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Abstract

Kenya's insurance industry has been growing steadily since 2013, with premium revenue and capital investment increasing. However, Return on Assets has declined over the past four years and reached an all-time low in 2022 compared to the previous five years which was partly attributed to the reforms introduced to cater the impact of Corona virus pandemic on and the need to close infrastructure gaps. As a result, as gross domestic product grows, firm deposits and loans rise along with interest income and loan losses. This study focused on understanding how macroeconomic dynamics affect the profitability of insurance companies listed on NSE in Kenya. It particularly looked into how changes in exchange rates, interest rates, and the overall price rise in the economy (inflation) influence these companies' profits. The study was guided by the theoretical frameworks of purchasing power parity, deflation, the balance of payment, the classical theory of interest, and the balance scorecard model. The study adopted an explanatory research design and targeted the six insurance firms listed on the NSE. The secondary data collection for this study involved the utilization of secondary data sheets. Data was obtained from the official audited financial statements of the insurance firms for the fiscal years 2016 through 2022. Data analysis involved both descriptive and inferential analysis. Inferential analysis incorporated both correlation analysis and panel regression analysis. The study found that key macroeconomic dynamics had significant impact on the profits of insurance companies listed on the NSE, explaining 57.71% of the changes in profits (R-squared = 0.5771). It discovered that while changes in the exchange rate do not significantly affect profits ($\beta = 0.0761$, $p = 0.5358$), higher interest rates lead to higher profits ($\beta = 2.1647$, $p = 0.0233$), and inflation negatively impacts profits ($\beta = -0.3447$, $p = 0.0011$). The study's validity is supported by strong statistical evidence (F-statistic = 21.0100, p-value = 0.0000). It suggests that insurance companies in Kenya should focus on managing risks related to economic changes to improve their financial performance. This research adds to the understanding of how macroeconomic dynamics affect the profitability of insurance firms in the context of the NSE.

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Keywords: *Exchange rates, insurance profitability, interest rates, inflation impact, Nairobi Securities Exchange*

1.0 Introduction

In terms of financial services, the insurance sector is essential to economic growth, resource allocation, liquidity creation, scale economies in investments, and loss distribution (Trichet, 2018). According to Chen and Wong (2020), insurance businesses face a great deal of pressure to improve their operations, generate more revenue, enhance customer satisfaction, boost shareholder returns, and expand their clientele all of which are aimed at boosting shareholder wealth. Therefore, Understanding the drivers and its impact on profitability helps managers create an effective profitability plan for their organization.

The state of a nation's economy has an impact on the performance of its companies. When the economy is doing well, most investors and shareholders expect companies to do well and thus overall wealth growth (Oscar, Sackey, Amoah & Manso, 2019). According to Malik (2021) the profitability measurement is at the heart of accounting practice and theory because the company's stakeholders need the profitability data for their short-term and long-term decisions. Therefore, the insurance firms need to be profitable so that the entire system can grow and develop, taking into account the makeup of the financial system in our nation and the challenges insurance firms have in creating and assembling the financial non-banking system.

The size and maturity of the insurance industry is one of the metrics used to gauge the expansion and development of an economy's insurance sector, according to Monogbe (2019), particularly in a developing nation like Nigeria. That is because of the reality that coverage companies play a position within the allocation and accumulation of funds from the financial system's surplus to deficit spending units, which are subsequently utilized for investments. According to Oke (2019), the Nigerian insurance industry is essential to maintaining the country's riches and bringing in additional revenue in order to guarantee its economic growth. Furthermore, the insurance industry has been essential to Nigeria's economic expansion. This is because of the fact that the Nigerian coverage industry's overall premium revenue as of 2021 increased dramatically.

Macroeconomic dynamics are those elements such as population, income, unemployment, and so on that have a broad impact on the country's economy etc. and bring both opportunities and threats to business continuity (Fischer, 2019). According to Chong and Phillips (2021) the business is influenced by several macroeconomic dynamics, which encompass but are not confined to the inflation rate, unemployment, interest rates, and economic production. These macroeconomic dynamics, focusing on the broader modifications in the economy like unemployment, growth rate, gross domestic product, and inflation, predominantly affect societies rather than individual entities. In recent times, the non-existence insurance region in Africa has confirmed first-rate profitability. In spite of this, greater than 60% of non-life coverage executives consider that low insurance profitability is a result of declining rates, rising claims, and rising expenses.

Macroeconomic dynamics affect the entire economy rather than just a single unit of the economy and are country-wide variables outside the control of bank administration (Ibrahim & Aziz, 2018). Kandir (2021) indicate that commercial banks, businesses often spread out their investments over a lengthy period of time anticipate that macroeconomic dynamics conditions

will stay steady and beneficial to their business operations for the whole investment period. Therefore, in order to lessen their impact on future cash flows and profitability, commercial banks must be aware of these risks. An interest rate is the difference between how much money you borrow now and how much money you repay at a later date and it is affected by the macroeconomic environment (Ogundipe & Alege, 2018).

Profitability is a measure of how much money a business makes after paying all its costs and it shows if a business is successful in generating earnings compared to its expenses (Asika, Chitom & Chelichi, 2017). High profitability means a business is doing well financially and it is important for long-term survival and growth. Teece (2019) observe that profitability is a key factor for many companies because it allows them to keep growing and competing in their markets. Profitability can also help companies get financing from banks, investors, and shareholders. Therefore, in comparison to a less efficient firm that needs to spend more to generate the same amount of money, more efficient companies will make more money as a percentage of their costs.

The Insurance Act created the IRA, a State Corporation that oversees the insurance industry in Kenya (Amendment) 2006, CAP 487 Laws of Kenya. In addition to defending the rights of insurance beneficiaries and policyholders, the Authority's responsibility includes managing, developing, and regulating Kenya's insurance sector. Risk Based Supervision (RBS) is now being implemented by IRA. Kenya Insurers Association (AKI), established in 1987 as an advisory and consulting body for insurance firms, acts as a self-regulatory body for the industry. AKI is recognized under The Society Act, Cap 108 Laws of Kenya.

Kenya’s insurance industry has been growing steadily since 2013, with premium revenue and capital investment increasing, according to Deloitte’s Insurance Outlook Report 2022/21 East Africa. However, The Return on Assets (ROA) has been on a declining trend since 2016. Between 2017 and 2019, Gross Written Premiums (GWP) for general insurance had a stable but increasing trend. Expense and claims ratios have increased slightly over the last six years, with a slight decline in expense ratio for 2020 and 2021. Return on assets (ROA) has declined over the past four years and reached an all-time low in 2022 compared to the previous five years. The expenditure ratio has increased over the past four years, showing that the general insurance underwriting expenses have gone up without the premiums for those risks being up in line. Evidence from across the World indicates that changes in macroeconomic dynamics affect profitability of service firms such as the insurance sector. However, the empirical evidence from Kenya remains unclear on the type and degree of the connection between profitability and macroeconomic dynamics.

1.1 Statement of the Problem

One of the world's most dynamic and competitive markets is the insurance one. As a result, companies in the sector have to continually create, implement, evaluate, and refine strategies to stay ahead of the competition in this market (Milis & Mercken, 2019). According to Anyona (2020), insurance corporations play a critical position within the resilience of economic structures. This is largely because they are major contributors to financial markets, insurers and banks have a growing relationship, and insurers cover risks to safeguard the financial health of businesses and households. However, while many of these changes have been positive, such as digital transformation in the insurance industry and the impact it has had on businesses and customers, some have also led to new challenges for the industry.

Anyona (2020) argues that insurance businesses play a critical role in the resilience of financial systems, in particular due to the fact they're principal participants to monetary markets, insurers and banks have a growing symbiotic relationship, and insurers cover risks to safeguard the financial health of companies and households. In 2021, there were fluctuations in currency rates due to the strengthening of local currencies in certain regions and a consistent inflow of foreign exchange. Throughout 2021, the Central Bank Rate (CBR) stayed at 7.00%. In 2021, the total amount of money in circulation (the broad money supply) increased by 9.5% while overall liquidity increased by 6.1%. Nonetheless, the average interest rate spread decreased to 5.66% in 2021 as a result, interest rates on loans and advances increased by 12.16%, compared to 12.02% previously (AKI Report, 2022).

The dynamic world that insurers operate in today demands that they be adaptable and strong in order to thrive. Kenya's economy rebounded from the COVID-19 pandemic's devastating impacts to grow by 7.5 percent in 2021 as opposed to contracting by 0.3 percent in 2020. The majority of economic activity resumed following the removal of the COVID-19 containment measures implemented in 2020, which served as the primary catalyst for the rebound. Nonetheless, the nominal gain of 8.7% in non-life premiums was undermined by the severity of the inflation increase, especially in developed markets. Globally, motor premium growth was largely slow. In 2021, de-tariffication rate reductions were predicted to result in a 7.1% decrease in motor premiums. The overall expense ratio for non-life insurance in 2021 was 37.27%, down from 38.70% in 2020. At 54.43%, the personal accident expenditure ratio was the highest, followed by public liability and domestic fire at 53.47% and 53.37%, respectively. In 2021, the overall loss ratio was recorded as 67.63%, as opposed to 63.83% in 2020. With a loss ratio of 84.41%, motor private was the highest, followed by motor commercial at 72.95% and medical at 74.90% (AKI, 2022).

The available empirical evidence indicates a notable association between the profitability of insurance companies and macroeconomic conditions. Mwangi (2017) conducted a study to examine how macroeconomic dynamics affect the profitability of insurance companies in Kenya. The findings revealed a detrimental correlation between inflation and all significant performance metrics. But Return on Equity (ROE) was used to quantify profitability, creating a conceptual gap. The interest rate, Gross Domestic Product (GDP), claim ratio and expense ratio are reliable measures of an insurance company’s financial health, according to a study conducted by Murungi in 2019 on the correlation between macroeconomic dynamics and insurance company profitability in Kenya. Nonetheless, the research concentrated on profitability from 2015 to 2018.

In their study of the firm-level effects of macroeconomic dynamics on the financial performance of insurance firms in Ghana, Gatsi and Gadzo (2020) found that a number of important performance determinants, including inflation from macroeconomic dynamics and firm-level characteristics. According to Hailegebreal's (2021) analysis of firm-specific and macroeconomic dynamics, the GDP and the profitability of Ethiopia's insurance sector are statistically positively and significantly correlated. In their analysis of the profitability of Kenyan deposit-taking microfinance firms and macroeconomic dynamics, Walde and Makori (2022) discovered a very poor association between financial performance and inflation rate. Therefore, the present study sought to determine the effect of macroeconomic dynamics on profitability of insurance firms listed at NSE.

1.2 Research Objectives

i. To determine the effect of exchange rates on the profitability of insurance firms listed on the Nairobi Securities Exchange (NSE).

ii. To assess the effect of interest rates on the profitability of insurance firms listed on the NSE.

iii. iii. To examine the effect of inflation on the profitability of insurance firms listed on the NSE.

1.3 Research Hypotheses

H_{01}: Exchange rates have no statistically significant effect on the profitability of insurance firms listed on NSE.

H_{02}: Interest rates have no statistically significant effect on the profitability of insurance firms listed on the NSE.

H_{03}: Inflation has no statistically significant effect on the profitability of insurance firms listed on the NSE.

2.1 Theoretical Review

The theories and models covered in this section helped to guide the study's objectives. These are presented as follows; profit maximization theory, purchasing power parity theory, deflation theory, and the balance of payment theory, the classical theory of interest and balance scorecard model.

2.1.1 Profit Maximization Theory

The idea that every company should function in order to make a profit is known as the profit maximization theory, which was developed by Hauser and Simmie in 1981. Profitable companies can increase sales by reducing their production costs and increasing the price of their goods or services. Since they have more resources available to them than other companies, they can do this. Profit maximization theory states that a company's overall performance increases while its earnings grow. The time worth of money is not taken into account while analyzing profit in this theory. A given amount of money today will not be equal to the same amount of money a year from now, according to the time value of money theory. In economics, Witesman, Agle, Ames, Christenson, Moore and Pankey (2021). The profit. Another economic theory, profit maximization, states that a company might pick out the option with the bottom production price, even if there were other options that would have lower total costs or higher total benefits. The profit maximization theory made it simpler for economists to understand how a company chooses what it produces, how much it produces, and how much it charges for its goods.

According to Primeaux (2017), the following presumptions underpin the profit maximization theory: the company's objective is to maximize profit, which is the difference between profit and expenses; the entrepreneur is the sole proprietor of the business; consumers' preferences and preferences are fixed and unchanging; production methods are fixed; the company creates a single, indivisible commodity; the company is fully cognizant of the amount of output it can sell at each price point; demand and cost for the company are predictable; new businesses can only enter the market over a long period of time; short-term entry is not allowed.; the company maximizes earnings over a given time period, with short- and long-term profits being

maximized. The company knows for sure what its own expenses and demand are; it cannot allow new businesses to enter the market in the short term; it maximizes earnings over a given time period, with the goal of maximizing profits in both the short and long terms. This theory was linked to profitability variable.

2.1.2 Purchasing Power Parity Theory

Menon and Viswanathan (2005) developed the PPP theory, which explains why the value of equivalent commodities is comparable across nations based on their respective currencies. Purchasing power parity (PPP) is the idea that, once a change fee is carried out, the fees of products and services in two countries are the equal. In other words, when the prices of a basket of commodities are the same in two countries, the exchange rate of two currencies is equal. Additionally, the theory suggests that when purchasing power is comparable across nations, there will be equilibrium between the currencies of those nations. This idea explains why one country's money is worth more than another, which makes it pertinent to our study. According to this theory, the equilibrium exchange charge is the alternate fee that ensures that the fee of the exchange can be exchanged for the same basket of products and services from any one of the participating countries. This theory was linked to inflation variable.

2.1.3 Exchange Rate General Equilibrium Theory

David Hume proposed the Balance of Payments Theory in the 1930s. It is also referred to as the "balance of payment" theory. This idea states that the exchange charge of a rustic is affected by the call for foreign forex and the supply of overseas forex. Foreign exchange prices rise when the supply cannot meet the demand. The price of foreign exchange will decrease if there is a greater demand than there is supply. Johnson (2018) asserts that debit and credit items, external demand and supply of foreign exchange, particularly in the stability of payments (BoP). The debit facet of BoP, which incorporates import of products and offerings, as well as foreign investment and loans is what drives the call for foreign currency. The credit facet of the stability of payments, which consists of capital receipts and exports of goods and offerings, provides forex.

According to Alawattage (2019), the exchange rate of a country depreciates when its BOP is negative. Conversely, a country’s exchange rate depreciates when the BOP is positive. An unfavourable balance of payments (BoP) is an exchange rate that deviates from the equilibrium rate of a country. When the trade rate returns to the equilibrium rate, the balance is restored. Whilst exports boom, the stability is removed. When exports decrease, the exchange charge rises above the equilibrium price. When the stability improves once more, the change price decreases. The relevance of this principle to the take a look at is that it demonstrates how disequilibrium in the stability of payments can be corrected via marginally altering the trade fee through devaluation or revaluation. This theory was linked to exchange rate variable.

2.1.4 The Classical Theory of Interest

The classic theory of interest was developed in 1936 by economists such as Pigou (1936), Marshall (1937), Ricardo (1937), and Mill (1938). It argues that interest is real and that the demand for and supply of capital in an ideal market only determines interest rates. Capital productivity determines the demand of capital, while time preference or saving determines the supply (Ricardo, Mill, Marshall & Pigou, 1936). According to the theory, which presupposes best competition in the component marketplace, the equilibrium charge of interest is determined via aggressive forces within the capital market. Additionally, interest rates are flexible, meaning

they can move freely to whatever extent that is determined by supply and demand (Andrews, 2018). Ahiakpor (2019) asserts that the theory also presupposes that every resource is fully employed. This suggests that delaying or refraining from consumption is necessary in order to save money, and that interest is the benefit of delaying or refraining.

This theory was considered relevant because it predicts a positive real interest rate. The theory implies that the demand curve and the supply curve of capital intersect at a positive real interest rate. Conventional theory states that interest is a charge paid for the utilization of capital. The demand and supply of capital are the elements that decide the price of interest. Demand for capital is negatively correlated with interest rates, while supply of capital positively correlates with them. This theory was linked to interest rate variable.

2.2 Empirical Review

This section provides an overview of previous research investigations conducted by different researchers concerning the study variables.

2.2.1 Exchange Rates and Profitability

Francisco and James (2019) looked at The UK Car Market, 2015–2018, to see how exchange rate swings affected profit margins. In order to determine model-specific profit margins, the study initially attempted to estimate a layered logit demand model for new automobiles. Subsequently, similar approximations were employed to examine the PTM practices of automobile imports and domestic manufacturers. The findings indicate a decline in profit margins between 2015 and 2018, coinciding with the UK car market's transition from a concentrated to a greater loosely dependent oligopoly. Moreover, there may be a fine correlation between fluctuations in alternate costs and modifications made to the markup of imported motors. However, the study concentrated on the UK Car Market, 2015-2018 thus presenting a contextual gap.

Longrun (2020) looked on how South Africa's insurance industry performed in relation to exchange rate volatility. Using insurance penetration and coverage density as metrics to evaluate the performance of the insurance industry in South Africa, this examine sought to analyze the enduring effects of trade price volatility on stated performance. Employing the vector error correction model, the analysis spanned the period from 1986 to 2018. Findings discovered that alternate fee volatility exerted a massive and favorable have an effect on at the insurance overall performance of South Africa over the longer term. However, the study covered performance of insurance firms between year 1986 to 2018. Thus, presenting a contextual gap.

2.2.2 Inflation and Profitability

Kimani (2021) assessed how Kenyan insurance firms' profitability was impacted by inflation. A couple of linear regression version become hired for the cause of figuring out the correlation among the variables, whilst a descriptive study methodology was utilized. The observe populace consisted of the fifty-six coverage organizations that were operational in Kenya as of the conclusion of the 12 months 2020. Merely the data of 49 insurance firms were gathered. There is a methodological gap, though, because the previous study utilized a descriptive research approach, but the current study would employ an explanatory research design.

Muthoni (2019) investigated how investments made by Kenyan insurance firms were impacted by inflation. In order to choose 35 insurance firms that were authorized to engage in different categories of insurance operations and, consequently, bid bonds business, the study employed a

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deliberate sampling approach. The gathered data was subjected to a number of models in order to clearly illustrate how changes in inflation affect a firm's investment decisions. According to the report, Kenyan insurance firms' investments were negatively impacted by inflation. However, the purposive sampling method was used thus presenting a contextual gap.

2.2.3 Interest Rates and Profitability

Ahmed, Rehan, Chhapra and Supro (2018) examined the relationship between interest rate and profitability of banks in Pakistan. The aim of this research is to assess how interest rate variations affect banks' profitability. As a result, annual data for 20 banks that operate in Pakistan has been collected for the seven years between 2007 and 2014. The banks in the sample are selected based on their highest market share and return. The conclusion demonstrates that while advances, loans, and investments have a favorable impact on banks' profitability, deposits with other banks and interest rates have a negative impact. However, the main focus of the study was on the profitability of the banks in Pakistan from 2007 to 2014.

In Kericho County, Kenya, commercial banks' profitability was examined by Musyimi and Kising'u (2019) in relation to interest capping. In this study, a quantitative cross-section survey was conducted. The goal populace changed into 86 respondents operating at industrial banks in Kericho County, Kenya. The primary records series turned into executed using self-administered, based questionnaires distributed thru drop and pick out. Descriptive analysis and inferential records have been used within the evaluation of the information amassed. The findings confirmed statistically sizeable effect of hobby capping on financial performance. However, the focus of the study was on profitability of commercial banks in Kericho County, Kenya.

2.3 Conceptual Framework

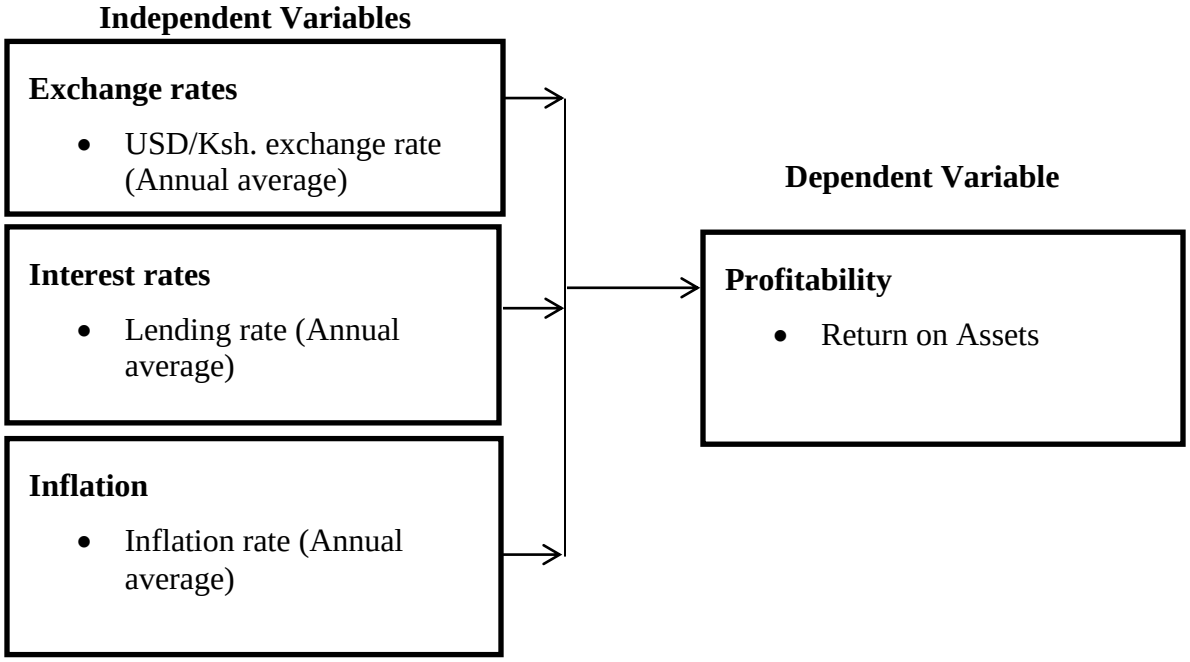

Figure 1: Conceptual Framework

Source: Researcher (2023)

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3.0 Research Methodology

This study used explanatory research design to give a clearer picture of how macroeconomic dynamics impact the insurance firms listed on Kenya's Nairobi Securities Exchange's profitability. The target population for this study comprised insurance firms listed on NSE. For the purpose of the study, a list of six insurance firms listed on NSE was conducted. According to Etikan and Bala (2017) the results obtained using the census method of data collection are highly consistent and precise, less skewed, investigate a wide range of characteristics and the data collected is comprehensive and more relevant. Therefore, a census of population was the most preferred method of statistical enquiry. The research employed secondary data sources. The study used secondary data sheets. Data was collected from the official audited financial statements of insurance companies listed on the National Stock Exchange (NSE) for the fiscal years following 2016 to 2022. The yearly data was used for the purpose of data analysis. The research project used a secondary data collecting tool, namely a secondary data collection sheet (see to appendix I). All six of the NSE-listed insurance firms were included in the cross-sectional data, and each firm's data from 2016 to 2022 comprised the time series. The yearly financial statement reports from these companies served as the origin of this information. Data was collected using secondary data collection sheet.

The examination of data is in using time series analysis, descriptive statistics, and Pearson correlation analysis. Statistical techniques like Pearson's correlation study and time series examination were utilized. It was crucial to evaluate the association between dependent and independent factors at the 0.05 significance level and 95% confidence interval. The transformation of the dependent variable (profitability) was achieved by getting the aggregate mean of ROA for cash year.

The panel regression model was presented below:

$$\mathbf{Y_t = \beta_{0t} + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \varepsilon}$$

Whereby Y_t= Average Profitability (ROA) at time t

X_{1t} = Exchange rates (USD/Ksh. exchange rate-Annual average) at time t

X_{2t} = Inflation (Lending rate -Annual average) at time t

X_{3t} = Interest rates (Inflation rate-Annual average) at time t

β_1, β_2 and β_3 = Coefficients

ε = Error term

The study ensured ethics by ensuring confidentiality, free consent, and privacy. By securing a research permission and an approval letter from NACOSTI to collect data from the insurance firms registered at the NSE, the study took ethics into account when gathering data. The results would be published by a respectable company and distributed to NACOSTI and other relevant parties.

4.0 Findings and Discussion

The chapter presents descriptive statistics, trend analysis, correlation analysis, diagnostic tests, regression analysis and hypothesis testing.

4.1 Descriptive Statistics

Table 1 shows the descriptive statistics on study variables including exchange rates interest rates, inflation and profitability for the year 2016-2022. The descriptive statistics provide a valuable overview of the key variables in the study, shedding light on the variability and trends within each.

Table 1: Descriptive Statistics

Variable	N	Min	Max	M	Std. Dev.
ROA	42	-0.0315	0.1331	0.036795	0.0369722
Exchange Rates	42	101.3016	117.9577	106.0404	5.695792912
Interest Rates	42	6.694329	8.751354	7.796558	0.760603458
Inflation	42	4.68982	9.546582	6.471271	1.614130044

The findings show that the range of ROA values for the six insurance firms under study varied from a minimum of -3.15% to a maximum of 13.31% for the study period (2016-2022), with a mean value of 3.68% and a standard deviation of 0.0370. This implies that the profitability of these insurance firms, as measured by ROA, exhibited some level of variability over the years, suggesting that there was a range of profitability levels within the insurance industry in Kenya, with some companies performing better than others within this study period.

Additionally, the findings revealed that the exchange rates ranged from a minimum of KES 101.3016 to a maximum of KES117.9577 to the USD, with a mean value of KES106.0404/USD and a standard deviation of KES 5.6958. This indicates the fluctuation in exchange rates during the study period of between 2016 and 2022 for the insurance firms in Kenya. The implications are significant, as changes in exchange rates are likely to impact the international operations and investments of insurance firms. Firms with exposure to foreign markets may need to closely monitor and manage exchange rate risk to maintain profitability. These findings are consistent with the conclusion by Okika, Udeh, and Okoye (2018) in Nigeria that there is no statistically significant effect of change rate fluctuations at the return on property of Nigerian conglomerates. However, the study presents a contextual gap as it focused on selected quoted conglomerates in Nigeria.

The results of the analysis indicate that interest rates within the specified time frame varied between 6.6943% and 8.7514%. The average interest rate was calculated to be 7.7966%, with a standard deviation of 0.7606. This suggests that there was a certain level of fluctuation in interest rates across the years. This result is important to the insurance firms since they often invest in interest-sensitive assets, and thus fluctuations in interest rates is likely to have a direct impact on their investment income and, consequently, their profitability. Firms may need to adapt their investment strategies in response to changing interest rate environments. According to Ahmed, Rehan, Chhapra and Supro (2018), while advances, loans, and investments have a favorable impact on banks' profitability, deposits with other banks and interest rates have a negative impact.

Finally, descriptive statistics results on inflation revealed that inflation rates ranged from a minimum of 4.6898% to a maximum of 9.5466%, with a mean value of 6.4713% and a standard deviation of 1.6141%. This reflects the inflationary pressures faced by the insurance industry

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during the study period between 2016 and 2022 in Kenya. The findings underscore the importance of insurance firms in managing inflation risk, as rising inflation is expected to erode the real value of insurance claims and investments. Strategies to hedge against inflation should thus be considered to protect profitability. The implications of these findings emphasize the need for insurance firms to carefully monitor and manage factors such as exchange rates, interest rates, and inflation, as they can significantly impact profitability. In a study by Batayneh, Alsalamat and Momani (2021), it was indicated that inflation has a statistically tremendous unfavorable effect at the growth of the economic enterprise, both inside the short and long term.

4.2 Correlation Analysis

Correlation analysis helps to determine how closely associated or related two sets of data are. Table 2 shows the correlation matrix.

Table 2: Correlation Matrix

		ROA	Exchange Rate	Interest Rate	Inflation
ROA	Pearson Correlation	1.000			
	Sig. (2-tailed)				
Exchange Rates	Pearson Correlation	0.671	1.000		
	Sig. (2-tailed)	0.002			
Interest Rates	Pearson Correlation	.511**	0.012	1.000	
	Sig. (2-tailed)	0.000	0.741		
Inflation	Pearson Correlation	-.491**	0.022	.710**	1.000
	Sig. (2-tailed)	0.000	0.635	0.000	
** Correlation is significant at the 0.01 level (2-tailed).					

The study found a positive but insignificant association between exchange rates and profitability (ROA) among listed insurance firms in Kenya ($r=0.671$, $p=0.002$). This indicates a strong association, indicating that as exchange rates increase, the profitability of these insurance firms also tends to increase but insignificantly. This shows that these firms possibly have beneficial foreign exchange exposures or that their revenue streams are positively influenced by stronger foreign currencies. This is consistent with the findings by Kemuma (2015) who investigated how Kenya's insurance industry's profitability was impacted by fluctuations in foreign exchange rates and found that the volatility in foreign exchange rates exerts an adverse impact on the insurance sector's return on assets.

Additionally, the correlation between interest rates and ROA was found to be positive and significant ($r=0.511$, $p<0.001$). This positive correlation implies that higher interest rates are associated with increased profitability for the insurance firms. This is likely to be due to the potential impact of higher interest rates on the investment income of these firms, as they often hold significant interest-bearing assets. This finding aligns with the research conducted by Njeri (2016), which examined the impact of interest rate fluctuations on the profitability of insurance companies. The study revealed a substantial correlation between financial performance and loan performance. The analysis also revealed a significant negative correlation between inflation and ROA ($r=-0.491$, $p<0.001$). This implies that higher inflation rates negatively affect the

profitability of the insurance firms which is likely to the eroding purchasing power of currency and increasing costs associated with higher inflation, which then outweighs the revenue gains.

4.3 Panel Regression Analysis

A regression analysis was performed in this study to evaluate the correlation between macroeconomic dynamics, including exchange rates, interest rates, and inflation, and the profitability of insurance companies that are publicly traded on NSE. Table 3 show the panel regression analysis results.

Table 3: Panel Regression Analysis

Dep Var: ROA	Coef. Std.	Err.	t	P>|t|
D(Exchange Rates)	0.0761	0.1527	0.4984	0.5358
Interest Rates	2.1647	0.8072	2.6817	0.0233
Inflation	-0.3447	0.0741	-4.652	0.0011
Constant	-0.2481	0.1581	-1.5693	0.0815
R Squared	0.5771			
F statistic	21.0100			
P-value	0.0000			

$$\mathbf{Y=-0.2481+0.0761X_1+2.1647X_2-0.3447X_3}$$

Where:

Y= Profitability

X_1 = D (Exchange Rates)

X_2= Interest Rates

X_3= Inflation

The results of a panel regression analysis, which investigates the influence of macroeconomic factors on the profitability of insurance firms listed on the Nairobi Securities Exchange (NSE), are presented in Table 3. The coefficient of determination, represented as R-squared, was computed to be 0.5771, based on the obtained results. The aforementioned result indicates that around 57.71% of the variance in profitability, as measured by return on assets (ROA), can be explained by the independent variables, specifically currency rate, interest rate, and inflation. This suggests that the macroeconomic factors discussed above have a significant impact on the profitability of the insurance sector in Kenya.

The results the first difference of exchange rate showed a positive but not statistically significant relationship with ROA ($\beta = 0.0761$, $p = 0.5358$), indicating that changes in exchange rates had a minimal direct impact on the profitability of these firms. Conversely, the interest rate exhibited a positive and significant relationship with ROA ($\beta = 2.1647$, $p = 0.0233$), suggesting that as interest rates increases, is the profitability, possibly due to the effect on investment returns or other financial aspects of these firms. Moreover, inflation was negatively and significantly related to ROA ($\beta = -0.3447$, $p = 0.0011$), indicating that higher inflation rates negatively affected profitability, possibly due to increased costs or reduced purchasing power. The model also included a constant term, which was negative but not statistically significant ($\beta = -0.2481$, p

= 0.0815), indicating at other unaccounted factors influencing profitability. The model's overall fitness was statistically significant, as indicated by an F-statistic of 21.0100 and a p-value of 0.0000, confirming the model's reliability. The findings are consistent with conclusion by Longrun (2020) alternate fee volatility exerted a massive and favorable have an effect on at the insurance overall performance of South Africa over the longer term.

Based on the results displayed in Table 3, the p-value associated with the exchange rate was determined to be 0.5358, surpassing the predetermined significance level of 0.05. The null hypothesis (H01) was not rejected as a consequence. Consequently, the research findings indicate that the profitability of insurance businesses listed on NSE in Kenya is not significantly influenced by exchange rates. According to the data shown in Table 3, the p-value associated with the interest rate was determined to be 0.0233 at a significance level of 0.05. The investigation came to the conclusion that the alternative hypothesis (H02) was more likely to be correct than the null hypothesis (H02), which was based on the results that were collected. According to the alternative hypothesis, the profitability of insurance companies that are publicly traded on the Nairobi Securities Exchange in Kenya is significantly impacted by interest rates. This is true for both domestic and international insurance companies. According to Table 3, the p-value for inflation was found to be 0.0011, indicating statistical significance at a significance level of 0.05. Therefore, the research findings contradicted hypothesis H03 and provided empirical support for the significant influence of inflation rate on the financial performance of insurance firms listed on NSE.

5.0 Conclusion

The study presents a number of conclusions based on significant findings. The research findings indicate that doing a thorough examination of macroeconomic dynamics and their influence on the profitability of insurance businesses listed on the Nairobi Securities Exchange (NSE) in Kenya yields significant findings regarding the financial status of these firms. The research findings indicate that the financial performance of insurance companies, shown fluctuations throughout the years. These findings indicate that the insurance market in Kenya saw varying levels of profitability between 2016 and 2022. Certain companies exhibited superior performance compared to others, suggesting that both competition and internal variables have a substantial influence on the profitability of the sector.

The study finds that exchange rates fluctuated during the study period. While the study did not find a statistically significant direct impact of exchange rates on profitability, the findings emphasize the need for insurance firms with exposure to foreign markets to closely monitor and manage exchange rate risk to maintain profitability, especially given the significant fluctuations observed. Moreover, the study concludes that interest rates experienced some degree of variability over the years. This suggests that these companies' investment income may have been positively influenced by higher interest rates during the study period.

Furthermore, the study highlights the significant impact of inflation on the profitability of insurance firms. The negative and significant correlation between inflation and profitability implies that higher inflation rates negatively affected the profitability of these firms. This underscores the importance of managing inflation risk for insurance firms, as rising inflation erodes the real value of insurance claims and investments. The study concludes that the panel regression analysis results support the significance of macroeconomic dynamics in explaining profitability. While exchange rates did not have a statistically significant direct impact on

profitability, interest rates positively affected profitability, and inflation had a negative impact. This suggests that insurance firms in Kenya should carefully consider the implications of macroeconomic dynamics on their financial strategies and risk management practices to ensure sustained profitability.

The study provides valuable insights into the complex relationship between macroeconomic dynamics and the profitability of insurance firms listed at the NSE in Kenya. It underscores the need for these companies to adapt to changing market conditions, manage risk effectively, and develop strategies that mitigate the impact of factors such as exchange rates, interest rates, and inflation on their financial performance. These findings are relevant not only to insurance firms but also to policymakers, investors, and stakeholders in the Kenyan financial sector seeking to understand and navigate the challenges and opportunities in this dynamic industry.

6.0 Recommendations

In view of the findings, the study presents a number of recommendations. Firstly, the study recommends that insurance company management, should strive to develop robust risk management strategies that can effectively mitigate the impact of macroeconomic dynamics, such as exchange rate fluctuations, interest rate changes, and inflation. This should include closely monitoring these variables and implementing proactive measures to hedge against potential risks. Diversifying investment portfolios to minimize exposure to interest rate fluctuations and inflation risk, as well as exploring opportunities in foreign markets to counterbalance exchange rate volatility, could be beneficial. Additionally, insurance firms should focus on enhancing their operational efficiency and cost management to withstand the adverse effects of inflation and maintain profitability.

Secondly, policy-makers in Kenya should consider implementing policies and regulations that promote stability and predictability in macroeconomic dynamics. Providing a conducive environment for stable exchange rates, interest rates, and inflation can help insurance firms plan and strategize effectively. Furthermore, policy measures to enhance the resilience of the insurance sector to external shocks, such as providing incentives for the development of innovative insurance products, can be explored. Collaborative efforts between regulatory bodies and the insurance industry are crucial to ensure the sustainability of the sector in the face of economic uncertainties.

Thirdly, the study recommends that future researchers should delve deeper into the specific mechanisms through which macroeconomic dynamics impact the insurance industry in Kenya. Conducting qualitative studies, surveys, and interviews with industry experts and practitioners can provide valuable insights into the strategies and practices that insurance firms employ to manage these macroeconomic challenges. Additionally, investigating the role of other external factors, in shaping the insurance industry's performance can contribute to a more comprehensive understanding of the sector.

Furthermore, there is a need for continuous monitoring and research to keep abreast of the evolving economic landscape in Kenya and its implications for insurance firms. Regularly updating models and analyses to account for changing macroeconomic dynamics is necessary. This can most likely aid in the development of early warning systems that alert insurance firms to potential risks and opportunities, allowing them to adjust their strategies accordingly. Additionally, the dissemination of research findings and knowledge-sharing within the insurance industry and among relevant stakeholders is vital. Collaboration between academia, industry

associate will help listed insurance firms adopt innovative solutions and strategies for managing macroeconomic risks and ultimately contribute to the long-term sustainability and growth of the insurance sector in Kenya.

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