

**PURCHASING POWER RISK AND THE PERFORMANCE OF NON-LIFE
INSURANCE COMPANIES IN KENYA**

BY

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DECLARATION

I, the undersigned, declare that this research project is my original work and has never been submitted to any other Institution for academic purpose.

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This Research project has been submitted to the University of Nairobi, School of Mathematics for Examination with our approval as the University Supervisors.

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DEDICATION

This study dedicated to my son Brian Onyango a source of inspiration and my late Dad Patrick Ogutu, my late Mum Leonora Ogutu, Crescent Osindo and love and whose support enabled me go back to School.

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ABSTRACT

This study aimed at re-examining the consequences of purchasing power Risk on Non-Life Insurance Industry in Kenya. Specifically, the study targeted at examining the extent to which inflation rate especially in developing economies have affected the operations of Non-Life Sector. Non-life sector basically deals with two portfolios; investment and Underwriting of premiums which are very sensitive to inflation rate level.

In the study, therefore, the role of inflation rate on the performance of general insurance industry is studied and it was observed that inflation rate is a major factor in the performance of general insurance operations. Further, the study critically examined how inflation rate relates with both Real Underwriting and Real Investment activities. It was observed that the two portfolios in the Non-Life are too sensitive to inflation rate to the extent that the movement of inflation rate is inversely proportional to the Real Investment and Real Underwriting Returns. Further the researcher wanted to estimate the inflation thresholds; the lexis points at which inflation becomes detrimental to the activities of Non-Life Industry. It was observed in a developing economy like Kenya, the inflation rate ought to be maintained at a ceiling of 9.2 per cent and a floor of 4 per cent. However, the expectation of the purchasing power Risk is 9.99 %. It is therefore necessary to maintain the Inflation rate below two digit level; below 10% level.

It was observed in the study that inflation in Kenya is unstable and unpredictably high with the outlier being observed during 2007/2008 post-election violence. Also it was observed that inflation rates in the country become more unstable especially during and immediately after electioneering period.

TABLE OF C ONTENTS

DECLARATION.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENTS.....	iv
ABSTRACT.....	v
TABLE OF C ONTENTS.....	vi
LIST OF FIGURES	ix
LIST OF TABLES	x
CHAPTER ONE.....	1
GENERAL INTRODUCTION	1
1.1 Concept of inflation.....	1
1.2 Effects of inflation on Insurance industry	3
1.3 Effects of inflation Non-life Insurance.....	4
1.3.1: Underwriting and Investment.....	4
1.4 Problem Statement	6
1.5 Objectives of the study	7
1.5.1 General objective.....	7
1.5.2 Specific objectives.....	8
1.6 Significance of the study	8
1.7 Scope of the study	9
1.8 Literature Review	9
1.9: Definition of terms	9

CHAPTER TWO.....	11
LITERATURE REVIEW.....	11
2.1: Introduction	11
2.2: Inflation	11
2.3: Knowledge gap.....	24
CHAPTER THREE	25
METHODOLOGY	25
3.1: Introduction	25
3.2: Data Collection.....	25
3.3: Data analysis	25
3.4: Type of data required	26
3.5: Threshold model.....	27
CHAPTER FOUR.....	31
DATA ANALYSIS	31
4.1 Introduction	31
4.2 Descriptive Analysis	33
4.2.1: Regression analysis	36
4.2.2: Regression analysis of Inflation Rate on the performance Income.....	39
4.2.3: Graphical Analysis	42

CHAPTER FIVE..... 46

INTRODUCTION..... 46

5.1: Summary of the findings 46

5.2: Conclusion..... 47

5.3: Recommendations 49

5.3.1 Recommendations to policy makers 49

5.3.2: Recommendations to the Non-Life Industry..... 50

5.3.3: Recommendations for further studies 51

REFERENCES 53

LIST OF FIGURES

Figure 4.1: The Relationship between the Purchasing Power Risks on the Performance of Non-Life Insurance.....	38
Figure 4.2: The Relationship between Inflation Rate on Nominal Investment Returns and Real Investment Returns.....	42
Figure 4.3: The Impact of Purchasing Power Risk on the Real Underwriting Returns on Non-Life Insurance Industry in Kenya.....	44

LIST OF TABLES

Table 3.1: Real Investment Return.....	29
Table 4.1: Nominal investment and Nominal Underwriting Return	33
Table 4.2: Real Investment and Real Underwriting Returns.....	34
Table 4.3: The Relationship between the Purchasing Power Risks on the Performance of Non- Life Insurance.....	36
Table 4.4: Regression Analysis of Inflation Rate, Annual Nominal Underwriting Returns, Nominal Investment Returns and Yearly Performance Income.....	37
Table 4.5: Regression Analysis	40
Table 4.6: Inflation Rates, Nominal Investments and Real Rates of Investment.....	43
Table 4.7: Represents annual inflation Rates, Annual Nominal Returns and Real rates of Returns of Underwriting of premiums	45

CHAPTER ONE

GENERAL INTRODUCTION

1.1 Concept of inflation

Since independence, the rate of inflation in Kenya has been unpredictable and uncertain. The economic growth of any Economy depends on the value of Money. The value of money changes from time to time. Inflation can be defined as the sustained or continuous rise in the general price level of goods and Services or, alternatively a sustained or continuous fall in the value of money. Inflation can also be defined as the purchasing power of money for goods and services. In this definition, the movement in the general level of prices does not refer to changes in one price relative to other prices. These changes are common even when the overall level of prices is stable. The relative prices of prices must be substantial and continuous over a period of time, for instance, one week, one month.

Modern approach to inflation follows the theory of price determination which states that inflation is caused by both demand side and supply side factors. Demand side factors happens when forces of demand pull inflation, excess consumer demand may out space the wages upward follows an argument on the basis for Phillips Curve which states that inflation and unemployment is inversely related, this happens as more workers earn wages; the additional demand causes a demand pull inflation. the demand pull inflation while the supply pull factors of inflation happen as a result of cost push in the factors of production. These are exogenous shocks to supply effect factors of production. For instance higher cost of raw materials, labour and other commodities for production may lead to inflation. The elevated prices get passed on to consumers especially when there is no close substitute for the products. Monetary Economists are of the opinion that supply of money leads to inflation, when there is no corresponding increase in output, the currency gets devalued. This School of thought who believe that inflation may also happen due to upward pressures coming from the activities which would produce a fall in output, monopolistic pricing behaviour

Generally, people believe that inflation is everywhere and a rapid growth of money results when the government spending is increased leading to a rise in money supply. A rapid growth of money plays an active role inflation and is boosted when finances its budget deficits through

money creation. According to monetarists, the Central of the Economy has the mandate to regulate inflation through interest rates and Taxation.

The description of inflation is therefore confusing due to the fact that a loss by one party is a gain on the other. The redistribution of inflation has real effects in the Economy. Some the effects brought by inflation are permanent as long as inflation continues, the costs will be incurred while some of the costs are transitory and they take an upward trend as inflation varies. The extra costs are met because inflation rates are unanticipated while other costs arise when the inflation is fully anticipated. Anticipation of inflation occurs when there is full indexation of which very few economies have managed to, while unanticipation of inflation is when the real effects of inflation is analyzed and the economy relies on nominal contracts. Inflation therefore reduces the real value of public wealth and with it the real value of the private sector. It redistributes wealth from private sector to the public sector. Unanticipated inflation to a greater magnitude affects market economy since pricing system. The cost of inflation is higher when the rate of inflation is high.

To measure inflation, Laspeyers, Retail Price Index (RPI), and Consumer Price Indices (CPI), are used. In this study, the Consumer price index will be used to determine the rising cost of commodities. This study focuses on Kenya. Kenya is a developing country whose inflation rate is unanticipated and uncertain. Since independence, Kenya has had unpredictable rate of inflation. In certain cases for instance in 2002 the rate of inflation was 2.0 per cent, in 2003 the rate was 9.8 per cent, this gives a 5 times rise in the rate of inflation. In 2007, the inflation rate was 9.8 and the following year, the rate of inflation was 26.2 per cent; this gives an indication that it was approximately three times the year before. In most of the developed countries for instance United States, the inflation rate during the year was in 2002 was 1.6 per cent and 2.3 per cent in 2003 per cent. Similarly, in 2007 inflation rate in the United States was 2.8 per cent and 3.8 per cent in 2008. The yearly gap can is too small and the rate of inflation can be predicted. High and unanticipated rate of purchasing power risk increases uncertainty which often lead to inter and intra temporal misallocation of resources as long as prices not stable. High and accelerating rate of inflation have dire consequences on economic growth.

High rates of inflation cause problems not only to individuals but also to the aggregate economic performance. The magnitude of problems as a result of high inflation rate deep in the developing countries compared to the developed ones. A moderate inflation positively influences the

investment level in an economy whereas a higher rate of inflation has a significant negative influence on the investment level in any given economy. It is against this background that the study attempts to investigate the impact of purchasing power risk on the insurance sector particularly on non-life insurance operations. Insurance Companies fall under the Financial Sector in the economic growth. This paper targets Kenya as a case study for developing economies which are often characterized with high and unpredictable Purchasing Power Risk. The high and uncertain Purchasing Power Risk is a challenge to any economic growth and Development and if not checked, instead of Economic development, the developing Economies will continue borrowing and Repaying endless Debts.

1.2 Effects of inflation on Insurance industry

Insurance Industry is a return oriented. Insurance Companies are defined as legal institutions whose mandate is to cover the financial impact or part of it that derives as result of occurrences of certain unexpected Insured events that affect the Insured. The Insurance Industry offers this benefit in exchange of regular and consistent payments of premiums. This is achieved by pulling together similar Risks and transforming the unpredictability of the occurrences of sad events to expected events affecting any of the Insured.

The insurance Industry has two broad divisions; The Life and General Life Insurance. In the life division, the Insurance is concerned two sectors; Life and Health Cover Policies. Under Health Cover the Insurance meets the Cost medication incase the insured is hospitalized for an accident or a disease that is covered under the policy. In Life Insurance, the policies that the Insurance in this section provides are Term, Endowment and Whole Life Assurance Policies. The insured is paid the Sum Assured when the policy expires or upon death depending on the type of policy. Under the Life Insurance the Policy holder agrees to pay regular premiums to the Insurer and at the end of the policy, the policyholder receives the Sum Assured. The Premiums paid by the policy holder is equivalent to the sum assured and the office expenses. In this case inflation rate influences both the office expenses and the value of the Sum Assured. For instance, the Value of Sum Assured of Ksh.1million today will not be the same in 10 years' time. The cost of office expenses today will not be the same in 5 years' time. This will therefore affect the operations of the Insurer since the regular premiums paid are constant, they do not vary with the inflation rate. However, the study focuses on the impact of inflation on non-life Insurance

In non-life, the Insurance business is to cover general business activities like the motor vehicle, Aviation, operations of Organizations among others. In non-life the Insurance Companies are involved in Underwriting and Investment; Insurance Underwriting and Investment. The process of underwriting involves choosing of those risks and postulates that that will earn the company profits to the Insurance Companies. Underwriting of Policies aims at accessing how regular, the frequency, and the magnitude of the risks involved before accepting or rejecting the proposal to insure the Policy. Underwriting of Insurance policies is prone to gains and losses while the profitability of the Insurance Industry depends on both Underwriting and Investment Returns.

Insurance Underwriting Risks occur when Insurance Companies suffer losses as a result of economic situation (like high inflation risk) or occurring rate of incidents that have changed contrary to the forecast made at the time when the premium rate was determined.

Insurance Industry provides financial protection from identified risks occurring within specified period of time. The Insurance product is unique in the sense that its ultimate cost is only known after the occurrence of the insured event yet the pricing is done long before the event, regularly and fixed premiums are paid by the policy holder.

The Insurance Industry is a Return oriented and the operations of Insurance Industry are sensitive to the purchasing power risks.

1.3: Effects of inflation Non-life Insurance

1.3.1: Underwriting and Investment

In general insurance, the main portfolios to be examined are the underwriting and investment activities. Insurance premiums/pricing provides coverage for future losses and losses settlements, the assumptions of future inflation has to be factored. During low and relatively stable inflation levels, calculation of insurance pricing is easier. The variance of pricing against claims is no so large compared to situations where inflation is relatively high and uncertain inflation rate. Unanticipated hike in inflation can leave normal pricing inadequate to meet claim costs. The development of these models will be based on the nominal values of all variables under study.

The 5 year strategic plan released by Insurance Regulatory Authority in 2013 indicated that the Insurance penetration rate is far much below expectations. According to the Association of Kenya Insurers Report on Strengths, Weaknesses, Opportunities and Threats (S.W.OR.T) Analysis that was released for the year 2012, it indicated that both Life and General Insurance stood at 3.16 per cent. Out of this, Non-Life Insurance contributed 2.08 per cent, while the remaining 1.08 per cent was contribution from Life Insurance. The penetration rate was mentioned among the key challenges facing the Industry. The 5 year Strategic plan for the period indicated that inflation is one of main threats facing the penetration rate in the Industry. It indicated that achieving the target of improving penetration rate from 3.16 per cent in 2012 to 3.5 per cent in 2018.

This study seeks to understand how high inflation rate which is an economic problem and is regulated by the Central Bank of Kenya can be manipulated to a moderate level that will favour both investments and growth of Insurance Industry. Also to the policy holders the Real Income is not in tandem with the rate of inflation, only a few will be able to purchase the policies thereby reducing the demand for the Insurance products. The study investigates how high inflation rate affects the performance of the Industry in developing economies a case study of Kenya where the Purchasing Power Risk is unpredictable and high. In countries like Norway have effective inflation containment policy and this policy has been adopted by all financial sectors in economy unlike in Developing countries whose inflation rate is uncertain and unpredictable. A similar study was conducted by Nahum and Kahane in the United States. The inflation rate in the United States is often low and predicated compared to Kenyan case. Individual Insurance Companies intend to choose to underwrite and invest in those options that are less Risky and earn more Returns but with Purchasing Power Risk Insurance Companies do not achieve their intended target.

The purpose of this study is to determine how inflation affects the important elements of Investment Returns as well as Underwriting Returns. In addition, the study aims at determining the inflation threshold (the moderate inflation rate) rate to which a favorable response in the no-life industry will be realized.

1.4 Problem Statement

Insurance penetration rate in the Country as at 2013 had a penetration rate of 3.16 per cent. This implies that the ratio of premiums to the GDP is 3.16 per cent yet according to the strategic plan for 2013-2018 released early 2013 indicated that the main objective of the Industry is ensure that the penetration rate is in tandem with the yearly growth rate. For instance, the report indicates that in 2012, the economy grew at 4.6 per cent. Comparing with other sectors like agriculture, Trade and Transport and Communication whose contributions were 17.6 per cent, 15.2 per cent and 10.8 per cent respectively of the overall growth in 2012, the penetration rate was 3.16 per cent in the year in question. According to the report released by the Association of Kenya Insurers, Inflation has been mentioned as one of the key threats to the growth and development of the Insurance industry in Kenya.

Compared to developed economies which have continued to enjoy a long period of low and stable inflation rate since the early 1980s as a result of independent Central Banking, stable monetary policy focusing on stable inflation rates coupled with advanced technological gains together with reduced dependence on developed markets and energy prices which have led to stable prices in the developed economies, there is a sharp contrast with their developing counterparts which have been faced with rather high, volatile and persistent inflation rates. In developing economies, inflation is seen as a real risk for Insurers.

A study conducted by Goldman Sachs Asset Management in the early 2013 which aimed at understanding the both future investment and non- investments themes for the global Insurance Industry indicated that 26 per cent of the respondents listed inflation as a major macro-risks facing the Industry. Uncertainty surrounding the future path of inflation rate remains high and as Insurance Companies whose major target is to maximize returns and minimize the Variances to the Returns on both premiums and Investments must observe when pricing the policies and choosing investment portfolio. Property and Casualties bare the greatest risk when inflation bites or rises. New policies are never adjusted in tandem with the rising inflation rates. The rising inflation rates have tangible influence of the technical results in the balance sheet. This happens because whenever inflation rises in the insurance industry there is social inflation that is never factored in the CPI that makes inflation in the Industry take a different dimension. Claim costs in the Insurance industry means the sum of social Inflation (legal costs inflation, medical costs

inflation) and the Consumer Price Index or the Price indices. Insurance companies choose the right portfolio to invest their reserves. Insurance companies own financial assets which are also sensitive to rising inflation rates, for instance, government bonds earn fixed interest rates yet an increase in the nominal interest rates implies a rise in the inflation rates. It therefore means that the returns are negatively impacted. Moreover the liabilities owed by the Insurance companies rise with increase in inflation, this negatively impacts on the claim reserves. These Inflations have a negative impact on the balance sheet of the Insurance Industry and if not checked, some of the Insurance Companies operating in the Economy may be forced to close shops in the long run if not becoming insolvent.

The Insurance Industry being one of the main financial sectors in the Kenyan economy has not contributed adequately in the economic growth due to some factors like inflation which can be regulated to a moderate level. The insurance Industry has a role to play towards the achievement of Vision 2030 that is expected to take the Country to the Medium Class economy in the world. If Insurance Companies are not supported there the realization of the vision 2030 may just be a dream since high rate of inflation generally slows down the economic growth of economies. Therefore the Insurance Industry is faced with high cost of meeting the claims, low income yields; low returns on equity, inflation claims higher than the actual inflation rate hence failure to meet targets. Insurance Industry, apart from experiencing the normal inflation, it also experiences claims inflation that always couple with social inflation. Therefore the term inflation in the Insurance means more than just inflation. Without contribution from the Insurance Industry to the Economic Pillar, it means that the realization of the Vision 2030 will not come to exist since its one of the major financial sectors in the Economy.

1.5 Objectives of the study

1.5.1 General objective

The main objective of the study is to re-examine the effect of inflation on no-life insurance Industry

1.5.2 Specific objectives

1. To establish the impact of purchasing power risk on Real Investment Returns
2. To establish the impact of purchasing power risk on Real Underwriting Returns
3. To establish the inflation rate (moderate inflation rate) threshold to which a positive influence on the performance of non-life industry will be realized

1.6 Significance of the study

Insurance Industry is one of the key pillars of the financial services sector, the Industry is central to the realization of financial services targets as set in the vision 2030, a long term blue print for Kenya. To achieve this target, there is need for the Industry to improve efficiency. The Insurance Industry has been faced with a reduction in claim reserves; low returns as a result of poor financial performance. This study seeks to come up with mitigation strategies for the non-life Insurance Industry. This study seeks to come up with proposals on how the monetary policy makers could be made to control inflation rate to a moderate and stable that favours growth in the Industry. This will help in boosting the financial performance in the Industry which would eventually lead to the Industry's full contribution towards the achievement of vision 2030 target. Better financial performance of the Insurance Industry means that the industry will hire more labour thereby reducing unemployment rate in the economy, this further indicates that living standards will be improved hence poverty reduction in the economy. Reduced inflation translates into higher affordability (higher demand) of the Insurance services as a result of cheaper premiums hence better financial performance and there is possibility of the Companies doing Corporate Social Responsibility in the Society. This will promote the general development in the economy. Investors will also find it cheaper to do business in the country. There will be improved taxation to the government. In addition, the realization of expected profits will be achieved. In general the study will be useful due the fact that controlled inflation will enable the Industry players to make important decisions regarding premium loading, retention of reserves that will ensure high profitability and realization of the expected returns for the industry.

1.7 Scope of the study

The study covers the period between 1998 and 2012; a period of 15 years. The study is on non-life Insurance and it is affected by inflation rate. In the study, there are other variables that influence the performance of the Insurance Industry but in this case, the researcher assumes that inflation has a general influence on the financial performance of the Industry. In addition, as suggested by other studies, the researcher intends to come up with the moderate inflation threshold which if obtained; a rise in the performance of the non-life will be realized.

1.8 Literature Review

Little of knowledge exists on inflation on the performance of the Insurance Industry in the US which experiences a low and stable inflation rate, none or little of the literature exists in the Kenyan case which is faced with relatively high and volatile inflation rates. This study is unique because of high and volatile inflation rates coupled with different methodology in the analysis. The previous study by Kahane and Nahum used the Insurance performance model in the analysis to obtain the target.

1.9: Definition of terms

Purchasing power risk: refers to the ability of a currency to purchase a basket of goods in a given period of time

Non-life Insurance industry: Insurance companies that provide Underwriting of Premiums and Investment Activities only

Insurance industry: a combination of Insurance Companies offering the same line of business

Real Investment Returns: these are returns on the Non-life industry obtained when the inflation rate is subtracted from the Nominal Returns on the Investment Portfolio

Real underwriting Returns: this refers to rates obtained from the Underwriting of premiums portfolio after inflation is factored in the calculation. Inflation rate value is subtracted from the nominal rate of return on underwriting premium

Nominal investment returns: is the rate of return on investment before inflation and other expenses are factored in

Nominal underwriting returns: this refers to the rate of return on the amount invested in the coverage of premiums

Premiums: these are monthly contributions the insured persons pay to the Insurer and is meant to compensate the Insured incase of any eventuality or occurrences of risks or policy covered.

Inflation Threshold: the optimal level of inflation to which any value exceeding or below the upper and lower limits would be disastrous to performance of Insurance Industry

Insurance Performance: the amount of income the non-life Insurance Industry obtains from Underwriting of premiums and Investment Activities

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses previous studies that were conducted in relation to the current one. In

2.2 Inflation

Inflation is generally defined as a sustained increase in the cost of living. While there are several indicators of the cost of living, the most commonly used is the Consumer Price Index (CPI). Siklos (2002), the CPI is the imperfect measure of changes in the overall price level.

Siklos (2000), inflation is fairly attributed to the World War II and a global phenomenon of the 20th Century. In the study, it was observed that Countries like the Latin and South America have lived with for decades with high inflation, experiencing 20 % or more inflation annually. Siklos (2000), Inflation continues to persist in all economies except the industrialized ones whose inflation level dropped sharply during 1990s. It was observed that during the gold standard era, (1900-13), the average inflation rate in US was 1.23 % while that of UK was 1.22%. This sharp decline was as a result of Central banks in these economies taking control of inflation.

Siklos (2000), inflation began to persistently rise in early 1970s. This was attributed to the fact that wages being the main contributors of inflation. Wages formed the major component of production. The formation of unions to negotiate on behalf of workers in the production sector made the wages to increase; there was excess demand for goods and services that led to wages hikes. This led to the emergence of Philips curves which shows the inverse relationship between unemployment and inflation. Policymakers at one point used to believe that the type of government has an influence on the inflation status of the economy. This is due to fact that there is a simple tradeoff between unemployment rate and inflation. What determines the preference of political authorities? It's observed that election promises and political temperatures raise the Inflation rates.

Allesina, Robini and Cohien 1997 and Persson and Tabellini (1994) argued that a looming election puts pressure on elected officials to influence the economic performance; (higher economic growth or lower unemployment rate) to enhance election campaign promises, a

political inflation emerges. Economic performance can be improved by stimulating aggregate demand with positive impacts for inflation. In developed economies, people vote those candidates with strong economic policies and these policies end up the candidates forming two opposing blocks; for reduction in inflation and unemployment. One party favours lower unemployment rate over inflation, while the other party may put greater emphasis on lowering inflation. Consequently, this leads to partisan inflation cycle.

It can be observed that in Kenya's data, inflation is recorded high during and immediately after elections. Volatile during and after election periods

High inflation rates cause problems not only for individuals but also on aggregate economic performance. The magnitude of inflation in developing countries is often high and unanticipated unlike in the developed economies whose inflation rate is low and stable. In the study, it was observed that a moderate inflation is positively related to economic growth. A moderate inflation rate has a significant positive influence on the investment level on any economy whereas high inflation rate is negatively related to investment level of any given economy. The purchasing power risk in the developing economies has been characterized by high and unpredictable and uncertainty.

Khan and Ssnhadji (2001), re-examined the threshold effects of inflation and growth, in the study, it was observed that a somehow inflation rate positively influences economic growth while a high inflation has a negative impact on the economic growth. In this study, the findings reveal that there is a non-linear relationship at switch over point where if the inflation surpasses, the opposite relationship changes to a negative relationship. The inflexion point indicates therefore that inflation rate should be maintained at that level to spur economic growth. In the study, non-econometric techniques were used to estimate the effects. In the study, findings indicate that the inflexion point in developed economies is lower than that of the developing countries.

Kahane and Nahum, examined the consequences of uncertain inflation to non-life insurance companies. In the studied, insurance companies are assumed to be risk averse; the findings indicated that with better assessment of inflation and the examination of co variability, there are higher possibilities of yielding better returns hence better performance

Society of Actuaries (1975) Vol.1 on the impact of inflation on life Companies, the findings revealed that inflation has devastating impact on the life Industry, in their discussion, inflation pose horrendous problems by eroding the cash value and pension benefits. In addition, it erodes the ability of clients to pay. To the discussants, inflation is caused by huge debts owed by the government and in their presentation, it was concluded that economic growth of a country huge debts impossible until the debts are fully destroyed.

D'cracy on the impact of inflation on Insurance company operations, a total return determination in insurance industry from both underwriting and investments is considered. The paper indicated that very little attention has been paid to the impact of inflation to the performance of insurance industry. Fischer (1958) introduced the theory of interest rate and argued that there is a direct relationship between interest rate and inflation. Inflation is main cause for rising interest rates. Depending on the actual leverage position, of the insurance company, a rise in interest rate reduces the underwriting profit margins.

Nahum Binger (1976) conducted a study on portfolio selection and purchasing power risks; the consequences of inflation for portfolio decisions and allocation of funds between different capital asset using the recent Canadian data. It was found that when inflation rates is assumed to be unknown, the composition of portfolios based on the a proper assessment of both nominal yields and the inflation rate is likely to be different from that of portfolios constructed without any particular attention on purchasing power risk. The findings indicate that real performance of the portfolios whose inflation rate assumed to be unknown dominates those whose portfolios were not constructed without paying attention to any particular attention to the purchasing power risk. Shares, treasury bills were the main capital assets.

Luenberger (1998:153), Investment Science, Portfolios with only a few assets highly subjected to high degree of risks. Generally the variance of the return of portfolio may be reduced by including additional assets in the portfolio. Process called diversification (do not put all your eggs in one basket)

$$\frac{1}{n} \sum_{i=1}^n r_i = r$$

It is a fact that individual returns are uncorrelated. The variance returns reduces as the number of assets increases

Kahane and Nye (1975), on the portfolio model of the insurance Industry examined through the use of US aggregate data to demonstrate the magnitude of portfolio effects and their influence on the underwriting and investment policies of the industry. Kahane and Nye (1975), it was observed that the composition of the optimal investment portfolios of insurance companies depend on the composition of insurance portfolios. This observation was evidenced by the fact that the optimal investment portfolios have a tendency to become more risky for higher insurance leverage levels, for instance to include more stocks and less bonds. Another observation in the study was that the regulations of insurance companies only constrained the investments on certain types of assets but is not related to the composition of insurance portfolio of the firm even though such relations are detected on the optimal portfolio. These regulations pose constraints to the industry and indicate that the industry is inefficiently structured and is located beneath the efficiency frontier thereby increasing riskiness of the firm for a given level of expected returns. This brings to conclusion that the industry's capital is inefficiently employed to attract better expected returns to the industry, Kahane and Nye (1975).

Sugars,() the managerial theory for the Non-life Stock Company, the objective of the study was to describe how the expected financial performance of an insurer over a finite period of time horizon is equated with the expected value of periodic profit, the variability of profit from one period to another and the probability of ruin occurring at the end of the period. The Insurance transaction is often characterized as one in which the insured exchanges the financial uncertainty for certainty. The responsibility of insurance is to reduce and to maintain very low probability ruin through choosing the efficient portfolios and underwriting policies with low probability ruin. Sugars (1970) ,argues that the value of investible assets at the beginning of a period may be controlled by altering the value of the buffer fund assets. The funds available for investment may also be controlled by altering credit terms for the agents, the size of cash floats, the policy terms and the term of cash payment available to policy holders (investible assets). The chebyshev model used in the study yields inflated estimates of probability ruin. The theory of finance suggests that insurer should first identify the efficient frontier for all possible sets of administrative policies. Determination of the frontier for the Insurer is a formidable

mathematical programming problem; the program must reflect interaction between non catastrophe exposure elements of the insurance portfolio, the catastrophe exposure, re-insurance arrangements and the generation of investible funds. The identification of the efficient frontier will enable the Insurer to identify the efficient frontier, relate the total periodic mean and variance associated with the administrative policies to shareholder and stakeholder welfare and thereafter identify a set that will yield a maximum welfare. Sharpe in his paper argues that share price relates to periodic expected yields. However finance theories omit the provision a negative effect on policyholder and shareholder welfare, with rising probability of ruin leads to more premiums for welfare of the shareholder.

Boyd, Levine and Smith (2000), conducted a study on the impact of inflation on financial sector, the study aimed at investigating the relationship between the inflation and banking sector development and equity market. The study revealed that there is a non-linear and negative relationship. As the rate of inflation rises, the marginal impact of inflation on banking lending activity and stock market development diminishes rapidly. Boyd, Levine and Smith (2000), the data indicated that as inflation rates exceeded 15 percent mark, there is a discrete drop in financial sector performance, therefore more inflation is does not match the greater equity returns in low inflation countries, nominal stock returns move essentially one for one with marginal increase in in high inflation economies.

Sugars (1970), investigated the relationship between selected administrative policies prescribed by the top management and financial welfare of both policyholder and shareholder. Given the stochastic nature of insurance industry, the spirit of the insurance transaction is that the insured exchanges the uncertainty for virtual certainty. The responsibility of the company is to attempt to maintain a very low probability of the ruin and maximize periodic profits. These two forms are the performance variables.

Harun Jnr, some insurance companies have put apart the investment departments to protect the assets built up and to earn return on funds and additions generated by volume growth and retained earnings. The separate investments are like two different firms operating under one entity; the Investment Company and insurance company. The paper indicated that there is a challenge to improve the financial position of company relative to its competitors, inability to add premiums, to innovate, raising and increasing capital

The paper concludes by stating that weak insurance companies with poor underwriting results must maintain relatively conservative portfolios

Capital adequacy is the single most important influence on the investment policy. A company whose return is between 40-45 per cent of its liabilities would be severely damaged should there be a severely damaged in case of sharp increase in market decline. In contrast to this, a company with substantial capital position would be able to afford the risk associated with full investment of their capital funds in common stock, overcapitalized companies, its uncommon to find the value of equities in the portfolio exceeding the capital funds.

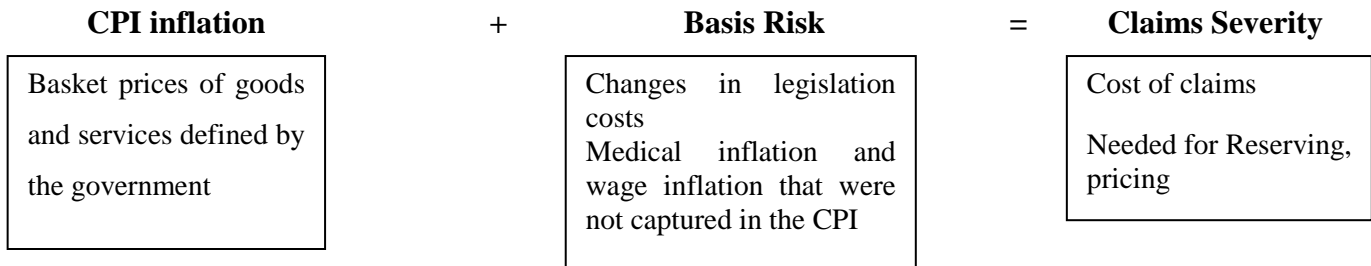
Chen and Bonness (1975), investigated the impact of inflation on the investment and financing decision of a firm, it was observed that the presence of uncertain inflation has a significant impact on a firm's investment decisions and ignoring its presence may lead incorrect decision when during project selection. Uncertain inflation affects cost of capital of a specific project through the market price and the systematic risk of the project and hence the firm's investment decisions. It was also concluded in the study that leverage factor affects the premium for a firm's financial risk through the components of variability and inflation risks.

General Industry business, the basic core activities are the underwriting of policies and Investment. Although Investment activity is one of the main operations in non life Insurance Industry, Premium underwriting has been and continues to hold the top priority in the non life Insurance activities. Non-life Insurance generates its income from Premiums and investment activities. Pune (1985). All other activities emanate from mainly Underwriting. Pune, defines Underwriting as the process of evaluating the proposal that comes for insurance. Profits and Solvency concern has forced the Insurance Industry to take a different look at the Underwriting of Policies. Insurance Companies just like any other organization have regulations that have a bearing on the underwriting and pricing. The pursuit of premium is the goal of all general insurance industry and the premium written has to be quality and be able to generate profit (Pune). The ability to offer excellent and quality underwriting will determine the long-term survival of the general Insurance. Pune (1985), marketing, claims settlement and investment operation all depend on the underwriting operation of the Company.

Developed economies have enjoyed a long period of low and stable inflation since the early 1980s. This has been attributed to Strong independent central banking system which mainly focuses on stable monetary policy particularly targeting inflation, technologically driven productivity benefits and reduced independence on the developed markets on energy prices that have supported price stability in these economies. In a sharp contrast, the developing economies have been faced with volatile and rising inflation rates since 1970s that has partly been fuelled by part oil shocks and deflationary period of 1930s.

Normally the expected inflations on average ought to be consistent with the central bank's inflation target but in real senses a bimodal outcomes of either higher or lower inflation rate scenarios presents which the insurance companies ought to prepare for. A survey conducted by Goldman Sachs Asset Management (2013), indicated that inflation is seen as a very real current risk for insurers. The study aimed at understanding the future investment and non- investment issues for the global insurance industry. Also noted as a major risk in the insurance Industry is the current monetary policies. In the study, it was observed that there are two types of inflation; CPI inflation and claims inflation.

The diagram below shows the linkage between Claims and CPI inflations



In the diagram above, CPI inflation is the one targeted by the Central bank or the inflation used in the indexation of the inflation-linked bonds or swaps. Apart from CPI inflation, there are other costs that insurance firms meet in the course of their operations, for instance, there are legal costs and social inflation that were not initially captured in the CPI called the Basis Risks. Social costs may include rising wages to employees, rising cost of office expenses.

Fama (1981), Gibbons (1982) and Marshall (1992), real stock returns are negatively correlated with inflation, expected returns or unexpected. Stock price is also negatively related with price of consumption. Further, real returns to nominally risk free bonds are negatively related with inflation. Chen, Roll and Ross (1986), Asset prices which are positively related with inflation are those with inflation earn a lower risk premium. However, the negative correlations between asset returns and inflation sharply contradicts the assumption that equity shares should be used to hedge against inflation (Chen 1996). Insurance just like any investor is risk averse, it wants to invest in those assets whose portfolio will yield highest returns against a small risk of variance (small risk) and a high expected return Marling and Emanuelson (2012).

Kahane and Nye (1975), on the analysis of a portfolio model to the property-liability insurance industry; it was observed that some efficient portfolios that are capable of yielding high returns have been excluded from optimal portfolio because of their risk-return features. It was found that the investment policy of the insurance firm need not to be more conservative as the insurance portfolio becomes risky. The use of diversification as a means of reducing portfolio riskiness which basically means diversification of insurance and investment portfolios arises as a result of Mean-Variance criterion.

Markowitz (1952), on portfolio selection indicated that in the process of selection, there two stages that investors has to go through; observation, experience and beliefs about future performance of securities. The next stage is the investor believing in future performances of given portfolios and then choosing the right portfolio given the observation. The portfolio selection model assumed the market perfection and that all investors are risk averse. Diversification is both observed and sensible. It found that probabilistic reformation of security analysis was necessary.

Elton, Gruber and Rentzler (1982), on Inflation and Capital Asset Prices, indicated that the underlying tenet of mean variance is that the level of expected returns investors wish and to minimize the variance of the return. In mean variance equilibrium models, the only risk that cannot be away is the covariance of an assets return with the markets return and assets with same covariance with the market have the same equilibrium return. In this model works well then, a stock which has a perfect hedge against inflation should be able to give the expected returns.

Dao (2014), Risk and Development in developing countries, examined the impact of risk management on economic development in developing countries. The survey was conducted in seventy-eight developing economies and some selected risk indicators were studied. The findings of the study indicated that the selected risks have strong effect on the development of economies. The risk indicators in the study among them was the Purchasing Power Risk per Capita GNI, Adult male mortality rate, homicide rate developing countries risk penetration index poverty lead count ration. The study focused on the impact on the impact of selected risks indicators on economic development, the results of the study shows that more than three-quarters of cross countries variations in purchasing power parity can be explained by linear dependency on the number of years over which the country was in recession.

Dao (2014) indicated in his study that Economic development can take place only if countries can successfully confront risk and pursue opportunity

Ahlgrim and D'cracy (2012,conducted a study on the effect of deflation of high or high inflation on the Insurance industry, it was observed that high inflation itself may increase claims of insurers and the interaction with other economic and financial variables may lead to a more complex risk assessments. It was further observed that high and unanticipated inflation creates

significant uncertainty in the economy, long-term real economic growth become depressed especially if the inflation rate exceeds wage growth leading to declining real earnings. Ahlgrim and D'crazy (2012), inflation negatively impacts on the future claims on the current policies. Values of property are based on the cost to repair or replace the item at the time of the loss, as inflation increases, the value of the property also the cost of claims. The insurance company can expect collision damage repair costs to increase more rapidly than the general rate if inflation were to increase significantly. This therefore increases the medical inflation rate portion of property-liability tends to exceed the general inflation rate. In the study, the findings indicated that apart from the high cost of future claims, property-liability insurers are likely to experience a slowed development on loss of reserves should the rate of inflation continue rising. An increase in inflation means that insurers have to pay more than expected to settle the claim.

Sheraton Mirage (2010), conducted a seminar discussing the inflation risk in the general insurance, it was concluded that finding a simple stochastic inflation model is hard or may be impossible, loss severity trending should be by yearly payment, the risk of unanticipated inflation should be factored in the economic capital. The findings also indicated that some standard reserving methods do not respond well with varying inflation, further, hedges such as inflation-linked securities, cash, property and commodities used have drawbacks. The paper also further recommended that investing in shorter nominal bonds could be useful. Quantification of inflation is rather challenging.

Ahlgrim and D'crazy (2012), a negative impact relationship between inflation and investment portfolio was observed. Fisher (1930), inflation rate and interest rates directly proportional and therefore a rise in the inflation rate means a rising interest rate. Investors expect more real returns over the inflation rate. An increase in interest rates reduces the value of long term fixed income holdings which make up significant portion of investment of property-liability insurance.

D'crazy (1982) and Krivo (2009), during 1933-1981 and 1977-2006, insurance investment were significantly negatively correlated with inflation. This was due to high inflation experienced during the periods; a return to a high level of inflation reduces the value of stocks held in insurers' portfolios. A sharp increase in inflation rate significantly negatively affects the property-liability insurance; earnings from both underwritings and investments will be significantly reduced.

D'Arcy, the lowest underwriting profit margin was experienced during the period of moderate inflation. However during high inflation, the underwriting profits were somehow high.

Fischer (2011), investigated the relationship between inflation uncertainty and the investment decisions of small, micro finance-funded firms. The findings indicate that periods of increased inflation are associated with significantly lower investment rates in fixed assets and reduced business growth.

Krivo (2009), conducted a study on the “An Update to D’Arcy’s “A Strategy for Property-Liability

Insurers in Inflationary Times”, in the study, it was observed that the Insurance Industry have to priorities the effect of inflation. The rate of inflation is a major concern for Insurance Companies and the Insurance Industries have to proactive in analyzing and selecting trend factors in order to keep prices and reserves adequate. Insurance companies can target low or even negative underwriting profit margins due to the income earned on their invested assets. However when inflation rates rise, their portfolios of bond assets lose value. Findings revealed that that investment income return and inflation are negatively correlated.

A survey conducted by GSAM Insurance (2013), indicated that real assets are investments that have the potential to deliver long-term income that increases with inflation rates. The assets that appeared to deliver better returns on capital include infrastructure, real property and commodities and naturally create an inflation- resilience investment strategy. Property prices have a long history of exhibiting a strong correlation to inflation especially during high inflation periods. Also rental income increase as inflation increases.

Hobbs, LeGraw and Veit (2010), considered asset class performance in times of high inflations, it was observed that a rising inflation is not unilaterally negative for event for an insurer. The impact of inflation on the real value of an insurance company’s surplus depends on the sensitivity of the liabilities. In certain cases, the values of liabilities decrease as inflation rate increases. Further it was found that even if the insurance company’s liabilities are not inflation sensitive, the real value of a company’s surplus is still subject to inflation to the impacts of inflation. Therefore, even those companies whose insurance liabilities are not sensitive to inflation have to adjust the risk of inflation on their surplus assets. Hobbs, LeGraw and Veit (2010), inflation- linked bonds are not a perfect inflation hedge as they are also affected by

changes in real interest rates. However, during high inflation, they offer substantial inflation protection. Inflation-linked bonds provide income like nominal bonds and have low risk-based capital charges. In moderate inflation, the inflation-linked bonds obtain lower yields thereby suppressing the earnings. Hobbs, LeGraw and Veit (2010), rising inflation severely punishes nominal bond returns as the bonds negatively re price to reflect higher prevailing rates. Hobbs, LeGraw and Veit (2010), equities are expected to earn a risk premium over bonds, in transition period of inflation, equities produce much greater earnings and balance sheet volatility to insurance company as well as much higher risk based on capital charges.

RBC Global Asset Management (2011), is inflation still a major risk worthy of concern? This was the major question. Not really. This was the question asked in the study where inflation risk and core investment vehicles. The findings indicated that the central banks' monetary policy in the western economies have managed to control the inflation rate making it successful. It further indicates that since embarking on the formal inflation targeting, central bank policy for most economies have remained credible, and long term inflation expectations have remained anchored. Deep global downturn of 2008/2009 have however stocked fears of a return to higher and potentially more volatile inflation like the one experienced in early 1970s.

United States along with quite a number of developed economies have enjoyed relatively stable economies. Potentially rising inflation rates is a concern for investors. Inflation has an impact on the asset class returns. Expectation for higher inflation or increased uncertainty around future inflation may be a cause to panic for investors to revisit their investment portfolio selection. In addition, the main objective of the investor is to secure long-term income investment streams to meet expenditure requirements that are tied to inflation. Investors aim at earning sufficient long-term investment returns over and above inflation. Arising inflation uncertainty coupled with a maturing population challenges investors' ability to meet the desired objects on returns. In the study, it was observed that there is a relevant risk for US investors and this is evidenced by the fact that there has been a marked uptick in inflation volatility since 2010 April.

Minimum Risk Portfolio is an investment strategy that delivers an income objective with the least amount of risk and for an investor looking to realize a real income level (the adjusted inflation level). MRP is a portfolio of the Treasury Inflation Protected Securities (TIPS)

Thornburg Investment Management (2013), focusing only on nominal returns ignores the degrading effects of inflation, taxes and investment expenses. The 20th edition of the newsletter indicates that the three mentioned factors above must be considered and are beyond nominal returns that investors should use for successful planning. Thornburg Investment Management (2013), it was observed that inflation is the investors' old nemesis, and is a by-product of extremely accommodative policy. Inflation can easily erode purchasing power of income generated from investments. Thornburg Investment Management (2013), all investors pay expenses, the investors therefore must look beyond the nominal returns, to what investments generate after inflation, taxes and expenses in order to attain Real Return.

Reid (1978), claim reserves in non-life whose main objective was to develop mathematical model for claim experience in the general business which was to be based on the general applicability and will be capable of modification to reflect aspects of claim expense. The findings of the study indicated that the approach would lead to insights into the nature of reserves that enable a number of questions arising naturally; for instance the extent to which the margin inherent in undiscounted reserves is capable of offsetting random fluctuations (inflation) in claims development have to be scrutinized. The methodology has been successful in cases where there is a short-term in the sense that claims are made perhaps a few months of the event giving rise to claim. Short-term investments are seen as less sensitive to inflation and in long-term, inflation rates are factored. Theory of estimation in long-term investment becomes less effective.

Andrew Ang and Knot Kjaer (2012) on investing in the long run; investors in the long-run have an edge over the short-run ones. The long-run investors can ride out of Short Run fluctuation in risk premiums, profits from periods of elevated risks aversions and short-term mispricing. In addition, the long-term investors can pursue illiquid investment opportunities. In the study, it was observed that mistakes that are usually by long-term investors are procyclical investment and misalignments between asset owners and the managers, they ignore the long-term investment horizon. Andrew Ang and Knot Kjaer (2012), long-term investors should invest in many factors of risk premiums and engage all stakeholders for successful implementation of long-term strategies. The study concluded that short-term horizon investors cannot invest in illiquid assets since they would want to access the capital before the returns are obtained

2.3: Knowledge gap

In the literature reviews revised, it was observed that none of the literature discussed about the highest and lowest thresholds at which inflation must not exceed so as to favour the performance of both Life and Non-Life Industry.

CHAPTER THREE

METHODOLOGY

3.1: Introduction

This chapter is concerned with the Research design, Sampling techniques, methods of data collection and models that will be used to analyze data. At the end of the analysis, the researcher intends to obtain how the purchasing power risk has influenced the performance of non-life insurance industry ;especially given the fact that the general insurance has two main activities of operations; underwriting of premiums and investment activities. Also the study aims at estimation the inflation thresholds; both the upper and the lower thresholds which might be harmful to the performance of non-life insurance industry.

3.2: Data Collection

In the study, the main Variables are Consumer Price Index (Inflation rates), Non-life Insurance Income. Under non-life; the two activities are underwriting of premiums and Investment Activities. The study will use Secondary data. Data on the Annual rates of Inflation was obtained from Central Bank of Kenya

Also raw data for non-life Insurance Industry Incomes was obtained from IRA. The data from IRA was raw and calculations had to be done in order to obtain the required data.

3.3: Data analysis

The data will be analyzed using a statistical package called R Program in order to give the required results

- Performance
- Inflation

Insurance performance is measured in terms of the income Y_t ; Y_t is defined to be equal to Underwriting profit plus investment Income

$$Y_t = P_t U_t + I_t r_t$$

3.4: Type of data required

In the analysis, the data required is the Income from the Insurance Industry. The data was obtained by;

Getting the non-life Insurance performance data; $Y_t = P_t U_t + I_t r_t$

P_t = the aggregate amount of premiums in year t

U_t = the rate of underwriting profits, that is expressed as a percentage of premiums

I_t = the aggregate Value of investment activities in the non-life Industry in year t

r_t = rate of return on investment in year t

r_t and U_t are random variables

The aggregate amount of premiums and Values of Investment Activities were available for the data obtained from the Source; Insurance Regulatory Authority (IRA)

Rate of underwriting premiums were obtained by dividing the annual underwriting profits by the earned profits for the year. To obtain earned premiums, we obtained the gross premiums less expense associated with the premiums

Annual rate of return on investment was obtained by dividing the annual investment profits by the average assets for the year. Under rates on Return on investment activities there are two general types of investments; Stock and Bonds. The distribution of rates of returns is approximated the behavior of market performance.

The study will focuses on the period between 1998 and 2012. This is due to the fact that although the data on Inflation was available from Central Bank of Kenya since 1961, raw data available from IRA on Non-life were only available as from 1998 until 2012. This therefore made it only possible to carry the study on data available for 15 years.

Rate of underwriting Returns is the same as Nominal Underwriting Returns while Nominal rates of Return is the same as Nominal Returns. Underwriting profits is the estimated expected return on each line of Insurance for practical purpose. In this case historical profits are used for calculation of expected return and its variability. Underwriting returns /profits is obtained from

different lines of under which non-life insurance industry operates. Some of the lines that non-life provides are: domestic fire, industrial fire, engineering, Aviation, marine, motor private, motor commercial, workmen's compensation, theft, personal accident, liability and miscellaneous.

In the study, the annual rate of underwriting was an aggregate combination of the lines in the entire insurance Industry to come up with a single annual rate of premium Underwriting. The annual rates of underwriting profits of all the lines combined together for the entire period of study; 15 years and then arithmetic mean is calculated along its covariance matrix.

To obtain Real Return on Investment, Nominal Investment Return less inflation rate, also Real Rate of premiums is equivalent to Rate of underwriting Return less Inflation rate.

A study conducted by Thornburg Investment management (Vol 20 July, 2013) on a study of *Real* Real Returns on Investment used Time series to determine the influence of inflation on investment Activities between The model compared the level of nominal return and real return; that is after inflation has been factored in. it is observed that the level of real return compared to nominal return is far much below nominal return curve

3.5: Threshold model

Threshold models are used in several different areas of statistics, not just time series. The general idea is that a process may behave differently when the values of a variable exceed a threshold value. That is, a different model may apply when values are greater than a threshold than when they are below the threshold. In this case the model will be used to estimate at what purchasing power risk will be considered harmful to the growth or performance of the Insurance Industry

To obtain the impact of inflation on non-life insurance Industry, A regression analysis will be used obtain the relationship between the two. Also to obtain the influence of inflation on Real Underwriting of premiums and Inflation on the Real Investment activities on non-life Industry similar model will be used. It can be realized from the data available that the relationship is non-linear and therefore Ordinary Linear Squares will be used

To obtain the threshold level inflation on the performance of non-life Insurance Industry, the aggregate annual income Y_t from non-life will be the performance (dependent variable) while annual inflation will be the independent variable. Yasir (2005) used threshold model developed by Khan and Senhadji (2001). The study was on the inflation and growth; it aimed at estimating the threshold level of inflation in Pakistan.

Sarel (1997), the main test for inflation threshold is based on Ordinary Linear Squares estimation of growth equation. In his study on growth, he used Economic Growth as a dependent variable and investment, terms of trade, population growth, government spending and inflation as explanatory variables. In this study, investment activities, underwriting of premiums and inflation rates are the explanatory variables while income from Insurance Industry is the dependent variable. In the analysis, the variables to be used are nominal.

Inflation rate has two terms; inflation rates itself and the extra term. In the analysis, regression is rotated a wide range of threshold values to obtain the highest R^2 or explanatory power is chosen for inferential purposes.

The model is also useful in the determination in the computation of impact of inflation on the general performance of non-life insurance Companies.

The equation is given as:

$$\text{PERFINCOME} = f(\text{INVEST}, \text{UNDERW}, \text{INFL})$$

Where; PERFINCOME= Performance Income (Y)

INVEST=return on investments (X_1)

UNDERW=underwriting returns (X_2)

INFL=rate of inflation (X_3)

$$\text{PERFINCOME}; Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Boyd, Levine and Smith (2000), on Impact of Inflation on the Financial Sector performance, did a threshold Regressions. In their study, they used Financial Development Indicator as the

Independent variable with income, Government Spending, inflation, population Growth as among others as the independent variables. In their analysis econometric model was used.

Table 3.1: Real Investment Return

YEAR	INFLATION RATE %	ANNUAL NOMINAL INVESTMENT RETURN	ANNUAL REAL INVESTMENT RETURN
1998	6.7	0.2069	-6.4931
1999	5.7	0.1549	-5.5451
2000	10	0.1302	-9.8698
2001	5.7	0.1383	-5.5617
2002	2	0.135	-1.865
2003	9.8	0.1023	-9.6977
2004	11.6	0.1212	-11.4788
2005	10.3	0.1452	-10.1548
2006	14.5	0.18	-14.32
2007	9.8	0.1521	-9.6479
2008	26.2	0.1064	-26.0936
2009	9.2	0.1358	-9.0642
2010	4	0.2091	-3.7909
2011	14	0.0444	-13.9556
2012	9.4	0.0715	-9.3285

	ANNUAL NOMINAL UNDERWRITING RESULTS				
YEA R	ANNUAL UNDERWRITING PROFITS/RESULTS	ANNUAL NET EARNED	RATE OF UNDERWRITING PROFITS,		
	KSHS "000"	PREMIUMS KSHS "000"	R=U/P;NOMINAL UNDERWRITING RETURNS		
1998	-113,494	9,283,491	-0.00124		
1999	-136,608	11,086,216	-0.0123		
2000	-597,835	18,756,090	-0.0309		
2001	218,669	19,541,135	0.0112		
2002	296,520	21,779,700	0.01361		
2003	224,537	23,765,633	0.00945		
2004	412,094	28,029,923	0.0147		
2005	936,212	29,023,028	0.0323		
2006	715,860	33,520,388	0.0214		
2007	236,011	39,628,480	0.00596		
2008	872,496	45,593,023	0.01914		
2009	401,806	45,592,656	0.00881		
2010	1,271,437	64,123,285	0.01983		
2011	2,416,236	75,068,663	0.03219		
2012	3,107,093	87,475,983	0.03552		

CHAPTER FOUR

DATA ANALYSIS

4.1 Introduction

In this chapter, the researcher analyzed the data described to obtain or estimate the impact of purchasing power risk on the performance of non-life Insurance Industry, real Investment and real Underwriting Premiums and the inflexion point, or threshold, at which the sign of the relationship between the two variables switches. Under the threshold the researcher focuses on the existence of a statistically significant threshold level of inflation above which inflation affects growth differently than at lower inflation rates. The data that was collected is analyzed in order to obtain the required results pertaining to the objectives of the study. Inflation data was already calculated. Inflation data is further compared with the data obtained from Insurance Regulatory Authority; a body that is charged with ensuring that operations of Insurance Industry are within the law. In this chapter, there two types of analysis to be carried out; descriptive and Regression analysis. The descriptive analysis gives us how the values for Regression analysis was obtained and tables will be given to demonstrate the data obtained. Under the descriptive analysis, we shall calculate and obtain tables for the following Variables:

Annual Nominal Investment Return, Annual Nominal Underwriting Return, Real Investment Return, Performance Insurance Income (Y_t) and Consumer Price Index whose data was already calculated

In the Regression analysis, the data obtained from the descriptive analysis will be analyzed using R package to give the numerical impact of the independent variables against the dependent variables. Also in the Regression analysis, Ordinary Least Linear Squares will be used to estimate both lower and upper Inflation thresholds.

To obtain the graphical estimations on the impact of inflation on Real Investment Return and Real Underwriting Returns, Time Series model will be used in the analysis. Similarly, Time Series model will be used to show the graphical relationship between the Purchasing Power Risk and the Performance of Non-life Industry in Kenya. To estimate the threshold limits of inflation R^2 is used. The upper limit will be shown by highest value on the graph.

4.2: Descriptive Analysis

Table 4.1: Nominal investment and Nominal Underwriting Return

YEAR	NOMINAL	NOMINAL	VARIANCE & STD	VARIANCE & STD
	INVESTMENT	UNDERWRITNG	DEV.	DEVIATION
	RETURN	RETURN	OF UNDERWRITING	OF INVESMENT
			U^2	I^2
1998	0.2069	-0.00124	1.5376E-06	0.04280761
1999	0.1549	-0.0123	0.00015129	0.02399401
2000	0.1302	-0.0309	0.00095481	0.01695204
2001	0.1383	0.0112	0.00012544	0.01912689
2002	0.135	0.01361	0.000185232	0.018225
2003	0.1023	0.00945	8.93025E-05	0.01046529
2004	0.1212	0.0147	0.00021609	0.01468944
2005	0.1452	0.0323	0.00104329	0.02108304
2006	0.18	0.0214	0.00045796	0.0324
2007	0.1521	0.00596	3.55216E-05	0.02313441
2008	0.1064	0.01914	0.00036634	0.01132096
2009	0.1358	0.00881	7.76161E-05	0.01844164
2010	0.2091	0.1983	0.03932289	0.04372281
2011	0.0444	0.03219	0.001036196	0.00197136
2012	0.0715	0.03552	0.00126167	0.00511225
SUM	2.0333	0.35814	0.045325186	0.30344675
MEAN	0.135553333	0.023876	=	
			0.003021679	0.020229783
Standard deviation			0.054969801	0.142231443

Nominal Investment Return was obtained by dividing the annual Investment profits plus the capital gains (this obtained by sale of capital goods which in this case there were none) by the average assets. Average assets in this study, is the annual value of asset divided by two.

To obtain annual underwriting return, it is the annual rate of underwriting profits divided by the annual net earned profits.

In the table 4.2.1 above, it is observed that the mean rate of investment return portfolio is 0.135 with a standard deviation for Nominal Investment Return is 0.1422 the average rate of return on underwriting is observed to be 0.0239 with a standard deviation of 0.0545 for the period between 1998 to 2012.

Table 4.2: Real Investment and Real Underwriting Returns

YEAR	INFLATION RATE %	REAL INVESTMENT RETURN	REAL UNDERWRITING RETURN
1998	6.7	-6.4931	-6.70124
1999	5.7	-5.5451	-5.7123
2000	10	-9.8698	-10.0309
2001	5.7	-5.5617	-5.6888
2002	2	-1.865	-1.98639
2003	9.8	-9.6977	-9.79055
2004	11.6	-11.4788	-11.5853
2005	10.3	-10.1548	-10.677
2006	14.5	-14.32	-14.4786
2007	9.8	-9.6479	-9.79404
2008	26.2	-26.0936	-26.18086
2009	9.2	-9.0642	-9.19119
2010	4	-3.7909	-3.98017
2011	14	-13.9556	-13.96781
2012	9.4	-9.3285	-9.36448
Sum	148.9	-146.8667	-149.12963
MEAN	9.9267	-9.7911	-9.9410
Std Deviation	11.3381	11.2280	11.3509

In table 4.2.2 above, Purchasing Power Risk is factored in the activities in the activities; investment and underwriting of premiums. To obtain the Real rates of Return on both Investment and underwriting activities in the No-Life Insurance Industry, we get the difference of annual Inflation rate from the Nominal Returns.

With an average rate of 9.9267 per cent inflation annually, the non-life Insurance Industry in the Country lost an average rate of return on Investment of 9.7911 per cent. During the same period of study, the Non-life Insurance Companies in Kenya also lost an average rate of return on underwriting activities 9.9410 per cent.

In the analysis it is observed that the annual Nominal rate of Return on Investment is 0.1422 per cent compared a loss of 9.7911 per cent. This shows a negative impact of inflation rate on the Investment portfolio. Also before purchasing power Risk is factored in the analysis, the return on the underwriting premiums stands at 0.0239. In the analysis, it has been observed that the standard deviation for Nominal Investment turn Return is **0.1422** compared to the Standard deviation of Real Investment Return of **11.2280**. The standard deviation of Rate of Return on nominal premium underwriting stands at **0.0550** per cent but after factoring in Consumer Price Index for the period, the standard deviation for Real Underwriting of premium rates stand at **11.3509** per cent. This could be attributed to the fact that there was a wide variance between the nominal values of Investment a portfolios and underwriting of premiums Activities and the Real figures of Investment and Underwriting of Premiums. Also it can be observed that the Standard Deviation of Inflation Rates is a double digit. This implies that the inflation Rates are too high and then not stable/unpredictable

This shows there is a negative correlation between higher inflation and the general activities of non-life insurance industry; investment portfolios and underwriting of premiums.

4.2.1: Regression analysis

Table 4.3: The Relationship between the Purchasing Power Risks on the Performance of Non-Life Insurance

YEAR	INFLATION RATE %	PERFORMANCE INCOME IN (Ksh.100,000)
1998	6.7	13.35566
1999	5.7	7.7579
2000	10	5.9144
2001	5.7	6.139
2002	2	6.633
2003	9.8	4.579
2004	11.6	6.8238
2005	10.3	11.3141
2006	14.5	20.363
2007	9.8	16.96
2008	26.2	8.882
2009	9.2	16.4835
2010	4	49.117347
2011	14	3.20061
2012	9.4	9.054398

The figure 4.3 above shows the yearly Non-Life Insurance performance against their corresponding Inflation rates. The performance income has been converted into Kshs. ‘100,000’ to accommodate the data for analysis purposes

Table 4.4: Regression Analysis of Inflation Rate, Annual Nominal Underwriting Returns, Nominal Investment Returns and Yearly Performance Income

Inflation Rate %,(X1)	Nominal Underwriting,(X1)	Nominal Investment,(X2)	Performance (Ksh.100,000),(Y_t)
6.7	-0.00124	0.2069	13.35566
5.7	-0.0123	0.1549	7.7579
10	-0.0309	0.1302	5.9144
5.7	0.0112	0.1383	6.139
2	0.01361	0.135	6.633
9.8	0.00945	0.1023	4.579
11.6	0.0147	0.1212	6.8238
10.3	0.0323	0.1452	11.3141
14.5	0.0214	0.18	20.363
9.8	0.00596	0.1521	16.96
26.2	0.01914	0.1064	8.882
9.2	0.00881	0.1358	16.4835
4	0.1983	0.2091	49.117347
14	0.03219	0.0444	3.20061
9.4	0.03552	0.0715	9.054398

lm(formula = PERFORMANCE ~ INFLATION + UNDERWRITING + INVESTMENT)

Coefficients:

(Intercept) INFLATION : UNDERWRITING : INVESTMENT

-9.5630 0.1888 161.2437 120.0813

ANOVA Table

Analysis of Variance Table						
Response: PERFORMANCE						
	Df	Sum Sq	Mean Sq	F value	Pr(>F)	
INFLATION	1	87.26	87.26	6.2891	0.0290999 *	
UNDERWRITING	1	1229.25	1229.25	88.5940	1.349e-06 ***	
INVESTMENT	1	318.51	318.51	22.9555	0.0005612 ***	
Residuals	11	152.63	13.88			

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

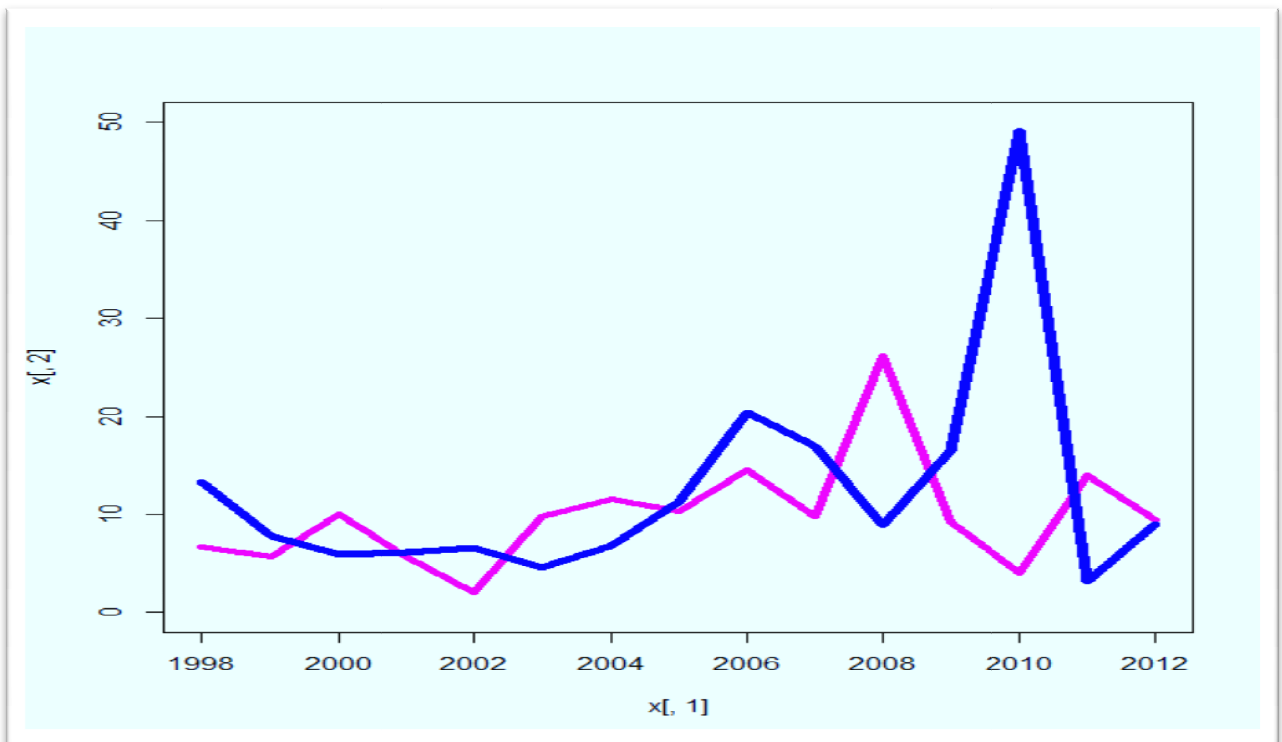
In the regression analysis above, Inflation Rate, Nominal Underwriting and Nominal Investment Returns were the exploratory variables and Performance Income was the dependent variable and were computed and it was observed that In the form of ,

$$Y_t = \beta_0 + \beta_1 \text{inflation}_t + \beta_2 \text{Investment}_t + \beta_3 \text{underwriting}_t$$

$$Y_t = 9.5630 + 0.1888 \text{inflation}_t + 161.2437 \text{investment}_t + 120.0813 \text{underwriting}_t$$

From the analysis is can be observed that an increase of inflation by 1 % increases the income of Non-Life Insurance Industry by Ksh.18880, an increase in the Nominal Investment Return by a Unit increases the value of Income by Ksh.16124370 while an increases of Underwriting return on Premiums improves the value of performance level by Ksh.12008130. it is assumed that the level of inflation should not exceed the 4 and 9.2 per cent as this would be detrimental to the performance of the Non-Life Industry

Figure 4.1: The Relationship between the Purchasing Power Risks on the Performance of Non-Life Insurance



Key:

The blue line shows the trend of Income in (performance income in Ksh.'100,000) from 1998 to 2012 in Kenya.

The Pink line indicates the trend of Inflation Rate in % from 1998 to 2012 in Kenya

The diagram above shows the graphical relationship between Non-Life Insurance Industry Income and Purchasing power Risk. It is observed that the performance of the Non-life Insurance Industry is highest over the period studied when the rate of inflation is at 4 per cent while the Performance is at 49Million. Also it can be observed that between 2009 and 2010 that was the point which the inflation rate was going down while the performance began to rise sharply to the pick. The inflation rate at this point was at 9.2 per cent when there a sudden rise in the performance of the Non-Life Insurance Industry. This can be used to estimate the inflation thresholds. It can be observed from the diagram that Non-life industry performs better when the inflation rate is at 4 per cent and 9.2 per cent. The highest inflation rate should go is then 9.2 per cent and the lowest the inflation rate should go is 4 per cent for the Non-Life Industry to perform to its best

4.2.2: Regression analysis of Inflation Rate on the performance Income

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	16.8088	6.1113	2.750	0.0165 *
Inflation	-0.4403	0.5390	-0.817	0.4288

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05
'.' 0.1 ' ' 1

In the Equation, the performance Model is linearized to be

$$Y = \beta_0 + \beta_1 \text{INFLATION} + \varepsilon$$

Where β_0 is the intercept and $\beta_1 \text{INFLATION}$ the matrix of coefficients and ε is the error term

In the equation it can be observed that

Performance represented by the equation given

$$Y = 1.8088 - 0.4403 \text{INFLATION} + \varepsilon$$

It is therefore observed that an increase in Inflation rate by 1 per cent, the performance or the income in the Non-life Insurance Industry is reduced by Ksh.44030 (0.4403 by 100,000).

Table 4.5: Regression Analysis

Inflation Rate % (X1)	Real Investment Return (X2)	Real Underwriting Returns (X4)	Performance In (Ksh.100,000), (Y)
6.7	-6.4931	-6.70124	13.35566
5.7	-5.5451	-5.7123	7.7579
10	-9.8698	-10.0309	5.9144
5.7	-5.5617	-5.6888	6.139
2	-1.865	-1.98639	6.633
9.8	-9.6977	-9.79055	4.579
11.6	-11.4788	-11.5853	6.8238
10.3	-10.1548	-10.677	11.3141
14.5	-14.32	-14.4786	20.363
9.8	-9.6479	-9.79404	16.96
26.2	-26.0936	-26.18086	8.882
9.2	-9.0642	-9.19119	16.4835
4	-3.7909	-3.98017	49.117347
14	-13.9556	-13.96781	3.20061
9.4	-9.3285	-9.36448	9.054398

Real Underwriting Returns

Coefficients:

lm(formula = UNDERWRITING ~ INFLATION)

Coefficients:

(Intercept) INFLATION

-0.01924 -0.99960

$Y_t = -0.01925 - 0.9996 \text{inflation}$

$Y_t = \beta_0 + \beta_1 \text{inflation}$, where Y is the Real Underwriting Returns while β_1 is the Inflation Rate Coefficient and β_0 is the intercept value

In the analysis above, Real Underwriting Return was the predicted variable while inflation rate was the explanatory variable. It was observed from the equation below that if inflation rate increases by 1 %, the rate of Real Underwriting Return on Premiums in decreased by ksh.99, 960.

For Real Investment Returns

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.166040	0.022758	7.296	6.04e-06 ***
INFLATION	-1.003071	0.002007	-499.737	< 2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.04259 on 13 degrees of freedom
Multiple R-squared: 0.9999, Adjusted R-squared: 0.9999
F-statistic: 2.497e+05 on 1 and 13 DF, p-value: < 2.2e-16

In the analysis it was observed that;

$Y_t = \beta_0 + \beta_1 \text{inflation}$, where Y_t is the Investment Returns in time t

Therefore,

$$Y_t = 0.166040 - 1.003071 \text{inflation}$$

The analysis shows that an increase in inflation rate by 1 % erodes the value of real Investment returns by Ksh.1003071

In the Regression Analysis, if the minimum threshold is held at 4 %, the Real Return on Investment would be

$$Y_t = 0.166040 - 1.003071 \text{inflation}$$

$$Y_t = 0.166040 - 1.003071(4)$$

The Real Return on Investment would be Kshs. **12591.72**

Should inflation rate be held at 9.2 percent, the real rate of return be

$$Y_t = 0.166040 - 1.003071(0.092)$$

Real Investment Return=Ksh.7, 375.75

4.2.3: Graphical Analysis

Figure 4.2: The Relationship between Inflation Rate on Nominal Investment Returns and Real Investment Returns

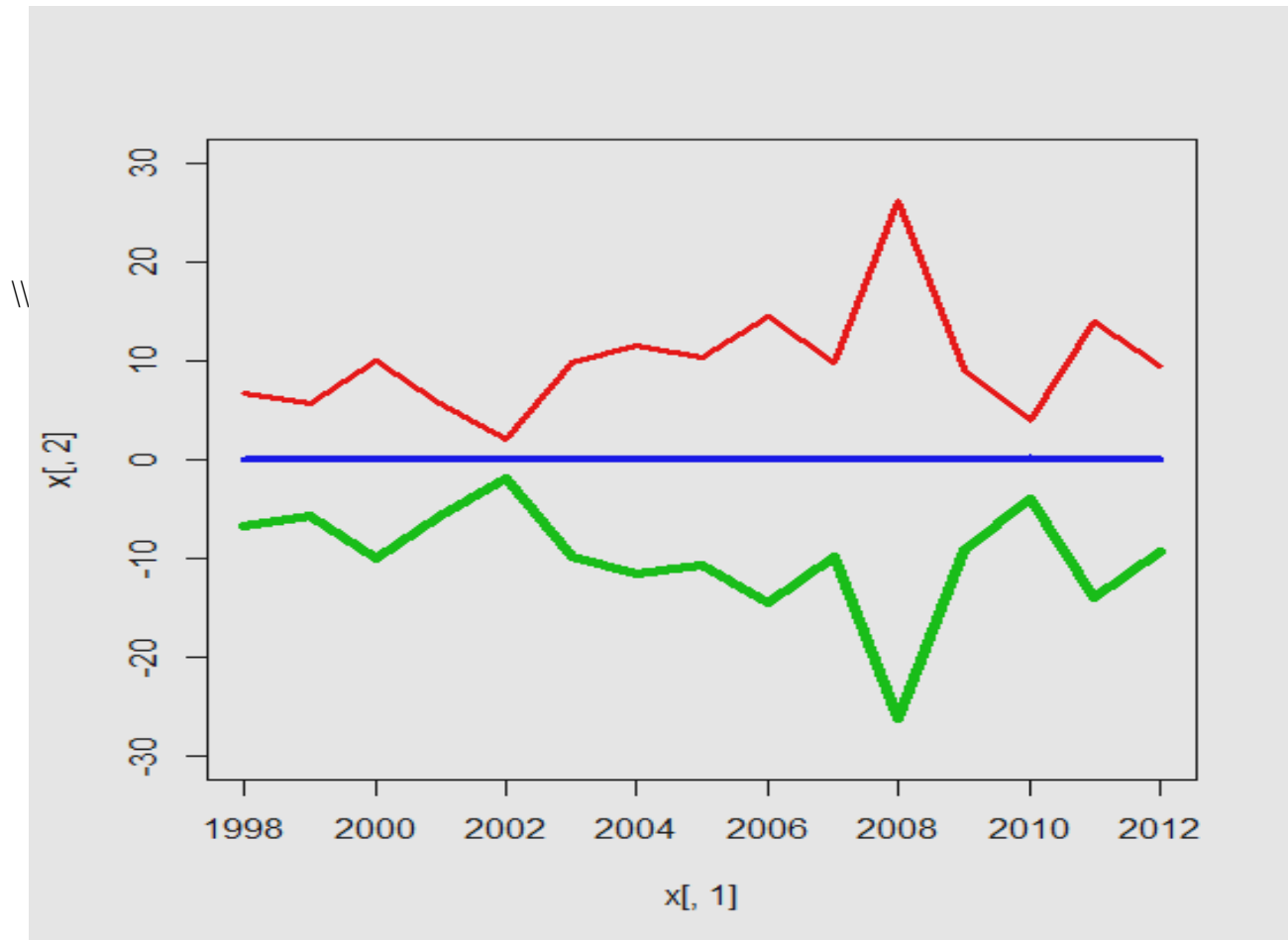


In the diagram above, the Red line shows the trend of Inflation Rate from 1998 to 2012, the green represents the Nominal Rate of Returns on Investment while the Blue line represents the shape taken by Real Rate of Investment. The Real Rate of Investment is obtained by factoring the inflation rate from the Nominal Rate of Returns

Table 4.6: Inflation Rates, Nominal Investments and Real Rates of Investment

YEAR	INFLATION RATE %	NOMINAL INVESTMENT RETURN	REAL INVESTMENT RETURN
X	Y1	Y2	Y3
1998	6.7	0.2069	-6.4931
1999	5.7	0.1549	-5.5451
2000	10	0.1302	-9.8698
2001	5.7	0.1383	-5.5617
2002	2	0.135	-1.865
2003	9.8	0.1023	-9.6977
2004	11.6	0.1212	-11.4788
2005	10.3	0.1452	-10.1548
2006	14.5	0.18	-14.32
2007	9.8	0.1521	-9.6479
2008	26.2	0.1064	-26.0936
2009	9.2	0.1358	-9.0642
2010	4	0.2091	-3.7909
2011	14	0.0444	-13.9556
2012	9.4	0.0715	-9.3285

Figure 4.3: The Impact of Purchasing Power Risk on the Real Underwriting Returns on Non-Life Insurance Industry in Kenya



In the diagram above, the red line represents the movement of inflation rates from 1998 to 2012 during the period of study. The blue line represents the movement of Nominal Rate of Returns on

Figure 4.3 above shows the Impact of Purchasing Power Risk on the Real Underwriting Returns on Non-Life Insurance Industry in Kenya.

The green line indicates the movement of the Real Rate of Returns on underwriting portfolio. It can be observed that as inflation rate increases the Real Rate of Underwriting Returns decreases.

The relationship therefore indicates that there is a strong negative relationship between inflation rates and underwriting of premiums

Table 4.7: Represents annual inflation Rates, Annual Nominal Returns and Real rates of Returns of Underwriting of premiums

YEAR	ANNUAL INFLATION RATE %,(Y1)	ANNUAL NOMINAL UNDEWRITING RETURNS,(Y2)	ANNUAL REAL UNDERWRITING RETURNS,(Y3)
1998	6.7	-0.00124	-6.70124
1999	5.7	-0.0123	-5.7123
2000	10	-0.0309	-10.0309
2001	5.7	0.0112	-5.6888
2002	2	0.01361	-1.98639
2003	9.8	0.00945	-9.79055
2004	11.6	0.0147	-11.5853
2005	10.3	0.0323	-10.677
2006	14.5	0.0214	-14.4786
2007	9.8	0.00596	-9.79404
2008	26.2	0.01914	-26.18086
2009	9.2	0.00881	-9.19119
2010	4	0.1983	-3.98017
2011	14	0.03219	-13.96781
2012	9.4	0.03552	-9.36448

CHAPTER FIVE

INTRODUCTION

This chapter deals with the Summary of the findings, conclusion as far as the objectives of the study are concerned as well as the Recommendations.

5.1 Summary of the findings

In the study, it was observed that when descriptive analysis was done, in the table 4.2.1 above, it is observed that the mean rate of investment return portfolio is 0.135 with a standard deviation for Nominal Investment Return is 0.1422 the average rate of return on underwriting is observed to be 0.0239 with a standard deviation of 0.0545 for the period between 1998 to 2012.

. However, in table 4.2.2, Purchasing Power Risk is factored in the activities in the activities; investment and underwriting of premiums. To obtain the Real rates of Return on both Investment and underwriting activities in the No-Life Insurance Industry, we get the difference of annual Inflation rate from the Nominal Returns.

With an average rate of 9.9267 per cent inflation annually, the non-life Insurance Industry in the Country lost an average rate of return on Investment of 9.7911 per cent. During the same period of study, the Non-life Insurance Companies in Kenya also lost an average rate of return on underwriting activities 9.9410 per cent.

In the same analysis, it is observed that the annual Nominal rate of Return on Investment is 0.1422 per cent compared a loss of 9.7911 per cent. This shows a negative impact of inflation rate on the Investment portfolio. Also before purchasing power Risk is factored in the analysis, the return on the underwriting premiums stands at 0.0239. In the analysis, it has been observed that the standard deviation for Nominal Investment turn Return is **0.1422** compared to the Standard deviation of Real Investment Return of **11.2280**. The standard deviation of Rate of Return on nominal premium underwriting stands at **0.0550** per cent but after factoring in Consumer Price Index for the period, the standard deviation for Real Underwriting of premium

rates stand at **11.3509** per cent. This could be attributed to the fact that there was a wide variance between the nominal values of Investment a portfolios and underwriting of premiums Activities and the Real figures of Investment and Underwriting of Premiums. Also it can be observed that the Standard Deviation of Inflation Rates is a double digit. This implies that the inflation Rates are too high and then not stable or unpredictable.

This shows there is a negative correlation between higher inflation and the general activities of non-life insurance industry; investment portfolios and underwriting of premiums. In the regression analysis, it was observed that when inflation rate, Nominal underwriting rate and Nominal Investment rates were taken as the explanatory variables with the Insurance Income in the Non-Life Sector, it was observed that there was a positive correlation between explanatory variables;(Inflation Rates, Nominal Underwriting Rates and Nominal Investment Rates) on the general performance on Non-Life Insurance Income which was the predictor variable.

When the Inflation Rate was regressed separately against the general performance in the Non-life sector, it was observed that they negatively correlated. The same scenario was observed when Inflation Rate was regressed separately on Real Rates of Investment Returns and on Real Rates of Underwriting Returns. This was also supported by the graphical analysis which showed that as Inflation Increased, both real investment returns and real underwriting returns took completely opposite and nearly equal direction.

5.2: Conclusion

In the study, the researcher aimed at re-examining the how purchasing power Risk influences the performance of Non-life Industry Sector. In the Non-Life Industry, there are two main portfolios which the non-life sector deals with; investment and underwriting activities. Under these two activities, they are the main business activities that generate income to the non-life sector. In the study, the researcher attempted to investigate the performance of the two main portfolios separately before purchasing power Risk is factored and after and thereafter they were compared. It was observed that in the Nominal rates of return, it was observed that the relationship was somehow constant. However, after purchasing power is factored in, the analysis, it was observed that the rate at which the real rates of returns on both investment and underwriting took

completely opposite directions,. This can be observed in figures 4.2 and 4.3 in chapter four. This indicates that there a strong negative relationship between the real rates of investment returns and real rates of return on underwriting of premiums. A negative correlation between inflation rate and real investment and real underwriting returns rates.

In the study, the researcher attempted to investigate the inflation threshold; the turning points at which inflation rate becomes disastrous to the performance of non-life industry. it was observed in the regression analysis of inflation rate against the performance of non-life industry that inflation below 4% was not yielding much and also beyond 9.2%, the performance was turning negative. In the study, it was revealed that at very low level of inflation, the non-life insurance industry performed below, it implies that very low inflation at 2 per cent, the growth of non-life insurance will be stagnated or perform below it ability. It was therefore realized that for the non-life to perform to the optimal level, the rate of inflation should be maintained between 4% and 9.2%. Therefore, any inflation rate level below 4 per cent or above 9.2 per cent would be harmful to the growth of the non-life industry. It was further observed in the study that inflation rate in Kenya is significantly influenced by political mood of the country. After each and every electioneering period, it is observed that there is always a jump of inflation rate. This can be attributed to the fact that there is a lot of money in circulation to finance campaign and election activities. Also there is a tendency of politicians promising to create more employment opportunities in the economy. Some politicians fight for employment opportunities rather than reducing inflation rate as a priority. This implies that prices of goods remain high since there is a tradeoff between inflation and creation of employment opportunities. This therefore leaves the politicians to grapple with creation of jobs after election to fulfill election pledges thereby leaving the inflation rate extremely high. However, in 2008, the inflation rate experienced was an outlier. This was due to the fact apart from election promises on job creation, there was violence that made the cost of commodities rise due to high demand and low supply as some of the commodities could not be accessed easily.

In the study, it was observed that insurance companies often price and sell their premiums without actually studying the future trend of inflation rates. When the prices of commodities rise, the price of premiums remain constant and it doesn't move with the same pace as inflation.

It can be seen that most of the insurance companies fail to forecast for inflation and therefore the investment are basically long term. Long term investments are sensitive to inflation. In the study, it was further observed that most of the Insurance Companies invest locally and whenever inflation rates rise, the investments are really affected in which their incomes yield less or negative on the amount invested in.

Diversification of investment opportunities is still low in most of the Insurance companies. It can be further revealed that most of the Insurance firms invest on those bonds that guarantee only the nominal rate of returns at the expense of real rate of returns. Nominal rates of return do not account for the consequences of inflation rates, expenses and taxes. It therefore fails to look beyond the nominal returns.

In the study, it appears that Central Bank of Kenya that is charged with regulating the inflation rates and other monetary issues do not work in consultation with the Insurance Industry in Kenya. It also appears that the Central Bank of Kenya especially during and after elections is usually reluctant to regulate the rate of inflations thereby hurting the general performance of No-life industry.

5.3: Recommendations

5.3.1 Recommendations to policy makers

From what has been observed in the study, it is recommended that the central Bank that is charged with regulation of monetary issues like inflation, interest rates, and other macro-economic issues become active especially during and after elections to ensure that the inflation rates is at a manageable level.

The inflation rate threshold be maintained at a threshold level of between 4 per cent and 9.2 but must not exceed the expected rate of 9.9267 per cent which is shown in table 4.2.2. According to the graphical analysis, the ceiling should be at 9.2 while the expected inflation rate is 9.9267 per cent for a better performance of Non-life Industry.

Those vying for political offices should diversify their election promises to ensure that the cost of commodities (CPI) is also considered in their election. This will help in ensuring that the rate of inflation is brought to a manageable level.

There is need for Central Bank of Kenya charged with regulating Macro-economic issues and the Insurance Industry to have regular consultative meeting or a committee that will see to it that inflation rate that is detrimental to performance of Insurance Industry is never attained at any given period of time.

5.3.2: Recommendations to the Non-Life Industry

To insurance industry, there is need to offer affordable products to enable a large pool of premiums. The Industry should target the small markets like the hawkers, farmers, small scale business people and offering attractive premiums.

Insurance industry should carry out an audit and find the most expensive line of business products pay extra and if possible give allowance of 6 % inflation rate when pricing premiums.

Insurance Companies should be pricing their products especially after the electioneering period so as to enable them price during hard inflationary times, it would make other periods easier since a dramatic drop in inflation is expected thereby creating a surplus.

The insurance industry should consider investing across the globe. This is because not all regions will experience the same inflationary state

Since premium risks arise as a result of premiums being priced long before the risk takes place, the risks occur due to the fact actual claims exceeding the expected claims, these occur due to Risk of Random and Risk of Error. Risk error occurs when the number of claims size exceeds the expected claims. This risk can never be ruled out. The risk of random says that claims are subjected to a number of random unforeseen factors that are unavoidable. This can be reduced by seeking the actuarial calculation of risks and factoring the possibility of such risks in pricing of premiums

The insurance industry needs to diversify their investment portfolios. By investing in various portfolios, some portfolios are less sensitive to inflation while some are very sensitive to inflation but very profitable when the inflation risk fails to harm the investment.

Non-life Insurance Industry should consider investing in regular coupon. The coupon payment is regular and is based on the real rate of return rather nominal rates. Coupons are interest protected Securities and tend to be lower than the normal coupon. On normal bond, the Interest Protected is coupon pays interest on the inflation accrued principle rather than the nominal principle. Therefore the principle and interests are protected.

Short term investment portfolios should be adopted by most insurance industry as the investors (Non-life Industry) may take immediate action to adjust their portfolios according to the movement of inflation rates.

Stock market also provide good news for equities, Treasury Protected Inflation Securities,, (TIPS). The government issued bonds come with the guarantee that their par value will rise with inflation as measured by Consumer Price Index. TIPS protect investors against inflationary concerns while bonds do not.

Insurance Industry should consider investing in the mutual funds. This is a vehicle that is made up of a pool of funds from many investors with aim of investing in securities like stocks, bonds. The mutual funds are operated by manager with the sole objective of producing capital gains for investors.

Insurance Industry needs to advertise its products to the public so as to attract large market. The industry covers a pool of risk brought together; there will b large premiums against very few claims thereby providing a wider base for reserves.

5.3.3: Recommendations for further studies

More research should be done on how inflation risk affects the ability of people to take or purchase life policy in any developing economy. More studies should carried out on the role of taxation in the performance of life and non-life Insurance Industry There is need to carry out a study on the inflation on specific lines of businesses in the non-life Industry. Also, a study should be conducted the relationship between expenses and the performance of non-life industry

A similar study; on the relationship between expenses and the performance of life industry.; the expenditure on the life industry correlated to the performance or income in the Industry? Does a growth in expenditure reflect a favourable performance in the industry?

A cross sectional study should be on the impact of inflation rate on the performance of both life and non-life insurance industry in a few selected developing economies to determine if there is any similarity.

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