

THE EFFECT OF GLOBAL FINANCIAL CRISIS ON MORTGAGE INTEREST
RATES IN KENYA

BY

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DECLARATION

This research project is my original work and has never been presented for degree in any other university

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Date.....

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

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DEDICATION

This research project is dedicated to my dad Mr. William N. Orina, without whose financial support and guidance, would not have been possible to get this far; my mum, family members and my dear friends. They have always loved me and supported my every choice. As I know, they will be the happiest and the most proud when am awarded this degree.

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I'm deeply grateful to God for guiding me throughout the way.

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ABSTRACT

The real estate sector is one of critical pillars in a country's economic growth and development. This sector makes up 5.3% of Kenya's Gross Domestic Product (GDP) and has shown positive growth since the year 2001 (Keeler, 2009). Mortgage industry is part of the real estate sector it provides mortgage facilities. Mortgage financing is on the rise because commercial banks now offer facilities of up to 100 percent, and new regulations from the Retirement Benefits Authority allow pensioners to leverage up to 60 percent of their benefits as mortgage security (Keeler, 2009).

The objective of the study was to determine the effect of global financial crisis on mortgage interest rate in Kenya. The population under study comprised the banking institution that offers mortgages in Kenya, the study period was between years 2003 to year 2011. Secondary method of data collection was used. Through an event-study approach, patterns of price changes for the periods proceeding public announcements could yield interesting evidence about market efficiency. The study utilized the event-study approach where the transaction date, report date, and publication date as reported in the real estate Market were adopted.

Data was analyzed using ordinary least square (OLS) market model which measured the estimation of abnormal return on house prices. The average abnormal returns (AARs) was computed during event period (-4 to +4). T test was used to determine the statistical significance of CAARt & AARt. A testable hypothesis was set. H1: The null hypothesis being tested was that abnormal returns on & around intervention are less than or equal to zero. If the t-test statistic was larger in absolute value than 1.96 or 2.58, the relevant abnormal return was statistically non zero at 5% or 1% significance level respectively.

From the finding the study found that Kenyan mortgage market reacted positively to global financial crisis of year 2007s. This study showed that there were positive mean returns with respect to global financial crisis , this is an indication that Kenya mortgage market reacted positively to global financial crisis and led to house price boom in Kenya.

This survey has provided a framework that can be improved on, if necessary, and used to do a similar survey or any other related studies. Such surveys can be done by leading mortgage lending institutions, in collaboration with Kenya National Bureau of Statistics (KNBS). Leading mortgage lending institutions should submit accurate data on to KNBS so as to enable this exercise. This will be instrumental in providing accurate, timely and consistent market information to the players in the market. Since this study reacted positively to the global financial crisis of 2007. Other studies need to be done on factors that have favored Kenya against the expected positive impact.

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LIST OF ABBREVIATIONS

CBK: Central Bank of Kenya

GDP: Gross Domestic Product

GFC: Global Financial Crisis

KEBS: Kenya Bureau of Statistics

NSE: Nairobi Security Exchange

NSE; Nigeria Stock Exchange

USA: United State of America

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The real estate sector is one of critical pillars in a country's economic growth and development. This sector makes up 5.3% of Kenya's Gross Domestic Product (GDP) and has shown positive growth since the year 2001 (Keeler, 2009). It spurs investment in both formal and informal sectors of a country's economy. It spurs investment in both formal and informal sectors of a country's economy. The sector provides employment to a big percentage of Kenyans in real estate firms, mortgage companies, consultant firms, construction firms, and brokerage firms.

The climate of real estate market is generally captured by considering all the fundamental dimensions of the market. These dimensions include house and office prices of old and new houses, rents and vacancy rates, and mortgage applications, interest and default rates. This research paper takes on this holistic approach in its survey.

1.1.1 Global Financial Crisis

Financial crisis is applied to a situation where some financial institutions or assets lose a large part of their value, thus causing an economic meltdown (Matt, 2010). It can also be defined as a collapse of the world financial system, where there is a widespread failure of financial institutions or freezing up of capital markets that can substantially reduce the supply of capital to the real economy (Acharya, Philippon, Richardson, & Roubini, 2009). The fundamental cause of this crisis was a combination of credit boom and housing bubble. This led to a wave of defaults, world over, with many more expected to come, in the mortgage sector.

The 2007–2012 global financial crisis is considered to be the worst financial crisis since the Great Depression of the 1930s. It resulted in the collapse of large financial institutions and downturns in stock markets around the world. Bursting of the U.S. housing bubble, which peaked in 2006 led to the real estate pricing to go down.

1.1.2 Mortgage Interest Rates

Mortgage interest rate is the rate of interest charged on a mortgage. Mortgage rates are determined by the lender in most cases, and can be either fixed (stay the same for the term of the mortgage) or variable (fluctuate with a benchmark interest rate). Mortgage rates rise and fall with interest rates and can drastically affect the homebuyers' market. The borrower's credit score can often play a role in the rate charged on a mortgage and the size of mortgage loan they are able to obtain. The rate charged ultimately determines the cost of the mortgage and the amount of the monthly payment. Therefore, borrowers should always seek the lowest rate possible.

Interest rate is the price a borrower pays for the use of money they borrow from a lender/financial institutions or fee paid on borrowed assets (Crowley, 2007). Interest can be thought of as "rent of money". Interest rates are fundamental to a 'capitalist society' and are normally expressed as a percentage rate over the period of one year. Interest rate as a price of money reflects market information regarding expected change in the purchasing power of money or future inflation (Ngugi, 2001).

The bank charges mortgage rates according to risks. First, the bank will analyze the size and purpose for the mortgage. You can expect interest rates to increase for larger principal balances. Mortgage rates are also higher for investment properties. The bank feels that a resident-owner

should be highly motivated to keep his mortgage current to avoid foreclosure and eviction. Alternatively, an investor may simply abandon a failing project and refuse to pay the mortgage due to a lack of rental income.

1.1.3 Impact of Global Financial Crisis on Mortgage Interest Rates

The impacts of global financial crisis of 2007 have been felt greatly by the different sectors of the economy, especially the real estate sector. According to Matt (2010), the financial crisis marked the end of very high valuations of the real estate markets and sudden decrease in house prices. Investors who had put their money in high valued real estate not only lost the money invested in the property, but also the money borrowed against it. There was huge number of foreclosed homes.

A crisis that originated in the market for sub-prime mortgages in the US has now escalated to global proportions, shaking the global financial sector to its foundations and afflicting the economies of many industrialized countries. The origins of the current crisis lie in the expansion of mortgage lending to the sub-prime market in the US from the late 1990s onwards. Property prices were driven higher through massive growth in lending, low interest rates and the steadfast belief that housing was a 'safe' investment. Mortgages were then packaged into complex debt instruments, which became increasingly popular, as investors diversified portfolio risk in their and mortgage lenders passed on credit risk to investors through mortgage pools, providing ever greater incentives for sub-prime lending.

DeBoer (2008), tighter credit narrowed the market for housing. The fall in demand pushed housing prices further down. Recent buyers of houses found that they owe more on a house than

the house is worth (negative equity). This encouraged them to default mortgage obligations and foreclosures increased.

Big banks and real estate firms started reducing their operations and filing for bankruptcy. This finally led to loss of many jobs throughout the world. There was a decrease in rents up to 20 percent and increase in office vacancies by a range of between five and seven percent due to companies going bankrupt or being acquired. Builders were more cautious, and they tend to build less since less money was available. In some areas, building almost came to a standstill since there were already more homes on the market than buyers.

Since the start of the crisis, the Institute of International Finance estimates that the global financial system has suffered worldwide write downs and credit losses of over US\$ 1.5 trillion as at the end of June 2009. These losses are concentrated in America (around US\$ 1 trillion) and Europe (over US\$ 450 billion), while Asia has been minimally affected (around US\$ 50 billion).

In a series of influential papers, Carmen and Rogoff (2008) have studied the historical record of countries experiencing severe effects of global financial crisis of 2007. They report that real housing price declined by an average of 35 percent, stretched out over six years from peak to trough, while equity price collapsed by an average of 55 percent over a period of about three and a half years. Unemployment rate rose by an average of seven percent over the down phase of the cycle and output fell by an average of over nine percent. The real value of government debt rose to an average 86 percent, because of lost tax revenues.

The study by Kaptich, (2008) revealed that property companies in the East Africa are still enjoying an economic boom despite the global credit turmoil. It identified that there is demand for property probably due to increase in population and stability in the region. The study also identified reluctance by banks in lending and predicted a slowdown in the real estate investments across the region as a result of this. Markets in the study revealed that East African region are amongst the most robust, and will continue to be interesting for investors. The market appears to be more insulated from the slowdown more than others.

Between the month of August and September 2008, the online real estate search in East Africa region grew by 58 percent, although, there was a slowdown between the month of July and August; a drop of 1.75 percent. Online real estate search has grown on average by 27 percent since it started monitoring online property search. The data suggests that there is high demand for East African real estate (Propertyzote, 2008, cited in Kaptich, 2008).

1.1.4 Mortgage Industry in Kenya

The Mortgage Company is the premier independent Mortgage Brokerage firm in the East African region. Borne out of a desire to open up property ownership in the African continent, The Mortgage Company aspires to develop the market and radically open up the mortgage sector. With prior accumulated experience spanning over 25 years working with the banking and mortgage industry, the company provides a unique skill of appreciating the banking position whilst representing the interests of the customer.

Recent statistics released by the World Bank in collaboration with Central Bank of Kenya indicate that less than one in every 10 Kenya's living in urban areas can afford a

mortgage, while rural incomes are too low to even consider. Kenya's untapped mortgage market is estimated to be Ksh 1.1 billion, and is the third-largest in Sub-Saharan Africa after South Africa and Namibia. The fact is that it is growing in double-digits rates of between 10%-20% and is projected to start growing at 30%-40% once the economy hits the high-speed gear, offers an unlimited market for developers and mortgage providers alike. Developers account for the biggest individual borrowers, with some securing hundreds of millions to construct high-end housing estates.

Mortgage industry is not as rosy as it seems owing to various impediments. Lack of access to long-term funds, low incomes, credit default risk and astronomical interest rates as well as a large informal employment sector comprising small-scale farmers, traders and others serve to slow down the uptake of mortgages. The erratic income and absence of pay slips eliminates them from the pool of those deemed qualified to be granted mortgages.

Improving access to mortgages would mostly benefit higher income earners, the needs of the vast majority of the population would still go unmet. Other solutions such as building more efficiently and having affordable loans from savings and credit cooperative societies, or creating incentives for developers to build rental houses, could significantly improve access to mortgaged housing for low income earners.

Mortgage financing is on the rise because commercial banks now offer facilities of up to 100 percent, and new regulations from the Retirement Benefits Authority allow pensioners to leverage up to 60 percent of their benefits as mortgage security (Keeler, 2009). He identified that real estate investment inflow from the Diasporas that had increased by 80 percent from 2004 to

2008 and driven property values up have since declined as a result of the global crisis. It also recognized that Somali pirate cash has contributed to the boom in Real estate market in Nairobi.

Land price now amount to an often prohibitive 50 percent of development costs and cost of building materials is up, for example steel by 110 percent since 2002 (Keeler, 2009). According to him, despite input cost challenges, demand continues to far outpace supply in most real estate sectors, increasing market stability and potential returns for investors.

1.2 Research Problem

The property market is a critical sector to the economy and its performance is directly and indirectly affected by the prevailing economic, political and social conditions of the country (Regent Management, 2010). This market is known to be directly linked to the global financial crisis of 2007. In fact, it is the origin of the crisis. The effects of the crisis were felt all over the world. Kenya's economy is characterized by recovery from insecurity, drought and global economic recession. This makes the real estate market in Kenya to be more vulnerable to the negative effects of 2007 global economic recession.

The study by Kaptich (2008) revealed that Property companies in East Africa are still enjoying an economic boom despite the global credit turmoil of 2007. This study covered a scope of the whole East Africa region. It therefore does not represent the specific conditions of real estate market in Kenya.

The Hass Consult Property Price Index and Hass Consult Letting Index are the latest study on house prices and rents in Nairobi housing market. They studied on the house prices and rents, their percentage change and their trend. The scope of the studies is limited to Nairobi region and it has only considered residential property. Also, the studies will include some of the fundamental dimensions of real estate market, currently there are no other better property price indices.

Up to date, there is no clear position on whether or not Kenya's real estate market and the economy in general have been affected by the 2007 global financial crisis (Property Kenya, 2005). There are those players in the market that argue that Kenya's real estate market has been cushioned from the effects of global financial crisis, while others argue that the market has felt its effects. Whichever the argument, there is no clear picture on either the extent of the effects or the extent of the cushion. This shows a knowledge gap in real estate market literature. There is a need for an up to date survey on the impact of global economic crisis of 2007 on Kenya's real estate market. The survey has to consider the residential houses in Nairobi and effects on fundamental dimensions of real estate market.

Mortgage industry tends to be a unique sector in the economy. The continued growth in the property industry and increased sophistication has made it necessary for interested players to make competent and prudent decisions. Principally, real estate decisions take time to make and involve large capital outlays. Consequently any chance to avoid or minimize risk or errors translates into a saving both monetarily and time wise making it different from other sector of the economy.

Studies related to this work include Kaptich, (2008) revealed that property companies in the East Africa are still enjoying an economic boom despite the global credit turmoil. Kilonzo (2008), in her speech, “The global financial crisis, its Impact on Kenya and Possible Strategies to Mitigate the Effects,” reviewed previous economic crises since 1920 to 2007 which were done in the peak of the crisis and the effect of the crisis may not have been fully explained in Africa and hence not conclusive. Therefore the current study will address the knowledge gaps and answer the research question on whether Kenya was really impacted with the GFC by surveying the impact of global financial crisis of 2007 on real estate market in Nairobi. It will take a case study of Nairobi, which has the most vibrant real estate market in Kenya. To attain this objective, the study will answer the following research question. How has the global financial crisis affected mortgage interest rate in Kenya?

1.3 Objective of the Study

To determine the effect of global financial crisis of 2007 on mortgage interest rate in Kenya.

1.4 Value of the Study

Findings of this study will address the existing knowledge gap in literature of global financial crisis and real estate market in Kenya. Also, it will add on the body of existing knowledge and provide a basis for further research on the impact of 2007 global financial crisis of 2007 on real estate market in Kenya thus will be useful to scholars and academicians.

This study will be useful to investors, speculators and other stakeholders in terms of providing current and timely information necessary to predict future performance of the real estate market.

This survey will stimulate and direct the necessary industrial and government response to restore or maintain equilibrium in real estate market. The policies and regulations developed as result can play an important role in helping the government control and monitor the operations of different players in this sector.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section will review the theoretical discussion and the empirical studies on impact of global financial crisis in real estate market. The first section examines the theories related to the impact of global financial crisis. The second section deals with the empirical studies.

2.2 Theoretical Review

Nicholson, Lensen & Blackmore (2008) recognized that financial crisis which initiated in U.S.A between 2006 and 2007 has now become a global phenomenon. It is clear that the U.S.A's house bubbles which occurred between 1994 and 2006 is what led to credit crunch in U.S.A in July 2006 and 2009 (DeBoer, 2008). The mechanical phenomena behind the global economic crisis of 2007 are domino effects and psychological contagions as many institutions had financial links (Kilonzo, 2008). The effects and global nature of the crisis has attracted the attention of many scholars world over. Various studies have been done on this topic, thus building on the literature of global financial crisis, house bubble, credit crunch and other related concepts.

2.2.1 House Bubble Theory

Throughout this decade, many people expressed concern about the rapid pace of growth in housing prices. Between 1994 and 2006, the average price of a single family home increased by almost 200 percent (Case-Shiller Housing Price Index, cited in DeBoer, 2008). Many scholars concentrated in explaining this paradox. DeBoer presented a clear view on the concepts behind the house bubble of USA in the years between 1994 and 2006.

According to DeBoer (2008), the cause of this growth was (1) inexpensive mortgage rates, averaging 5.7 percent between 2003 and 2005, (2) reduced adherence to banking rules in the

mortgage industry, and (3) changes in consumer expectations. He explains the connection between low mortgage interest rate and high house prices using the concept of demand and supply. In most cases, purchasing a house is a joint purchase (involving a purchase of both house and a mortgage). This is complementary purchase. Economic theory shows that when the price of one good in the pair falls, hence increase in its demand, the demand for the other good also increases. Therefore, the fall in mortgage rates led to high demand of houses and consequently high prices.

When illustrating the factor of deregulation of banks and change in banking practices, DeBoer (2008) identifies that this is what led to widespread movement to branch banking and bank consolidation. These banking systems had great impact on banking practices. In the initial banking system, neighbourhood banker was the primary source for credit. Further, that banker personally knew many of his customers. This offered a casual information channel by which a banker could assess risk. The introduction of larger branch banking institutions removed this information channel. As the casual information channel was being cleared, the incentive structure within the financial sector further changed in such a way that increased mortgage turnover.

Further, Compared to a historical mortgage mechanism where the issuer of a mortgage was likely to maintain an equity stake in that mortgage, the existing mortgage mechanism has no that constraint, as a result of deregulations. Also, banks and other financial institutions introduced numerous financial derivatives. These are collateralised backed securities, security investment vehicles and collateralized debt obligations. These derivatives allowed mortgages (and other types of debt) to be packaged and re-sold (and as time went by, re-sold again). DeBoer (2008)

argued that this reduced the need for lenders to practice quality oversight. In essence, if a loan was defaulted, it would no longer belong to the issuer. DeBoer (2008) identifies that with the growth in foreign savings in the U.S and too much domestic money, lenders found many ready buyers of this repackaged debt. Mortgage turnover therefore increased as lending practices became increasingly weak.

Another factor identified by DeBoer (2008) is the factor of subprime mortgages. As mortgage debt became more easily available, new buyers of housing entered the market, the 'subprime' borrowers. The influx of these new borrowers who would traditionally not have had access to loans, further spurred housing demand.

Finally, DeBoer (2008) argued that consumer expectations changed as housing prices rose. Consumers came to expect housing prices to continue to appreciate at a high rate. This encouraged the entrance of new real estate speculators into the market. In this way, the new buyers again drove up housing demand and continued to propel the upsurge in housing prices. This final speculative demand, when piled onto the other forces driving an upsurge in housing prices, formed a housing price bubble. If asset price bubbles never burst, they would not be of concern. Unfortunately, they always do. The cause of this downturn tied to the notable decline in the international confidence in the U.S.A's economy started in 2006 (DeBoer, 2008). The fall in confidence dried up some of the foreign savings and pushed some foreign buyers out of the housing market, which put upward pressure on mortgage interest rates and likely started the downturn in the housing market.

2.2.2 Credit Crisis Theory

The credit crisis was caused by the fall in housing prices that began in July 2006 in U.S.A (DeBoer, 2008). DeBoer (2008) explained the channels and events through which the housing prices enter the financial sector. He identified that core connection was the requirement for capital asset backed loans. Every bank or other financial entity in the U.S is required to have capital assets backing its loans. In his illustrations, the introduction of financial derivatives contributed by encouraging financial entities to widely use mortgage-backed securities as a share of the capital backing their operations. As housing prices declined, the value of mortgage-backed securities also declined. This led to banks' capital assets decline in value. Banks were then forced to issue fewer loans. The tightening of credit conditions necessitated by this logic started a downward spiral.

First, According to DeBoer (2008), tighter credit narrowed the market for housing. The fall in demand pushed housing prices further down. Recent buyers of houses found that they owe more on a house than the house is worth (negative equity). This encouraged them to default mortgage obligations and foreclosures increased. As foreclosures increased, the value of properties next to foreclosed houses declined. This pushed more homeowners into a situation of negative equity.

Secondly, DeBoer (2008) argued that the continued decline in housing prices further reduced the value of mortgage-backed financial derivatives. As they declined, credit conditions further tightened. This became an increasing problem as variable rate mortgages began to reset. Those who were planning to refinance prior to the interest rate reset were unable to do so. Some also found that they were unable to afford the now higher payments. This led to another round of foreclosures.

Despite focusing on the housing market and mortgage-backed derivatives, which were the early locus of the problem, DeBoer (2008) also explained how the house bubble connected to other sectors of the economy. As credit conditions tightened, consumer loans, loans for business operating expenses, and loans for corporate expansion became increasingly difficult to obtain. This drove down the sales of many items and forced many otherwise well-functioning firms into failure. He identified that the effects of this broader downturn are currently being seen in markedly high unemployment and vacancy rates.

2.3 Causes of the Global Economic Crisis of 2007

According to Bartlett (2008), the crisis was started with the downfall of U.S.A sub-prime mortgage industry. He records that 'mark-to-market' losses on mortgage backed securities, collateralized debt obligations, and related assets through March 2008 were approximate \$945 billion. This amount is significant enough to cause a significant negative effect on the economy as a result of the sector failure.

Bartlett (2008) argues that this is the largest financial loss in history. He compared it to loss caused by Japan's banking crisis in 1990, (approximately \$780 billion loss), loss caused by the Asian crisis of 1997-98 (approximately \$420 billion loss) and the loss caused by savings and loan crisis of U.S.A in 1986-95 (approximately \$380 billion loss). Yilmaz (2008) charged U.S.A subprime mortgage industry to be the major reason of the 2007 global financial crisis.

Also, it is argued that the 2007 global financial crisis started from a confluence of three categories of factors: Macroeconomic or market factors, risk management failures, and inadequate regulations or policies (Archarya, & Richardson, 2009; Brunnermeier, 2009; Financial Services Authority, 2009; International Monetary Fund, 2008). Macroeconomic or

market factors for the crisis are macro financial complacency brought about by a long period of expansion in credit and leverage, combined with rapid innovation. The crisis was preceded by more than a decade of booming economic conditions, manifested by low interest rates, low volatility, and abundant liquidity. This period was also characterized by increased appetite for risk and leverage by both creditors and investors.

At the same time, there was a growth of innovated, complex structured financial products, which made it easier to trade credit risk and thereby increased the perceived liquidity of these products. Bundling of mortgages into an asset backed Security, which is then traded rather than held, an impression that the risk of such asset was minimal for an institution. As a result, there was an unprecedented expansion of mortgages and credits in the United States.

Multiple risk management failures left the financial system vulnerable to excessive risk taking. In the study by Archarya, and Richardson, (2009); Brunnermeier, (2009); Financial Services Authority, (2009) and International Monetary Fund, (2008), it is evident that market discipline, which is supposed to check excesses, had failed. Misaligned compensations and incentives for executives and traders, as well as for bankers, underwriters, and rating agencies, encouraged the weakening of underwriting and credit standards in favor of promoting volume expansions.

Credit rating agencies' due diligence might have been compromised by incentives for fee income as well as inadequate methodologies, while institutional investors' search for yield may have undermined their own due diligence, putting excessive reliance on rating agencies. Finally, banks may have underestimated the liquidity risk in their funding models due to the misperception of

counterparty risk or of complicated derivative instruments as well as misunderstanding of extreme “black swan” events (Taleb, 2007).

Policy frameworks, as identified in the study by Archarya, and Richardson, 2009; Brunnermeier, 2009; Financial Services Authority, 2009 and International Monetary Fund, 2008 was inadequate to prevent the crisis. Regulatory and prudential norms, along with supervising oversight, had lagged behind financial innovation. Supervisors lacked a macro prudential perspective, failed to monitor off-balance sheet entities and liquidity buffers, relied too heavily on ratings for capital charges, and failed to take countervailing actions. In addition, central bank liquidity frameworks were not flexible enough to cope with unexpected liquidity shocks. In some cases, crisis management and deposit-insurance schemes proved to be outdated, and various regulatory agencies were compartmentalized without sufficient regard to the interdependencies of different financial institutions and markets.

Further, valuation, disclosure and accounting inadequacies seem to have exacerbated the situation. Weaknesses in the application of accounting standards and gaps associated with the valuation and financial reporting of structured products were also key contributing factors for the crisis (Archarya, and Richardson, 2009).

According to Kallis, Martinez-Alier, and Norgaard, (2009), the finance sphere grew far too fast and too large to be supported by the real economy beneath. This mismatch in turn led to the global financial crisis of 2007. Soddy (1926) noticed that the financial system can be prone to increase debts (both private and public) and then mistake the expansion of credit for the creation of real wealth. Asset bubbles, first technology shares and then houses, contributed to maintaining

the perception of a vibrant economy and consumption growth, but only at the cost of building up personal and corporate indebtedness (Brenner, 2006).

While enlightening the factors that led US sub-prime mortgage crisis to turn into global banking crisis, Khatiwada and McGirr (2008) pointed out that many of the sub-prime mortgages were risky to lending institutions that originated them but they were made attractive to foreign banks by high investment grading. When sub-prime borrowers failed to repay their mortgages, the originating institution needed to finance the foreclosure with their own money. This left many banks in a financially unviable situation, in a short timeframe.

It is argued that “trust crisis” which caused this global predicament (Hyun-Soo 2008, cited in Ullah et. al. 2008). DeBoer (2008) believes that it was series of events which caused the crisis. It begun with the collapse of currencies in East Asia in 1997 and became edgy due to the financial crisis of Russia in 1998. Next, in U.S.A was the “dot-com” stock collapse in 2001, and the final stroke was again in U.S.A, when after a swift decline in housing prices and rapid contraction in credit, it fell into recession.

2.3.1 Other Past Crisis

During the 20th century, the world experienced two major financial crises. The first global financial crisis was seen during 1929 to 1930, which affected developed nations, Europe and America. The second crisis came in 1997 which remained till 1999, and was experienced by emerging economies of Asia Pacific (Ullah, Malik, Azam, & Marwat, 2008).

Kilonzo (2008), in her speech, “The global financial crisis, its Impact on Kenya and Possible Strategies to Mitigate the Effects,” reviewed previous economic crises since 1920 to 2007. First, there was ‘The Wall Street Stock market Crash’ which led to declining real estate values in America. It peaked in 1929. A precursor to the Crash was a time of prosperity and high price levels in U.S.A, despite warnings against speculation. Then, there came “The global financial crises of 1987.” The 1987 market crash in U.S.A was caused by sales through program trading, overvaluation, illiquidity and market psychology.

In 1997, there was ‘The Asian Crisis of 1997.’ It was triggered by the devaluation of the currency in July 1997 which prompted attacks on East Asian stocks and currencies. Other causes were widening current account deficit resulting from falling export performance due to exchange rate appreciation, rising capital inflows encouraging excessive imports, exchange rates pegged to the US dollar and Increased financial liberalization.

2.4 Determinants of Rent and Vacancy Rate

A number of literatures inside and outside the property market literature have examined the relationship between rent and vacancy rate. Some studies have proposed a natural vacancy rate and have measured the rate of change in rent relative to the deviation of the observed vacancy rate from the natural rate.

There have been attempts to estimate the impact of vacancy on real rent. Smith (1974) proposed that supply and demand factors interact to simultaneously determine the level of rents and vacancy rate. His model stipulates that the rate of change in rent is a function of the vacancy rate,

the vacancy rate lagged one period and the rate of change in property taxes (as a substitute of operating expenses). He finds that vacancy has a negative effect and that property taxes have a positive effect on the rate of change in rent. The author concluded that vacancy rate does significantly affect the rate of change in rents and that land lords are able to pass along a significant portion of operating expenses in the form of higher rents.

Rosen and Smith (1983) provided a test of the “smith mode” by proposing that the rate of change in rent is a function of the deviation in the observed vacancy rate from the natural vacancy rate. In modeling, they assumed that the natural vacancy rate is constant over time, thus it is represented in the intercept term. Their equation is estimated with observed vacancy, observed vacancy lagged one period, and the rate of change in operating expenses (lagged one period). They found vacancy to be negative and significant for thirteen of the seventeen cities studied and also for the pooled cross–section regression.

The “smith rent and vacancy model” was further tested by Shilling, Sirmans and Corgel (1974). They measure the rate of change in rent against operating expenses and observed vacancy rate. Because the risk from holding commercial real estate increases as vacancies increase, their adoption of “Rosen and Smith model” added an interaction variable consisting of the rate of change in rent times the vacancy rate because the risk from holding commercial real estate increases as vacancies increase. The authors found the vacancy variable is negative and significant for eleven of the seventeen cities and the interaction variable is significant for all cities. The author conclude that vacancies play an important role in setting rent in the short run and that the greater the number of vacancies, the greater the risk.

2.6 Empirical Review

Karem (2009) in his review of literature on the impact of financial crises on decentralization process revealed that the effects of the financial crisis on developing countries were possible through financial links, trade links, and remittances. The effects of a financial crisis on an economy will vary according to the nature of the crisis and the economy's structure. Accordingly, financial crises can affect central government through revenue in terms of lower corporate taxes, as well as through lower income tax and VAT revenues.

Karem revealed that the financial crisis can lead to decrease in royalties and mining taxes; lower import taxes; and lower capital income to the central government. In this situation, according to him central government may opt to cut down in social sector service delivery and in local budgets for the benefit of the national budget. The literature opined that financial crises can be transmitted to local governments through higher unemployment and social needs, and through difficulties in investment financing. The problem of unemployment, in turn, would prompt urban to rural migration, as has been noted in China and in the case of Cambodia construction workers in 2008 as stated in the literature. He further revealed that is possible that decentralization might contribute to financial crises especially in the few instances where there are not strict regulations for local government borrowing.

Olu and Tayo (2009) examined the impact of the global financial crisis in Nigeria. According to them the impact has different ramifications for the capital market, the banking sector, foreign exchange and the balance of payments, as well as the real sector. They asserted that the impact of the global financial crisis is transmitted through decreased prices of oil exports to the Nigerian economy leading to a decline in external reserves and hence accruable revenue. They argued that

the impact is more severe in Nigeria than in other countries in the region because of its almost total reliance on oil revenue to run its economy. Their findings confirm the impact of negative oil price shocks on macroeconomic variables and poverty/household welfare in the Nigeria. The shocks have increased the level of poverty and worsened household welfare over the period August 2008 to January 2009 and are expected to worsen them in 2010. In view of the serious adverse effects of negative oil price shocks on the Nigerian economy they suggested that government should determine the appropriate monetary, fiscal and exchange rate policy responses and institute measures to reduce oil dependence.

Dike (2008) saw the new global financial and economic crisis as an added burden on poor nations as their economies are affected directly or indirectly. Dike said Nigeria might experience worst of the crisis because it depends on foreign aid, remittance from abroad and trade for its economies activities. He concluded that Nigerian government should reduce waste and improve social environment with rapid industry and service sector, job creation to reduce the rising youth unemployment and underemployment in the society. Also, he suggested massive investment in the non-oil and agricultural sector of the economy, commitment to sustainable monetary and fiscal policies, and sufficient highly skilled personnel to supervise the needed reforms and manage the affairs of the nation.

Chukwuma (2009) however noted that Impact on the Nigerian Economy led to declining capital inflows in the economy, de-accumulation of foreign reserves and pressure on exchange rate. Impact could also be felt in limited foreign trade finances for banks and divestment by foreign investors. According to him the attendant effects would be increased pressures to spend the

'excess crude', falling commodity prices abroad and freight costs cheapen imports and threaten domestic industrial and productive base.

Chukwuma (2009) further opined that the crisis also presented an opportunity for Nigeria to concentrate on other neglected sectors like agriculture solid minerals; gas; infrastructure, etc. A side Lower world prices will benefit Nigeria because of her large imports Peter (2009) examined the impacts of the global financial crisis on the Nigerian banking industry before and after the financial crisis. Findings obtained from the research show that the banking sector before the global financial crisis was sound and vibrant enough to support the nation's economic growth and development. This is evident from the questionnaire that was distributed to stakeholders in the banking industry. However, the crisis has eroded the confidence of the general public in the Nigerian banking industry, despite their consolidation. Even the Nigerian Stock Market (NSM) which is expected to act as buffer of fund is not left out of the financial crisis. He argued that the banks became vulnerable because of their over reliance on foreign financial institution and banks for credit lines.

The empirical study by Case et al (1999) implies that real estate returns are dependent on fundamental cross-country correlated economic variables; but local output is a more important determinant for real estate returns than global variables. Bardhan, Edelstein and Leung (2004) provide tentative statistical evidence for the explicit impact of international economic openness on residential real estate rents, while controlling for urban wages, city size and location.

They find that urban rents are positively affected by openness. None of the existing papers comparing real estate returns across countries takes into account international economics variables, such as measures of openness, or makes allowances for cross-border investing and capital flows.

2.4 Conclusion

Kaptich, (2008) revealed that property companies in the East Africa are still enjoying an economic boom despite the global credit turmoil. It identified that there is demand for property probably due to increase in population and stability in the region. The study also identified reluctance by banks in lending and predicted a slowdown in the real estate investments across the region. Kilonzo (2008), in her speech, “The global financial crisis, its Impact on Kenya and Possible Strategies to Mitigate the Effects,” reviewed previous economic crises since 1920 to 2007. Chukwuma (2009) however noted that Impact on the Nigerian Economy led to declining capital inflows in the economy, de-accumulation of foreign reserves and pressure on exchange rate. Impact could also be felt in limited foreign trade finances for banks and divestment by foreign investors.

Kibaara (2009), Kilonzo (2008) and Chukwuma (2009) studies were done in the peak of the crisis and the effect of the crisis may not have fully manifested itself in Africa hence the studies cannot be said to be conclusive thus this study will therefore add to the new knowledge on how real estate in the emerging economy of Africa dealt with the crisis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines the methods, tools and sources of research data, targeted groups and sample from which data was collected in order to attain the objective of the study, which was used to investigate the effect of global financial crisis of 2007 on real estate market prices in Nairobi. It further discusses how the data was processed and tools used in analyzing and presentation

3.2 Research Design

To examine the effect of global financial crisis of 2007 on real estate market prices in Nairobi event study methodology was used. The event is what the researcher would like to study. To construct an event study the event, event date, event window, estimation window & estimation model was determined. The events defined for this study was the 8 years surrounding the global financial crisis of year 2007. The event years were year 2007. It can be expressed as t_0 . The event window comprised some period before & after the event day. The event window in this study was 4 years before and 4 years after the global financial crisis. It can be expressed as -4 to +4. The estimation period is the period prior to the occurrence of the event. This method clearly showed the impact of global financial crisis on real estate market prices before and after the global financial crisis.

3.3 Target Population

The population under study comprised the number of years that surrounding the global financial crisis, the study period was between years 2003 to year 2011.

3.4 Data Collection

Secondary method of data collection was used. Through an event-study approach, patterns of price changes for the periods proceeding public announcements could yield interesting evidence about market efficiency. The study utilized the event-study approach where the transaction date, report date, and publication date as reported in the real estate Market were adopted.

3.5 Data Analysis

Data was analyzed using ordinary least square (OLS) market model which measured the estimation of abnormal return on house prices. Following is the formula for OLS market model to compute abnormal returns:-

$$AR_{jt} = R_{jt} - ER_{jt}$$

Where

AR_{jt} = Abnormal return of real estate market prices j on day t

R_{jt} = Actual return on real estate market prices j on day t

ER_{jt} = Expected return on real estate market prices j on day t

Actual return on house prices j in period t will be computed as follows:-

$$R_{jt} = \frac{P_{jt} - P_{jt-1}}{P_{jt-1}}$$

$$P_{jt-1}$$

Where

P_{jt} = Price of forex j on day t

P_{jt-1} = Price of real estate market prices j on day prior to day t

Expected return on real estate market prices j in period t was computed as follows:-

$$ER_{jt} = a_j + b_j R_{mt}$$

Where

a_j = Risk free rate of return

b_j = Relative riskiness of the real estate market prices

R_{mt} = The rate of return on market index on the day t

After computation of abnormal returns of all the real estate market prices the average abnormal returns (AARs) was computed during event period (-4 to +4). AARs were computed as follows:

$$AAR_t = \frac{1}{N} \sum_{j=1}^N AR_{jt}$$

Where

AAR_t = Average of abnormal return for year t

N = Number of securities in the sample

The abnormal returns are aggregated years –wise & then divided by number of real estate market prices. Thus cross-sectional & time- series aggregation was done. After this cumulative average abnormal return (CAARs) was computed. The formula for CAARt:

$$CAAR_t = \sum_{i=t-k}^t AAR_i$$

Where

k = Number of event years before day t

T test was used to determine the statistical significance of CAARt & AARt. For computation of t statistics the aggregate pre- event standard deviation of abnormal returns of all the real estate market prices was be computed. Individual company's pre- event standard deviation i.e. (from -4 to + 4) was computed & then aggregation done. The formula for estimation of pre- event standard deviation of yearly abnormal returns is as follows:

$$s_{i, pre} = \sqrt{\frac{\sum_{n=-4}^{-2} (AR_{jt} - AAR_{jt pre})^2}{n}}$$

Where

$s_{i, pre}$ = Standard deviation of abnormal returns of real estate market prices i estimated from pre- event measurement period.

n = Number of years in pre- measurement period

AARpre = Average of abnormal return of real estate market prices i estimated from pre- event measurement period. Aggregate pre- event standard deviation will be computed as follows:-

$$s_{N,pre} = \sqrt{\sum_{I=1}^N \sigma^2(I_{pre})}$$

i,pre was applied on AAR of each year. The t- test for AARs was as follows:-

$$AAR_t \text{ t stat} = \frac{AAR_t}{s_{N,pre}}$$

$$s_{N,pre}$$

For testing CAARs, The t –test formula is:-

$$CAAR_t \text{ t stat} = \frac{CAAR_t}{s_{N,pre} \sqrt{N_t}}$$

$$s_{N,pre} \sqrt{N_t}$$

Where N_t = the absolute value of event year t plus 1 (e.g. for event day -30, the absolute value will be 4 and $N_t = 4$)

A testable hypothesis was set. H1: The null hypothesis being tested was that abnormal returns on & around intervention are less than or equal to zero. If AAR_t or CAAR_t are greater than zero and statistically significant it indicates that the forex prices on an average reacted positively to bonus issue. If the t-test statistic was larger in absolute value than 1.96 or 2.58, the relevant abnormal return was statistically non zero at 5% or 1% significance level respectively.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the data findings on the effect of global financial crisis on mortgage interest rates. These data were collected from the Central Banks on mortgage interest and mortgage house prices. Analysis involved evaluation of abnormal return and market prices variability around global financial crisis. The study covered a period of 9 years surround global financial crisis, from year 2003 to year 2011.

4.2 Analysis and Interpretation

4.2.1 Abnormality of Returns

Table 4.1: Average Abnormal Returns

Years	AAR	T	Sig. (2-tailed)
-4	.4696	1.346	.112
-3	.7834	1.890	.023
-2	.9267	2.159	.047
-1	2.4129	2.967	.006
0	5.0166	2.834	.026
1	4.1724	1.841	.025
2	1.5159	-0.758	.040
3	.2945	-1.660	.158
4	.2251	-1.346	.236

Source: Research Findings

The study analysed the returns of the interest rates and compared the same with the market returns so as to establish the abnormality of returns following global financial crisis. The analysed data was presented in Table 4.1 above , which shows the abnormal returns for the house market following the global financial crisis in 2007, from the results it is shown that t-4 to t-3 the abnormal return were below 1; 0.4696 and 0.7834 respectively , t-1 to t-2 had a positive abnormal returns of values greater than 1; 2.4129, 5.0166, 4.1724, and 1.5159 respectively. The period between t3 and t4 had average abnormal return of less than 1 which means that real estate investors benefitted from above normal returns pointing at market adjusting to global financial crisis. This implies that the Kenyan house market did not react very fast to global financial crisis which could point that the real estate market in Kenya was efficient though not that perfectly efficient. From the finding on the significance value , the study revealed that the significance value between t-3 and 4 were less than 0.05 an indication that they were significantly significant .

4.2.2 Market Returns Variability (MRV)

Table 4.2: Market Returns Variability

Day	Mean (MRV)	STDEV	T-stat	Sig
-4	0.4375	0.5234	2.047	0.196
-3	0.7938	1.8582	1.837	0.026
-2	1.2875	0.6349	2.267	0.073
-1	1.7102	0.5702	3.051	0.028
0	3.0529	1.1117	2.320	0.008
1	1.3839	0.4850	1.939	0.010
2	0.2612	0.2629	2.434	0.049
3	0.4774	0.4699	2.488	0.055
4	0.3698	0.3010	3.009	0.030

Source: Research Findings

The study sought to establish the variability of the market price following global financial crisis thus determine the mortgage market reaction to global financial crisis. The information presented in table 4.2 shows that that the variability in mortgage market does increase erratically with time though there is more variability in the years preceding and after global financial crisis. However, the t-significance shows between t-3 and t2 were significant. The global financial crisis had year had an average MRV of 3.0529 at 95% confidence level, t-2, t-1, t 0 and t1 had MRV greater than 1. Results support the semi-strong form efficient market hypothesis since house prices adjust so fast to public information that no investor can earn an above normal return by trading on the global financial crisis year and years thereafter.

Table 4.3: Average Value of MRV

Estimation year Period	Market Return Variability
From year -4 to year +4	3.1542
From year -4 to year -1	1.8127
From year 0 to year +4	2.7475
From year 0 to year +1	2.5413
From year -1 to year 1	3.1454
Form year -3 to day +3	2.1987

Source: Research Findings

To analyze the speed at which the mortgage market absorbs the global financial crisis in its prices, the study presented the average market return variability across the global financial crisis. From the findings show in the above table on mortgage prices variability was more in post global financial crisis period than pre- global financial crisis period; while t-4 to t-1 had AMRV of 1.8127, t0 to t4 had AMRV of 2.7475. Between t0 and t1 the AMRV was 2.5413, t-1 to t1 had a

variability of 3.1454. Year's t-3 to t3 had AMRV of 2.1987. Therefore, the mortgage market positively absorbed global financial crisis information positively.

Table 4.4: CAR Across the Event Windows

Years	Mean of CAR	Variance
t-4 to t-1	6.0135	1.1657
t-2 to t 0	10.9606	4.7112
t0 to t1	21.8143	10.7291
t-1 to t1	25.7861	11.1235
t+2 to t+4	31.2367	12.7167

Source: Research Findings

To track abnormal returns over a number of year surrounding the global finanacail crisis , the cumulative abnormal return (CAR) is computed through out the event period for the global finanacail crisis and presented in table 4.3. From the findings presented in the above table 4.1, it can be noted that CAAR for the martage market were positive during entire event window.

Table 4.5: Sample Statistics in the event period

Years	T	Mean CAAR	Sig. (2-tailed)
-4	.995	.7084	.343
-3	.931	.7262	.024
-2	.684	1.3705	.010
-1	1.122	2.4945	.031
0	1.119	2.6855	.007
1	1.127	3.0673	.026
2	.938	3.0849	.030
3	.841	3.1002	.020
4	1.093	4.4908	.300

Source: Research Findings

From the results shown in table above the mean CAAR was found to be positive in the period after global financial crisis an indication that the house trading volume reacted positively towards the global financial crisis, in the period before global financial crisis the mean CAAR was found to have value less than 1 , an indication the market was not sensitive to global financial crisis, in the results on t- value the study found that period surrounding the event date the value of t was close to 2 an indication that trade volume were very sensitive to global financial crisis, the study further revealed that the sigificance value surrounding the global financial crisis were less than 0.05 an indication that they were statistically significant .

4.2.3 Hypothesis Testing

Table 4.6: Hypothesis testing

	-4 to 0 years			0 to 4 years			Testing hypothesis
	T= $\mu 1$	Sig.	Mean	T2= $\mu 2$	Sig.	Mean	$\mu 1 - \mu 2 \geq 0$
Event period	5.797	.000	82805.73	4.967	.000	671106.5	0.83

Source: Research Findings

In order to test the hypothesis that $\mu 1 - \mu 2 \geq 0$, the mean for the entire event period , the t value for the pre post global financial crisis was done , the t test was done on the same data for pre and post global financial crisis , from the results the study found that the mean of the pre global finanacial crisis was less than that of post global finanacial and crisis an indication that there positive response by trading volume to the global financial crisis, it was also revealed that the value of t in pre period was higher than the t value in the post pre global finanacial crisis an indication that the entire period satisfied the condition that $\mu 1 - \mu 2 \geq 0$ which implies that the

trade volume reacted positively to pre global financial crisis in the Kenyan market . The p-value was found to be less than 0.05 an indication that they were statistically significant.

4.3 Interpretation of Findings

From the finding the study found that Kenyan mortgage market reacted positively to global financial crisis of year 2007s. There was an increase in volumes of house traded after global financial crisis of year 2007 compared to those before the global financial crisis. This study showed that there were positive mean returns with respect to global financial crisis , this is an indication that Kenya mortgage market reacted positively to global financial crisis and led to house price boom in Kenya. From the findings on the returns of the interest rates as results of global financial crisis. The study revealed that the Kenyan house market did not react very fast to global financial crisis which is an indication that the real estate market in Kenya was efficient though not that perfectly efficient; the significance value was found to be less than 0.05 an indication that they were statistically significant.)

From the finding on the variability of the market price from global financial crisis, the study found that the mortgage market reacted to global financial crisis. It was also revealed that variability in mortgage market does increase erratically with time though there is more variability in the years preceding and after global financial crisis. This supports the semi-strong form efficient market hypothesis since house prices adjust so fast to public information that no investor can earn an above normal return by trading on the global financial crisis year and years thereafter.

From the findings on the speed at which the mortgage market absorbs the global financial crisis in its prices, the study found that mortgage prices variability was more in post global financial

crisis period than pre- global financial crisis period, this is an indication that the mortgage market positively absorbed global financial crisis information positively. The study also found that CAAR for the mortgage market were positive during entire event window.

From the findings on the CAAR , the study found the value were positive in the period after global financial crisis an indication that the house trading volume reacted positively towards the global financial crisis, in the period before global financial crisis the mean CAAR was found to have value less than 1 , an indication the market was not sensitive to global financial crisis, in the results on t- value the study found that period surrounding the event date the value of t was close to 2 an indication that trade volume were very sensitive to global financial crisis, the study further revealed that the significance value surrounding the global financial crisis were less than 0.05 an indication that they were statistically significant .

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter gives the summary, conclusion and recommendation based on findings of the study in chapter four. This chapter gives the summary of the findings in reflection of the literature review and a comparison of the researcher own findings and the finding of the literature review.

5.2 Summary

This study investigated if there was any negative effect of 2007 global financial crisis on mortgage interest rates. This was done by analysis the mortgage interest rate before the global economic crisis 2006 and after the crisis. The Negative impact experienced in USA are: Significant fall in reduced number of mortgage applications, increased expected credit standards and score, increased mortgage interest rate, and increased number of loan defaults and foreclosures

Mortgage interest rate movements were analyzed through event study model. To construct an event study the event, event date, event window, estimation window & estimation model was determined. The events defined for this study was the 8 years surrounding the global financial crisis of year 2007. The event years were year 2007. The event window comprised some period before & after the event day. The event window in this study was 4 years before and 4 years after the global financial crisis. It can be expressed as -4 to +4. The estimation period is the period prior to the occurrence of the event. to test the hypothesis that $\mu_1 - \mu_2 \geq 0$, the mean for the entire event period, the t value for the pre post global financial crisis was done, the t test was done on the same data for pre and post global financial crisis, from the results the study found

that the mean of the pre global financial crisis was less than that of post global financial and crisis an indication that there positive response by trading volume to the global financial crisis A keen analysis revealed that the mortgage interest rate trend revealed in the data collected still gave a picture of positive effect of the 2007 global financial crisis.

5.3 Conclusion

From the finding the study found that Kenyan mortgage market reacted positively to global financial crisis of year 2007s. There was an increase in volumes of house traded after global financial crisis of year 2007 compared to those before the global financial crisis. This study showed that there were positive mean returns with respect to global financial crisis , this is an indication that Kenya mortgage market reacted positively to global financial crisis and led to house price boom in Kenya. The finding of the study was in agreement with what was found by Kaptich, (2008) who revealed that property companies in the East Africa are still enjoying an economic boom despite the global credit turmoil. His study identified that there is demand for property probably due to increase in population and stability in the region. The study also identified reluctance by banks in lending and predicted a slowdown in the real estate investments across the region as a result of this.

5.4 Recommendation for Policy

This survey is subject to inadequacies of limited scope and the fact that we do not intend to carry out the research in future. These limitations provide room for a similar, but more comprehensive nationwide survey to be carried out periodically. This survey has provided a framework that can be improved on, if necessary, and used to do a similar survey or any other related studies. Such surveys can be done by leading mortgage lending institutions, in collaboration with Kenya

National Bureau of Statistics (KNBS). Leading mortgage lending institutions should submit accurate data on to KNBS so as to enable this exercise. This will be instrumental in providing accurate, timely and consistent market information to the players in the market. As a result, mortgage firms in Kenya will continue to increasingly boom, just like it is in the Nairobi stock exchange (NSE) market.

The finding of this study was that Kenya's mortgage interest reacted positively to the global financial crisis of 2007. Other studies need to be done on factors that have favored Kenya against the expected positive impact.

5.5 Limitation of the Study

Secondary data was collected from the firm Hass Consultants and Central Bank of Kenya. The study was also limited to the degree of precision of the data obtained from the secondary source. While the data was verifiable since it came from the Consultants and Central Bank of Kenya publications, it nonetheless could still be prone to these shortcomings.

The study was limited to determining the effect of global financial crisis of 2007 on mortgage interest rates in Kenya. For this reason only data on interest rate and house price was used.

The study was based on a nine year study period from the year 2003 to 2011. A longer duration of the study will have captured periods of various economic significances such as booms and recessions. This may have probably given a longer time focus hence given a broader dimension to the problem.

5.6 Areas for Further Research

The study was limited to determining the effect of global financial crisis of 2007 on mortgage interest rates in Kenya. The study recommends an in-depth study to be conducted on the relationship between interest rate and house prices.

The study recommends a study to be conducted on other factors influencing mortgage interest rates in Kenya as it was found that global financial crisis of 2007 didn't have an effect on the mortgage interest rates.

There is need for a study to be done on the effects of global financial crisis of 2007 on real estate financing among commercial banks in Kenya.

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APPENDICES

Data on price index and interest rate

	Interest Rate	Real House Price Index
2003	13.4703	15000000
2004	12.25	15820935
2005	13.1607	16210000
2006	13.7401	16284652
2007	13.3223	18300000
2008	14.8727	18373273
2009	14.7606	18630940
2010	13.8718	19996447
2011	20.0438	20919793