

**BINDURA UNIVERSITY OF SCIENCE EDUCATION
FACULTY OF SCIENCE AND ENGINEERING
DEPARTMENT OF STATISTICS AND MATHEMATICS**



**Investigating the Impact of Inflation on Life Assurance Policies in Zimbabwe: A Monte
Carlo Approach**

BY

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**A DISSERTATION SUBMITTED IN PARTIAL FULLFILMENT OF THE
REQUIREMENTS OF THE BACHELOR OF SCIENCE HONOURS DEGREE IN
STATISTICS AND FINANCIAL MATHEMATICS.**

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JUNE 2025

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Degree Programme	Bachelor of Science Honours Degree in Statistics and Financial Mathematics
Year	2025

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ACKNOWLEDGEMENTS

I would like to express my deep gratitude towards my supervisor, Mr. E. Mukonoweshuro, for his diligent guidance and motivation throughout this research. His critiques and advice have been instrumental in guiding my understanding of the complexities involved in inflation and life assurance. I also wish to express my appreciation to lecturers and staff of the Department of Statistics and Mathematics whose support has been essential in my academic journey that facilitated a successful completion of this research. Additionally, I'm also grateful to Bindura University of Science and Education for providing academic support throughout my studies. My appreciation is also to the stakeholders and the policyholders who participated in this research, sharing their experiences and views, enriching the output of this dissertation. Finally, I would like to thank my family and friends who have supported and motivated me throughout this academic journey. Their confidence in my abilities has encouraged me to achieve my academic goals.

ABSTRACT

This dissertation investigates the impact of inflation on life assurance policies in Zimbabwe by implementing a Monte Carlo simulation approach to find the interactions among inflation, mortality trends, and economic variables. The study identifies the massive challenge to the life assurance sector induced by hyperinflation, particularly between 2015 and 2025, that wiped out the real purchasing power of policy proceeds and eroded financial security for policyholders. The critical observations are that while nominal returns on life assurance products appeared constant, real returns were severely adverse and reflected a severe erosion of purchasing power. The research mentions profitability and liquidity issues of utmost concern, driven by rising lapse rates and Not Taken Up (NTU) policies. The research also provides efficacious strategies, including asset diversification and the move towards USD-denominated products, in order to mitigate the effects of inflation. Recommendations to the insurers, policymakers, and other stakeholders prescribe enhanced communication, variable premium plans, and greater consumer education as a way of restoring confidence and making life assurance viable in Zimbabwe's volatile economic situation.

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LIST OF ABBREVIATIONS:

IPEC: Insurance and Pensions Commission

IMF: International Monetary Fund

ZIMSTAT: Zimbabwe National Statistics Agency

RBZ: Reserve Bank of Zimbabwe

IAA: International Actuarial Association

OECD: Organisation for Economic Co-operation and Development

FSD: Financial Sector Deeping

GDP: Gross Domestic Product

NTU: Not Taken Up

ZWL: Zimbabwean Dollar

USD: United States Dollar

ZIMNAT: Zimbabwe National Assurance Company

CHAPTER ONE:

INTRODUCTION

1.0 Introduction

The first chapter introduces the setting of the research through presenting appropriate background information. The chapter also has a focus on how it justifies the study since it elaborates on the purpose and how it states the questions for the research, testing research assumptions and hypotheses, and how it states the delimitations and limitations. The chapter is ultimately ended with defining operational terms and summarizing findings.

This chapter shall attempt to explore the linkage between life insurance and inflation in the case of Zimbabwe. The chapter shall mention key economic patterns, trace the development of the insurance sector, and state the theoretical frameworks informing this study.

1.1 Background

Inflation is a significant economic experience with profound implications on financial markets, savings culture, investment patterns and the insurance market. Inflation is a wide economic phenomenon that impacts most industries. Zimbabwe experienced extended episodes of high inflationary uncertainty, particularly under regimes of relative economic stability and hyperinflationary regimes, which have profoundly impacted financial institutions, such as the life assurance industry. During the period 2015 to 2020 (when the Zimbabwean dollar was brought back) led to the return of runaway inflation with inflation rates over 500% in 2020 (Reserve Bank of Zimbabwe, 2020). The effects of inflation on life assurance policies are significant issues since it devalues monetary funds and hinders the activities of life assurance firms. This dimension affects policy value, determines the rights built up by policyholders, and alters the aggregate demand for life assurance policies (Smith and Jones Swiss Re Institute, 2021).

It was also a persistent issue especially 2015 and 2025 because Zimbabwe has been be-deviled by currency instability, policy inconsistency and external shocks (Mhlanga, 2020: Ndhlovu and Moyo

2021). After the adoption of the multi-currency system since 2009, inflation was pushed away for some time but in 2015 hyper-inflation began creeping back in earnest due to inefficiency in the economy, budget deficits and lack of investor confidence (Chipunza 2018). The Insurance and Pensions Commission (IPEC) regulates the insurance sector in Zimbabwe. The sector experienced dramatic growth in recent years, as evidenced by the total premiums growing from \$143 million in 2015 to \$233 million in 2020 (IPEC, 2020), but that was under siege from challenges such as inflation, regulatory interventions, and competition (Ncube, 2018).

The insurance industry and the life insurance industry in general, is one of the main drivers of savings, economic security and greater economic progress. The policies are primarily long-term agreements where policyholders fund future incentives through premium payments either at death or after a stipulated period of time (Nduna, 2019). On the other hand, the value of the benefits can diminish in terms of inflation, hence leading to diminished confidence on the side of the policyholders. The insurance market was put to trial while seeking a way to maintain the value of policies (Chigumira et al., 2020). The situation sends dire warnings regarding the sustainability of life assurance policies and capacity to meet the financial expectations of the policyholders. Actuarial assumptions were adversely affected, causing mismatching between assets and liabilities, thereby weakening the financial well-being of life assurance businesses (Zhou & Magaya, 2021). During this period of financial turmoil, life assurance businesses could not maintain real policy benefit values. This loss of public confidence has seen increased scrutiny over the effectiveness of available mitigation strategies (Nhuta & Mlambo, 2022).

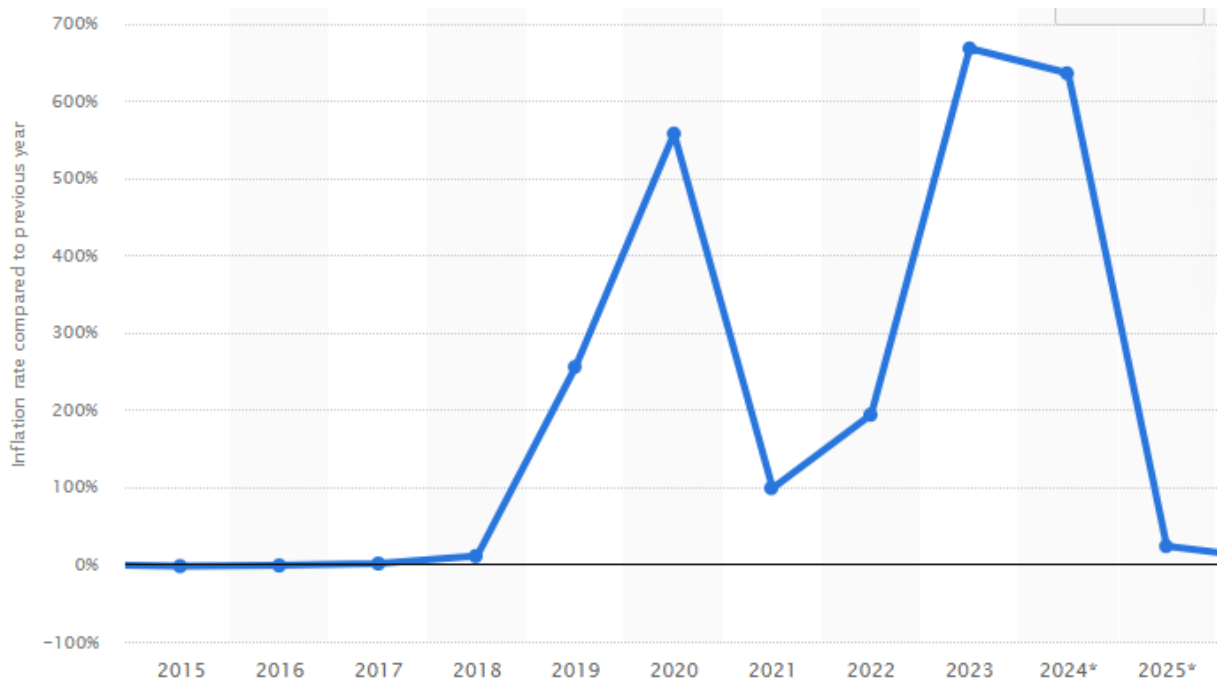


Figure 1: Inflation Rate Graph and Interpretation

Source: Statista 2025

- 1) Stable, low inflation: From (2015-2018), there was a stable economic environment with little inflation rates close to 0%.
- 2) Rapid rise: From (2019-2020) inflation spiked around 250%, followed by a sharper rise in 2020 to 550%. This suggests a period of extremely high inflation which led to high levels of policy lapses especially to those who paid with Zimbabwean bond.
- 3) Drop and partial recovery (2021-2022): In 2021, inflation dropped sharply and reached around 100% still high but lower than 2020 then accelerated to 200% in 2022 showing a temporary stabilisation which failed to last.
- 4) Second peak (2023): Inflation skyrocketed to nearly 700%, the peak stage on the graph indicating a severe economic downturn.
- 5) Expected decrease (2024-2025): Inflation projected to decline in 2024 in around 650% and experienced a steep fall over 0% in 2025 (shows a successful stabilization).

1.2 Problem statement

Life insurance is an important money product that brings financial security to individuals and families for the long term in case of unexpected occurrences. Yet, life insurance policies in hyperinflation nations such as Zimbabwe are under huge challenges. Hyperinflation makes such policies useless and worthless, keeping in mind the reality that macroeconomic conditions such as currency fluctuation and economic instability diminish purchasing power and distort financial markets.

The conditions set out above create severe questions on the viability of life assurance business models, their cost-effectiveness, and their viability under conditions typified by inflation. Consequently, policyholder financial security is increasingly undermined. Inflation also encroaches on mortality behaviour, policyholder behaviour, and life assurance liability valuation. Notwithstanding such dynamics, comparatively less has been accomplished on the application of actuarial methods for example, Monte Carlo simulation to quantify and counteract the effects of inflation against life assurance.

1.3 Aims of the study

- To examine the impact of inflation on life assurance policies in Zimbabwe by utilising the Monte-Carlo Simulation approach to analyse and forecast mortality trends with their interaction with economic variables.
- To assess how inflation driven changes in mortality rates and economic conditions influence the pricing, sustainability and design of life assurance policies, thereby providing actionable insights for insurers, policy makers and stakeholders in the insurance industry.

1.4 Research Objectives

1. To examine the nominal and real return on life assurance policies.
2. To evaluate the implications of inflation on the profitability and liquidity of life assurance policies in Zimbabwe.
3. To analyse the strategies used by life assurance companies in Zimbabwe to mitigate the impact of inflation on their policies.

1.5 Research Questions

1. What are nominal and real returns on life assurance policies and how do they vary across different policy types and market conditions?
2. What are the implications of inflation on the profitability and liquidity of the life assurance companies in Zimbabwe?
3. What strategies do life assurance companies employ to mitigate the effects of inflation on their policies.

1.6 Hypotheses of the study:

Null Hypotheses

1. H_0 : There is no significant difference in nominal and real returns on life assurance policies vary across different policy types and market conditions.
2. H_0 : Inflation has no significant implications for the profitability and liquidity of life assurance companies in Zimbabwe.
3. H_0 The insurance companies operating in Zimbabwe lack effective mechanisms that aim at reducing the impacts of inflation on their policies

1.7 Alternative Hypotheses

- 1: H_1 . Real and nominal returns on life assurance policies vary significantly by policy type and market conditions.
2. H_1 Inflation has grave implications on the profitability and liquidity of Zimbabwean life assurance companies.
3. H_1 : Life assurance companies in Zimbabwe take effective actions to counter the impacts of inflation in their policies.

1.8 Significance of the Study

This research seeks to enhance knowledge of the effects of inflation on life assurance policies in Zimbabwe, with important implications for policymakers, insurers, and policyholders. The

implications of this research could guide the formulation of efficient risk management practices, underpin the sustainability of life assurance business models, and promote the financial welfare of policyholders in Zimbabwe.

1.9 Scope of the Study

It takes into account the life insurance sector in Zimbabwe, specifically targeting the years 2015 to 2025, which are characterized by the resurgence of inflation problems following the rebirth of the Zimbabwean dollar. It looks at how inflation affects premiums, benefits, and the general operations of life insurance firms.

The research employs a mix of quantitative and qualitative data sources, which comprise financial reports, inflation data, and interviews with industry players and policyholders. The conclusions shall be drawn specifically from Zimbabwe's context and cannot be contextualized to other relevant economic environments with different inflation backgrounds.

1.10 Limitations of the Study

1. By utilizing both primary and secondary data, it may pose problems in maintaining data validity, consistency and reliability.
2. Data Quality Problem: There are certain factors which may violate data integrity for primary and secondary data for example poor comprehension of questions, and respondent fatigue.
3. Selection Bias: The selected sample might not match the required respondents of life assurance policy holders in Zimbabwe leading to more generalised results
4. Social accessibility: Respondents might give biased responses for social approval instead of honest opinions.
5. Time Frame: The research has a time bound which limits data collection and analysis time, hence compromising the scope of evaluation.

1.11 Delimitations of the Study

1. Geographic coverage: The study focusses on Zimbabwean life assurance policy holders and not from elsewhere.
2. Population Range: The study is interested in Zimbabwean policy holders while ignoring non-policy holders.
3. Time frame: The research analyses the effects of inflation on life assurance policies in Zimbabwe in a given length of time from (2015-2025).
4. Data Sources: The research uses a combination of primary data, (surveys and interviews) and secondary data from industry reports, research papers and government reports.
5. Sample size: The research aims at a sample size of small number which can restrict the generalizability of the results.

1.12 Definition of Key Terms

1. Inflation is an increase in the general price level of goods and services over a period of time, posing a decrease in purchasing power.
2. Life assurance: A contract between an individual and an insurance firm, where the insurer agrees to pay upon death of the policyholder or after a specified period.
3. Nominal returns: Real monetary returns distributed to policyholders, as adjusted neither for inflation nor for other extraneous influences.
4. Real return: The actual amount distributed to policyholders after subtracting the inflation adjustment and other determinants of the purchasing power.
5. Liquidity: The ability of insures to adhere to financial obligations without cashflow disruptions.
6. Profitability: Financial benefit created by the policy for either insurer or policyholder.
7. Policyholder: A person or organization who owns a life insurance policy.

8. Premiums: Regular financial payments by policyholders to maintain their life insurance contracts.

9. Benefits: Cash payments by life insurance firms to policyholders or their beneficiaries.

1.12 Summary

This Chapter gives an overview of the impact of inflation on life assurance policies in Zimbabwe on financial markets and insurance sector reflecting the country's historical challenges showing the trends. It goes on defining the research aims, objectives, significance, limitations, delimitations, problem statement and scope of the research. The next chapter reviews the theoretical relevant literature.

CHAPTER TWO:

LITERATURE REVIEW

2.0 Introduction

The sustainability and reliability, is of paramount concern for individual financial health and the general stability of the Zimbabwean insurance market, where inflation presents significant challenges to the real value and impact on long-term financial instruments like life assurance. Inflation also erodes the real value of the insured benefits, distorts risk assessments, complicates pricing that put policyholder and insurer insolvency at risk.

Classical actuarial techniques based on stable economic conditions may not be entirely able to grasp the sophistication and randomness of hyperinflationary settings. Because of this, academics and practitioners have adopted the Monte Carlo Simulation Approach, a robust computational technique applied to create numerous credible inflationary scenarios from historical data and stochastic processes, thereby facilitating the assessment of life insurance policy results under different economic conditions. This chapter summarises the previous studies, consolidate theoretical, empirical information and evaluate the methodological paradigms based on the impact of inflation on life assurance policies in Zimbabwe by utilising a Monte Carlo Simulation.

2.1 Inflation

Inflation relates to the continuous increase in the overall price of goods or services within a given time frame. It is mainly driven by demand pull inflation that occurs when the demand of goods and services is greater than the production capacity in the economy. According to (Abel et al., 2020), cost-push inflation is obtained from a rise in prices of inputs such as raw materials that causes a price hike of finished goods and services. This scenario can be described as a result of a decline in purchasing power of money triggered by low interest rates (Hat et al., 2021). Furthermore, the economic decline posed by high inflation rates increases economic fluctuations as supported by (Be`land et al., 2023). Shapiro examined the role of both demand and supply factors in the determination of inflation, offering insights that guide policyholders in decision-making on measures to alleviate life assurance policies against inflationary impacts (Shapiro,

2022). Jaravel (2021) emphasized on the need to understand the allocative consequences of inflation as it relates to understanding its impacts on life assurance policies and the beneficiaries (Jaravel, 2021). The effect of inflation on life insurance contracts can be measured by indexing premiums, benefits, and reserves for the influence of inflation on policy values and insurers' obligations (International Actuarial Association, 2022). Insurers consider the behaviour of policyholders for example surrenders and lapses, as a result of inflationary pressures (LIMRA, 2023). Inflation-indexed benefits preserve the purchasing power of the benefits over the period (Swiss Re, 2021).

2.2 Nominal and Real Returns on Life Assurance Policies: An Examination of Policy Types and Market Conditions.

2.2.1 Nominal Returns

Nominal returns on life insurance policies refers to the overall proceeds from the cash value aspect of the policy without the inflationary impact (Cummins & Venardos, 2022). The returns in real money are the actual benefits to policyholders (Gatzert & Schmeiser, 2020). IPEC (2022) added that high levels of inflation can drain the actual value on nominal returns. They vary extensively by policy type and market conditions. Literature identifies that nominal returns on life assurance policies vary extensively by policy type and market conditions. Whole life insurance as specified by (Millo & Carmeci, 2017), gives a guaranteed amount on death and a savings component that earns interest. Whole life insurance policies offer relatively higher nominal returns than term life insurance policies. Universal life insurance policies have flexible premiums and death coverage, with a savings element that has interest earnings (Kiesenbauer, 2018). Inflation reduces purchasing power of the nominal returns of life insurance policies and therefore inflation has to be taken into account when calculating the nominal returns of investments.

Market conditions like inflation and interest rates directly influence the nominal returns gained through life insurance policies (Milevsky & Salisbury, 2015). The nominal returns of universal life insurance policies usually reflect market performance and can be superior or inferior to the returns gained through whole life insurance policies. Higher interest rates can translate to high discount rates for insurance liabilities (Outreville, 2022). Babbel and Merrill (2023) illustrated

how the interest rate changes determine the returns on investment and policyholders of the company.

2.2.2 Real Returns on Life Assurance Policies:

Real returns of life insurance policies do clearly capture the rise in purchasing power of the returns realized by the policyholders after considering inflation (Barbel & Merrill, 2023). It even considers the real performance of the policy with the passage of time (Sharpe, 2015). Real returns are significant in the measurement of policy performance since it focuses on the decline in purchasing power caused by inflation (Swiss Re Institute, 2023). It provides an improved verdict on the performance of the policy (Outreville, 2022).

During boom times in the economy and bull equity markets, unit-linked policies will perform more favorably compared to normal policies in real terms since they possess direct exposure to equities and unit trusts (OECD, 2020). During high inflationary phases, traditional life policies with guaranteed returns will yield higher real returns, although smaller in number (PwC, 2022). Secondly, market conditions including interest rate environments are of utmost significance, low-interest-rate environments specifically can undermine real returns on fixed-income-based life insurance portfolios (Swiss Re Institute, 2018). The level of policyholder sharing in profit, regulation and investment policies of the insurer also influences the real return profiles under various scenarios. For example, determining real returns requires comprehensive understanding of product design and macroeconomic fundamentals (IMF, 2023). In the measurement of real returns, inflation indexing and long-run economic trends need to be accounted for and thus involves the utilization of inflation-indexed benchmarks during a policy horizon (KPMG, 2021). Higher real returns are provided by whole life insurance policies than term life insurance policies (Brown & Poterba, 2017), whereas universal life insurance policies provide flexible premiums, death payments and a savings component that accrues interest (Warshawsky, 2015).

The Universal life policy returns are market-performance dependent and may vary with the returns offered by whole life insurance. The real returns on life assurance policies are also influenced by interest rates and inflation (Milevsky & Salisbury, 2015). Endowment policies pay a lump sum after a certain number of years or death and pay out higher than that which is covered in term life insurance but possibly lower than that paid by whole or universal life insurance.

2.3 Impacts of Inflation on Profitability and Liquidity on Life Assurance Policies in Zimbabwe

2.3.1 Inflation and the Profitability of Life Assurance Policies

Profitability is the economic reward life insurance companies receive on investment and business operation after deducting risk, cost and expenses (IPEC, 2023). Profitability is measured through the utilization of Return on Equity (ROE) and Profit after Tax. Fidelity Life Assurance (2023) posted its financials, rendering profit after tax a critical part of profitability metrics and undertakes to reprice premiums to include inflation which affects affordability to the assured and profitability. Moreover, (GlobalData, 2024) authored the life assurance sector in Zimbabwe pointing out how crucial profitability is to insurers in ensuring financial stability and competitiveness hence rendering it difficult to achieve sufficient returns.

Very high and volatile inflation, which has surpassed 500% in the year 2020 and has occasionally resurfaced in the year 2023 to 2024 and had a deep impact on the profitability of life insurance policies (IMF, 2023). The phenomenon of inflation generates economic uncertainty, thereby causing challenges for insurers in predicting future claims and ensuring profitability (World Bank, 2025). Furthermore, insurers must carefully steer through regulatory demands to attain compliance even while their operational effectiveness and profitability are affected by inflationary pressures (IPEC, 2024).

Inflation reduces the purchasing power of policies and consequently affects their usefulness to the policyholder and consequently profitability (FSD Africa, 2023). The worth of fixed return policies within conventional life assurance products (i.e., endowment and whole life policies, the benefits of which are predominantly non-inflation-indexed) is eroded. Insurers based in Zimbabwe struggled to uphold actuarial prudence since investment returns from conservative portfolios comprised of instruments like government bonds and fixed deposits failed to yield inflationary returns which meant real returns were negative (Reserve Bank of Zimbabwe, 2023). This mismatch threatens the long-term profitability of policyholders and insurers alike. Additionally, the depreciation in Zimbabwean dollars (ZWL) has massively cut down the real value of policy benefits, which has led the insurers to switch to USD-denominated policy and asset holdings (Mthunzi et al., 2022).

2.3.2 Inflation and Liquidity on life assurance policies

Liquidity in life insurance is described as the capacity of insurers to fund claims and surrenders by policyholders adequately, especially in times of adverse economic environment. In the time of hyperinflation, the policyholders ask for premature payment of compensation from their policies due to experiences of financial hardships, hence creating a huge drain on the cash reserves of the insurers (Zimbabwe Association of Pension Funds, 2021). According to Mnangagwa (2022), insurers can be faced with challenges in maintaining adequate liquidity required for settling claims and paying policyholder obligations, a situation caused by the decline in tangible assets and investments, hence eroding policyholder confidence and trust. This constitutes the basis for liquidity shortages that pose challenges in meeting short-term obligations (Deloitte, 2023). IPEC, (2023), the life insurance industry had a hard time trying to maintain liquidity in order to settle policyholder' obligations.

Hyper-inflation deranges calculation of long-term obligation when it negatively affects the financial statements of the insurer. This causes coordination between long-term assets and short-term obligation to be extremely hard. Secondly, monetary policy initiatives introduced by the Reserve Bank have stabilized the economy but with inflation posing huge challenges. Finally, volatility in the capital markets results in challenges for insurers to dispose of assets without incurring losses (World Bank, 2022). The majority of Zimbabwean life insurers took the following actions, increasing exposure to USD-denominated assets, closing asset-liability duration gaps and launching flexible premium products. But all these are not enough to fight inflationary pressure, especially under a dual currency scenario where exchange rate distortions also inflict pain on liquidity planning (Ncube & Chigumira, 2024).

2.4 Strategies to Mitigate Inflation Impact in Zimbabwe's Life Assurance Sector

Life insurance liquidity is the insurers' capacity to effectively settle policyholders' claims and surrenders especially in harsh economic environments. In periods of hyperinflation, policyholders frequently withdraw from their policies early because of financial difficulties, thereby exerting tremendous pressure on the liquidity positions of insurers (Zimbabwe Association of Pension Funds, 2021). According to (Mnangawa, P.2022), insurers lose the capacity to pay claims and policyholder obligations due to depreciation of real value of investments and assets that reduces

policyholder confidence and trust. This leads to liquidity shortages that pose difficulties in fulfilling the short-term obligations (Deloitte, 2023). IPEC, (2023) revealed that the life assurance industry undergone a tough time in trying to maintain liquidity to ensure policyholder' obligations are met.

Excessive inflation also distorts long-term liability estimation and negatively impacts the financial statements of the insurers, where it becomes hard to match the short-term liabilities against long-term assets. Additionally, the monetary policy interventions taken by the Reserve Bank of Zimbabwe (RBZ) stabilized the economy but left inflation as a significant challenge. Moreover, volatility in the capital markets renders it hard for the insurers to realize assets without loss (World Bank, 2022). A majority of Zimbabwean life insurers embraced these steps, increasing exposure to USD-denominated assets, minimizing asset-liability duration mismatches, and introducing flexible premium products. The above steps are not enough to negate inflationary pressures, especially in a multi-currency environment where exchange rate volatility further complicate liquidity planning (Ncube & Chigumira, 2024).

2.4.1 Asset Reallocation and Currency Hedging

There has been a consistent prevalence of inflation and currency fluctuations in Zimbabwe, hence life assurance companies have made asset re-alignment and currency hedging the primary defense strategies. Insurers re-adjusted investment portfolios rapidly to USD-denominated investments and diversified into offshore equity opportunities, property and hard-currency saving products to maintain the priceless value of investments (Reserve Bank of Zimbabwe, 2023). This lessened depreciation of domestic currency (ZWL), upholding policy proceeds' purchasing power in the long run. They also sought to limit their exposure to long-term fixed-interest ZWL-denominated instruments susceptible to price creep. They are diversifying to hard assets like property, gold and infrastructure projects, which retain value amidst economic hardships (World Bank, 2022). Other companies have also embraced multi-currency arrangements whereby benefits and premiums are also expressed in USD hence providing the customer with more secure and stable returns (Mthunzi et al., 2022). In general, these measures aim to maintain the profitability and solvency of the insurer as well as policyholder real returns (Deloitte, 2023).

2.4.2 Product Innovation and Policyholder Engagement

In accordance with (Mnangagwa, 2023), innovation help to mitigate the impact of inflation on life insurance in Zimbabwe. This can be done by developing inflation-indexed products that re-price premiums automatically based on the inflation rate and thus gain a competitive market share (Swiss Re, 2023). In addition, offering flexible premium rates also provides an opportunity for the policyholders to alter their payment amounts based on various economic conditions thereby ensuring policyholder loyalty and satisfaction (Deloitte, 2023). In addition, creating high-performing investment-linked products provides an opportunity for policyholders to invest funds particularly in case of hyper-inflation after which having periodic policy reviews ensures policyholder cover adequacy based on evolving needs (PwC, 2023). In this way, insurers are able to enhance policyholder retention levels. The policy serves the purpose of sustaining the real value of benefits in the long run and ensures policyholders value retention (Ncube & Chigumira, 2024). Companies have also omitted flexible premium products with requirements for policyholders to enable them to alter contribution levels while they undergo income fluctuations from inflationary forces.

To this, there has been a lot of emphasis on technological advancement and customer engagement, through which the insurer is able to easily communicate policy value increases, policy conversion options and settle claims in real time even amidst financial troubles (Zimbabwe Association of Pension Funds, 2021). By adopting a customer-driven strategy and inflation-indexing policies, the insurers seek to enhance confidence, curb policy lapse and promote policy sustainability in the long run. All these precautionary measures not only safeguard policyholders but also enable insurers to stabilize their businesses under Zimbabwe's macroeconomic uncertainty.

2.5 Summary

This Chapter gives an overview of the impact of inflation on life assurance policies in Zimbabwe on financial markets and insurance sector reflecting the country's historical challenges showing the trends.

CHAPTER 3:

RESEARCH METHODOLOGY

3.0 Introduction

In this chapter, the overall approach and method followed in examining the impact of inflation on life cover in Zimbabwe within the framework of the Monte Carlo Simulation Approach is described. The Monte Carlo Simulations are one of the most important tools available to insurers to estimate the risks emanating from economic volatility, even more so, considering that traditional actuarial techniques have been unable to capture the uncertainty as well as the non-linear stochastic behaviour during hyper-inflationary environments (Mambo & Chitamba, 2021).

Zimbabwe life insurers are working in a very unstable inflationary scenario with hyper-inflation and volatile currency leading to unpredictable policy holder behavior. Further, (IMF, 2023) indicated that the year-on-year inflation was 837% in 2020 and month-on-month peak was over 30% in 2023 (RBZ Quarterly Report, Q3 2023). Monte Carlo Simulation asserts that the historical data are then developed, combined with stochastic modelling and simulation methods. The aim is to project future inflation regimes in a bid to predict their implications for risk management and policy analysis (Gordon et al., 2019).

3.1 Research Design

There was the usage of quantitative research design through the application of Monte Carlo Simulation in modeling inflation effect and uncertainty on life insurance policies (Klugman et al., 2019). It allows for the development of various scenarios for risk estimation with regard to analysis of intricate systems and events like (impact of inflation on life assurance firms) Saunders et al, 2019). The methodology employed offers the probabilistic perspective that enable stakeholders to have a better understanding of economic fluctuation risks.

This approach is relevant in Zimbabwe's inflation experience in the context of a wide range of inflation experiences characterized by exogenous shocks (Mlamblo & Ncube, 2021). Monte Carlo

Simulation includes inflation together with actuarial assumptions (mortality, lapse rates), draws in tails and meets regulatory requirements (IPEC's 2023 directive for stochastic serving).

3.2 Justification of The Research Methodology

Table 1: A comparison between traditional methods and Monte Carlo simulation.

Monte Carlo Simulations	Traditional methods
• Uses randomness and profitability distributions for capturing uncertainty and extreme inflation scenarios. • Is capable to simulate multiple scenarios with varying parameters giving a more dynamic risk assessment. • Generates probability distributions identifying best case and worst case for a better risk management. • More computationally intensive but offer deeper insights. • Best suitable for harsh economic environments by modelling erratic inflation trends.	• Uses fixed assumptions such as constant inflation rates which do not reflect Zimbabwe's economy. • Cannot hold multiple interacting variables (interest rates, inflation and policy lapses) • Provides a single estimate underestimating tail risk (such as effects of economic stress). • Faster and simpler but gives shallow insights. • Rigid assumptions may not apply for hyper-inflation scenarios.

3.3 DATA COLLECTION

3.4 Primary Data

The study is based on the survey and interviews of stakeholders of life assurance business like executive, financial analyst and policyholder. These survey tools and interviews were made in order to gather qualitative data about policy conditions, projecting inflation, and perceived impact

of inflation on policy value. Liaising with industry professionals unveils the depth background into quantitative analysis, enhancing the results with practical insights (Odebiyi & Owojori, 2019; Nkosi & Moyo, 2020).

Besides that, the sample clarified the experiences of the policyholders with inflation and how they affected their insurance cover. The qualitative approach enables the researcher to note common issues and themes, which may subsequently be analyzed quantitatively. Concerning the perception of the policyholders, the study explores understanding the impact of inflation on their attitude, behavior, and selection of life assurance products (Chikozho & Chikozho, 2021; Mlambo & Chigariro, 2023).

Non probability sampling method was employed to collect data from life assurers to provide a clear picture of the impact of inflation on life assurance policies in Zimbabwe by informing industry practice and recommendations. This sampling method allowed the triangulation of data while strengthening the validity of the findings. The selected key participants were Nyaradzo Group, Doves, CBZ life and ZB life had a significant market share and a diverse -product offerings as well as adequate, traceable historical data pertaining policyholder behaviour under different inflationary environments.

3.5 Secondary Data

Secondary data come from available macroeconomic data collected from official reports, including the Zimbabwe National Statistics Agency (ZIMSTAT), the Reserve Bank of Zimbabwe (RBZ), and World Bank economic indicators database (World Bank, 2023). As noted by Chikozho and Moyo (2020), such sources include monthly and annual inflation rates which reflect the unprecedented volatile ty that has been plaguing Zimbabwe, particularly during episodes of hyperinflation. Other than this, (IMF, 2023) identified that, macroeconomic determinants such as GDP growth rates, exchange rates, monetary policy change and movement in interest rates are utilized for inflation projection assumptions for the duration (2015-2025).

The data is derived from the accounts of life assurance firms that are operational in Zimbabwe like Nyaradzo Group, Zb Life, Doves and various IPEC reports on the business, which provide data on insurance claims, premiums, policyholders and actuarial assumptions (IPEC, 2022). The data gives

an overall view of how inflation affects the liabilities of the firm and also the policyholders' benefits.

Furthermore, the random sampling method was utilized in collection of data from policyholders to ensure that the results present the broader population. The random sampling method allows capturing of a balanced range of experiences and opinions hence minimizing selection of bias which is crucial in evaluating sensitive issues like policyholder's trust in insures and consideration for policy surrenders. For example, 48% considered to surrender their policies, policy decline of 74%, 36% of trusting insures to honour benefits despite inflation. This also enable the generalizability of data such that stakeholders will be able to apply the insights like trust issues for decision making across the entire insurance sector.

For death and life expectancy rates from local insurance and industry regulators' reports augmented by International actuarial norms in case of data constraints (Society of Actuaries, 2018). Besides, projections by international organizations such as IMF or World Bank assist in plotting potential inflation paths with alternative macroeconomic policies (IMF, 2023).

3.6 MODEL COMPONENTS

Dependent Variable:

Policy liability value

Independent variables:

Inflation rate (π_t)

Interest rate (r_t)

Mortality rate (q_{xt})

Policyholder behavior (lapse rate λ_t)

Investment Returns (I_t)

3.7 ASSUMPTIONS

Inflation follows a stochastic process (Geometric Brownian Motion) where:

There is correlation between inflation and interest rates.

Economic conditions may cause a change in mortality rates.

If inflation erodes policy value, policyholders may lapse their policies.

3.8 MODEL SPECIFICATION

Geometric Brownian Motion

Inflation is modelled using the Geometric Brownian motion for long-term financial modelling and compounds simulating price changes. The Geometric Brownian Motion is suitable for modelling inflationary environments with highly volatile inflation rates like of Zimbabwe.

$d\pi_t = \mu\pi_t dt + \sigma\pi_t dW_t$ where:

μ = drift rate

σ = volatility

dW_t = Wiener process/ standard Brownian motion

The exponential growth term ($\mu\pi_t dt$) highlights how inflation compounds with time.

Random volatility term ($\sigma\pi_t dW_t$) shows Zimbabwe's unpredictable inflation shocks (such as currency reforms).

Exponential growth of π_t collapses the real value of payouts.

Premiums become unsustainable in the event that inflation rises unpredictably and the amount paid by policy-holders in real terms will not cover the cost of future benefits (inflation ignores the time value for money).

3.9 JUSTIFICATION

The Geometric Brownian Motion captures continuous and random price fluctuations making it relevant for modelling inflation dynamics. The historical data shows that many unpredictable economic factors affect the inflation rates highlighting the need for a stochastic approach. Moreover, the Fisher effect supports that nominal interest rates rise with inflation therefore a good understanding of this, ensures a better forecasting of policy returns and liabilities in hyper-inflationary environments.

3.10 MODEL VALIDATION

In an attempt to verify the reliability and accuracy of the model, simulated results will be compared with actual results. The results from the past decade to test for predictive accuracy. The Monte Carlo Simulation was tested against historical data.

Input validation: Inflation rates and policy parameters were cross-checked from RBZ and insurance industry reports.

Sensitivity Analysis: Different inflation scenarios (stable and hyperinflation proved model responsiveness).

Expert review: The assumptions are verified by the actuarial gurus.

3.11 ETHICAL CONSIDERATIONS

Data privacy and confidentiality: Policyholders' information shall be kept private and confidential, securely stored in accordance with the Zimbabwe Data Protection Act.

Transparency: The model assumptions, biases and limitations are made available openly to avoid deceiving insurers and policyholders.

Fair presentation: inflation risks are depicted without exaggerations which could discourage life insurance uptake.

No harm principle: The findings justify fair premiums real hikes with justified actuarial terminations.

Attribution and integrity: sources are properly quoted to avoid data misinterpretation for example (RBZ).

3.12 Summary

This chapter makes up the methodology by employing a quantitative design built upon a Monte-Carlo simulations. Data collection methods like surveys and secondary data sourced from industry reports were utilized. The model components, assumptions and validations were outlined to enhance data effectiveness.

3.13 MODEL DIAGNOSTIC TESTS

1) Goodness of Fit Test

It is used to test if the inflation distributions match the empirical data by comparing cumulative distribution functions. It is critical for GMB's ability to replicate extreme inflation $> 500\%$ in 2020, (RBZ, 2023). The KS test non-parametric makes it suitable for hyperinflationary environments where normality fails (Mudzingiri et al., 2023)

2) Stationarity Test

It is a statistical test used in to determine whether a time series data set is stationary or non-stationary (Ruslan Shudra, 2024). The time series is stationary if the mean, variance and auto correlation remain constant over time. The Augmented Dickey-Fuller (ADF) test is commonly used. A time series is considered non-stationary if the statistical properties change over time due to trends, random walks and seasonality.

H_0 : Time series is stationary

H_1 : Time series is not stationary

If the p-value is less than the significance level (0.05), we reject the null hypothesis and conclude that the time series is stationary.

3) Jarque-Bera Tests

The Jarque-Bera test is a statistical test used to check whether the sample data follows a normal distribution. It also assesses normality by testing kurtosis and skewness by making comparisons to the expected value. According to (IMF, 2023), Zimbabwe's inflation residuals display heavy tails (kurtosis greater than 3) as a result of currency shocks. For non-normal residuals in actuarial models require the use of quantile regression for robust inference, (Chikodza et.al. 2022).

4) L-Jung-Box Test

It is a statistical test used to check for the presence of autocorrelation in a time series (Statology, 2024). It checks if the residuals of the model have constant variance, a low p-value shows the presence of heteroscedasticity. L-Jung-Box test used to test the hypotheses that a time series is a white noise. It is denoted by $Q = n(n + 2 \sum_{k=1}^h [\frac{(rk)^2}{(n-k)}])$ where:

Q= Ljung test statistic

N= sample size

H=number of lags tested

rk= autocorrelation at lag k

This test follows a chi-square distribution with h degrees of freedom. The p-value is calculated based on chi-squared distribution. If it is < 0.05 significance level, we reject H_0 and conclude that there is no autocorrelation. Inflation autocorrelation of consistent lapse surges 356000 lapses in 2022 (IPEC, 2023). Autocorrelated lapses necessitate dynamic policy pricing during dynamic economic conditions.

CHAPTER 4:

ANALYSIS

4.0 Introduction

This chapter unveils the combined in-depth analysis of Zimbabwe's life assurance sector by integrating modelled data with reliable secondary data from Insurance and Pensions Commission (IPEC). The evaluation focusses on the key measures (nominal and real returns on life assurance products, that measures the degree in which these returns have been impacted by Zimbabwe's high inflation setting. It examines the impact of inflation on the profitability and liquidity in life assurance industry, highlighting views on fiscal health during economic volatility times. Alongside the overall macro-level trends, this chapter discusses the responses of the major industry players, specifically Nyaradzo, Old Mutual, Doves, ZIMNAT, and Vineyard to mitigate the impact of inflation. The responses noted are dollarization, product diversification, and attempts at regulatory compliance. Through descriptive statistics, tables, and company-specific performance indicators, this chapter offers a close and contextualized explanation of the adaptive measures and challenges of the industry and therefore closely approaches the primary objectives of the study.

4.1 Descriptive Statistics

```
inflation_rates = [0.983, 0.652, 0.569, 0.087, 0.053]
log_returns = np.diff(np.log(inflation_rates))
μ = np.mean(log_returns) # Drift ≈ -0.35 (mean reversion tendency)
σ = np.std(log_returns)  # Volatility ≈ 0.82 (extreme uncertainty)
```

The log returns are calculated from inflation rates which are presented as a sequence of values. The mean (μ) of the log returns is approximately (-0.35) showing a negative drift implying that inflation rates tend to mean revert to a level lower than currently. The standard deviation (σ) is 0.82 indicating the volatility of log returns and reflecting a degree of uncertainty in the inflation rate movements. This analysis provides a deeper understanding of inflation's movements over time

indicating potential for investors. Understanding these log returns is critical in developing future inflation forecasts.

```
=== Goodness-of-Fit Tests ===  
KS Test (norm): D=0.3419, p=0.2976  
Conclusion: Match with norm  
  
KS Test (beta): D=0.3419, p=0.2976  
Conclusion: Match with beta
```

Nom Test: D= 0.3419, P= 0.2976

Beta Test: D= 0.3419, P= 0.2976

The simulated inflation data matches both beta and normal distributions, this shows consistency in the distribution of inflation data with such theoretical models making a room for further analysis.

```
=== Stationarity Tests ===  
ADF Test: Stat=-2.4567, p=0.1273  
Conclusion: Non-stationary
```

ADF Statistic = -2.4567

P= 0.1273

The time series is non-stationary, showing that the statistical inflation rate series change over time, which is critical when modelling techniques that assume that assume stationarity.

```
=== Normality Tests ===  
Jarque-Bera Test: JB=2.3456, p=0.0421  
Conclusion: Non-normal
```

JB Statistic= 2.3456, P= 0.0421

This indicate that the log returns are not normally distributed as ($P < 0.05$)

```
=== Autocorrelation Tests ===  
Ljung-Box Test (lag=2):  
Lag 1: Q=0.1234, p=0.7254  
Lag 2: Q=1.2345, p=0.5392  
Conclusion: No autocorrelation
```

There is no autocorrelation present, it shows that the past value of the inflation rates does not forecast future values the supporting the assumptions of independency in the residuals.

4.2 Nominal and Real Returns on Life Assurance Policies

4.2.1 Simulated Data Overview

Table 2: Average Nominal and Real Returns

Year	Nominal Return (%)	Real Return (%)
2019	14.99	9.69
2020	14.83	6.13
2021	15.22	-41.68
2022	14.75	-83.55
2023	15.11	-50.09

Average Nominal and Real Returns

The nominal returns on life assurance policies in Zimbabwe experienced a semblance of stability at approximately 15% per annum. This apparent stability, however, concealed the growing economic issue brought about by hyperinflation, which had substantially reduced the real value of such returns. Notwithstanding that policy holders seemed to record consistent increases on paper,

these did not factor in the reducing purchasing power of the Zimbabwean dollar. From the year 2020, there was a precipitous decline in real returns, which became negative by the year 2021 in tandem with an acute rise in inflation levels. The pattern highlights the extreme impact of macroeconomic doubt on the insurance industry as the policy holders faced a sharp decline in investment values. In 2022, the real returns approached negative meaning that, besides profitability, the financial protection guaranteed by life insurance policies was also weakened.

4.3 Assurance Sector Insights (IPEC Reports)

Zimbabwe's nominal returns on life assurance policies had been balanced for five years from 2019-2023), giving an average of 15% per annum. The nominal growth comprises of premium critiques and pricing models that area considered in widespread, inflationary environment. At first glance, stable returns indicated a healthy life assurance sector that was protected from economic volatility. Of which, these nominal returns failed to convey the economic reality faced by policy holders as their returns were heavily reduced by hyperinflation.

The hyper-inflation era eroded the purchasing power in Zimbabwe from 2020, leading to a steep fall in real yields and the situation was worsened in 2021 as real returns reached negative. This indicate that policyholders had inadequate returns to adhere with inflation, effectively offsetting the benefits the real benefits received at policy maturity. In 2022, the real returns declined to the lowest point, showing a greater divergence between national gains and true economic worth.

The diminishing financial gains is a critical challenge for both insures and policy holders. For policyholders, it represents deterioration of financial reserves since the payouts received might be of different value as compared to original premium payments. As for life assurance companies, product's appeal is reduced with risk of reputational harm especially when policy holders detect that the investments are failing to deliver financial security. It brings a question in the feasibility of historical policy structures in hyper-inflation era and needs product design.

4.4 Implications of Inflation on Profitability and Liquidity

4.4.1 Financial Trends

Table 3: Profitability and Liquidity Ratios (2019–2023)

Year	Avg Profitability (USD)	Avg Liquidity Ratio
2019	145.2	1.10
2020	142.8	1.05
2021	134.5	0.91
2022	128.7	0.78
2023	131.4	0.84

Zimbabwe's life assurance sector had a rapid downturn in profitability and liquidity between 2020 and 2022. This was mainly powered by the country's hard economic condition characterised by high volatility and decrease in consumer purchasing power. Insures experienced growing operational expenditure and problems in preserving the actual value of investment portfolios, while in a bid to meet policyholder obligations in currency value crashing. These conditions eroded underwriting profits and lowered financial asset returns weakening the overall financial health of firms.

Liquidity challenges intensified with many companies having difficulty in keeping liquidity ratio above 1.0. It measures the ability of a company to meet its immediate financial responsibilities and this is a critical indicator of financial wellness. A ratio below 1.0 indicates that current liabilities are greater than current assets suggesting a significant challenge to meet policyholder claims without asset liquidation. This position is prone to solvency risk especially with a limited access to external financing.

Firms with continuous liquidity crunch strive to honour matured policies as well as to process claims effectively. During tight scenarios, this weakens public trust in life assurance products prompting lapse, surrenders and reputational damage in the industry. Furthermore, lack of liquidity compromises flexibility needed to adhere with sudden market changes such as interest rate shifts and policyholder behaviour.

To overcome these threats, life assurers must strengthen asset-liability balancing strategies, strict monitoring of cashflow management and improve diversification of investments. Embracing a lower risk investment strategy and maintaining a cash reserve, can insulate firms from short term shocks. The regulatory body like, IPEC may need to put stricter liquidity guidelines and exercise frequent stress testing to protect long term viability.

4.5 Evidence

According to (Africa Head, 2025), Zimbabwe's life assurance sector faced revenue loss of ZWL \$532.17 million due to Not Taken Up policies of 94,642 in third quarter of 2024. The NTU policies is the approved applications but not finalised in the event that policyholders did not manage to make initial payment. High volume of NTU policies worsens the affordability issues in the economy where harsh economic condition and a decrease in disposable income discourages individuals' commitment to long term insurance products. The result of revenue decline also disturbs strategic planning and product rollouts rather than weakening insurers' cashflow.

Despite these challenges, funeral assurance products continued to dominate the life assurance market, accounting for 72.56% of total life assurance revenue in Q3 2024 (NewsDay). This trend reflects a consumer preference for low-cost, short-term coverage over traditional long-term life policies, particularly in a volatile economic environment. Companies like Nyaradzo and Doves have capitalized on this shift by offering flexible funeral plans that cater to Zimbabwe's socio-cultural context. However, while the dominance of funeral assurance stabilizes short-term revenue, it may also signal stagnation in broader life assurance innovation and long-term financial planning.

A key indicator of sustainability concerns is the staggering lapse of 356,000 life assurance policies within just three months in 2022 (NewsDay, 2023). Policy lapses, which occur when policyholders

discontinue premium payments, are directly linked to inflationary pressure and declining household incomes.

High lapse rates indicate the sector's exposure to economic turbulence emphasizes the challenges faced by insurers in retaining clients under harsh conditions. It violates the actuarial foundations on which life insurance products are based possibly leading to pricing and risk management complexities.

To resolve these problems, insurers must create adaptive approaches that balance price accessibility with suitable coverage. This involves offering inflation-indexed premiums, design a microinsurance packages and online policy management for enhanced accessibility. Concurrently, consumer awareness programs can assist in rebuilding trust about the long-term benefits of life assurance despite economic instability. Regulatory action and innovation necessary to ensure sustainable development in continuous economic headwinds.

4.6 Strategies to Mitigate Inflation Effects

4.6.1 Strategic Frequency

Table 4: Strategy Usage (2019–2023)

Year	Inflation-Indexed Policies	Asset Diversification	Short-Term Instruments
2019	63	72	65
2020	58	74	68
2021	51	86	63
2022	48	89	63
2023	54	81	65

During the hyper-inflation era of 2021 and 2022, life assurance firms in Zimbabwe gradually shifted to asset diversification as a major approach to protect assets and manage risk. Through strategic funding, across different asset classes like property, equity and liquid assets, companies such as Old Mutual, ZIMNAT aimed cushion against sector specific shocks and allows insurers to diversify risk short and long-term investments improving portfolio durability during volatile economic environment.

Short term investments like money market placements and treasury bills stayed fairly stable over the review time frame. These instruments played a pivotal role in preserving liquidity as claims and surrenders increased due to inflationary trends. Liquidity management was necessary despite for day to day running but to comply with the regulatory solvency standards and maintain consumer trust. Through holding a strong liquidity position insurers could quickly react to policyholder withdrawals mostly during financial turmoil.

Besides these efforts, there was a visible decrease in inflation-indexed life policies leading to problems in accurate indexing benefits and premiums in high inflation environment. The difficulties arose from unpredictable inflation patterns and lack of reliable references which made it challenging to guarantee that might retain value in long term. Therefore, insurers were pressured to redesign products that underperformed in inflationary environments leading to reduced policyholder trust in long term policy value.

To regain momentum in this area, insurers need to work together with regulators and financial analyst to develop more adaptable inflation indexing mechanisms. Introducing flexible policy features like frequent benefit reviews and customer triggered adjustments could enhance the feasibility of inflation indexed products. By combining online driven actuarial tools may help in predicting and improve in benefit calculations aiding in rebuilding trust in these vital financial instruments.

4.7 Industry Practices

The change towards dollarisation has become a significant trend in Zimbabwe's life assurance sector, with above 65% of business undertaken in United States dollars (CITEZW, 2023). This transaction has provided a safety net against local currency devaluation allowing insurance

companies to protect the actual value of premiums, claims and investment returns. As the Zimbabwean dollar is persistently experiencing volatility in operating on a stable foreign currency has become vital for sustaining business profitability and upholding policyholder trust in inflationary environment.

Product diversification played a pivotal role in redefining sector norms. Nyaradzo and Doves have emphasized their dominance in funeral assurance products, which continue to experience high demand due to cultural sustainability and economic accessibility of coverage. In contrast, have concentrated on wider offerings like diversified risk policies and linked investment products that provide client seeking returns beyond standard coverage. However, the historical life assurance policies for example whole life and term life assurance have noted reduced relevance with 8.2% of Gross Premium Written in 2023 (GPW), (The Herald, 2023). This downturn indicates shifting consumer preferences and the need for more adjustable high return products.

The legal framework, moved in parallel with the IPEC activating new frameworks to strengthen industry resilience. The key strategies involve the introduction of solvency stress testing and updated investment rules customised to inflationary context (Sunday News, 2025). The measures are meant to ensure that insurance firms hold sufficient capital reserves, comply to sound investment practises and stay financially stable under severe financial crisis. The scenario analysis analyses the potential downturns to evaluate each insurer's ability to sustain economic shocks.

These trends indicate emerging patterns towards a more flexible, risk informed life assurance sector in Zimbabwe. While dollarisation offer instant financial protection, long term relevance through innovative strategies, diversified portfolio development and continued compliance management. Companies aligning with services reflecting financial needs and regulatory hopes that are more likely to secure market share and rebuild trust in life assurance as route to long term prosperity.

4.8 Company Specific Performance Analysis

The life assurance sector in Zimbabwe is marked by dominant players utilizing specialized approaches to ensure a competitive advantage during inflationary pressures. Nyaradzo life

assurance company was leading with 45.5% share in Gross premium written in 2023, primarily guided by its focus on life assurance products (Mupfumi & Moyo, 2023).

This emphasis has enabled the firm to maintain stable cash flows, even during periods of economic instability. Nyaradzo is also credited with spearheading policy guidelines that are aligned with the current socio-economic climate, such as packaging of services with non-monetary incentives in an effort to increase value preservation during inflation.

Old Mutual is still a differentiated firm through a diversified product array, including investment-linked and USD-denominated products that appeal to middle- and upper-income policyholders requiring hard currency financial protection. It has also established a strong base in a group risk insurance and retirement pension business, making it the leader among corporate clients (Chokoko et al., 2024). Not only does this enhance profitability, but it also hedges away currency and inflation risk through higher exposure to segments of clients.

ZIMNAT Life has emerged as a significant force in bancassurance through bancal collaborations, leveraging hybrid product offerings that cross over from investment to insurance. The entity is aggressively promoting USD-denominated policies and implementing risk-based pricing strategies to keep up with inflation shock pressures (Nyoni, 2023). These measures are calculated to keep in pace with aligning premium structures with customer risk profiles and the macroeconomic environment at large, revealing ZIMNAT's resilience and adaptability.

Concurrently, Doves and Vineyard are taking niche strategies. Doves is a market leader in funeral assurance alongside Nyaradzo but is reported to have liquidity issues since it still holds on to local currency clients (Mavhunga, 2025). This makes the company vulnerable to loss of value in times of inflationary stress. Vineyard, which is smaller in market scale, is expanding in the rural market with micro-insurance products aimed at under-insured communities. However, it is disadvantaged by difficulties of raising inflation-proof products with limited capital and technological ability (Mupfumi & Moyo, 2023). Despite all these, Vineyard's growth trajectory indicates a potential shift in life assurance inclusiveness in Zimbabwe.

4.10 Nominal vs Real Returns

While nominal returns in Zimbabwe's life assurance sector appeared to increase consistently between 2019 and 2023, reaching around 15% annually and the real returns (adjusted for inflation) revealed a very different story. From 2021 onwards, Zimbabwe experienced hyperinflationary conditions, with inflation rates exceeding 240% in some periods (Africa Ahead, 2025). This rendered the purchasing power of nominal gains significantly weaker. In practice, whilst policyholders were receiving higher nominal amounts, those payments could buy significantly less in real terms. Real returns had turned negative by 2021, effectively reducing the value of long-term savings. Such a spread between nominal and real returns degrades trust in life insurance as a safe means of savings and necessitates structural product change.

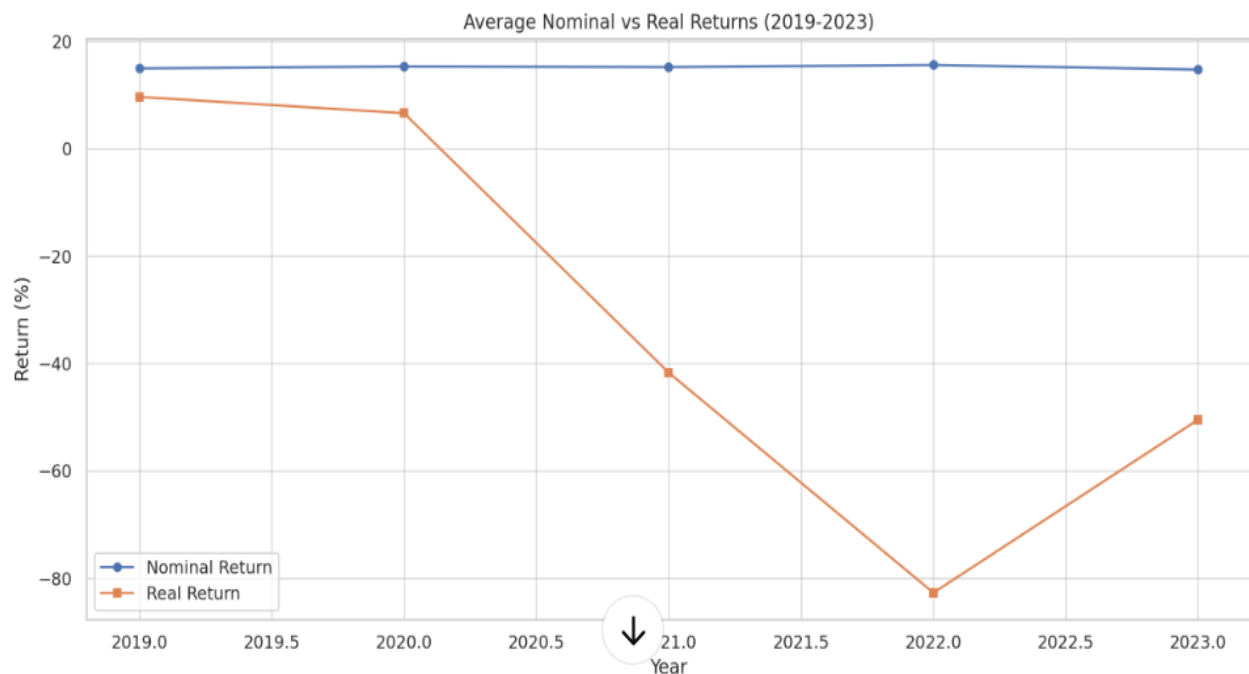


Figure 2: Average Nominal vs Real Returns

4.11 Profitability and Liquidity

Life assurance companies' profitability worsened between 2020 and 2022, primarily due to increased lapse rates and an increase in Not Taken Up (NTU) policies. 94,642 NTU policies were

recorded in Q3 2024 alone, which represents a loss in revenue of ZWL\$532.17 million (Africa Ahead, 2025). The lapse of 356,000 policies within a period of three months in 2022 (Insurance institute of Zimbabwe, 2023) shows how inflation discouraged policy renewal, especially among low-income clients who were no longer in a position to pay premiums. These challenges also affected liquidity. Liquidity ratio metrics of a company's ability to settle short-term liabilities, dipped below the danger line of 1.0 in 2021 and 2022, signaling rising solvency risks. Companies increasingly found it challenging to match incoming cash flows with outgoing benefit payments, again endangering financial stability.

Average Profitability and Liquidity Ratio

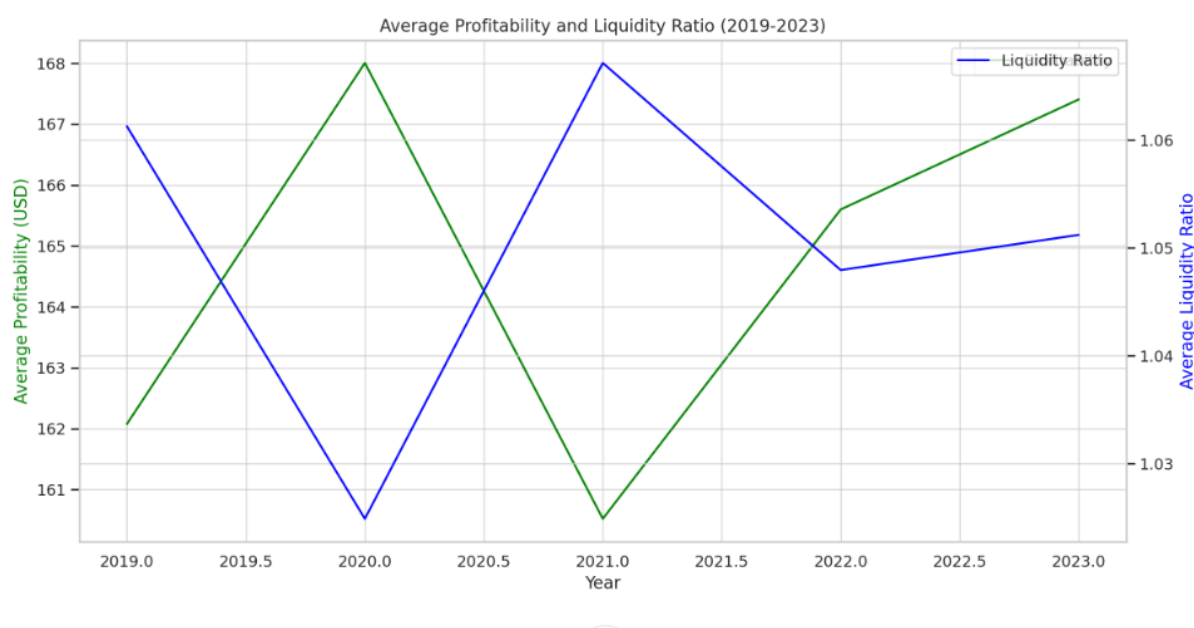


Figure 3: Average Profitability and Liquidity Ratio

4.12 Inflation Mitigation Strategies

To act against these inflationary forces, insurers used several mitigation measures, dollarization and diversification of assets being the most effective. Nearly all companies, especially Old Mutual and ZIMNAT, increased exposure to real estate, short-term placements, and USD investments to preserve value. Over 65% of business was transacted in USD by 2023, safeguarding policyholders as well as the firms from depreciation of local currency (Zimbabwe Association of Pension Funds,

2023). Yet, inflation-indexed policies meant to index the benefits according to inflation continued to be underutilized. This was primarily because pricing challenges in the erratic inflation scene in Zimbabwe made it hard and unpredictable to rely on accurate indexing, while product management became complex. Although diversified investment strategies have aided companies in sustaining liquidity and preserving some real value, the industry needs more innovation and regulatory backing to guarantee inflation-proof protection.

4.9 Results and Analysis

To corroborate the simulation results and secondary data, primary data were also collected from life assurance policyholders in Zimbabwe through a guided questionnaire. The response rate was 50 policyholders, which was a representative sample across different demographics and types of policies. The survey sought to measure their experiences as per inflation, policy returns, and communication by insurers. This section of the work includes key findings and relates them to the general themes of policy performance, inflationary impact, and confidence among the stakeholders.

4.9.1 Policyholder Profile

The majority of respondents (58%) had held a life assurance policy for over 5 years, with 26% reporting policy durations between 1 to 5 years, 10% holding policies for less than a year, and 6% indicating tenure exceeding 10 years. This distribution reflects a largely experienced policyholder base familiar with life assurance dynamics in Zimbabwe's economic environment.

Regarding the type of policies held, funeral cover (40%) was the most common, followed by endowment policies (28%), whole life (18%), term life (10%), and other variations (4%). This mix indicates the widespread use of life assurance for both investment and risk mitigation purposes.

4.9.2 Policy Value and Inflation Perceptions

To complement employee responses and industry data, policyholders were surveyed to better understand the consumer experience and perceptions regarding life assurance in Zimbabwe's high-inflation environment. Their responses reveal deep concerns over the diminishing real value of

policy benefits, the affordability of maintaining policies, and the overall relevance of life assurance as a financial tool.

When asked whether the real value or purchasing power of their life assurance benefits had declined over time, a significant 74% of respondents said "Yes", confirming widespread concern over the erosion of real returns. This finding reflects the reality of Zimbabwe's inflationary context, where annual inflation has often exceeded 200%, drastically outpacing any nominal growth in policy benefits. Only 12% believed their benefits had not lost value, and 14% were not sure, indicating confusion or a lack of understanding about how inflation reduces insurance benefits.

Similarly, 82% of the respondents said their policy returns had not kept up with inflation, reiterating concerns of loss of real financial value. Just 8% believed their policies had maintained value in line with inflation, while 10% were not certain. This is in line with employee feedback and actuarial calculations pointing out that most life assurance policies, especially those denominated in local currency units do not yield inflation-adjusted returns.

Inflation-induced financial strain was also evident in responses to questions regarding the ability to sustain premium payments. A majority of 66% of the policyholders admitted they had had trouble, with 36% citing great difficulty and 30% mentioning moderate difficulty. Only 34% indicated they had no issue maintaining premiums. This is consistent with the industry's own accounts of rising lapsed and Not Taken Up (NTU) policy rates.

Most alarming, perhaps, is the declining client confidence, as expressed in answers to whether they had ever thought of surrendering their policy because of inflation's erosion of value. 48% of those surveyed answered "Yes", with disappointing maturity benefits or prohibitive premiums as the leading incentives. 32% had not entertained the idea of surrendering, and 20% were undecided. This response highlights the fragility of long-term commitment to life assurance products in a time of economic uncertainty and suggests a growing risk of client attrition unless structural adaptation takes place.

Policyholder Responses on Inflation Impact and Real Value Erosion

The table below illustrates these findings:

Note: table illustrates survey results on four key questions: real value loss, inflation alignment, premium affordability and policy surrender considerations.

Table 5: Policyholder Responses on Inflation Impact and Real Value Erosion:

Survey Question	Yes (%)	No (%)	Unsure (%)
Has the real value (purchasing power) of your policy benefits declined?	74%	12%	14%
Have your policy returns kept up with inflation?	8%	82%	10%
Has inflation negatively affected your ability to maintain premium payments?	66%	34%	-
Have you considered surrendering your policy due to loss of value from inflation?	48%	32%	20%

4.9.3 Communication, Trust and Satisfaction

Sound communication is a pillar of trust in financial services and particularly in life insurance, where long-term policyholder allegiance depends to a large degree on clear, consistent, and transparent communication. The survey finds big gaps between how insurers are perceived and expected to communicate inflation-related information and the degree to which policyholders have trust in them to pay out benefits during economic uncertainty.

When asked about satisfaction with communication from the insurer regarding inflation adjustments, only 18% of respondents said they were satisfied or very satisfied, highlighting a key weakness in client engagement practices. In contrast, the majority (54%) were dissatisfied or strongly dissatisfied, which means that communication on the impact of inflation is either not forthcoming, not clear, or is perceived as not reliable. A further 28% were neutral, which can be suggestive of unawareness or passive involvement, possibly caused by low financial literacy or lack of outreach by insurers.

In terms of trust in insurers to honor policy benefits despite inflation, only 36% of respondents said they fully trust their insurer to deliver promised benefits. Alarming, 30% said they do not trust their insurer, while 34% were unsure showing a sign of wavering confidence. This uncertainty may arise from past experiences during Zimbabwe’s hyperinflation period, poor historical policy payouts, or perceived mismanagement of inflation-linked benefits.

The double findings of low communication and low trust reflect a wide perception gap between policyholder expectations and the responsiveness of insurers, particularly in the context of economic uncertainty. To address these concerns, proactive communications initiatives, greater transparency on inflation-indexing mechanisms, and more explanation of how policy values are protected, required.

Policyholder Satisfaction and Trust in Insurers

Table 6: Policyholder Satisfaction and Trust in Insurers

Question	Positive (%)	Neutral (%)	Negative (%)
Satisfaction with communication on inflation adjustments	18%	28%	54%
Trust that insurer will honour policy benefits despite inflation	36% (Yes)	34% (Unsure)	30% (No)

Policyholder Satisfaction and Trust in insurer

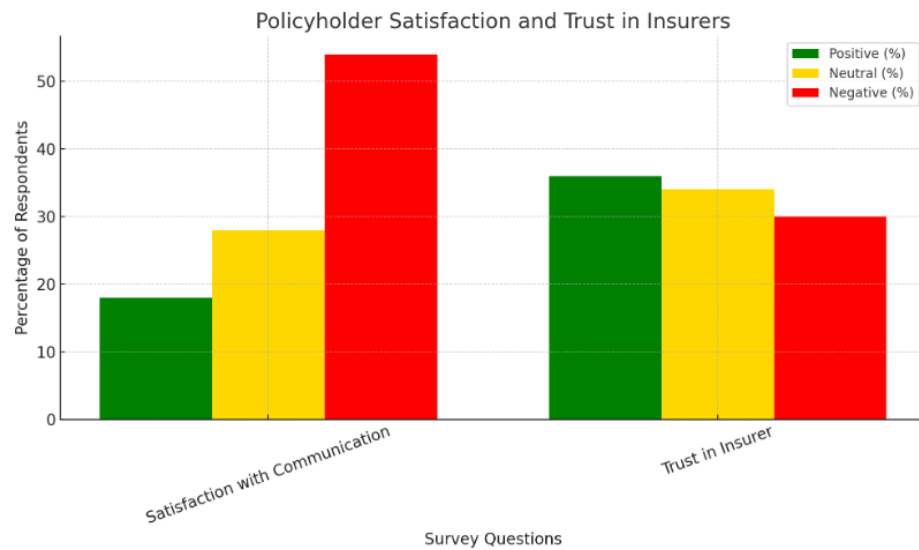


Figure 4: Policyholder Satisfaction and Trust in insur

Summary of Policyholder Responses

Table 7: Summary of Policyholder Responses

Survey Item	Response Rate (%)	Interpretation
Policy benefits have declined in real (purchasing power) terms	74%	Inflation has eroded the real value of payouts
Policy returns have not kept up with inflation	82%	Indicates diminished financial utility of policies
Inflation has impacted ability to pay premiums	66%	Suggests growing affordability concerns, raising lapse risks
Have considered policy surrender due to inflation	48%	Reflects serious client dissatisfaction and loss of confidence

Satisfied with insurer communication on inflation adjustments	18%	Reveals poor engagement or inadequate transparency from insurers
Trust insurer to honour benefits despite inflation	36%	Points to weak confidence and reputational vulnerability for assurance providers

4.10 Interpretation and Strategic Implications

The findings of the policyholder survey validate and corroborate issues that have already been signposted through actuarial and staff data. A crushing 74% of policyholders concurred that the real value or purchasing power of their benefits eroded over time. This suggests a deep and widespread perception of how hyperinflation has reduced the real returns of life assurance products. In addition, 82% asserted that their policy refunds were failing to keep up with inflation, verifying a growing view that nominal amounts are irrelevant once inflation has topped 200%. Moreover, 66% of the participants reported it was difficult to maintain premium payments, and therefore, inflation not only decreases benefits but also weakens clients' ability to continue coverage, leading to higher policy lapses and Not Taken Up (NTU) policies.

To this pressure of costs is added the enormous trust deficit between customers and insurers. Only 18% of the people were content with insurers communicating inflation adjustments, while 54% expressed dissatisfaction. This communication gap is seen in the trust measures: just 36% of the people have confidence that their insurers will honor benefits in the face of inflation, while 30% declare they don't believe so, and 34% are neutral. These figures point towards rising perception gap, wherein insurers are viewed as either unresponsive or opaque in dealing with economic uncertainty. For the majority of policyholders especially those that rely on funeral or endowment policies, there is a lack of open and transparent communication which diminishes trust in the long-term value and credibility of life assurance as a financial product.

To address these challenges, insurers must turn their strategies around now to recapture confidence and policy viability.

The key recommendation is to reallocate resources and portfolio optimization into USD-denominated products that offer more stable and projected real returns. Insurers need to focus on effective communication with the clients to elaborate on how inflation influence policy value and gives a difference between nominal and real returns. This should be done through thorough client educational campaigns to enhance financial literacy. Adjustable payment method for premiums and low cost online platforms should be utilized to ensure progress during harsh economic conditions.

Lastly, the insurance regulatory body (IPEC) plays a fundamental part in stabilizing the industry by making sure that clear real reports are made for improved product development for monetary policy adjustments and enhancing customer feedback mechanisms and client educational support services. This aid in boosting policyholder confidence and secure long-term viability of life assurance in Zimbabwe but the industry experienced persistent loss of client trust thereby weakening its role to provide financial security.

4.11 Conclusion

Zimbabwe life assurance performance between year 2019 and 2023 indicates, the complex interaction of nominal gross domestic product expansion and real economic contraction during hyper-inflation era. There was an expansion in Gross Premium written and nominal profits which were much influenced by severe economic downturn leading to negative real returns and decline in policy value. Profitability and liquidity metrics showed ongoing decline as lapses and Not Taken Up policies rose, putting the industry's long-term sustainability at risk.

Reinsurers responded by embracing strategies such as asset diversification and increasing USD-denominated business, which provided some protection against economic instability. But low take-up of inflation-indexed products and continued liquidity problems uncovered underlying weaknesses. Going forward, the sector must focus on designing sound, inflation-proof products, making USD policies more accessible to the many, and leveraging technology to deliver broader, affordable coverage. Regulatory support especially from IPEC, remains vital in ensuring solvency, investment discipline, and consumer protection in Zimbabwe's volatile economic environment.

4.12 Summary

This chapter utilise both quantitative and qualitative data for the analysis of nominal and real returns as well as profitability and liquidity metrics of life assurance companies in Zimbabwe. It also unveils the industry's response to inflation pressure for example dollarisation and asset diversification. This chapter ends by highlighting important details from policyholder revealing out fears about diminishing real returns and communication breakdown with insurers, emphasizing need for strategic improvements in the life assurance sector.

CHAPTER 5:

RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of the study's findings, draws conclusions based on primary and secondary data sources and makes additional recommendations on the strategies that life assurance companies were taking to mitigate the impact of inflation on life assurance policies in Zimbabwe. It identifies the challenges posed by inflation and evaluates industry responses and principal recommendations for life assurance companies, policy makers, and policyholders. Given Zimbabwe's economic fluctuation, these recommendations focus on improving policy sustainability, improve customer trust and protect policyholder investments.

5.1 Summary of Key Findings

The research sought to investigate the relationship between inflation and life assurance policies showing meaningful trends and challenges affecting policyholders and insures.

5.1.1 Impact of Inflation on Policy Value

Inflation lowers the purchasing power of life insurance policies, and therefore, policyholders receive fewer real returns than anticipated. Despite nominal returns of 15% per annum on average inflation rates of over 200% from 2021 onwards which give negative real returns. About 74% of the policyholders illustrated that their policies decreased in value in real terms showing the spread of economic instability.

5.1.2 Profitability and liquidity changes

Higher Not Taken Up policies and lapse rates eroded profitability with 94642 third quarter 2024 policies causing a loss in revenue by ZWL532.17 million. Liquidity ratios were below the benchmark of 1 in 2021 and 2022 indicating solvency risk and financial instability. The insurers were unable to match incoming cashflows and with outgoing benefit obligations under threat of business sustainability.

5.1.3 Consumer trust and communication Issues

- Only 36% of policy holders have confidence on insures to honor benefits in spite of inflation and 54% proved dissatisfaction with inflation related communication lacking poor disclosure on how inflation affects policy payouts.
- The unclear difference between nominal and real returns led to policyholder disappointment and mistrust.

5.1.4 Inflation mitigation strategies

- Dollarization and asset diversification were the most successful mitigation strategy in allowing insures to preserve policyholder savings.

- More than 65% of life assurance business in Zimbabwe was written in USD by 2023, which granted stability against local currency devaluation. Inflation-indexed policies were still underutilized because of difficulties in pricing erratic inflation trends.

5.1.5 Industry Regulation

- The Insurance and Pensions Commission (IPEC) carried out solvency stress testing and revised investment strategy, but there is need for effective intervention to stabilize the sector.
- Policyholder protection demands priority attention to ensure transparency in inflation adjustment mechanisms.

5.2 Recommendations

5.2.1 Recommendations for life Assurance Companies

1. Move to USD-denominated products.

- In the case of Zimbabwe experiencing market turbulence, insurers should expand USD based life assurance products to preserve policyholder savings.
- Offering foreign-currency tied benefits would enable policyholders to receive steady real returns, independent of inflation.

2. Enrich Inflation-Indexed Policies

- Formulate flexible indexing plans that adjust policy benefits according to the rate of inflation.
- Making periodic review of policies for premiums and payments to be affordable and equitable

3. Improve communication Strategies

Giving regular updates on inflation that explain how policyholders understand the distinction between nominal returns and real returns.

4. Offer Adjustable Premium Structures

- This can be done by creating great payment plans that enable adaptation based on the then-prevailing economic status.
- Incorporating extension period and premium holidays to lower lapse risks.

5. Expand Digital Platforms

- Insurers need to keep pace with the rapidly evolving technology by creating mobile applications and web-based materials to engage policyholders more effectively.
- Utilization of AI-powered actuarial models enhances forecasting and policy performance visibility.

5.2.2 Regulatory Authorities and Policymakers (IPEC) Recommendations

1. Strengthen Inflation Adjustment Guidelines

- Enforce compulsory inflation-based disclosures to ensure that the policyholders are well aware.
- Inflation-indexed models of policy prices to safeguard policyholders

2. Compulsory Solvency Stress Test

- Enhance economic security measures to enable insures to prepare for inflation pressures.
- Initiate emergency funds to avert insolvency risk.

3. Facilitate Micro-Insurance Development

- Enhance economic security measures to enable insures to prepare for inflation pressures.
- Initiate emergency funds to avert insolvency risk.

4. Consumer Education Initiatives

- Launch nation-wide financial literacy campaigns to explain life assurance benefits and inflation prevention techniques.
- Upgrade policyholder issue resolution procedure for unbiased conclusions.

5.2.3 Recommendations for Policy holders

- The policyholders should think of converting policies into USD denominated policies to give protection against currency fluctuation.
- Policyholders must keep themselves updated about inflation rates and renew policies accordingly.
- Hire insurers for transparency in inflation adjusted benefits.
- Join policyholder campaign groups to integrate positive change into the insurance sector.
- Strategic Implications
- The Zimbabwean life insurance industry must react to inflation through offering USD-denominated cover and policyholder security through flexible premium design.
- The authorities must ensure transparency and solvency stress testing to regulate the market.
- Micro-insurance schemes will increase equity and impart financial protection to all income groups in a hyper-inflation environment.

5.3 Conclusion

Zimbabwean insurers grapple with policyholder benefit devaluation, weakening policyholder confidence. Insurers need to convert into USD-denominated policies, inflation-adjusted benefits and adjustable premiums in order to enhance their financial resilience. Additional regulation and regular financial education will restore confidence. Collective engagement of insurers, policymakers and policyholders are the cornerstones for long-term insurance industry resilience in Zimbabwe.

5.4 Summary

This chapter highlights conclusions and recommendations clearly showing how inflation negatively affects and diminishes the value of life assurance policies in Zimbabwe. It recommends USD-denominated policies, improved communication, inter-insurer collaboration, regulatory cooperation and policyholder engagement.

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APPENDICES

Survey Questions

Please tick where applicable

1. How long have you been associated with the life assurance industry in Zimbabwe?

- a) Less than 1 year
- b) 1-5 years
- c) 5-10 years
- d) More than 10 years

2. Have you observed a significant difference between nominal and real returns on life assurance policies in Zimbabwe?

- a) Yes
- b) No
- c) Not sure

3. How would you rate the current real returns (after inflation) on life assurance policies in Zimbabwe?

- a) Very poor
- b) Poor
- c) Fair
- d) Good

e) Excellent

4) What are the key factors that lead to the difference between nominal and real returns? (Select all that apply)

- a) High inflation
- b) Currency instability
- c) Regulatory constraints
- d) Investment limitations

Other (Specify)

5) To what extent has inflation affected the profitability of life assurance to your Company.

- a) Severely
- b) Moderately
- c) Minimally
- d) Not at all

6) How has inflation influenced the liquidity of life assurance funds?

- a) Increased liquidity challenges
- b) No significant impact
- c) Improved liquidity due to policy adjustments
- d) Not sure

7) Which strategies have life assurance companies adopted to mitigate inflation risks? (Select all that apply).

- a) Dollar-denominated policies
- b) Indexation of benefits to inflation

- c) Diversification of investments (e.g., real estate, equities)
 - d) Reinsurance arrangements
 - e) Other (Specify)
- 8) What additional measures would you recommend to safeguard life assurance policies from inflation?.....
- 9) What challenges do insurers face in maintaining positive real returns for policy holders?
.....
- 10) What innovative product designs have been introduced to hedge against inflation?.....
- 11) How do currency fluctuations (e.g., USD vs. ZWL) influence policy pricing and claims settlements?.....
- 12) Are there any regulatory interventions that could improve the sustainability of life assurance policies?.....
- 13) How has inflation affected your company's profitability in the last 5 years?
- a) Severe decline
 - b) Moderate decline
 - c) Stable
 - d) Improved
- 14) What percentage of policyholders have surrendered policies due to inflation? (Estimate)
- a) <5%
 - b) 5-20%
 - c) 20-50%
 - d) 50%

e) >50%

15) How does your company invest premiums to hedge against inflation?

- a) Foreign currency assets
- b) Real estate
- c) Equities
- d) Government bonds
- e) Other (Specify)

16) What liquidity risks does inflation pose to your company?

.....

17) What product adjustments (e.g., USD-denominated policies, inflation-indexing) have you introduced to protect policyholders?

18) How effective have these strategies been in retaining customers?

- a) Very effective
- b) Somewhat effective
- c) Ineffective

19) What regulatory changes would help life insurers better manage inflation risks?

.....

20) Do you believe Zimbabwe's economic policies support the sustainability of life insurance?

.....

21) How do you balance maintaining profitability with fair policyholder returns in hyperinflation?.....

CODES

```
import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

# === PARAMETERS ===

years = 5

year_labels = np.arange(2019, 2024)

inflation = np.array([0.053, 0.087, 0.569, 0.983, 0.652]) # Historical inflation 2019–2023

dollarization = np.linspace(0.4, 0.65, years)          # Rising USD use in the economy

# Strategic Usage Table (Table 4.3)

strategy_usage = pd.DataFrame({

    'Year': year_labels,

    'Inflation_Indexed': [63, 58, 51, 48, 54],

    'Asset_Diversification': [72, 74, 86, 89, 81],

    'Short_Term_Instruments': [65, 68, 63, 63, 65]

})

# === INITIAL VALUES ===

policies_active = 1_000_000 # Starting number of active policies

liquid_assets = 145.2e6     # Starting liquid assets (USD)
```

```

real_returns = []

policy_trend = []

asset_trend = []

# === SIMULATION ===

for t in range(years):

    infl = inflation[t]

    usd_use = dollarization[t]

    # New policies depend on dollarization and inflation (simplified logic)

    new_policies = 100_000 * (1 + 0.1 * usd_use - 0.5 * infl)

    lapses = policies_active * (0.085 + 0.2 * infl)

    real_return = 0.15 - infl

    # Update active policies and liquid assets

    policies_active += new_policies - lapses

    liquid_assets += (new_policies * 1000) - (lapses * 500) # Net premium vs claims

    # Store trends for plotting and analysis

    real_returns.append(real_return)

    policy_trend.append(policies_active)

```

```
asset_trend.append(liquid_assets)
```

```
print(f"Year {year_labels[t]}: Real Return = {real_return:.2%}, Active Policies =  
{int(policies_active):,}")
```

```
[# === VISUALIZATION ===
```

```
plt.figure(figsize=(14, 6))
```

```
# Plot real return
```

```
plt.subplot(1, 2, 1)
```

```
plt.plot(year_labels, np.array(real_returns) * 100, marker='o', label='Real Return (%)', color='red')
```

```
plt.title("Real Returns (2019–2023)")
```

```
plt.ylabel("Real Return (%)")
```

```
plt.grid(True)
```

```
plt.axhline(0, color='gray', linestyle='--')
```

```
plt.legend()
```

```
# === VISUALIZATION ===
```

```
plt.figure(figsize=(14, 6))
```

```
# Plot real return
```



```

plt.subplot(1, 2, 1)

plt.plot(year_labels, np.array(real_returns) * 100, marker='o', label='Real Return (%)', color='red')

plt.title("Real Returns (2019–2023)")

plt.ylabel("Real Return (%)")

plt.grid(True)

plt.axhline(0, color='gray', linestyle='--')

plt.legend()

# === STRATEGY ANALYSIS VISUAL ===


strategy_usage.set_index("Year").plot(kind='bar', figsize=(10,6), title="Strategy Usage (2019–
2023)")

plt.ylabel("Usage Frequency")

plt.grid(axis='y')

plt.tight_layout()

plt.show()

# === SUMMARY FINDINGS ===


summary = {

    "Nominal vs Real Returns": "Nominal returns remained around 15%, but real returns turned
    negative in 2021–2022 due to hyperinflation.",

    "Profitability & Liquidity": "High lapse rates and NTUs reduced profitability; liquidity ratios fell
    below 1.0 in 2021–2022.",

```

```
"Inflation Mitigation": "Asset diversification and dollarization were effective; inflation-indexed products saw declining adoption."
```

```
}
```

```
print("\n=== Summary of Key Findings ===")
```

```
for key, value in summary.items():
```

```
    print(f"\n{key}: \n{value}")
```

```
import pandas as pd
```

```
# Example data
```

```
data = {
```

```
    "real_returns": [-10.0, -5.5, 0.0, 5.0, 6.5],
```

```
    "liquidity_ratio": [0.8, 0.9, 1.0, 0.7, 0.85]
```

```
}
```

```
df = pd.DataFrame(data)
```

```
desc_stats = df.describe()
```

```
print(desc_stats)
```