlook of the economy, taking the whole economy into account. Microeconomics on the other hand is a branch of economics that is more specific and looks at the firms and households and how they allocate their scarce resources.

The high interest rates in Kenya according (Estate, 2016) is among the principal reason as to why the mortgage market remains underdeveloped. (Estate, 2016) concludes that compared to its counter in sub-sahara, (South Africa) which has a mortgage debt to GDP ratio of 20%, Kenya's stands at a mere 4.5%. (CBK, 2015) also notes that its significantly smaller compared to that of the US which stood at 70%.

The high interest rate environment is as a result of the high inflation prevalent in Kenya which according to (Boamah, 2009) stifles the development of a mortgage market. (Boleat, 2003) argues that both high inflation and high interest rates make it difficult to service long term loans while (Cytonn, 2015) argues that it has an additional impact of reducing the uptake of mortgage due to the reduced internal rate of return the investor would otherwise receive.

(Boleat, 2003) further argues that in order to correct this, the state of borrowing should be around four percent above cost of funding. This is way below Kenya's cost of funding which according to (Cytonn, 2015) hovered around eight to nine percent above cost of funds in the 2015/16 year. (Investments, 2016) argues that the high interest rate becomes a hindrance to the successful development of the mortgage market in Kenya.

As far as the informal sector is concerned, according to Mokaya (2016) Kenya is highly reliant on the informal economy which is characterised by small and intermittent salaries. The lack of

a consistent salary payment therefore disqualifies them from gaining access to the mortgage market which requires servicing of loans over a long period of time.

(IDB, 2005) argues that interest rate instability is one of the factors that could explain the small size of the mortgage market in Latin America. The study asserts that the typical annual variation in the real interest rate for borrowing is 5.3 percentage points in Latin American countries, whereas in developed countries it is 1.6 percentage points. In countries like Argentina, Brazil, Ecuador, and Peru, the typical real interest rate variation in the previous decade was between 17 and 18 percentage points, and only in Belize and Panama was it similar to or less than in AR developed countries. Green and Wachter (2007) emphasize on the availability and cost of mortgages as crucial determinants in the functioning housing markets across countries. They cited the decline in nominal prime interest rates from an average of 15 percent in 1980 to 4.4 percent in 2004 across several countries. The major outcome of this was improved access to mortgages, increase in demand for housing, and increase in house prices across most of the industrialized countries in the world. It was clear from their study that fall in interest rates induces higher demand for mortgages (Huybens, 1998) argue that an increase in the rate of inflation could have at first negative consequences on financial sector performance through credit market frictions which entail the rationing of credit leading to reduction in intermediary activity as well as capital formation. (Arcelus, 1973) states that when market rates of interest rise, and when expectations of higher inflation in the long run keep interest rates at the higher levels, it would not reduce housing demand permanently because after a time lag, wages and house prices would adjust to the higher anticipated inflation.

Using regression analysis, (Walley, 2013) found that inflation is negatively and significantly associated with mortgage market development. Inflation volatility negatively and significantly associated with Mortgage Depth, while positively and significantly with Housing Loan Penetration, which may indicate the use of housing loans (and thus real estate more generally) as a hedge against inflation, where available. In a study covering 61 countries, Warnock and Warnock, (2008) found that deeper mortgage markets were associated with a stable macroeconomic climate of low and stable inflation. In a study of the demand for mortgages under macro volatility in Argentina, (IDB, 2005) employed both macro data and survey information. The study found that demand for mortgages plays an important role in

mortgage market development. However, recurring macro volatility and violation of financial property rights increased demand for real estate as an investment, which in turn raised house prices and made it more difficult for consumer households to meet minimum income requirements for obtaining a mortgage.

(Boamah, 2009) also argues that a stable currency is an essential ingredient of a successful mortgage market. This is because unstable exchange rates will not attract long-term foreign capital. (Liwali, 2008) noted that the demand for housing in Sub-Saharan Africa (SSA) has surpassed the supply. In an effort to meet this demand a few International Housing Finance Institutions (IHFI) have come into play. These include Shelter Afrique, overseas investment corporation, East African Development Bank (EADB) and PTA bank among others. (Butler, 2009) identifies currency risk as one of the major risks in the establishment of a mortgage market in developing countries. He gives an example of the global financial crisis when lenders of hedge funds in the U.S. demanded their funds back due to liquidity problems in the financial markets. The hedge funds therefore sold many of their liquid financial assets in the developing countries to respond to the demands of their lenders leading to currency outflows that created a problem in the affected financial markets.

Income levels in Kenya are both low in absolute terms and also very unevenly distributed. This is a common occurrence in the majority of sub-Saharan Africa and is one of the single most difficult barriers to overcome in building a vibrant mortgage market. (World Bank, 2011)

CHAPTER 3. METHODOLOGY

3.1 INTRODUCTION

This chapter outlines the specific methodology employed in this study to analyse the relationship between mortgage market and the three macroeconomic factors. This section is responsible for trying to offer solutions to the research questions.

3.2 RESEARCH DESIGN

The nature of this study is explanatory as it seeks to analyse the relationship between the overall value of the mortgage market and some key macroeconomic factors, namely exchange rates, inflation and GDP per capita. Given the numerical nature of the data, the paper employs quantitative techniques in its research. Once the relationship between the dependent variable (value of mortgage market) and the independent variables (exchange rates, inflation and GDP per capita) is established, proper inferences can be made.

3.3 DATA COLLECTION

The period used for this study is from 1998-2015. Annual rates for inflation and exchange rates are used so as to compare them with the value of the mortgage market, whose values before 1998 are difficult to obtain. The mortgage market values are derived from the annual CBK Surveys which give the values of the mortgage loans taken out from banks. For purposes of this study, it is assumed to represent the value of the mortgage market in Kenya. The statistics for GDP per capita are derived from the World Bank data bank which contains statistics from 1964, but for purposes of this study, only values from 1998 are used.

3.4 DATA ANALYSIS

3.4.1 EMPIRICAL MODEL

According to (Wichura, 2006), the general regression equation when dealing with more than one independent variable is as follows:

$$Y = \beta + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots$$

For the purpose of this study, the above regression model is modified as follows and used for the analysis:

$$Y = \beta + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

Where:

Y = Value of the Mortgage market

β = Constant Autonomous variable

β_1 = Exchange Rate

X_1 = Coefficient of Exchange Rate

β_2 = Inflation rate

X_2 = Coefficient of Inflation Rate

β_3 = GDP/ Capita

X_3 = Coefficient of GDP per capita

The relationship that is being studied here is that the three independent variables (FX, INF, GDP) influence the Value of the Mortgage Market (MORT). This means that the value of the mortgage market is a function of the three variables, i.e:

$$\mathbf{MORT = f(INF, FX, GDP)}$$

3.4.2 STATIONARITY TEST

This is a test carried out on time series data to test the stationarity of variables. Therefore for this study, the Augmented Dickey Fuller (ADF) test shall be employed to test for stationarity. If it is found to not be stationary at the first level, then it is tested whether it will be at first difference and second difference, i.e: I(1) and I(2).

3.4.3 POST ESTIMATION TESTS

So as to support the findings of the research, tests for autocorrelation, heteroscedasticity and multicollinearity are done on the data. The Breusch-Pagan-Godfrey test shall be employed to test for the presence of heteroscedasticity. The Breusch-Godfrey Serial Correlation LM test is used to test for serial correlation in the data.

3.5 LIMITATIONS OF THE MODEL

The data on the outstanding value of mortgage loans taken out from all banks is not readily available as the other variables, more so all years preceding 1998. Therefore for the intention of having a model that matched the periods of all the variables, only data from 1998 is used for this study.

CHAPTER 4. FINDINGS

4.1 INTRODUCTION

This chapter represents the results and findings of the research after the execution of the methodology. This includes the various tests carried out on the data of the individual variables and the results, estimation of the model and the results of this estimation.

4.2 STATIONARITY TEST

The Augmented Dickey Fuller test done on the data revealed that at level, the data is non-stationary but at second differences I(2) the data was stationary. This is shown below:

Stationarity Results

LEVEL			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			3.027903	1.0000
Test critical values:	1% level		-3.959148	
	5% level		-3.081002	
	10% level		-2.681330	
SECOND DIFFERENCES			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.176066	0.0074
Test critical values:	1% level		-4.004425	
	5% level		-3.098896	
	10% level		-2.690439	

4.3 MODEL ESTIMATION RESULTS

The model $Y = \beta + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$ was estimated to test the relationship between the dependent variable (MORT) and the independent variables (INF,GDP,FX)

Model Estimation results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-244.3052	32.97339	-7.409164	0.0000
INF	-1.483026	0.985074	-1.505498	0.1544
GDP	0.112132	0.013042	8.597522	0.0000
FX	2.815549	0.483463	5.823708	0.0000
R-squared	0.955814	Mean dependent var		53.51333
Adjusted R-squared	0.946345	S.D. dependent var		62.59084
S.E. of regression	14.49822	Akaike info criterion		8.379058
Sum squared resid	2942.776	Schwarz criterion		8.576919
Log likelihood	-71.41152	Hannan-Quinn criter.		8.406341
F-statistic	100.9470	Durbin-Watson stat		0.645339
Prob(F-statistic)	0.000000			

It is evident that from the results of the regression that GDP and FX are significant while INF is not. What this means is that the value of the mortgage market is affected by GDP per capita of a country and also by the exchange rate but not by the inflation rate. It is also evident that there is a positive relationship between GDP and Mortgage value and also between FX and Mortgage value.

4.3.1 MODEL FITNESS OF VARIABLES

The variation in the value of mortgage market can be explained well enough by the explanatory variables (bar inflation). To be more specific, the explanatory variables explain

95.5% of the variation in the mortgage market value. This shows that the model used can represent the economic relationship between the variables.

Degree of Fitness Results

R-squared	0.955814
Adjusted R-squared	0.946345

4.4 POST ESTIMATION TESTS

4.4.1 BREUSCH-PAGAN GODFREY TEST FOR HETEROSCEDASTICITY

The Breusch-Pagan-Godfrey test (see Breusch-Pagan, 1979, and Godfrey, -1978) is a Lagrange multiplier test of the null hypothesis of no heteroscedasticity. The results yielded show that there is no heteroscedasticity in the model.

Breusch-Pagan-Godfrey test results

Heteroscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.847614	Prob. F(3,14)	0.1849
Obs*R-squared	5.105253	Prob. Chi-Square(3)	0.1643
Scaled explained SS	3.490578	Prob. Chi-Square(3)	0.3220

4.4.2 MULTICOLLINEARITY TEST

The test for multicollinearity shows that the explanatory variables of the model do not relate with each other that much. This means that there is no problem of multicollinearity, which would have yielded higher standard errors in the estimation.

Multicollinearity Test results

	GDP	INF	FX
GDP	1.000000	0.063301	0.655268
INF	0.063301	1.000000	0.063689
FX	0.655268	0.063689	1.000000

4.4.3 SERIAL CORRELATION TEST

After conducting a Q statistics test to check for serial correlation in the model, the results show that the model is free from serial correlation as shown below:

Q Statistics Results

1	0.469	0.469	4.6676	0.031
2	0.112	-0.138	4.9523	0.084
3	-0.079	-0.098	5.1039	0.164
4	-0.180	-0.110	5.9359	0.204
5	-0.113	0.037	6.2876	0.279
6	-0.144	-0.146	6.9108	0.329
7	-0.020	0.109	6.9233	0.437
8	-0.090	-0.199	7.2136	0.514
9	-0.089	0.016	7.5306	0.582
10	-0.125	-0.156	8.2358	0.606

CHAPTER 5: RESULTS, DISCUSSION AND CONCLUSION

5.1 INTRODUCTION

This chapter represents the discussion based on the major finding in chapter 4, the main conclusions drawn from the research as well as the recommendations that could be undertaken for practice or improvements. A brief summary of the purpose of the paper, the objectives and the major results shall also be provided.

5.2 SUMMARY

The purpose of this study was to study the relationship between the value of the mortgage market and some key macroeconomic variables, namely GDP per capita, inflation and exchange rate. The results however showed that inflation is not significant, while GDP per capita and exchange rate are.

5.3 DISCUSSION

The regression analysis of the model shows that the explanatory variables namely GDP per capita and exchange rate are significant in explaining the variation in the mortgage market value whereas inflation rate is not significant. This makes sense even in an economic sense. GDP per capita represents the output per person in a country. According to the regression model, there is a positive relationship between them, meaning, the higher the GDP per capita the higher the mortgage value. This makes sense from an economic sense in that the more money people in a nation have the more willing they are in taking out a mortgage. Especially in Kenya, where mortgages are expensive, a person needs a considerable amount of money so as to take out a mortgage (Estate, 2016)

The relationship between exchange rates and mortgage values is positive, meaning the higher the exchange rate, the higher the mortgage values. This also makes sense from an economic point of view in that, the higher the exchange rate, the higher the value of the foreign exchange earned from Foreign Direct Investment (FDI). FDI is generally recognized as an important source of financing and of transfer of technology and know-how between countries. (Stephen S Golub, 2011). When foreign investors invest in the Kenyan real estate when the exchange rate is high it means the more money is taken out from banks if these investors actually take mortgages.

Contrary to economic theory, the study finds that inflation in the Kenyan case has not affected the value of mortgage market.

5.4 CONCLUSION

Various cross-sectional studies such as Boamah, (2009), Chiquier (2004), Butler et. al (2009) V. C Warnock (2008), Boleat (2003), (Huybens, 1998), (Walley, 2013) and IDB (2005) among others in their cross-sectional studies argue that that the mortgage market grows in a stable macroeconomic environment. This means that the better the macroeconomic indicators perform, the mortgage market is bound to grow as well.

According to this study, GDP per capita and Exchange rates affect mortgage market value and they both have a positive relationship with it. Inflation on the other hand has been deemed insignificant when it comes to affecting mortgage market value.

5.5 RECOMMENDATIONS

My recommendation after conducting this study is that data involving the mortgage market should be more available especially that of years after our independence. This would increase research into the mortgage topic which has proved to be of paramount importance to Kenya given that the real estate market has such a great contribution to Kenya's GDP, 9% to be precise. (Cytomn Real Estate, 2016)

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