RELATIONSHIP BETWEEN THE TYPE OF MORTGAGE AND THE LEVEL OF NON-PERFORMING LOAN PORTFOLIO IN THE MORTGAGE COMPANIES IN KENYA

BY
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DECLARATION

I declare that this project is my original work and has not been presented for a degree in any other University.

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Reg. Number   D61/P/9019/2001.

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

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DEDICATION

This project is dedicated to my parents in deep appreciation of enormous sacrifices they have made for my success.

ACKNOWLEDGEMENT

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LIST OF ABBREVIATIONS

1. BBK   Barclays Bank Kenya Ltd
2. CBA   Commercial Bank Of Africa Limited
3. CBK   Central Bank Of Kenya
4. EABS   East Africa Building Society
5. HF   Housing Finance Limited
6. NIC   National Industrial Credit Limited-
7. NPL   Non-performing loan
8. P&L   Profit and loss account
9. S&L   Savings & Loans Kenya Ltd
10. STD   Standard Bank Kenya limited

ABSTRACT

The need for decent housing is fundamental to human survival. To satisfy this need, individuals seek to invest in home ownership. Often this is the single most significant investment in a lifetime. These home investments are financed through mortgage arrangements.

Mortgages are long term loans primarily financing home acquisition or development. The primary risk that the mortgage company faces in advancing mortgage is that of default. Due to the prevalence of the default risk, mortgage companies will have stringent criteria for all mortgage applicants .The property financed will further be pledged as collateral for the loan. This, alongside other mitigations of risk, ensures that the impact of mortgage defaults on the mortgage company's profitability is minimized. In spite of these factors, the non-performing loans in mortgage companies continue to pose a major challenge to the industry

This study focused on non-performing loan stocks in mortgage companies in Kenya In particular, the project studies the relationship between the type of mortgage offered and the level of non-performing loan stock. The study relied on secondary data obtained from the industry regulators for the period 1999 to 2005 The studies identifies the categories of mortgage as fixed rate mortgages, adjustable rate mortgages, income property mortgages, capital repayments mortgages interest only mortgages and capped rate mortgages It explores the sources of risk in mortgage financing and identified the key ones as the interest rate, inflation, defaults, business, financial, liquidity, management, legislation and Environmental regulations The study identifies factors determining mortgage pricing as anticipated inflation, default risk premium and the real rate of interest.

The findings of the study reveal that a positive relationship exists between the type of mortgage offered and the level of non-performing mortgage portfolio.

CHAPTER ONE: INTRODUCTION

1.1 Background

It is often argued that no country in the world has ever experienced a high rate of growth in home ownership, as did the United Kingdom between 1979 and 1991. The number of individuals owning homes grew by astronomical numbers over this period, and so did the number of mortgage loans advanced by commercial banks. This was achieved through sale of houses previously owned by municipal authorities and local councils to the tenants. Commercial lending financed the sale. This growth in the mortgage industry in the United Kingdom ignited a lot of interest within the industry and Academia (Healey, 1993).

With an ever-increasing urban population, the demand for houses is insatiable. There is a long tradition that minimum standards of housing should be available to all regardless of income, especially where there are children in the household. A distinctive feature of the houses is that their cost is high; its rare that one can afford to buy one out of personal savings. The increase in housing demand therefore translates into demand of mortgages (Lipsey, 1993)

A mortgage is defined as a long-term commitment between a prospective homeowner and a financial institution with the sole purpose of financing the purchase of a home (Ndirangu, 2004). Pandy (1999) defines a mortgage as the transfer of a legal or equitable interest in a specific immovable property for the payment of debt. It is thus a debt instrument used to finance the purchase of a home or other form of real estate when the underlying real estate serves as collateral for the loan.

If the borrower defaults, the lender receives the title to the real estate as payment to the debt (Fisher, 1997). The type of mortgages issued by various mortgage companies may differ depending on how mortgage interest is determined and serviced or by source of capital /interest repayments.

The fixed interest mortgage is a long-term loan facility whose interest rate is fixed. The monthly interest charge on the mortgage is determined upon the execution of the borrowing agreement by the borrower. The advantage this mortgage has to the borrower is the high level of certainty. The rate of interest charged on mortgages may also be linked to prevailing rates in the money markets. This usually would be a markup over the Treasury bill or banks lending rate. This mortgage is called the adjustable rate mortgage. When the prevailing interest rate of interest is low, the borrower's mortgage interest obligation will be low. This is the main advantage to the borrower. However, should the interest in the money market rise, the borrower's interest obligation will rise (Stowe, 1997)

Capped rate mortgages are a type of mortgage that share in some attributes of the fixed and adjustable rate mortgages. Under this type of mortgage, the agreement is fundamentally one that is adjustable allowing for variations on interest charged on mortgage. The lender however guarantees the minimum and maximum rate chargeable. The determination of lower and upper limits within which interest charged should vary makes the mortgage very attractive to borrowers.

Under the capital repayment mortgage, interests is charged at the start of each period /year and then have the loan reduced through repayments calculated to discharge it over the full term (Souster, 1996).
Under each of the mortgage types described so far, the mortgage advanced reduces over a period of time.

For the interest only mortgage however, the borrower services only the interest element. The debt does not reduce until the end of the term when he makes a lump some payment to clear the obligation.

A final type of mortgage is the income-property mortgaged. Typically, this mortgage is used to finance residential apartments, office buildings and non-owner occupier properties. The asset financed provides revenue for serving the principle as well as the mortgage interest (Thygerson, 1995).

Mortgage houses like the commercial banks are faced with several risks. These risks range from operational, currency, interest rate, legal and credit risks. (Fabozzi,2005) . Credit risk is the risk that a borrower may be unable to meet his obligations. The likelihood of borrower inability to meet his obligations increases with loan term. This primarily is because over a period of time the borrowers earning ability may change. To this extent then it may be urged that Credit risk increases with the loan term and consequently, mortgages carry a higher degree of risk than conventional lending (Clauretie et al, 2003).

The mortgage house is exposed to a varying level of risk depending on the type of mortgage offered. The uncertainty of income on the income-property mortgages, the certainty of borrowers obligations under the fixed rate mortgages, uncertainty of borrowers monthly obligations under the adjustable rate mortgages all reflect the chequered nature of levels of risk. (Wiedemen, 2001). With high risks its probable that, the mortgage house will have a high level of Non-performing mortgages.

1.2   Statement of the Problem

Mortgage business is one of long term lending. Then credit evaluation process primarily assesses the borrower's ability to service the mortgage over its term. The borrower's environment is however very dynamic and subject to several changes. These changes impacts on the borrower's ability to service the mortgage.

Risk in mortgage business emanates from factors that range

from interest volatility (which creates a high debtor obligation under adjustable rate mortgages), to loss on employment earnings under adjustable rate mortgages or loss of income under income property mortgage. The mortgage companies therefore have not been spared of the non-performing loan problem .

Considering the influences of such factors and the severity of problem of the non performing loans, its important to analyze the relationship between the level of NPLs and the types of mortgage offered by mortgage companies in Kenya.

Non – performing Loans (NPLs) continue to hamper growth of the mortgage industry in Kenya in particular and financial institutions in general. By definition, a Non – performing loan is a financial portfolio that has been advanced for which the borrower is experiencing difficulties in repayments in line with the agreed terms (Reilly, 1997)

The non-performing loans have a critical financial implication on the mortgage company's balance sheet. The provisions made on non performing loan portfolio erodes the mortgage company's assets. Asset reported on the balance sheet are usually net of the provisions made for the non-performing loans

High stocks of non-performing loans are often an indicator of poor quality decisions and or weak management. This may knock off market confidence or trigger a rush by the stock holders to sell their shares Due to the low levels of market confidence, the demand of the stock will be low leading to low stock prices.

In so far as high levels of non-performing loans may lead to a decline in stock prices its in shareholders interest to ensure that the management is vigilant on this matter to avoid erosion of their wealth in the stock market(Market Intelligence Report 2005).

Mortgage institutions will however institute a rigorous process of vetting credit applications. This process primarily assesses the borrowers' ability to service the mortgage over the proposed term. The impact of changes in the borrower's environment on his ability to service the mortgage may differ depending on the type of mortgage. Based on management's appetite for risk, different mortgage houses will typically offer varying types of mortgage leading to a chequered distribution pattern of non-performing loans in the mortgage industry This study therefore investigates the relationship between types of mortgage and the level of non-performing loans in Kenya.

1.3 Objectives of the Study

The objective of the study is:

To determine the relationship between the type of mortgage and the levels of non-performing loan portfolio of mortgage companies in Kenya.

1.4 Hypothesis

Ho- No relationship exists between the non-performing mortgage portfolio and the type of mortgage offered by the mortgage companies in Kenya.

H1- A relationship exists between the level of non-performing mortgage portfolio and the type of mortgage offered by mortgage companies in Kenya.

1.5 Importance of the study

The findings of this study would be useful to the following groups of people:

Commercial Banks

The findings of this study will enable commercial banks and mortgage companies to understand the type of mortgage less likely to lead to losses through defaults This would be particularly useful in products design and design of risk assessment tools.

With this understanding the banks will be able to price their mortgage products appropriately. Normally, the commercial banks will charge a higher interest rate on more risky loans.

House Owners

It will enable mortgage applicants to engage in effective negotiation for mortgage rates and help them to identify mortgage facilities suitable to their circumstances and long-term affordability.

Industry Regulators

The non-performing loan portfolio is of great interest to industry regulators. The industry regulators will benefit from this study in highlighting the problem areas in mortgage industry. The report will assist the industry regulators to identify mortgage categories that require close monitoring

Investors and shareholders

The study will help Investors and shareholders of Mortgage Companies and commercial banks in monitoring the performance of their investment. By understanding the mortgage types that are more likely to lead to erosions of shareholders wealth. In this perspective, the Shareholders and Investors will be able to objectively evaluate the management performance.

Academia

The determination of existence of a relationship between the type of mortgage and the level of no performing loans or lack of it will satisfy academic curiosity.

CHAPTER TWO: LITERATURE REVIEW

2.1 The Risk In lending

Banks are in the business of taking risks. The level of risk and uncertainty varies in direct proportion with the period of time for which a mortgage has been borrowed. Longer period of time for repayment will naturally have a higher level of risk and uncertainty (Wood, 1982).According to Nyandemo and Singh (2003), uncertainty is a situation when decision makers do not have full knowledge about the future of the product, demand, factor costs and other relevant variables. It may be stated that uncertainty is a state of knowledge in which one or more alternative result in a set of specific outcomes but where probabilities of the outcome are neither known nor meaningful. They also defined risk as the probable measurement of uncertainty. In other words, when uncertainty is reduced to possible outcomes and to alternative courses of action it becomes a risk. Risk is therefore a state of knowledge in which each alternative leads to one of a specific set of outcomes, each occurring with a probability that is known to the decision maker

It may therefore be asserted that the decisions to advance credit facilities carry a higher degree of risk and uncertainty as the loan term increases. The expected return should compensate the increase in risk and therefore interest charged on mortgages will be higher than that charged on short-term loans all other factors being equal

2.2   Categories of Mortgages

Meir (1999) identified the categories of mortgages. as fixed rate mortgages. adjustable rate mortgages. income property mortgages, capital mortgages and interest only mortgages.

2.2.1 Fixed rate mortgages

Fixed rate mortgages have been the more prevalently used in home financing. A fixed rate mortgage specifies an interest rate that is fixed over the term of the loan. Consequently, the loan repayments periodically deducted on the borrowers account are fixed. Typically this would be an amortized loan combining both interest and principal loan repayment into equal periodic repayments.

These mortgages carry a higher degree of certainty as the return to the bank is well known at the commencement of the facility and the obligation by the borrower is fixed. Banks will however impose heavy penalties on early repayment of this facility to discourage lump some payment of this loan as this may curtail their future expected earnings (Clauretie, 2003).

2.2.2 Adjustable rate mortgages

There are several versions of the variable rate mortgage. A common feature in all the variable mortgages is that the chargeable rate is a margin above the base rate or the Treasury bill rate. While the margin above the base or Treasury bill rate may itself be fixed, the rate charged on the mortgage will primarily be driven by short term movements in the money market. This implies that the net amount paid by the borrower cannot be projected with certainty. These loans are not amortized and therefore the borrower makes separate payments for interest and principal loan amount (Ndirangu, 2004).

The interest is charged on the current account monthly while the principal repayment is charged separately to the same account. In the long run Mayo (1998) stated that lenders have to ensure that their lending rates cover the interest paid to the depositors and their operational expenses.

2.2.3 Income property mortgages

This type of mortgage is not common in Kenya. It refers to a situation where the property financed is the collateral against the debt. Several companies will come together to finance the project and besides the borrowers own contribution to the project is significant. The property being financed is usually commercial based. Common examples include the apartments, offices, shops to let and warehouses among others. This nature of a mortgage will be serviced from the income generated from the collateral. The interest rate charged reflects the risks associated with the property ability to generate adequate income to cover both the interest and principle amount (Reilly, 1997).

2.2.4 Capital repayment mortgages

The monthly repayments cover both capital and interest on the mortgage. Most banks charge interest at the beginning of the period and then have loan reduced through repayments calculated to discharge it over the full term (Souster, 1996) In the initial periods of loan repayments, the interest proportion in the monthly repayment is far much greater than the principal loan. It is common for the lenders to insist on a credit life insurance protection cover over the borrower's life to cover any eventuality of death while the loan is outstanding (Fisher, 1997).

2.2.5 Interest only mortgages

Under this mortgage the borrower only meets the monthly interest obligations. The principal is repaid at the end of the loan term This then implies that the principal debt advanced does not reduce overtime and there is no guarantee that the individual's investment will grow sufficiently to repay the loan (Crosby, 1996).

2.2.6 Capped Rate mortgages

This is an improvement of the variable rate mortgage. It provides for the maximum chargeable rate for a period of time. With such a mortgage the borrower is usually protected from serious rises in the interest rate charged.

In an environment of risk and uncertainty the type of mortgage offered by the bank has an influence the following. Firstly, the return to shareholders since some of these mortgage arrangements provide for a revision of the interest rate charged. This enables the bank to recover its costs without any restrictions. This enables the bank to recover its costs without any restrictions (Khan. 1999).

On the other hand, Fixed and capped interest rate mortgages confines the banks to charge rates that are within certain specified limits. Should the costs of providing the service escalate the bank may be trading unprofitably(Mier.1999).

Secondly, the borrower's future capacity to meet his obligations. Where the bank has a free hand in revising the rates charged on the mortgage. there is a possibility that it could affect a rate that is unaffordable to the borrower. Such borrowings would eventually be categorized under the non-performing loans

2.3 Types of Risk

There are some investment characteristics peculiar to real estate that makes it more risky than investing in government securities. A summery of major investment risk characteristics that must be considered by investors and mortgage borrowers when deciding among alternative mortgage structures are discussed here under. Interest rate, inflation and default rate risks are common to all mortgages. while business and management risk has a higher impact on income property mortgages than residential mortgages. This enables the bank to recover its costs without any restrictions

2.3.1 Interest rate risk

Changes in interest rates will affect the price of all securities and investments. Depending on the relative maturity (short term vs long term), however some investment prices will respond more than others thereby increasing the potential loss or gain. Real estate tends to be highly levered and thus the rate of return earned by equity investors tends to be affected by changes in interest rate. Even where the investor has a fixed rate mortgage, an increase in interest rate may lower the price a subsequent buyer is willing to pay. Further more the yield rate (required rate of return) that an investor requires for real estate tends to increase with the overall levels of interest rates in the economy(Fisher,1999).

2.3.2 Inflation Risk

Unexpected inflation can reduce an investor's rate of return if the income from investment does not increase sufficiently to offset the impact of inflation thereby reducing the real value of the investment. Real estate has historically done well during periods of low inflation than in periods of high inflation.

This might be attributed to the uses of leases that allow for pricing adjustment with unexpected changes in inflation rates. Typically this is a common clause in adjustable rate, capped mortgages. Interest only mortgages.

Further more, the replacement cost of real estate tends to increase with inflation. During periods of high vacancy rates, when the demand for space is weak and new construction is not feasible, the income from real estate does not tend to increase with unexpected inflation (Matysiak, 2000)

2.3.3 Default Risk

When making mortgage loan, one major concern of the lender is the risk that borrowers will default on their obligations to repay the principal and interest. This is referred to as the default risk and it varies with the nature of loan and creditworthiness of the individual borrower.

Default risk relates to the likelihood that the borrower's income may fall after the loan is made, thereby jeopardizing the receipt of future mortgage payments. Similarly should the market value of a property fall below the outstanding loan balance the borrower to lose the motivation to repay the mortgage leading to default. The possibility that a default may occur means that lenders charge a premium or higher interest rates to offset possible loan losses(Clauretie,2003)

2.3.4 Business Risk

This risk is more prevalent on income property mortgage than any other type of mortgage. Real estate investors are in the business of renting space. They incur the risk of loss due to fluctuations in economic activity that affect the variability of income produced by the property. Changes in economic conditions often affect some properties more than others depending on the type of property, its location and any existing leases.

Many regions in the country experience differences in the rate of growth due to changes in demand, population changes etc. Those properties that are affected to a greater degree than others will be riskier. A property with a well-diversified tenant mix is less likely to be less subject to business risk. Similarly, properties with leases that provide the owner with protection against unexpected changes in expenses will have a lower business risk. Commonly, leases will provide contain a clause that allows the owners to review the rent due to recover any increase in costs necessary in managing the property (Matysiak, 2000).

2.3.5 Financial risk

The use of debt financing (referred to as financial leverage) magnifies the business risk. Financial risk increases as the amount of debt proportion financing a mortgage increases. The higher the loan to value ratio the higher the financial risk(Fabozzi,2005).

2.3.6 Liquidity risk

This risk occurs when a continuous market with many buyers and sellers and frequent transactions is not available. The more difficult an investment is to liquidate, the greater the risk that a price concession may have to be given to a buyer should the seller have to dispose off the investment quickly. Real estate has a relatively high degree of liquidity risk.

It can take 6-12 months to sell real estate income properties especially during periods of weak demand Special purpose properties would tend to have a much higher liquidity risk than properties that can be adapted to alternative uses(Kohn,1999).

2.3.7 Management Risk

Most real estate investment requires management to keep the space well maintained to preserve the value of the investment. The rate of return that the investor can earn depends on the competency of the management This risk is based on the capability of the management, its ability to innovate, respond to competitive conditions, and operate the business activity efficiently(Clauretie,2003).

Some business requires a higher level of management expertise than others. For example regional malls require continuous marketing of the mall and leasing of space to keep a viable mix of tenants that draw customers to the mall. This risk is therefore higher on income property mortgages than other mortgage types(Matysiak,2000).

2.3.8 Legislative Risk

Real estate investments are subject to numerous regulations such as tax laws, rent control, zoning, and other restrictions imposed by the government. Legislative risk results from the fact that that changes in regulations can adversely affect the profitability of the investment. This risk has a considerable impact on income property mortgages that the other mortgages. Some estate and local governments have more restrictive legislation than others, especially for new developments(Kohn,1999).

2.3.9 Environmental Risk

The value of real estate is affected by changes in its environment or sudden awareness that the existing environment is potentially hazardous. For example, while it used to be common to use asbestos to insulate building, asbestos buildings are now perceived as a health hazard. A property may also become contaminated by toxic waste that is spilled or was once buried on the site or an adjacent site. Environment risk can cause more of a loss than the other risks mentioned above because the investor can be subject to a clean up costs that far exceed the value of the property.

Ultimately, a prospective investor must estimate or compute an expected return on the project and compare it with expected returns of other specific real estate investments as well as other investments.

Any risk differentials must then be carefully considered relative to any risk premium or differences in expected returns in all such comparisons. This will enable the investor to justify such an investment(Berry.1993).

2.4 Risks Facing Different types of Mortgages.

The various types of risks described above may not occur simultaneously. Depending on its nature a mortgage may be susceptible to one or a combination of any of the risks described above. The severity of non-performing loans in mortgage companies in Kenya evidences the high levels of defaults in the industry. Default risk (the probability that the borrower may be unable to meet his obligations) may be precipitated by occurrence of the other risks. The mortgage lenders normally charge a premium to cover the default risks. This premium is a key component of the interest charged on the mortgage.

This partly explains why the various types of mortgages will attract different interest rates(Fabozzi.2005).

2.4.1 Risk and fixed interest mortgages

For a mortgage lender to remain liquid, a deposit must match any mortgage advanced. The deposits are reported as liabilities on the balance sheet while mortgages are reported as assets. The lender will be required to pay some interest on the deposits. This represents the costs to the lender. The interest charged on the mortgages will normally be higher than that paid on the deposits. The difference between the two rates of interest is referred to as the spread All the costs associated with operating the mortgage institution have to be covered by the income generated by the spread(Fisher,1997).

Whilst the mortgages are long term facilities spreading over 15-30 years, the maturity term of the deposits is normally short term often 3,6,9or 12months. This has the following general implications:

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There is often a general maturity imbalance between the assets and liabilities of the mortgage houses. This implies that mortgage lenders have to source for significantly high deposits in relation to the loans advanced to avert a liquidity crisis(Fabozzi,2005).

The interest paid on short-term deposits is often higher than that paid on long term deposits. This is mainly because the short-term interest (cost of funds in the short run) is a reflection of the lender and depositors expectations of the interest movement in the foreseeable future. In the long-term, some of the factors influencing the money market will have subsided. Further the depositors prefer the short-term investments due to the flexibility they enjoy. Should a need arise or should they identify an investment paying a higher return they are able to redeem the deposits quickly.

Where the deposit is held on long-term basis often 12, 18, and 36 or 60 months the rate of interest earned is lower. Moreover, the depositor is often required to give a withdrawal notice should he intend to redeem his investment. Even then, the penalties on such a withdrawal are quite punitive. From the foregoing, it is clear that the deposits funding fixed interest mortgages are susceptible to short-term market rates. If the interest rates rise, the spread is eroded by the increase in interest rates, as the lender cannot transfer the additional costs of funds to the borrower. Under fixed interest mortgages, the lender assumes all interest rate risk that is the variation of returns due to movement in market interest rates. Because of the absence of mechanism to transfer additional costs of borrowing to the borrower, fixed interest mortgages will normally be priced higher than the adjustable mortgages(Matysiak,2000).

The high interest rate charged on fixed interest mortgages, whilst creating certainty on the part of the borrower has the following implications;

The cost of borrowing to the borrower is significantly high. Often the lender will assess the borrowers' ability to sustain a stated level of income as to be able to service the mortgage. The assessment is however often limited to short term conditions affecting the borrowers' ability to generate adequate income to meet the debt repayments(Clauretie,2003).

However, often, the borrowers' income will fall due to loss of employment change in job market conditions or some other unforeseen circumstances that makes the continued mortgage repayments unsustainable. Sometimes the property market in which the asset being financed is located changes radically leading to decline in market values. Commonly such changes are brought about by events emanating from environmental or legislative risks. An environmental risks factor arises due to increased awareness of the environment. The use of asbestos to insulate houses or aluminum for roofing is now considered a health hazard. Properties with such metals are likely to have their market prices tumble(Kohn,1999)

Legislative risks are associated with new laws that are applied retrospectively. This is particularly common with taxes on property income and zoning guidelines issued by municipal authorities. When the property market price declines to levels lower than the mortgage debt balance, the borrower loses the motivation to service the debt. This market situation may also result from decline of property prices that typically follows a property boom. This condition is referred to as the negative equity(Fisher,1997).

Lenders normally anticipate the fixed interest mortgage to be serviced as agreed with no default or early payment. Having already booked the expected income from fixed interest mortgages, the lenders discourage early repayments by imposing a punitive penalty. The early repayment penalty is often an equivalent of the un-earned interest that the lender is likely to loose if the borrower settles the debt early(Fabozzi,2005).

The fact that the fixed interest mortgages are highly priced by lenders as a return for the interest rate risks taken and lacks the flexibility to respond to the market conditions leading to negative equity makes the proposition more risky than any other. Consequently, higher rates of defaults are anticipated with fixed rate mortgages than with the other types of mortgage. One major problem with fixed rate mortgages is that the interest rate is fixed on the date of origination and remains fixed until loan is repaid. Hence from the date of origination the lenders are underwriting the risk of any significant changes in implicit components of the mortgage interest rates. To the extent that lenders underestimate one or all the above variables at the time of origination of the fixed interest mortgage, they will incur a financial loss(Matysiak,2000).

There are many reasons why lenders may inaccurately predict the components of the inflation (I) over the expected repayment period. Monetary growth may expand or contract-causing changes in the rate of inflation (f).

General economic activity may expand or contract, resulting in a change in the general level of investment and employment, thereby affecting real interest rates and default risk (r and p).To avoid this loss arising from the unanticipated inflation lenders often require a higher default risk premium on fixed interest rate mortgages than on Adjustable interest rate mortgage.(Clauretie.2003).

2.4.2 Risk and adjustable rate mortgages

These loans are made with either adjustable interest rate or with a variable payment provision that change with economic condition. These instruments differ from the fixed interest mortgages in that they are designed to adjust in one or more ways to changes in economic conditions. Rather than making mortgages with fixed rates of interest overlong periods of time these mortgages provide an alternative method of financing through which lenders and borrowers share the risk of interest rate changes.

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This enables lenders to match changes in interest costs (costs of deposits funding the mortgages) with the changes in interest revenue more effectively and thus provide borrowers with potentially lower financing costs(Crosbie,1996).

2.5   Determinants of Mortgage Pricing

When pricing or setting the interest rate of a mortgage, the lender must charge a premium (p) that is sufficiently high to compensate for default and other risks, a premium (f) that reflects the anticipated inflation to earn a real rate of interest (r), which is competitive with real returns available on other investments opportunities in the economy. If any of these components is underestimated, the lender suffers a real economic loss (Fabozzi, 2005).

This relationship assumed to be of linear nature might be described as follows:

$$I = r + p + f \quad \text{where I is the interest on mortgage}$$

r is the real rate of interest

p is the premium on default risk

f is the anticipated inflation

The assumptions in this case are that each of the variables making up (I) are independent and additive, historical data on each of the variables is available to guide and inform decision making, and changes in interest rates, mortgage repayments and loan balances under adjustable rate mortgages .

By their nature, adjustable rate mortgages will have changes in interest rates, mortgage repayments and loan balances. There are generally two common approaches to these adjustments.

2.5.1 The price level adjustment

The lenders originate mortgages at interest rates that reflect expectations of the real interest rates plus a risk premium for the likelihood of loss due to default on a given mortgage loan. That is, real interest rate on a mortgage i = r +p

After estimating initial values for r and p, the loan balance would be adjusted upwards or downwards by a price index. Mortgage repayments would then be based on a new loan balance, adjusted for inflation This would shift the risk of changes in market interest rates brought by inflation (f) to borrowers and relieve lenders of the difficult task of forecasting future interest movements when originating loans. The lender would however still bear the risk of any unanticipated change in r or p

The mortgage agreement also provides that the mortgage will be indexed to the consumer price index (CPI) and adjusted annually.

This process which continues year after year, involves: computing the loan balance using an amortization schedule based on interest rate for the remaining term, increasing the balance by the change in the consumer price index (CPI) during the next year, and computing the repayment over the remaining term.

It is often argued that the process of adjustments occurring at the end of the year can be viewed as an annual series of new mortgage loan originations. Therefore payments may be modified based on different rates of interest or maturities with outstanding loan balance always representing the new amount being borrowed (Goacher, 2002).

2.5.2 Problems with price level adjusting approach

It is a common occurrence for mortgage balances to initially rise. This primarily occurs due to the low impact of the expected repayments as compared with that of the CPI. Should prices of the other goods represented in the CPI rise faster than housing prices, indexing loan balance to CPI would result in loan balances increasing faster than the property value. Once the debt outstanding exceeds the property value, the borrower would have an incentive to default. This poses a serious challenge to the lenders. Where this is anticipated, lenders will require the borrowers to make a significant level of deposit in the initial period to reduce the loan balance (Fisher, 1997).

This approach assumes that the CPI and the borrowers' income will grow at the same rate. In normal circumstances the annual income increases reflects the growth in CPI. However, should inflation rate increase sharply it is unlikely that the borrowers income would increase at the same rate. During such periods, the borrower may be unable to meet the new mortgage repayments leading to defaults. Lenders therefore have to estimate future incomes of the households in different occupational categories and the relationship of that income to inflation.

A fundamental problem with this approach however lies in the fact that the index is based on data collected in the previous period and published in the current period. The index based on historical data may not accurately predict future mortgage repayments. This problem is more exacerbated when the CPI drops and then rises. To overcome this problem lenders normally recommend that the index be reviewed regularly (Chorafas, 1995)

Moreover, the rate of inflation will affect the mortgage loan repayments and not the deposit costs where the interest paid on deposits. Should the interest paid on mortgages rise faster than interest on deposits a profit squeeze may develop.

2.5.3 Index to market interest rates

Under this approach, rather than use changes in price levels as a mechanism to adjust mortgage interest rates and payments, mortgage houses offer a variety of mortgages that are indexed to other market rates. Common used indexes include the interest rate on six-month treasury bills, interest rates on one-year treasury bonds, interest rates on three treasury bonds, interest on five-year treasury bonds. The weighted average of national cost of funds (deposits) as complied by the Central Bank (Chorafas, 1995).

In using this approach, the lenders avoid the trouble of having to estimate real interest rates and risk premium for the entire period that the loan is expected to be outstanding. Effectively, the lenders under this method offer loans with terms that are updated to current interest rate at the end of each adjustment period. The adjustment period may be six months, 12 months, two, three or five years depending on the index used. The interest rates are a reflection of borrower and lenders expectation of future values for r, p and f over the outstanding loan period Hence this approach provides for adjustments that are more timely than the price level adjustment mortgages because values for r, p, and f are revised at specific time intervals to reflect market expectations of each components of interest between the adjustment dates (Fabozzi, 2005).

2.5.4 Problems with the market index rated mortgages

This approach does not entirely remove the possibility of lender realizing losses because of interest rate risk. If for example, the market rate increased to 12 % on the day following the mortgage origination in the above illustration, the lender would have to sustain a 2 % until the adjustment period is over (Matysiak, 2000).

This may be addressed by inserting clauses In the mortgage agreement that allows the mortgage house to determine the adjustment period without reference to the borrower. This however will create uncertainty to the borrower. To the borrower, the market rate Indexed mortgage is more complex than the price level adjusted mortgage. Moreover, future increase in market rates also implies rise in cost of deposits that further reduces the returns on the mortgage. Market rate Indexed mortgages therefore may not completely relieve the lenders from the possibility of making loans with expected yields that is inadequate in relation to future deposit costs (Kohn, 1999).

To the extent that lenders select inappropriate indices, market margins or adjustment periods, they may be underwriting considerable amount of interest rate risk that may be adversely affect profitability. The market rate indexed mortgage may shift all or part of the interest rate risk to the borrower, the risk of default will generally increase to the lender, thereby reducing some of the benefits gained from shifting the interest rate risk to the borrowers. If, for instance the mortgage lender were to shift all interest rate risk to the borrower thereby increasing the required repayments in tandem with any changes in market rates without any limits, the risk of default would rise considerably (Souster, 1996).

Its important to recall that mortgages are long-term loan facilities and the borrowers income may dwindle due to retirement, retrenchment or change of employment. As such unanticipated increase in the mortgage repayment may lead to default. It is however, a common practice for lenders to assess a borrower likelihood of default under different market rate indices and plans that shift part or all the interest rate risk to borrowers and adopt the most appropriate one.

2.6   Purposes of Mortgages

Mortgages provide funding for the following purposes; (Meir, 1999)

2.6.1 Home purchase

This is the primary purpose of mortgages. Typically these mortgages will have tenure of five to thirty years. In more developed   markets   mortgages in this category are specifically applied in financing purchases of new houses for owner occupier purposes only. The target market for this product is usually newly married couples, fresh graduates and newly employed workers. It is envisaged that the borrower's income is expected to increase in future and thereby ease the pressure on his earnings.

2.6.2 Collateralized borrowing

This is a borrowing against an existing mortgage to meet other purposes other than home purchase. Typically this is a borrowing against an existing home In principle, this type category of borrowing is aimed at releasing the value trapped in the house investment in to some other domestic application.   A property acquired through mortgage financing 10 years ago might have appreciated in value while the debt outstanding in the bank has reduced (Baye, 2002).
 The difference between the property's current market value and the outstanding mortgage value represents the owner's equity. Mortgage companies advance secured borrowings against the owner's equity (Geist, 1998).
 In a family set up, financing obtained through equity release may be used for such purposes as payment of bills, school fees, acquisition of an asset such as a motor vehicle, or any other debt obligation.

2.6.3 Construction mortgages

Conventional construction mortgages will be available to enable debtors construct their own homes. Commercial banks regard these mortgages as high risk due to the following factors:

Firstly, the possibility of inability to complete the project. This view is borne of experience than of any predictive science. This may be caused by diversion of the projects financing to other purposes. Secondly, the possibility of material and labour prices escalating over the construction period making it difficult for the projects objective to be achieved. Thirdly, the possibility of having poor quality finishes than otherwise envisaged. The poor quality finishes may be a product of poor /cheap material used or poor workmanship. This is a significant factor due to the involvement of several professionals in the construction. It has to be remembered that the construction mortgage carries an aspect of delivery risk; the probability that the parties involved in the transaction will not deliver the product sought. Understandably, the interest rate charged on construction loans is higher than that charged on the other mortgages categories (Baya, 2002).

2.7 Sources of Non-performing Loans

There have been numerous theories explaining the possible sources of non-performing loans (Kagondu, 2001; Meir, 1999). The Central Bank Report of 2001 notes that the level of NPL in the banking industry was 38 %.as at 30th June 2001 which was attributed to the following interrelated factors;

2.7.1 Poor credit evaluation

The lack of scientific methodology in assessment of credit coupled with lack of relevant training in identification of good credit. Kagondu (2001) observed that only 30 % of credit officers are trained on credit assessment techniques.

2.7.2 Poor governance

Poor governance in most commercial banks exacerbates the problem where no checks and balance systems exist to ensure that the credit officers adhere to the proper assessment procedures.

2.7.3 Fall in economic conditions

The prevailing economic conditions may impact on the ability of the borrowers to meet their loan obligations. In an environment of increasing inflation, weakening currency rates and low gross domestic output the default rates on loans are expected to be high due to pressures exerted on the households income.

2.7.4 Insider lending

This refers to loan facilities advanced to directors, management and staff of the mortgage company. Controls over the lending to such borrowers are often weak. The borrower is able to influence the credit officer to his favour to disregard all credit rules.

2.7.5 Incomplete and inadequate credit information

No matter how skilled an officer is where inadequate information is offered there is a high probability of arriving at the wrong decision.

A wrong decision in credit assessment could be one which bad credit is sanctioned or good credit declined. The latter denies the bank some revenue while the former contributes to non-performing loans (Goacher, 2002).

2.7.6 Court Injunctions

Court injunctions are not by themselves causes of the non-performing loans. In the event of default however the borrowers seek court injunctions to bar the banks from recovering the debt. Moreover, the banks are required to issue three statutory notices before they can realize an asset pledged as collateral against a non-performing loan. In practice this may take up to seven months. Although the banks issue the notices as required by law, more delays on the recovery can be occasioned by court injunctions usually issued one or two days before the Auction (Hampel, 1994). This is common in cases of foreclosure. It becomes more complicated where the bank is required to seek authority from the court to realize a property held as collateral to a debt.

To the extent that the court process is viewed as an impediment to enforcement of credit agreements, the injunctions may be understood to be one of the causative factors to high non-performing loan portfolio in the banking industry.

To reduce the impact of non-performing loans on their returns, commercial banks have over time adopted a multi-dimensional in product design and credit assessment.

These approaches include offering a products mix that ensures that the risk of default is evenly spread over a wide spectrum of products and borrowers, each product having a differentiated target market and typically have a varying product life span and designing unique products that are tailor-made for specific categories of borrowers (Baye, 2002).

2.8 Approaches of Determining Interest on Mortgages

There are two main methods of calculating interest on mortgages, namely:

2.8.1 The reducing loan balance method

Under this method, the borrower meets the interest and capital loan obligations periodically. Consequently, the borrower makes a significantly high amount of repayment towards the mortgage repayment. In such cases interest is calculated on the balance of the mortgage facility outstanding monthly. This approach is usually adopted for adjustable rate mortgages. Typically the interest paid by the borrower varies from one period to another (Rouse, 1997).

2.8.2 Amortized Interest

Common with fixed rate mortgages, the amortized interest charge methodology implies that the total interest chargeable on a facility is calculated upfront. The total amount due from a borrower is the sum of total interest and the principal advanced. This amount is then subdivided into equal periodic repayments.

In this case therefore the amount paid by the borrower in the periodic repayments comprises of two-debt obligation; the interest   and the principal portions (Broadhurts, 1996).In general the borrower pays more under the amortized interest mortgages than the net interest method.

2.9   Factors Influencing Interest Charged on Mortgages

The interest charged on a mortgage represents the mortgage companies' return on the investment. To the borrower, the interest charged represents the price of the mortgage. The interest rate charged on a mortgage will be influenced by the following factors (Kohn, 1999).

2.9.2 The borrowers credit rating.

Banks rely heavily on credit reports for information about applicant's credit history. By examining past credit history of a potential borrower, a bank reduces the level of asymmetric information about that person. In effect the bank can infer the probability that a potential borrower will or will not default on a new loan by examining the frequency with which that borrower has defaulted in the past. If the credit report is sufficiently accurate, symmetric information between bank and the potential borrower exists. In this case the bank can set an interest rate for the borrower that is consistent with his or her likelihood of default and charge individuals with poor credit reports higher interest rates than those with good reports.

There is however some two main principle weaknesses associated with credit ratings (Baye, 2002). Firstly, the information held by the credit rating agency may be inaccurate or incomplete. Secondly some borrowers may have no credit history because they have never borrowed. Nevertheless, where the credit report is available the banks will refer to them in determining the quality of the borrower and consequently the interest to be charged (Market Intelligence Report, 2000).

2.9.3 The type of the mortgage

Different mortgage types attract different interest rate. In an environment characterized by low interest rate, the fixed rate mortgages usually is priced higher than the adjustable mortgage. In an environment where the rates are expected to fall, both types of the mortgages are expected to be priced at the same level (Geisst, 1988).

2.9.4   The term of the facility

Mortgages are long-term credit obligations. The interest charged may vary with the term of the facility. The pricing would however vary directly with the type of the mortgage as well as term of the facility as thus; short term fixed rate mortgages, with tenure of up to 5 years will attract a high interest rate based on a mark up over bond prices of a similar term. In addition medium term Fixed rate mortgages with a tenure of up to 10 years will attract a rate lower than the short-term fixed rate mortgage.

Adjustable rate mortgages will generally be priced at a rate that is primarily influenced by the short-term money market factors. The banks have an option of varying the rates every time the market factors changes. Both short term and long term adjustable mortgages will therefore attract the same interest rate(Reilly,1997).

2.10   Problems Experienced by the Mortgage Market.

There are two major problems experienced by the mortgage market namely the fragmentation of the mortgage market and vulnerability of the lending institutions to interest rate risk (Kohn, 1999).

2.10.1 Fragmentation of the mortgage market.

The concentration of mortgage lending in the hands of financial institutions operating only in regional centre may result into a fragmented mortgage market. In a fragmented market, one region may be experiencing a housing boom while another may be undergoing a slum. The major reason for this is the fact that the main commodities being traded in the mortgage market are immovable. Surplus supply in one area cannot therefore compensate for a deficit in another.

However, this has not been a big problem in Kenya. This is attributable to the fact that the government has vested interests in the mortgage industry.

It has formulated policies that keep the mortgage rates fairly uniform across the country(Market Intelligence Report,2005).

2.10.2 Interest rate risk for financial institutions.

Interest – rate risk poses an even greater risk to mortgage companies than default risk. Traditionally, the mortgage companies have largely relied on specialized mortgage lenders. There principal assets have been long term, fixed – rate mortgage; their principal liability, the short – term time deposit. As a result, their books of accounts suffered from a dangerous maturity mismatch. The mortgage companies are protected from such losses through regulation. The Implication of this is that when Interest rates rose, the rates of their deposits remained the same. Instead of taking a loss, they suffered dis-intermediation.

Deprived of new funds, they were unable to write new mortgages. Whenever dis-intermediation pressure (the difference between market rates and regulated deposit rates) increased, the growth in mortgage lending declined(Meir,1999).

Even where we have adjustable rate mortgages that are pegged to some short-term market rates, it may sometimes lead to increase in default risk.

What happens is that if interest rates go up as a result of increase in Treasury bill rates the monthly payments by the borrowers goes up. Consequently, most customers are forced to default thus increasing the level of NPLs (Ndirangu, 2004).

2.10.3 Government policy on interest rates.

Government policy on interest rates can directly help with systemic resolutions of the NPLs issue. The first has to be better CBK regulation of the financial sector and secondly, maintaining a stable monetary policy environment.

Policy instability can easily cause wide fluctuations in interest rates that would consequently impact negatively on the performance of mortgage companies.

On the macroeconomic level, the government has embarked on a shift on policy by reducing short – term borrowing through both 91 day and 182 day treasury bills, to long term borrowing through treasury bonds. This has significantly stabilized the interest rate market with a positive impact on the mortgage market. This is due to the fact that in most cases, the interest charged on mortgages reflects interest earned on treasury bonds.

If the government floats a 5-year bond at 6% interest, this forms the benchmark for which the interests on mortgages are pegged. However, in addition to this, the mortgage company takes into account the default premium and the cost of running the company thus offering the mortgage at a higher rate of interest (Dimitris, 1995).

2.10.4 Government equity

NPLs continue to be the main obstacle to growth of the mortgage industry in Kenya. For the past seven years, Kenya's financial sector has been under a huge portfolio of bad debts.

But in many ways, NPLs highlight systemic weaknesses in the financial sector. The main ones include poor intermediation, low national savings due to low deposit rates and low investments that do not generate enough returns to service short-term loans and debt instruments. Japan and Korea took the bold step of re-capitalizing banks by using public money to clear NPLs.

This can be done by buying the NPLs and converting them into government equity (Market Intelligence Report, 2001).

2.10.5 Competition

Banking is a scale game, and size matters. On average larger deposits and loans can be made at little incremental costs. Larger banks can also spread technology and infrastructure investments over more customers and transactions leading to lower costs.

In the recent past, other chief players in the financial sector like Barclays, NIC, Investment and Mortgages, Standard Chartered and CBA have started venturing in the mortgage industry thus making the industry more competitive.

For example, Barclays Bank has rolled out a new home loans product that provides financing of up to 85% of the cost of a new home at a variable interest rate of 12.5% with a repayment period of up to 15 years. The mortgage providing companies are operating in an increasingly competitive environment a factor that has a direct impact on their performance (Omondi, 2004).

2.11   Mortgage Industry in Kenya

The mortgage companies constitute a subset of the financial markets in Kenya. The other significant players include the commercial banks, pension schemes and Pension funds, the capital markets, and the Savings and Co-operative societies.

Despite their common characteristics, mortgage companies have developed several quite distinct operational differences over the years, which have only, recently began to converge. Perhaps the most important of this is the reliance upon floating, or adjustable, interest rates as the basis for accepting deposits and pricing new mortgages (Market Intelligence Report, 2004).

The other factor is that competition provided by other financial institutions has forced many mortgages companies to change some of their traditional practices. For instance, It is no longer mandatory for customers to have funds on deposits with a mortgage company or society before applying for a mortgage.

The older practice that dictated that societies only actually lent to their own depositors, a type of compensating balance, is increasingly being shelved in favour of more contemporary, competitive practices(Omondi, 2004).

While it is still appropriate to say that the mortgage societies survive in much of their original forms, their actual lending and depository practices have changed due to increasing external pressures from the other sectors of the financial industry.

For the purpose of this study, we analyzed the performance of three mortgage companies that dominated the industry in Kenya with keen interest on their respective non-performing loan portfolio and the main type of mortgage offered. These are Housing Finance Company of Kenya, East Africa Building Society and Savings and Loans Kenya Limited.

2.12 Non-performing Loan (NPLs) Portfolios in Financial Institutions.

There is a correlation between loans (whether recoverable or not) and provisions for bad and doubtful debts such that the larger the provision for bad debts the higher the probability that the bank has a huge portfolio of non-performing and / or unrecoverable loans.

Due to this correlation, the nature of the borrowing instruments involved in a lending transaction is very vital as it determines the mode of recovery to be employed if and when the borrower defaults(Market Intelligence Report,2004).

The most common lending instruments are guarantees, debentures, charges and mortgages. These instruments are usually to secure advances independent of each other or in combination.

Mortgage companies secure their interests using charges and mortgages in themselves as lending instruments. They only apply to immovable property and once executed and registered, the title is only partly vested in the borrower and therefore the borrower cannot deal with the property so charged or mortgaged without consent from the lender. This is provided for in law. It is a legal requirement that loans should be secured. Section 15 of the Banking Act (Cap 488) specifies the extent to which mortgage finance companies should secure their loans.

The provisions are buttressed by the Central Bank of Kenya (CBK) lending guidelines, which recommends that securities be obtained as additional cover besides lending being guided by prudent banking practices. (Ndirangu.2004).

The core issue here is that lending instruments grant certain proprietary rights in one way or the other to the mortgage providing institutions. How these institutions employ the lending instruments when advancing mortgages is purely at their discretion. However, the extent to which a particular lending instrument is used to secure an advance dictates the recoverability of that particular advance and the mode of the recovery to be employed

2.13   Measures of Non – performing Loans (NPLs).

By definition, a Non – performing loan is a financial portfolio that has been advanced for which the borrower is experiencing difficulties in repayments in line with the agreed terms. (Reilly, 1997). A bank's asset is comprised mainly of its loans and advances to customers. When loans become non-performing. they affect the bank's liquidity and impact negatively on its earnings. We hereby briefly outline the different assets quality assessment parameters.

According to Singh, (1983) common ratios used as measures of the NPLs are; NPL provision to operating income. net NPL to total loans. total provision for NPL to total NPL.

2.13.1 NPL Provision to operating income

These are the provisions charged on non-performing loans to operating income. This ratio measures how much of the banks operating income has been swallowed by the provisions set aside for the non-performing loans.

For example, the financial industry average in Kenya for 2003 and 2004 was about 64% and 70% respectively. It is instructive to observe that a high ratio is a manifestation of poor credit management. It poses a threat to customer deposits (CBK Annual Report, 2004).

2.13.2 Net NPL to total loans

This is a measure of just how much of the total loan portfolio is non-performing. To Asses the magnitude of NPLs. It is measured against the total portfolio of all loans and advances that the bank has extended. It is a clear pointer of whether or not a bank has been investing (or lending) prudently. In 2003 and 2004, the average NPL/Total Loan for the industry was 25% and 24% respectively. In this measure also, a lower ratio is desirable(CBK Annual Report 2004).

2.13.3 Total provision for NPL to total NPL

This is another measure of a bank's asset quality. Loans are assets for banks. Banks generally fail because of bad loans. When loans become non-performing, a bank is supposed to make some provision for the eventuality that they may not be paid These provisions are specific to individual loans. This ratio therefore measures how far the banks operating income cover the provisions. The ratio of provision for NPL to Total NPL should be maintained as low as possible. A high ratio is a reflection of imprudent lending practice.

The average industry ratios for this measure were about 51% and 57% for the years 2003 and 2004 respectively (Market Intelligence Report, 2004).

2.14 Types of Mortgages and the level of NPLs in Mortgage Companies.

The method of calculating mortgage interest and terms of capital repayment differs between the different categories of mortgages. This implies that the debtors periodical repayments will vary depending on the category of mortgage offered. For example, Kshs 3.0m 30 year mortgage on 8.25 % fixed interest term, the borrower will be required to pay Shs 25,000. This amount includes both capital repayment and interest. However, an equivalent amount on adjustable rate the debtor will have to pay Shs 28,929 in the initial month. This is comprised of Shs 8.333 (capital repayment) and Shs 20,596 in interest. The adjustable rate method nevertheless leads to a faster repayment of the capital amount borrowed than the fixed rate method.

Should hypothetically the two debtors default after an equivalent repayment period, the debtor on the fixed term interest mortgage will have paid a lower capital amount and hence a higher non-performing loan will be recorded. (Market Intelligence Report. 2004).

2.15 Related Studies in Kenya

Previous studies has focused on the determination of the proportion of total mortgages in relation to total assets held by mortgage companies in Kenya as well as determining whether different types of mortgages do have significant influence on the earnings of the individual institutions (Ndirangu. 2004).

The studies established that the types of mortgage influenced the earnings at the company level both positively and/or negatively.

Fixed rate mortgages as well as interest only mortgage were found to have a higher positive effect on earnings of a mortgage institution.

Kathanje (2000) identifies the key ratios of explaining performance of financial institutions as Non performing loans to total loans; profitability to total assets and non performing loan provisions to operating income. Kagondu (2002), focused on the level of skills and qualifications of credit department staff. The studies established that 58 % of the staff in credit department in commercial banks has relevant academic background, and that 22 % are trained in credit management. No evidence was found of any relationship between level of qualifications and that of NPLs.

Kibe (2003) studied the relationship between the interest rate spread and profitability of commercial banks in Kenya. The Author noted that the key determinant to success of lending institutions is their ability to understand the movement in interest rate and inflation. He cited ability to understand and interpret inflation forecast data as particularly important in pricing credit facilities.

He further identified factors influencing profitability of lending institutions as management of interest spread where he defined interest spread as the shilling difference between interest earned on assets (loans) and interest paid on liabilities (deposits)   Interest rate risk management was another factor. This refers to the mortgage exposure to the bank resulting from unexpected variations in interest rates The magnitude of the risk depends on the quality of asset, maturity and timing of expected cash flows.

In mortgage houses interest rate risk arises when assets (loans) and liabilities (deposits) have different maturity dates. Losses will occur when liabilities rates rises more or in greater proportion than assets resulting in a negative interest sensitivity gap. The third factor was identified as credit risk management. This is the risk of default or the risk that mortgages may never be repaid. Liquidity management was identified as the fourth factor. Access to cash is paramount to good banking operations. Holding too much cash is not preferred and does not contribute to income. Kibe concluded that the profitability of lending institutions in Kenya has been reducing in the past 10 years primarily due to diminishing interest rate spread.

He observed that decline in interest rate spread indicates low borrowings leading to falling levels of investment in the economy. This may affect the borrowers' ability to earn or service the mortgages leading to increase in mortgage defaulters.

CHAPTER THREE – RESEARCH METHODOLOGY

3.1 Research design

The research design is an empirical study.

3.2 Population and Sample

All the mortgage companies in Kenya were included in this study. These companies are as listed on Appendix 1. To preserve data consistency commercial banks that have recently joined the mortgage business in the past three years have been left out of the study.

3.3 Data collection

Data was mainly obtained from secondary sources. High reliance is placed on published accounts and central bank of Kenya.

3.4 Data analysis

The data was edited for consistency and completeness. An analysis of the losses on mortgages, non-performing loan stock, and provisions on bad debts in the target firms was analyzed. To provide consistency, the provision for bad debts has been expressed as a proportion of income and gross advances. Proportions of different mortgages as ratio of total mortgages were used as indicators of NPL. Financial ratio analysis was used as indicators of level of non-performing loans.

A regression equation was fitted to relate types of mortgage and the level of non-performing loans. The equation took the following form:

$Y = a + b_1x_1 + b_2x_2 + b_2x_3 + \ldots\ldots b_nx_n + e$

Where Y is the level of non - performing loans (dependent variable)

X is the type of mortgage (independent valuable)

a is the constant term explaining the level of NPLs that is not dependent on mortgages

b_n is the marginal change in NPLs following a change in type of mortgage.

e is the error term

The correlation coefficient Cr, coefficient of determination Cr^2 were estimated to establish the nature and strength of the relationship. Tests of significance were undertaken to analyze the magnitude of the relationship.

CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATIONS

4.1 Housing Finance Gross Mortgages, Operating Income, Specific Provision and NPL Trend.

4.1.1 Graph 1- Housing Finance Gross mortgages
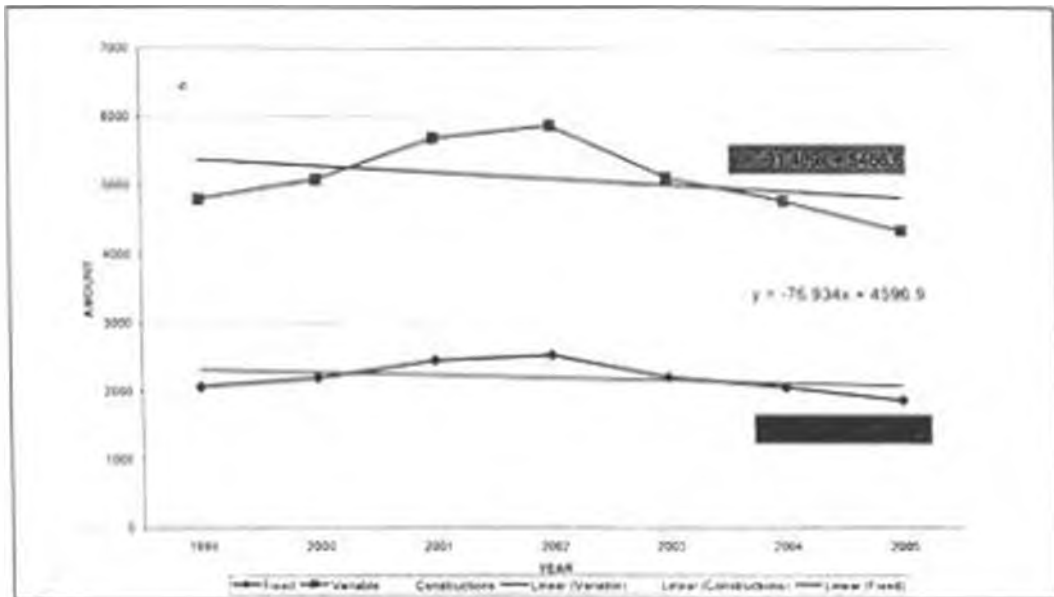
Source: Research data

Gross mortgages represent the outstanding mortgage debtors as per the balance sheet as at the close of the financial year. From the graph, Housing Finance gross mortgages increased during the period 1999 to 2002, there after it decreased over the period 2003 to 2005. This pattern is replicated in all the three categories of mortgages offered by the Company.

Prior to 2001, the company enjoyed a huge market share in the mortgage industry. The market was generally more stable, with three institutions controlling about 90 % of the market share. In 2001, commercial banks were licensed to offer mortgages. The influx of commercial banks in mortgage lending led to loss of market share for the Housing Finance. This explains the decline in gross mortgages between the year 2002 and 2005.

4.1.2 Graph No 2 Housing Finance Operating Income

Source: Research data

HF operating income increased between 1999 and 2000. However, a drop in operating profit was noted between 2000 and 2002. The operating profits nevertheless increased in 2003 and subsequently dropped in 2004 and 2005.

Interest on mortgages is the key income driver in Housing Finance. Construction mortgages are the highest contributors to the operating income. Fixed interest rate mortgages have the lowest contribution to the operating incomes.

In 1999, Joe Donde, the then Member of Parliament for Rarieda lobbied Parliament to enact some controls on interest rates charges by Financial Institutions. This culminated in the enactment of the finance bill 2000. He also founded a firm known as Interest Rate Advisory whose objective was to assist borrowers confirm that the interest charged by lending institutions conforms to the agreed rates in the borrowing contract.

4.1.2 Graph No 2 Housing Finance Operating Income
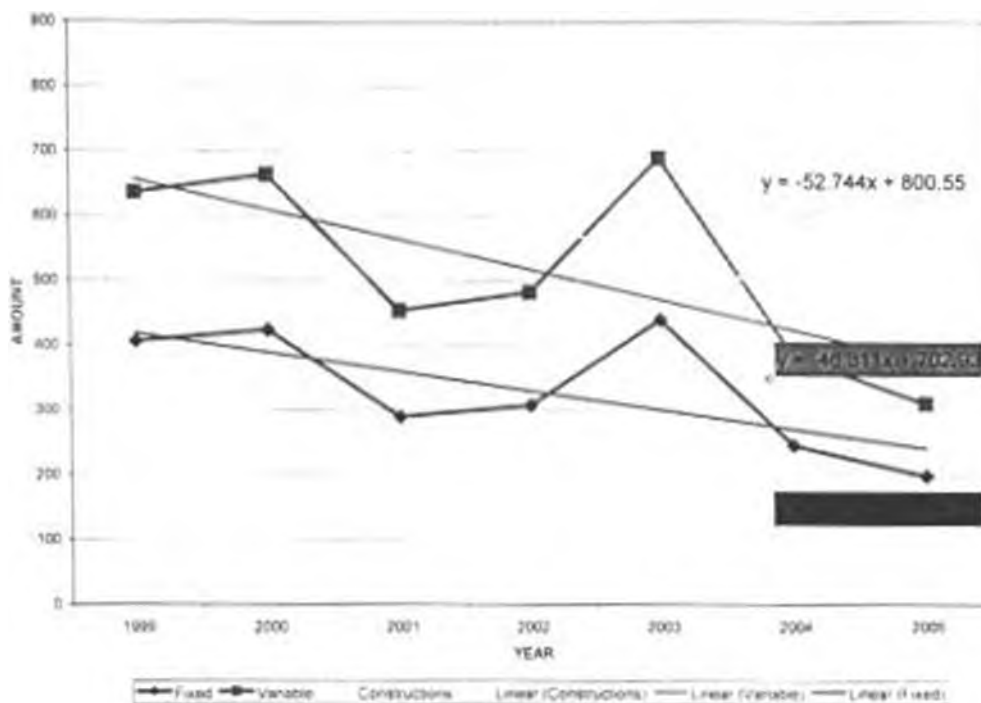

$y = -52.744x + 800.55$

Source: Research data

HF operating income increased between 1999 and 2000. However, a drop in operating profit was noted between 2000 and 2002. The operating profits nevertheless increased in 2003 and subsequently dropped in 2004 and 2005.

Interest on mortgages is the key income driver in Housing Finance. Construction mortgages are the highest contributors to the operating income. Fixed interest rate mortgages have the lowest contribution to the operating incomes.

In 1999, Joe Donde, the then Member of Parliament for Rarieda lobbied Parliament to enact some controls on interest rates charges by Financial Institutions. This culminated in the enactment of the finance bill 2000. He also founded a firm known as Interest Rate Advisory whose objective was to assist borrowers confirm that the interest charged by lending institutions conforms to the agreed rates in the borrowing contract.

Housing Finance was found to have violated several borrowing contracts with the mortgage debtors. The Interest Rate Advisory filed a legal suit at the High Court on behalf of all mortgage borrowers in 2000. To forestall other legal suits in future, the management waived some interest on mortgages and reduced the interest rate charged on mortgages to 25 %. Penalties on late mortgage payments were also abolished. This explains the decline in operating income between 2000 and 2002.

The management however, introduced some non-lending income streams in 2002 to make up for the decline in interest income. These income streams are mainly commissions and fees collected for other services offered other than mortgages. By 2003, Housing Finance had lost a significant market share in mortgage lending. This coupled with the decline in interest rate charged on mortgages explains the decline in operating income between 2003 and 2005.

4.1.3 Graph 3   Housing Finance Specific Provision

$$y = 193.9x - 43.314$$
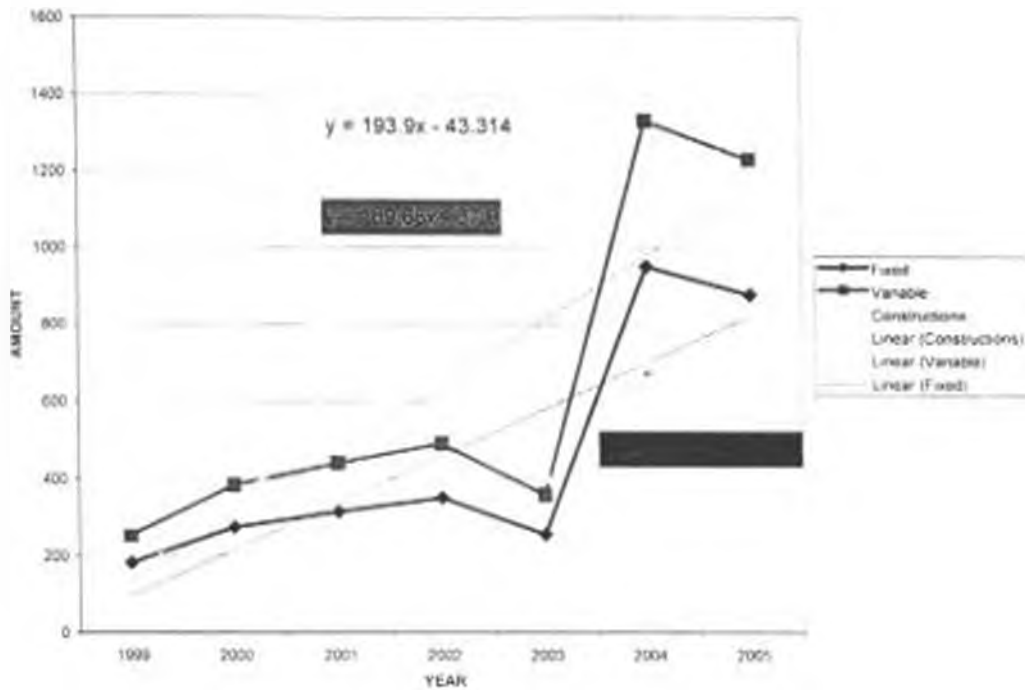
Source: Research data

The prudence principle in accounting requires that the management does not recognise all income received today if some debt is still outstanding with regard to the same debtor. This implies that some provision is made against the interest income received today, to provide for the probability that the firm may not earn any interest on the mortgage debt outstanding.

HF specific provision for bad and doubtful debts increased from the year 2000-2002. This increase was attributed to the growth in gross mortgages discussed earlier. The provision for bad and doubtful debts decreased in the 2003. In the year 2004, Housing Finance adopted the International Accounting Standards number 39 approach for the purpose of raising provisions for bad and doubtful debts. The change in accounting methodology resulted in a significant increase in the provision raised for bad and doubtful debts in 2004. In 2005, a slight decline in provision for bad and doubtful debt was recorded. This is attributable to the decline in gross mortgages in the year.

4.1.4 Graph 4:   Housing Finance   Non-performing Loans

$$y = -89.644x + 1846.4$$
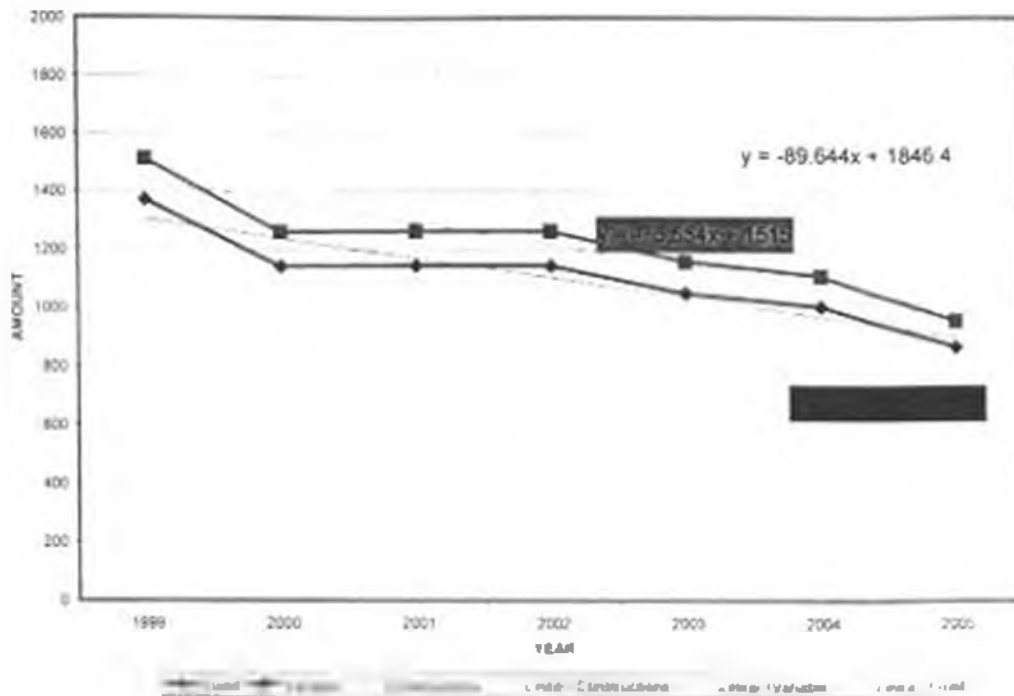
Source: Research data

Non-performing loans refers to the loans experiencing difficulties in repayments and has been categorized as poor debts in the companies financial statements. No income is derived from these assets. Consequently, the non-performing loans are not carried in the balance sheet but are written off. However, The industry regulator requires a disclosure of the non-performing loan stocks in the notes to financial statements.

Housing Finance Non performing loans have shown decreasing trend from the year 2000-2005. Construction mortgages had the highest level of non-performing loans in this period. Variable rate mortgages had the lowest non-performing mortgages. The general decline in non-performing loans in this period is attributed to the decline in gross mortgages. The decline in interest rate charged and late payment waiver in 2000 also enabled the mortgage debtors to service their obligations with less difficulty.

4.2 Housing Finance Relationship between Gross Mortgages and NPLs

4.2.1 Table 1 Housing Finance Fixed Mortgages versus NPLs

Regression Statistics	
Multiple R	0.553944545
R Square	0.306854559
Adjusted R Square	0.168225471
Standard Error	210.3194981
Observations	7

Source: Research data

From the equation :

$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots b_nx_n + e$

From the graph:

$Y = -66.659x + 1373$

The coefficient of determination (r^2) of 0.3068 means that 30% of the variation in non performing loans can be explained by the gross mortgages. The P value of 1.62 means that there is only 10% chance that there is no relationship between fixed mortgages of loan and NPL.

4.2.2 Table 2   HF Variable Mortgages versus NPL

Regression Statistics	
Multiple R	0.372519481
R Square	0.138770764
Adjusted R Square	-0.033475083
Standard Error	173.2601865
Observations	7

Source: Research data

From the equation :

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots\ldots b_nx_n + e$$

From the graph;

$$Y = -73.554x + 1515$$

The coefficient of determination (r^2) of 0.138 means that 13 % of the variation can be explained by the association between the type of mortgage (variable) and NPL. The P value of 0.406839 means that there is only 4% chance that there is no relationship between variable mortgages of loan and NPL.

4.2.2 Table 3 Housing Finance Construction Mortgages versus NPLs

Regression Statistics	
Multiple R	0.372519
R Square	0.138771
Adjusted R Square	-0.03348
Standard Error	211.1609
Observations	7

Source: Research data

From the equation:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots\ldots b_nx_n + e$$

From the graph:

$$Y = -89.644x + 1846.4$$

Where   Y is the level of non - performing loans (dependent variable)

X is the type of mortgage (independent valuable)

The coefficient of determination (r^2) of 0.138771 means that 13 % of the variation can be explained by the association between the type of mortgage (variable) and NPL. The *P value* of 0.406839 means that there is only 4% chance that there is no relationship between construction mortgages of loan and NPL.

4.3 SAVINGS & LOANS Gross Mortgages, Operating Income, Specific Provision and NPL Trend.

4.3.1 Graph 5 SAVINGS & LOANS Gross Mortgages
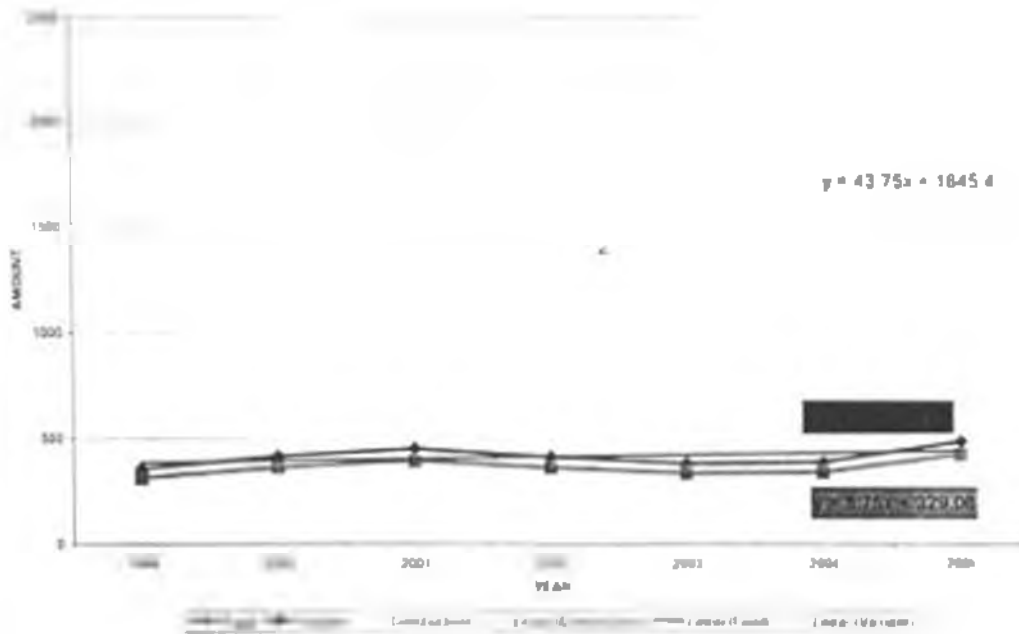
Source: Research data

Savings and Loans Kenya limited (S&L),is a subsidiary of Kenya Commercial Bank. The Company has been a significant competitor to Housing Finance prior to and even after the entry of commercial banks in the mortgage industry in 2002.Savings and loans Kenya Limited offer construction loans as its flagship mortgage product. This explains the high contribution of the construction mortgages to the gross mortgages. The mortgage portfolio was in a general increase until 2001. The subsequent decline in gross mortgages is attributed to competition from commercial banks offering the mortgages from 2002 to 2005. To fight back the competition, the management embarked on an aggressive marketing campaign that saw the repackaging of the mortgages products and re-branding of the company. This resulted in a general growth in gross mortgages in 2004 and 2005.

4.3.2 Graph 6: SAVINGS AND LOANS Operating Income

$y = -25.457x + 292.57$
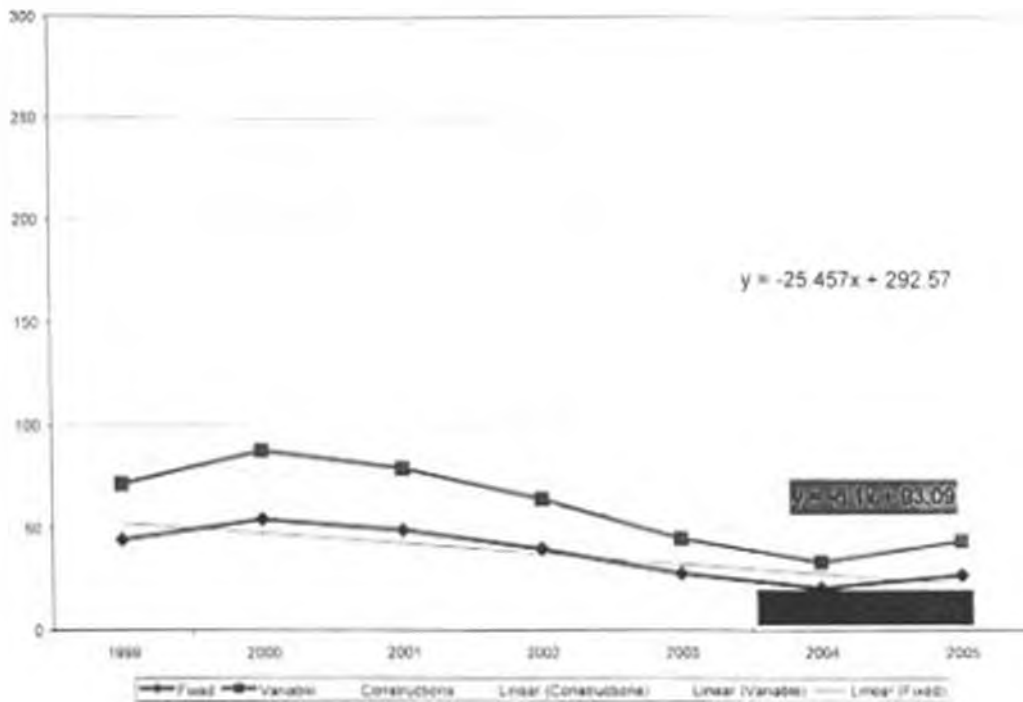
Source: Research data

In general, mortgage interest earned on construction loans has been the key revenue driver for Savings and Loans Kenya Limited. The company lost a significant income stream in 2000 when the management opted to enforce the provisions of the Finance Bill 2000. Under this bill, the total interest charged on a mortgage should not exceed the principal sum advanced. High interest is charged on the construction loans in the initial period means that the company had to stop recognizing interest income from a significant stock of its portfolio where the interest earned exceeded the principal sum advanced.

The impact of the Finance Bill 2000 on fixed interest mortgages and the adjustable rate mortgages was less severe. This explains the high decline in operating income attributable to construction mortgages and a slight decline in the operating income attributable to fixed and adjustable mortgages.

4.3.3 Graph 7 SAVINGS & LOANS Specific Provision
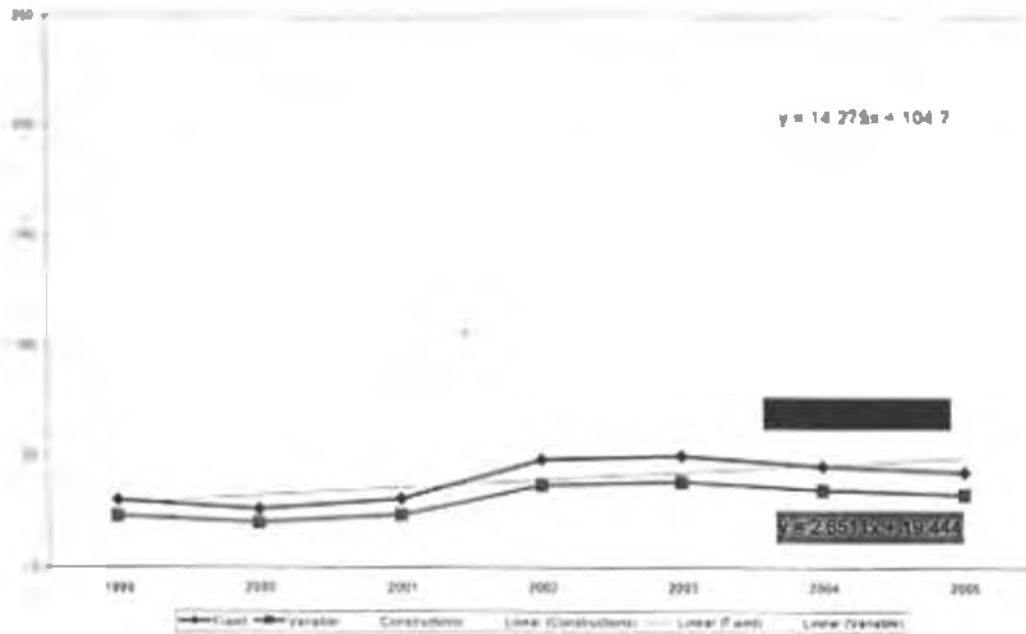
Source: Research data

In general. Savings and Loans made higher provisions for bad and doubtful debts for construction mortgages than for the fixed interest or adjustable rate mortgages. Primarily this is because the interest on construction mortgages accrues at a higher rate. This increases the default risk hence the need for a higher provision.

The adoption of a new accounting methodology in 2001 led to higher specific provisions being reported. The new methodology requires that a full provision is raised on any mortgage that has more than two late repayments. Typically. Savings and Loans flagship product, the construction mortgages, will have several delayed repayments. This is primarily because no repayments are expected while the property is under construction.

4.3.4 Graph 8 SAVINGS & LOANS NPL
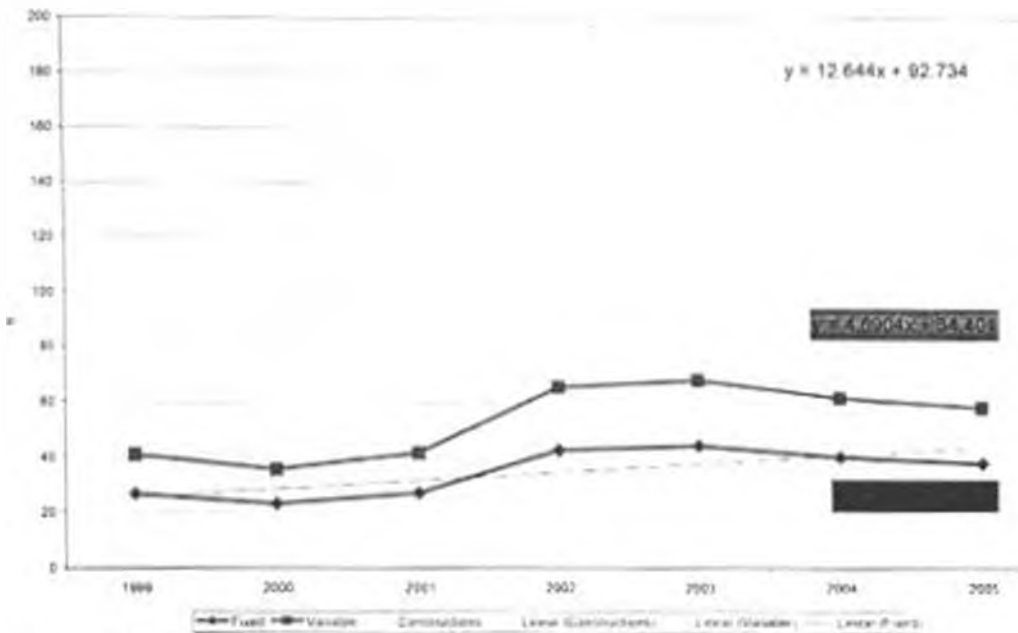
Source: Research data

The non-performing loans reported by savings and Loans Kenya Limited declined slightly between 1999 and 2000. The adoption of new accounting methodology in 2001 had a huge impact on the reporting of construction mortgages. This coupled with a higher debtor propensity to default led the institution to classify several facilities as non-performing.

There was a disproportionate increase in non-performing loans between the three categories of mortgages offered. Construction mortgages had the highest increase in non-performing loans in 2001.The decline in non-performing loans in 2003 is however attributed to decline in gross mortgages in the same year

4.4 Savings and Loans: Relationship between Gross Mortgages and NPL

4.4.1 Table 4 : Savings & loans   Fixed Mortgages versus NPL

Regression Statistics	
Multiple R	0.006198
R Square	3.84E-05
Adjusted R Square	-0.19995
Standard Error	9.534416
Observations	7

Source: Research data

From the equation:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots\ldots b_nx_n + e$$

From the graph:

$$Y = 3.06x + 23.433$$

Where   Y is the level of non - performing loans (dependent variable)

X is the type of mortgage (independent valuable)

The coefficient of determination (r^2) of 0.384 means that 38 % of the variation can be explained by the association between the type of mortgage (fixed) and NPL. The P value of 0.382533 means that there is only 3% chance that there is no relationship between fixed mortgages loan and NPL.

4.4.2 Table 5 : SAVINGS & LOANS Variable Mortgages versus NPL

Regression Statistics	
Multiple R	0.006515
R Square	0.424
Adjusted R Square	-0.19995
Standard Error	14.6183
Observations	7

Source: Research data

From the equation;

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots b_nx_n + e$$

From the graph:

$$Y = 4.6904x + 34.401$$

> Where   Y is the level of non - performing loans (dependent variable)
>
> X is the type of mortgage (Independent valuable)

The coefficient of determination (r^2) of 0.424 means that 42 % of the variation can be explained by the association between the type of mortgage (fixed) and NPL. The P value of 0.382193 means that there is only 3% chance that there is no relationship between variable mortgages loan and NPL.

.4.3   Table 6: SAVINGS & LOANS Constructions Mortgages versus NPL

Regression Statistics	
Multiple R	0.006515
R Square	4.24E-05
Adjusted R Square	-0.19995
Standard Error	39.40587
Observations	7

Source: Research data

From the equation;

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots b_nx_n + e$$

From the graph;

Y= 12.644x + 92.734

Where   Y is the level of non - performing loans (dependent variable)

X is the type of mortgage (independent valuable)

The coefficient of determination (r^2) of 0.424 means that 42 % of the variation can be explained by the association between the type of mortgage (fixed) and NPL. The P value of 0.382193 means that there is only 3% chance that there is no relationship between construction mortgages loan and NPL.

4.5 East Africa Building Society Gross Mortgages: Operating Income, Specific Provision and NPL Trend.

4.5.1 Graph 9: East Africa Building Society Gross Mortgages
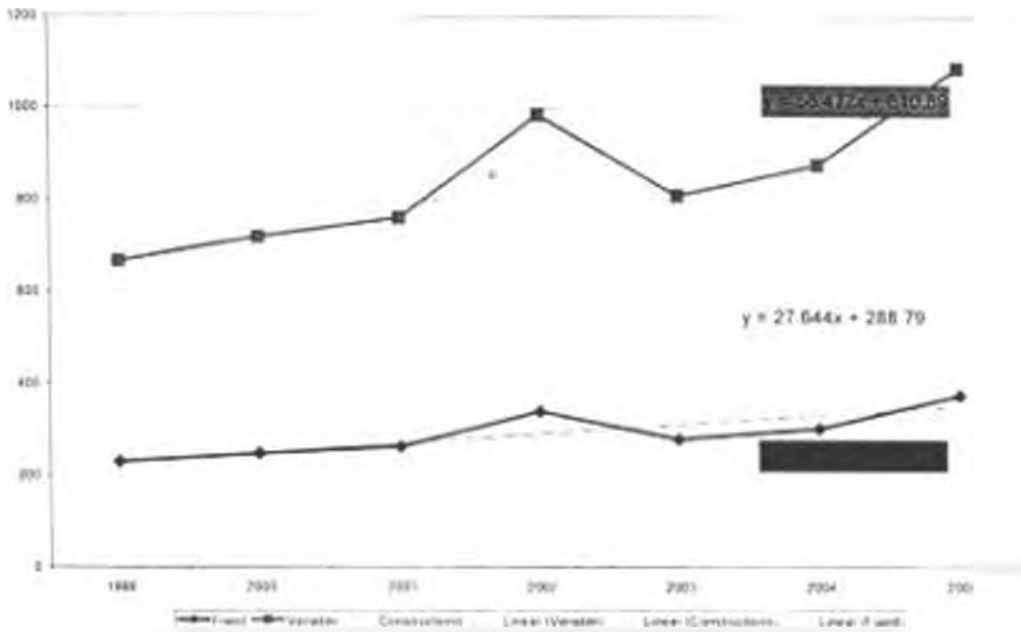
Source: Research data

The gross mortgage represents the total mortgages reported in the financial statements of East Africa Building Society. A pattern of general growth was recorded between 1999 and 2002.

In 2001 the commercial banks were licensed to offer mortgages. This presented competition, which had not been experienced hitherto. This led a decline in gross mortgages between 2002and 2003. However a moderate growth was recorded between 2004 and 2005.

On overall, adjustable rate mortgages had the highest contribution to gross mortgages, while fixed rate mortgages had the least.

4.5.2 Graph 10 : East Africa Building Society Operating Income
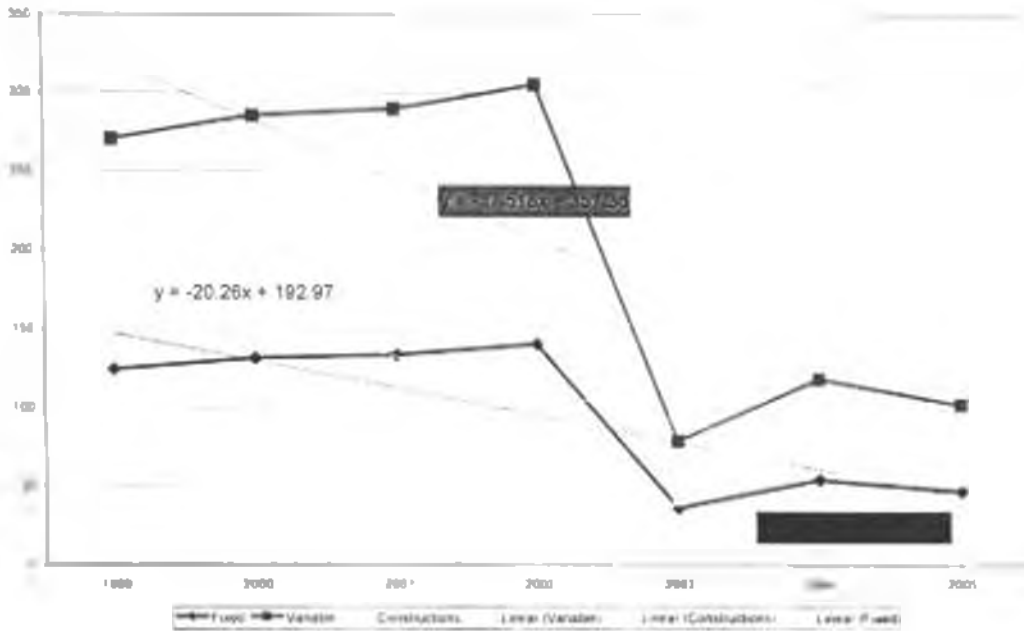
Source: Research data

The East Africa Building Society registered a steady growth in operating income between 1999 and 2002. Interest earned on adjustable rate mortgages made the highest contribution to the companies operating income.

In 2003. decline in gross mortgages advanced and major restructuring of the company led to a decline in operating profits reported. The adjustable rate mortgages continued to be the highest contributor to operating profits reported.

4.5.3 Graph 11: East Africa Building Society Specific Provision
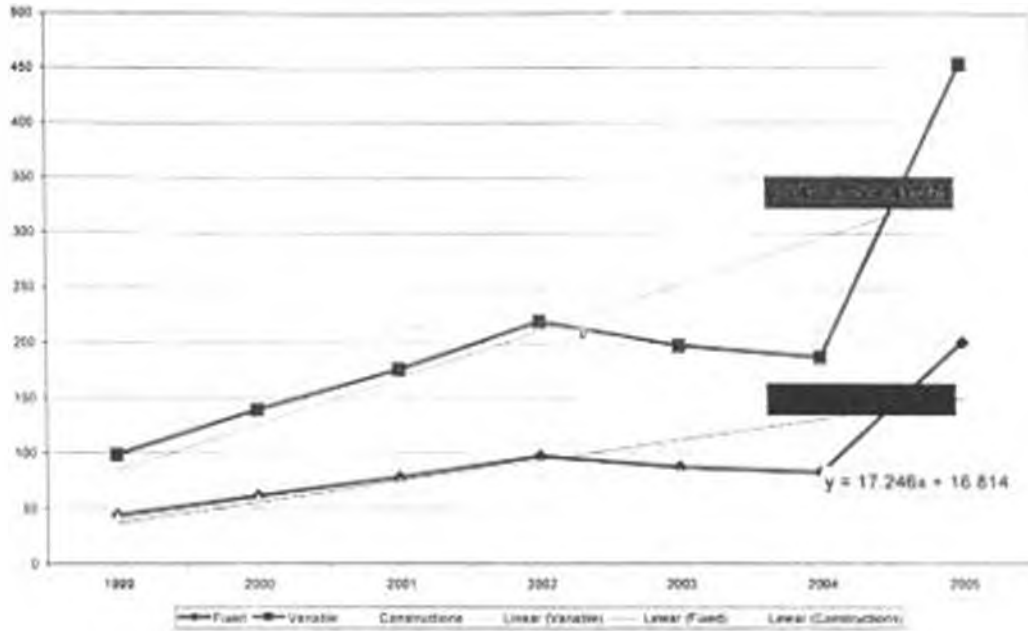
Source: Research data

To comply with prudential guidelines on financial reporting, EABS makes a specific provision on bad and doubtful debts. This provision is charged on the income statement against reported profit of the various products offered.

The specific provision for bad and doubtful debts recorded a moderate growth between 1999 and 2002, while a slight decline was registered between 2002 and 2004. This decline perfectly correlates with a decline in gross mortgages in the same period.

4.5.4 Graph 12: East Africa Building Society Non-performing loans

$y = 30.493x + 162.21$
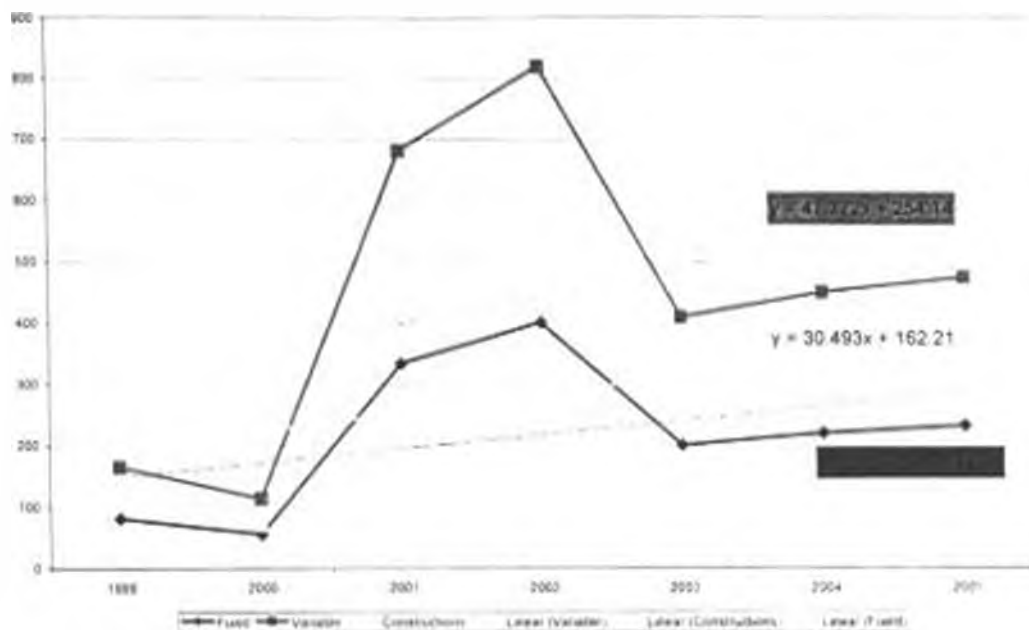
Source: Research data

The non-performing loans reported in the financial statements of East Africa Building Society indicated a slight decline during the period between1999 and 2000. The adjustable rate mortgages registered the highest contribution to the non-performing loan portfolio.

The company recorded a high increase in non-performing loan stock between the years 2000 and 2002. This increase is attributed the changes in accounting practices which led to a classification of hitherto good mortgages as non-performing. This was in adoption of the International Accounting Standard Number 39. With a clean balance sheet in 2003 a steady growth in non-performing loans was recorded. This steady growth in non-performing loan stocks between 2003 and 2005, bears a perfect relationship with the growth in gross mortgages.

4.6 East Africa Building Society Relationship between Gross Mortgages and Non-performing loans

4.6.1 Table 7 : East Africa Building Society Fixed Mortgages versus NPL

Regression Statistics	
Multiple R	0.581447
R Square	0.33808
Adjusted R Square	0.205696
Standard Error	110.8289
Observations	7

Source: Research data

From the equation:

$$Y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + \ldots b_n x_n + e$$

From the graph:

$$Y = 23.378x + 124.36$$

Where   Y is the level of non - performing loans (dependent variable)

X is the type of mortgage (independent valuable)

The coefficient of determination (r^2) of 0.33808 means that 33 % of the variation can be explained by the association between the type of mortgage (fixed) and NPL. The P value of 0.499108 means that there is only 4 % chance that there is no relationship between fixed mortgages loan and NPL.

4.6.2 Table 8 : East Africa Building Society Variable Mortgages versus Non-performing loans

Regression Statistics	
Multiple R	0.581447
R Square	0.33808
Adjusted R Square	0.205696
Standard Error	226.4764
Observations	7

Source: Research data

From the equation:

$$Y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + \ldots\ldots b_n x_n + e$$

From the graph:

$$Y = 47.772X + 254.14$$

Where   Y is the level of non - performing loans (dependent variable)

X is the type of mortgage (independent valuable)

The coefficient of determination (r^2) of 0.33808 means that 33 % of the variation can be explained by the association between the type of mortgage (fixed) and NPL. The P value of 0.499 means that there is only 4 % chance that there is no relationship between variable mortgages loan and NPL.

4.6.3 Table 9: East Africa Building Society Constructions Mortgages versus NPL

Regression Statistics	
Multiple R	0.581447
R Square	0.33808
Adjusted R Square	0.205696
Standard Error	144.5594
Observations	7

Source: Research data

From the equation:

$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + \ldots\ldots b_nx_n + e$

From the graph:

$Y = 30.493x + 162.21$

Where Y is the level of non - performing loans (dependent variable)

X is the type of mortgage (independent valuable)

The coefficient of determination (r^2) of 0.33808 means that 33 % of the variation can be explained by the association between the type of mortgage (fixed) and NPL. The P value of 0.499108 means that there is only 3% chance that there is no relationship between construction mortgages loan and NPL

CHAPTER FIVE: SUMMARY OF FINDINGS AND CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS FOR FURTHER RESEARCH.

5.1   Summary of Findings and Conclusions

5.1.1 Summary of findings.

Non – performing Loans (NPLs) continue to hamper growth of the mortgage industry In Kenya in particular and financial institutions In general. By definition, a Non – performing loan is a financial portfolio that has been advanced for which the borrower is experiencing difficulties in repayments in line with the agreed terms (Reilly, 1997).

The non-performing loans have a critical financial implication on the mortgage company's balance sheet. The provisions made on non-performing loan portfolio erodes the mortgage company's assets. Asset reported on the balance sheet are usually not of the provisions made for the non-performing loans. High stocks of non-performing loans are often an indicator of poor quality decisions and or weak management. This may knock off market confidence or trigger a rush by the stockholders to sell their shares. Due to the low levels of market confidence, the demand of the stock will be low leading to low stock prices. In so far as high levels of non-performing loans may lead to a decline in stock prices, it is in the Shareholders interest to ensure that the management is vigilant on this matter to avoid erosion of their wealth in the stock market (Market Intelligence Report 2005).

The coefficient of determination (r^2) of 3.36E-06 means that 33 % of the variation can be explained by the association between the type of mortgage (fixed) and NPL. The P value of 0.752641means that there is only 7 % chance that there is no relationship between construction mortgages loan and NPL

The coefficient of determination (r^2) of 0.703113 means that 70% of the variation can be explained by the association between the type of mortgage (fixed) and NPL. The P value of 0.276084 means that there is only 2 % chance that there is no relationship between variable mortgages loan and NPL.

The coefficient of determination (r^2) of 0.298956 means that 29% of the variation can be explained by the association between the type of mortgage (fixed) and NPL. The P value of 0.901815 means that there is only 9 % chance that there is no relationship between construction mortgages loan and NPL.

5.1.2 Conclusions

In the period under study, the mortgage industry in Kenya has recorded an increase in the levels of non-performing loans. This increase in non performing loans was reported in Housing Finance Company Limited and the East Africa Building Society Limited. Savings and Loans Company Limited however registered a slight decline in the stocks of non-performing mortgages in this period.

The level of non-performing loans depend significantly on the type of mortgage i.e. there is a relationship between the type of mortgage and NPL. Variable mortgages have highest relationship with NPL. followed by fixed mortgages and lastly construction mortgages. However, the relationship between the type of mortgage and NPL varies from one firm to the other.

5.2 Limitations of the study

This study relied on secondary data. The data was extracted from financial statements filed with the Central Bank of Kenya. The financial statements are prepared by the management and may be subject to manipulation.

The management may be motivated by a desire to show a favorable financial position so as to avoid Central Bank's statutory intervention

The change in accounting methodology of raising provisions for Non-performing mortgages in 2004 from arrears based to IAS 39 model might have resulted in higher provision for bad debt figures being reported in 2004 and 2005.

Nevertheless all mortgage companies appear to have implemented the new provisioning approach

5.3 Recommendation to Policy Makers

From the study, it is clear that:

a) A strong relationship exists between the type of mortgage and the level of non-performing mortgage in the mortgage industry.

b) The relationship between the level of non-performing loans and the type of mortgage is strongest with adjustable rate mortgages.

The Central Bank of Kenya and Industry regulators should pay close attention to mortgage companies offering this product. Further more, the industry regulators should encourage companies to offer a variety of mortgage types to minimize the risks carried on their balance sheet

5.4 Suggestions for Further Research

Further research may be conducted on the performance of mortgages under different economic climates and in particular, whether in times of high inflation when the value of property is appreciating, the borrowers are more likely to repay the debts thereby reducing the probability of defaults

Establishing the relationship between ownership structure and level of NPL in the mortgage industry is important. In particular, it would be of interest to determine whether mortgage companies controlled by the government are more likely to have high stocks of NPLs than privately owned institutions.

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APPENDICES

Appendix 1:

Institutions offering mortgage facilities in Kenya

1. East Africa Building Society (EABS).
2. Housing Finance Limited (HF).
3. Savings & Loans Kenya Ltd (S&L).
4. Barclays Bank Kenya Ltd – since 2004
5. Standard Bank Kenya limited – since 2004
6. Stanbic Bank Kenya Limited – since 2005
7. National Industrial Credit Limited- since 2005
8. Commercial Bank Of Africa Limited- since 2004

Fixed Mortgages	Company	NPL analysis						
	HF	1999	2000	2001	2002	2003	2004	2005
		000	000	000	000	000	000	000
Gross mortgages		2073.66	2198.3	2457.08	2537.45	2210.46	2064.35	1874.44
Operating Income		406.64	424.35	290.03	308.2	440.68	246.33	198.95
Specific provision		180.75	273	313.75	350	256	951.5	878.78
NPL		1372.28	1143.47	1147.24	1147.53	1054.15	1008.91	870.87
	S&I							
Gross mortgages		357.12	417.6	454.24	415.2	385.6	393.44	489.44
Operating Income		44.33	54.34	49.01	39.78	27.82	20.67	27.04
Specific provision		30.26	26.35	30.77	18.45	50.32	45.73	43.18
NPL		26.7	23.25	27.15	42.75	44.4	40.35	38.1
	EABS							
Gross mortgages		230.28	248.52	263.15	340.67	280.25	303.62	376.39
Operating Income		124.43	131.33	133.4	140.53	36.34	64.61	46.92
Specific provision		43.92	61.95	78.24	97.68	88.08	83.82	201.84
NPL		80.5	55.43	333.73	401.12	200.79	220.8	232.76

Appendix 3 : ANOVA tables

ANOVA Tables 1

Housing Finance Fixed Mortgages versus NPLs

ANOVA

	df	SS	MS	F	Signific ance F
Regressio n	1	97912 .31	9791 2.31	2.21 3493	0.1969 7
Residual	5	22117 1.5	4423 4.29		
Total	6	31908 3.8			

	Coef ficie nts	Stand ard Error	t Stat	P- value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	238 6.66	147.0 92	16.2 2	1.62	2008.5	2764. 7	2008.5	2764.7
X Variable 1	0.40 23	0.270 4	-1.48	0.19 7	-1.097	0.292 8	1.0974	0.2928

Anova Table 2
Housing Finance Variable Mortgages Versus NPLs

ANOVA

	df	SS	MS	F	Signific ance F			
Regression	1	24185.04	24185.04	0.80 565 5	0.4105 42			
Residual	5	150095.5	30019.09					
Total	6	174280.5						
	Coefficients	Standard Error	t Stat	P- value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	614.4216157	678.7346	0.905246	0.40 683 9	1130.3 2	2359. 164	1130.3 2	2359.1 64
X Variable 1	0.118883603	0.132449	0.897583	0.41 054 2	0.2215 9	0.459 354	0.2215 9	0.4593 5

Anova Table 3

Housing Finance Construction Mortgages Versus NPLs

ANOVA	df	SS	MS	F	Signific ance F		
Regress ion	1	35923.28	35923. 28	0.805655	0.4105 42		
Residua l	5	222944.5	44588. 91				
Total	6	258867.8					
	Coeffici ents	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%
Intercep t	748.82 63	827.2078	0.9052 46	0.406839	1377.5 8	2875.2 32	1377.5 8
X Variable 1	0.1723 01	0.191961	0.8975 83	0.410542	0.3211 5	0.6657 52	0.3211 5

Anova Table 4

Savings & loans Ltd Fixed Mortgages versus NPLs

ANOVA	df	SS	MS	F	Significance F
Regression	1	0.017459	0.017459	0.000192	0.989479
Residual	5	454.5255	90.9051		
Total	6	454.5429			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	35.17987	36.76185	0.956967	0.382533	-59.3195	129.6792	-59.3195	129.6792
X Variable 1	-0.00122	0.087925	-0.01386	0.989479	-0.22724	0.2248	-0.22724	0.2248

Anova Table 5
Saving loans Variable Mortgages Versus NPLs

ANOVA					
	df	SS	MS	F	Signific ance F
Regress ion	1	0.046 358	0.04 5358	0.00 0212	0.9889 39
Residua l	5	1068. 474	213. 6948		
Total	6	1068. 52			

	Coeffi cients	Stand ard Error	t Stat	P- value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercep t	53.98 007	56.36 38	0.95 7708	0.38 2193	90.907 7	198.8 678	90.907 7	198.86 78
X Variable 1	0.002 24	0.154 066	0.01 457	0.98 8939	0.3982 8	0.393 795	0.3982 8	0.3937 95

Anova Table 6

Saving loans Limited Construction Mortgages versus NPLs

ANOVA	df	SS	MS	F	Significance F
Regression	1	0.329598	0.329598	0.000212	0.988939
Residual	5	7764.111	1552.822		
Total	6	7764.441			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	145.5115	151.9372	0.957708	0.382193	245.056	536.0785	245.056	536.0785
X Variable 1	0.00121	0.083062	0.01457	0.988939	0.21473	0.212307	0.21473	0.212307

Anova Table 7

East Africa Building Society Fixed Mortgages versus NPLs

ANOVA					Signific
	df	SS	MS	F	ance F
Regress ion	1	31368 .22	3136 8.22	2.55 3784	0.1709 23
Residua l	5	61415 .17	1228 3.03		
Total	6	92783 .4			

	Coeffi cients	Stand ard Error	t Stat	P- value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercep t	187.0 31	256.8 141	0.72 828	0.49 9108	847.19 3	473.1 302	847.19 3	473.13 02
X Variable 1	1.387 428	0.868 197	1.59 8056	0.17 0923	0.8443 4	3.619 201	0.8443 4	3.6192 01

Anova Table 8

East Africa Building Society Variable Mortgages versus NPLs

ANOVA					
	df	SS	MS	F	Signific ance F
Regre ssion	1	130987 .5	1309 87.5	2.55 3784	0.1709 23
Residu al	5	256457 .7	5129 1.54		
Total	6	387445 .2			

	Coeffi cients	Standar d Error	t Stat	P- value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Interc ept	382.1 95	524.79 4	0.72 828	0.49 9108	1731.2 2	966.8 313	1731.2 2	966.83 13
X Variab le 1	0.979 426	0.6128 86	1.59 8056	0.17 0923	0.5960 5	2.554 898	0.5960 5	2.5548 98

East Africa Building Society Construction Mortgages versus NPLs

ANOVA	df	SS	MS	F	Significance F
Regression	1	53367 48	5336 7.48	2.55 3784	0.1709 23
Residual	5	104487 .1	2089 7.41		
Total	6	157854 .5			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	243.9 54	334.97 49	0.72 828	0.49 9108	1105.0 3	617.1 264	1105.0 3	617.12 64
X Variable 1	1.322 465	0.8275 46	1.59 8056	0.17 0923	0.8048 1	3.449 74	0.8048 1	3.4497 4

Anova Table 10

Industry Fixed Mortgages verses Industry NPLs

Regression Statistics	
Multiple R	0.001834
R Square	3.36E-06
Adjusted R Square	-0.2
Standard Error	395.8056
Observations	7

ANOVA

	df	SS	MS	F	Significance F
Regression	1	2.635256	2.63525 6	1.68E-05	0.996886
Residual	5	783310.5	156662.1		
Total	6	783313.2			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	667.3578	2004.058	0.33300 3	0.75264 1	4484.24	5818.953	4484.24	5818.953
X Variable 1	0.002816	0.686648	0.00410 1	0.99688 6	1.76227	1.767902	1.76227	1.767902

Anova Table 11

Industry Variable Mortgages Versus Industry NPLs

Regression Statistics	
Multiple R	0.838518
R Square	0.703113
Adjusted R Square	0.643736
Standard Error	156.4281
Observations	7

ANOVA

	df	SS	MS	F	Significance F
Regression	1	289756.9	289756.9	11.8414	0.018413
Residual	5	122348.8	24469.76		
Total	6	412105.7			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	922.107	754.4354	1.22225	0.276084	2861.45	1017.231	2861.45	1017.231
X Variable 1	0.410197	0.119204	3.441138	0.018413	0.103774	0.71662	0.103774	0.71662

Anova Table 12

Industry Constructions Mortgages versus Industry NPLs

Regression Statistics	
Multiple R	0.546768
R Square	0.298956
Adjusted R Square	0.158747
Standard Error	205.2043
Observations	7

ANOVA

	df	SS	MS	F	Significance F
Regression	1	89785.1	89785.1	2.13221 7	0.20406
Residual	5	210544	42108.8		
Total	6	300329.1			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	144.9402	1116.984	0.12976	0.90181 5	-2726.36	3016.238	-2726.36	3016.238
X Variable 1	0.24998	0.171194	1.46021 1	0.20406	-0.19009	0.690049	-0.19009	0.690049