MACROECONOMIC FACTORS AND GROWTH OF KENYA'S INSURANCE INDUSTRY

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ABSTRACT

Insurance vibrancy can be a critical turning point towards reduction of the protection gap standing at billions of monies and burgeoning by the day. In 2023 for instance, the Kenyan insurance industry grew by a paltry 1% to a dismal penetration rate of 2.4%, way below the global and African averages. Over the same time period, Kenya's economy grew at 4.6%, with other macroeconomic variables showing mixed effects on insurance uptake. This study sought to investigate the relationship between select macroeconomic variables and growth of the Kenya's insurance sector with a view of evaluating the non-directional null hypotheses that: interest rate, inflation rate and exchange rate have no effect on the growth of the Kenya's insurance industry. Theoretically, the study moored on the Quantity Theory of Money, Purchasing Power Parity theory, Loanable Funds theory. The nature of the research was positivist since the research utilizes secondary data 2001-2023, which was analyzed via Autoregressive Distributed Lag, ARDL (1,1,1,1) modeling following the discovery of different integration orders among the series analyzed. The Pesaran et.al (2001) bounds test affirmed the presence of a cointegration relationship. Model robustness diagnostics included homoscedasticity, normality and Serial Correlation and Structural stability testing. Safe for interest rates in the short run, all the variables indicated insignificant influence on insurance sector activity. The short-term dynamics gave a 49.67 percent adjustment speed to shocks on the predictor variables. Ethical considerations will be a core guide through ought the research. The study advises Managers and policy makers to focus on interest rates in the short run; academia to interrogate the proposed relationship through different methodology, variable series and sample periods.

INTRODUCTION

Study Background

The insurance sector has even been attributed to exist as a hallmark of modern financial systems due to the polyphonic functions of risk reduction, the intermediation of financial resources, and the mobilization of long-term capital, which are crucial to economic growth and wealth creation (World Bank, 2024). Insurance will increase entrepreneurship and investment because this will reduce financial uncertainty within individuals and firms, which will lead to the continuity of economic activity (OECD, 2023). In addition, it will result in inclusive growth through the establishment of jobs in underwriting and actuarial service, brokerage, and claims handling (IMF, 2023). This empirical evidence also indicates that the higher the insurance penetration, the more developed financial markets and the macroeconomic stability, particularly in the emerging economies (Swiss Re Institute, 2024). At least in such a way, the development of the insurance market can be viewed as one of the pioneers of sustainable economic growth.

The U.S. insurance market is a well-developed sector with its own extensive structure within the larger financial system, which makes it exceptionally vulnerable to complex macroeconomic factors. Interest rates also substantially impact the investment income of insurers because the bulk of insurance asset portfolios consist of fixed-income securities (their staple investment). The sector has also been demonstrated to influence by inflation since it has raised the cost of claims and operational expenses, and subsequently, it has affected the premium pricing and underwriting profitability (OECD, 2023). The shifts in the foreign exchange rates also impact the U.S. insurers that are engaged in the U.S.-Foreign cross-border activity of reinsuring, and investing abroad, because the latter may affect the prices of the foreign-currency assets and liabilities (IMF, 2024). This fact connotes that the macroeconomic variables have been closely related when developing the insurance sector in the developed economies.

The European insurance market is a macroeconomic environment, characterized by a coordinated intervention of monetary policies, and gradually emerging financial policies. The prolonged low-interest rates in the Eurozone have diminished the returns of insurers, compelling companies to respond by changing their asset placement and product construction to remain financially sustainable (European Insurance and Occupational Pensions Authority, 2022). At the same time, economic turmoil and inflation within health and property insurance across the globe imposed stricter strain on claims, stifling growth of premiums (OECD, 2024). The euro value variance over the other major currencies has led to a variation in the reinsurance cost and foreign investment value consequently influencing the cross-border insurers which are exposed (IMF, 2023). All these evidences can point to the fact that, in economically sound areas, the dynamic of development in the insurance industry depends on macroeconomic factors to the greatest extent.

The Asian insurance market has been growing fast with the evolution of the economy, urbanization, and the increased household income. The changes in interest rates within the territory have been identified to affect the investment performance of insurers and the affordability of long-term insurance products specifically life insurance (Asian Development Bank, 2023). Inflation has also influenced the demand on insurance because low real disposable income lowers the purchasing power of households to get an insurance cover (World Bank, 2023). The insurers and reinsurers in the emerging markets in Asia have also faced the challenge of exchange rate volatility that has contributed to uncertainty in their costs and the increase in currency risks (Swiss Re Institute, 2024). The findings underscore macroeconomic stability as a structural determinant that contributes to steady growth and institutional maturity in fast-growing economy in the insurance industry.

The African insurance market penetration level is low and the industry is still new where the main reason of low penetration is structural and macroeconomic factors. Chronic inflation has been demonstrated to diverge the actual worth of premiums and raise the expense of claims thus compromising the financial results of insurers (AfDB, 2023). The depreciation of exchange rates has already elevated the price of foreign reinsurance and exposure to currency risks among those insurers that have foreign-denominated liabilities (IMF, 2023). The volatility in interest rates has also influenced the investment income and pricing model of insurers restricting the ability to achieve long-term growth of the sector (OECD, 2022). Sub-Saharan Africa evidence reveals that those countries have quite stable macroeconomic environments and are likely to display an increased insurance penetration and more resilient insurance markets (World Bank, 2024).

The insurance sector in Kenya has a strategic position within the economy through risk reduction, mobilization of long-term funds and a contribution to development financing. In spite of the fact that gross written premiums are rising steadily, the rate of insurance penetration remains lower than that of regions and the global markets overall, so there is still much to be acquired (IRA, 2023). Such volatility in interest rates has a direct impact on an investment return, especially with the prevalence of government securities as part of investment portfolios owned by insurers (CBK, 2023). Inflationary tendencies also contribute to increase of claims and operational expenses in turn affecting the results of underwriting and level of premiums (IRA, 2024). Such effects also include the pricing of reinsurance and the value of foreign assets that raise the financial risks of insurers because of their fluctuating exchange rates (IMF, 2023). In collectivity, these macroeconomic variables interplay and dictate the growth and success of the insurance sector in Kenya.

Even though case studies in Kenya have investigated the determinants of firms like Internet access: capital sufficiency and corporate governance, as well as the relevance of risk management of firms, there has been less empirical analysis on how macroeconomic variables affect the growth of insurance industries at the aggregate level. Other studies have examined single macroeconomic

variables individually, providing inconclusive and mixed results because of discrepancies in terms of methodology and scope (Kamau & Were, 2022). Others have delved deeper into the performance of the financial industry as a whole without focusing on the insurance part which does not provide detailed analysis of the industry (Owino & Muturi, 2021). This puts into focus a substantial contextual and methodological disparity in investigating the connection among vital macroeconomic variables and expansion tendencies of Kenya insurance segment.

This paper assesses the macroeconomic parameters within the industry particularly the interest rates, inflation, and variations in the exchange rates. Analysis of each of these variables individually will provide evidence that can be acted upon to guide the policy making process, regulatory regulation and strategizing within the insurance industry (World Bank, 2024).

Statement of the Problem

To curtail the protection gap created to an individual population of a nation, the insurance industry is generally important. Theoretically, according to the hypothesis of supply-leading, the growth of the insurance industry contributes substantially to the economic growth, in the sense that such that the growth of the financial sector contributes to the development of industrial and economic growth, in general. On the other extreme, the demand-following assumption implies that the rise of an economy as such is a derived demand of financial services that in their turn propel the insurance business. Therefore, we can characterize the development of the insurance industry and economic activity by either having a reciprocal or one-way causal impact on the country.

The principal reason for studying the growth of the insurance industry is the low uptake particularly in Kenya. The 2024 average of 3.4 % of Africa and 0.97 of Africa without South Africa, to reflect the relatively low position of Africa as compared to the global average of 6.8%, is the case of structural underdevelopment. For Kenya, the uptake grew only +0.1 percentage point from 2.3 the previous year, again far below the global and continental achievement. This is a demonstration of local and regional potential and reorientation of underservice to the Kenyan market. Over the same time period, Kenya's GDP declined by 1 percentage point to 4.6% with 3.4% increase in net insurance premiums to Ksh. 361.4 billion, with inflation easing by 2.9 percentage points and the Ksh. /USD exchange rate strengthening by 17.2%. This is a cue in the direction mixed causality among macroeconomic factors and insurance industry growth.

Just like insurance premium growth and uptake in 2023, Kenya's nominal GDP growth was positive. This may give a pedestrian impression that economic growth leads to industry growth or there is reverse causality, so that more developed economies have higher insurance uptake level, supporting both the supply-leading and the demand-following hypotheses. Conversely, these schools of thought are contrasted in Figure 1.1 where higher economic development ranking does not connote higher insurance uptake and the converse. Tunisia, Algeria and Egypt for instance, more developed than Kenya have dismal levels of growth in the insurance industry, while South

Africa and Namibia which are considered more developed than Kenya significantly surpass Kenya Africa and the World in terms of uptake. The foregoing mix-up of findings gives rise to a number of questions: Whether the economy leads insurance or insurance leads the economy, whether the economy and insurance reciprocate influence; whether relationship between the economy and insurance insignificant.

The research studies on the relationship between the rise in insurance sector and economic performance have yielded inconclusive results. These differences originate on the span of the disparities in the sampling periods, geography, methodology applied in carrying out studies, and results in the building up of financial industry. One set of the studies includes Levin (1997), King (1993), Caldeon and Liu (2002), Apergis (2002) Adu et al. (2013) Okello et al. (2015); Puatoe and Piabuo (2015), according to whose findings, the relationship is positive from industry to finance. The second set of studies (for example Noor et al., 2017, Hossain, 2017, Calderon & Liu, 1999, Nyaliama & Kamanzi, 2019, Karangwa & Gichondo, 2016 and Okello, 2015) find a bidirectional relationship. Empirical studies find inconsistent evidence: one body of research has shown that there is no statistical correlation between the level of development in the financial sector and economic growth (Cecchetti & Kharroubi, 2012; Sahay et al., 2015; Jones et al., 2016), and another body of research has shown that the level of development in the financial sector can even have a negative effect on economic

From empirical literature examination, not a definite answer is available regarding the question on causality of economic growth and insurance industry growth and no consensus is available on the components to include in the study variables. The literature creates two major gaps in the field of empirical literature, the first being the insufficient knowledge on the causal nature of relationship between economic growth and the development of financial sector. Still, even if there was consensus on the direction, a second gap is evident-the studies are devoid of particular focus on insurance, making it a largely ignored yet important component of the financial sector. Most of these studies are generic, emphasizing on examination of the banking sector or stock markets with minimal attention to other components. Responding to increased protection deficit and underutilization of insurance products in Kenya, the current work seeks to address current gaps by concentrating on the insurance industry and examining it in the face of macroeconomic variability. If this is not done, there will be a looming possibility of ignoring critical components of economic growth on the one end and a critical component of financial sector development on the other.

Objectives of the Study

The overall purpose of this study was to ascertain the relation between macroeconomics and growth of the Kenya's insurance industry. Specifically, the study sought to address the following 3 objectives with the ensuing corresponding non-directional alternative hypotheses:

1. To determine the relationship between interest rates and the growth of the

Kenya's insurance industry.
2. To establish the relationship between inflation rate and the growth of the Kenya's insurance industry.
3. To determine the relationship between exchange rate and the growth of the Kenya's insurance industry.

Research Hypotheses

Concurrent with the four specific study objectives, the following 3 research hypotheses were postulated:

H_{01}: There is no significant relationship between interest rates and the growth of Kenya's insurance industry.

H_{02}: There is no significant relationship between inflation rate and the growth of Kenya's insurance industry.

H_{03}: There is no significant relationship between exchange rate and the growth of Kenya's insurance industry.

LITERATURE REVIEW

This review of literature was divided into two sections: theoretical and empirical and at the end there is a conceptual framework diagram. First, the theoretical review was a survey of theories relating to the proposed specific objectives. The theories reviewed were Quantity Theory of Money (advanced by Fisher in 1911), Purchasing Power Parity (by Cassel (1918)) and Loanable Funds Theory (Wicksell (1898))

Empirical Literature Review

In this empirical review, the first set of studies regard Interest Rates and Insurance Industry Growth.

Onafalujo (2019) reviews the macroeconomic determinants of non-life insurance growth in Nigeria. The researcher focuses on 23 non- life insurers. The secondary data are collected about the interest rates, and inflation rates and the real GDP during 1981-2015. The results were further analyzed using Dynamic Least Squares (DLS) regression model. The research concluded in negativity of influence. It was discovered that growth in insurance premiums was hampered by interest rate and inflation rate increases through higher loss ratios. This study occasions a methodological gap as the current study engages ARDL modeling.

Mwangi (2017) examined the impact of macro-economic factors on the financial performance indicators of the Kenyan insurers. Taking Return on Assets (ROA) and Debt Ratio as the selection variables, the researcher ran a Classical Linear Regression of this set on average exchange rates, interest rates and inflation rates. The findings revealed that all the macroeconomic variables had a negative relationship with all the elements of the regressed. Evidently, in this instance, there seems

to be an evidence gap and as such, any generalization of the finding to this study is not possible. This is a presentation of panel data and the dependent variable, which would lead to different findings in the study even on the premise that the model would have been the same as it is proposed, it would find different results of the study simply because they chose to use different measures of the dependent variable, otherwise the study would find similar results given coincidence.

Bokhitiar, Naidhul, and Abu (2019) explored the role of macroeconomic conditions on expansion of general insurance in Bangladesh. The analysis has utilized 32 entities as a total sample of non-life insurers covering different variables (age of the firm, size, liquidity, solvency margin, asset tangibility, leverage, loss ratio, management competence index ROA and ROE) on the 2009-2015 sample period. The results showed that interest rates and company-specific attributes had a profound effect on the insurance performance, but there were no statistical significance of inflation, GDP growth, and the exchange rate. This finding presents an evidence gap. Compared to the current one there is a target industry disparity.

The second category of studies is on Inflation Rate and Insurance Industry Growth.

This set gathers literature as follows: Kimani (2022) used the annual data of 49 publicly-traded insurance companies in the Nairobi Securities Exchange (2016-2020) to investigate the effects of inflation on financial performance. The results of multiple linear regression revealed that there was positive correlation although this was not statistically significant.

In a study in Nigeria, Asanya and Uche (2018) explore the influence of inflation on insurance claim in Nigeria. The study acquires secondary information of Central Bank of Nigeria (1981-2017) on yearly basis and computes the descriptive statistics and a multivariate analysis approach is pursued on the statistics. Exchange rate is used as a control variable as it related to both claims and inflation. The study established a positive correlation between inflation and insurance claim whereby when rate of inflation increases, there is an increase in price of insurance claims in the short term and a decrease in long term. Due to this study, there are at least two gaps. In another geopolitical context, the research is base contextually with its economic and business context. Secondly, there is a conceptual uncertainty of the level of insurance claims as a way of estimating insurance company efficiency. The research fills in the gaps existing in the literature, and puts the analysis in context, to Kenya, and uses a measure of growth in the insurance industry predetermined by the research, the uptake rate.

Hussein (2015) used actual evidence in Pakistan to determine the influence of the macroeconomic factors on insurance company profitability. Secondary data from a sample of 39 firms that operated between 2006 and 2011 was regressed via Ordinary Least Squares estimation. The findings were that inflation and expansion of the equity market and the macroeconomic setup positively impacted the increment of profitability of the Pakistani insurance companies. A methodological gap in this

study is evident. The data collected was applied to OLS estimation while in the current study, the methodology of econometrics applies.

The third and last set of studies was based on Exchange Rates and Insurance Industry Growth, consistent with specific objective 3:

Ipigansi, Egoro and Stephen (2022) studied the effect of exchange rate on insurance claims settlement in Nigeria from 1990 to 2019. From the annual reports of the Central Bank of Nigeria and the National Insurance Commission, they obtained secondary data using a data capture sheet. The researchers conducted Unit root tests on the time series data with Least Squares regression, observing that exchange rates had an insignificant effect on insurance claim settlement. The study presents two contextual gaps: The first is a geopolitical contextual gap while the second is a measurement gap where "insurance claims" is the dependent variable. This research opts for measurement of insurance industry performance in terms of growth in penetration rate with a Kenyan contextual environment.

In a non-local environment, Liu, Wee, and Wu (2009) investigated the foreign exchange risk of insurance companies in the United States. They find a significant share of the US insurance market vulnerable to exchange risk fluctuations among seven trading partners in the insurance business-United Kingdom, Canada, Germany, Japan, Netherlands, Switzerland and France. Contrary to expectations, the study found that there was no differentiated and systematic variation in the foreign exchange risk profile of life and non-life insurance segments. Further, the research recommends that both insurance categories can be pooled together since they have no exchange risk exposure differences. Here an evidence gap is clear.

Empirically, Nyairo (2015) conducted an experiment to find out how the other important macroeconomic variables, exchange rate volatility, GDP growth, interest rates and workforce expansion would affect the performance of insurance companies on the 2009-2014 sample period. The data was summarized and presented using exploratory techniques-statistical charts, tables and diagrams. The study found out that while all the macroeconomic variables negatively affected ROA, the extent of the effect was negligible. A methodological gap is apparent, in that the use of exploratory statistical summaries does not guarantee reliable application of the findings. This study applies econometric methodology.

Summary of Literature Review and Research Gaps

The current literature and available empirical studies provide limited and inconclusive evidence on the macroeconomic effect on the insurance business, creating a gap that necessitates systematic research. These studies were conducted in various geographical contexts, leading to contextual research gaps. Methodological gaps were also evident, as some studies relied solely on secondary data or employed panel regression methods for analysis. Furthermore, conceptual gaps emerged because certain scholars focused on different sectors of the economy, resulting in conflicting

findings. These gaps have been identified and have informed the current study as a way of knowing the influence of macroeconomic factors on growth of Kenya's insurance industry.

Conceptual Framework

On the basis of Sections 1 and 2, the relationship between insurance penetration and its delineated indicators can be perceived as in the ensuing diagram.

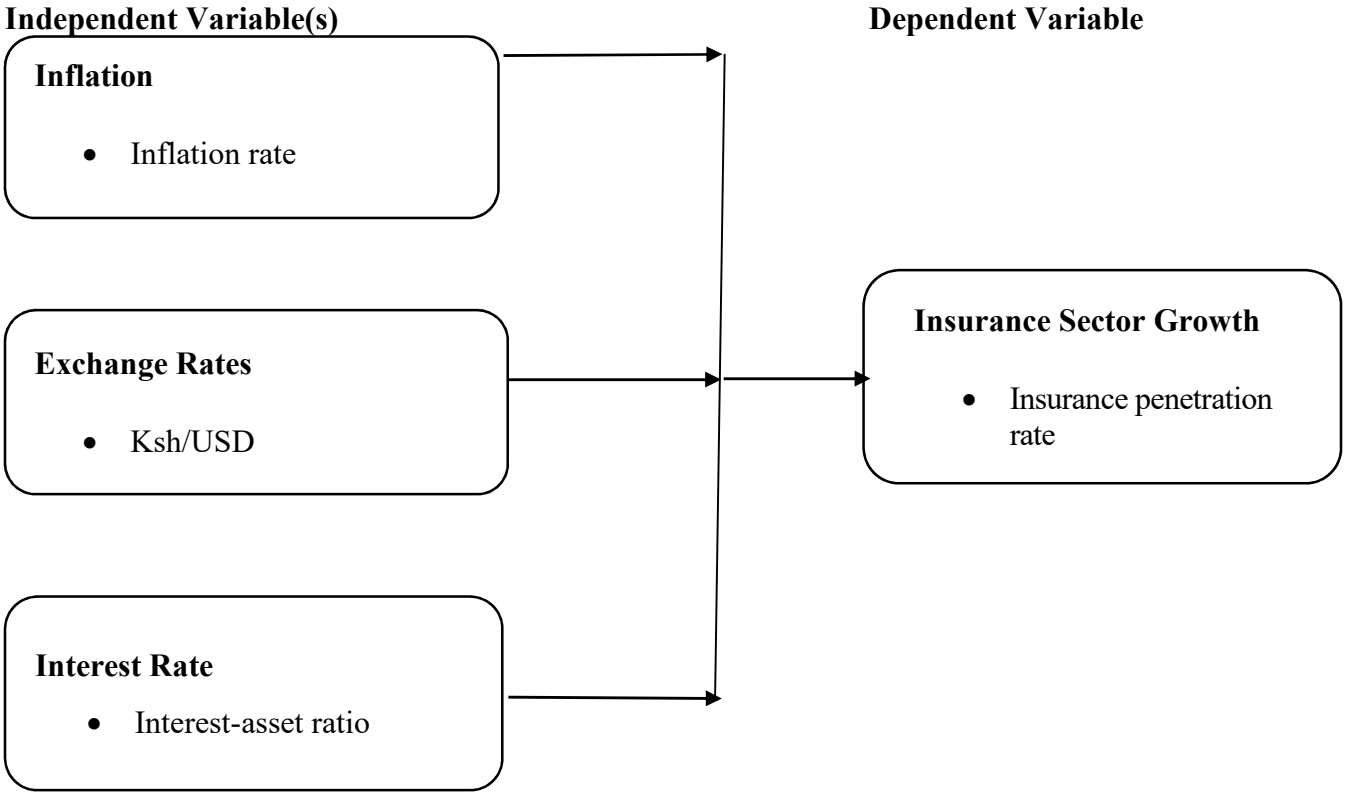


Figure 2.1: Conceptual Framework
Source: Author (2026)

METHODOLOGY

Research Design and data

It is the general procedure or methodological framework that guides the way a research study is to be performed and arranged (Gemma, 2018). Quantitative design was used in this research. This was dictated by the ratio type of data collected because the data sources were purely numeric.
The secondary sources in this study included KNBS, CBK, and IRA and covered the years between 2001 and 2023 with an annual frequency. On the four variables (including the dependent therefore), a panel data set was obtained and summarized for further processing.

Pre-estimation Diagnostic Tests

After summarizing the data, the researcher sought to determine the integration profile of the variables under study. The process involved running Augmented Dickey-Fuller stationarity tests

against the null hypothesis of a unit root. If a series was found to be non-stationary at level form, a first-difference was assessed using the same ADF test at 95% confidence level. Further the stationarity profile was processed into a bounds test cointegration test, following Pesaran, Shin and Smith (2001). This followed the use of information criteria (Akaike, Schwartz and Hannan-Quinn) to determine the lag length for the baseline model.

Modeling

This modeling procedure followed the presumption that the variables under study had a mixed integration profile, with none greater than order 2. The ARDL (p,q) model for each pair of variables (such as $Y\ and\ X$) is presented in its reduced form as:

$$Y_t = \emptyset_{0i} + \emptyset_1 X_{t-1} + \emptyset_2 Y_{t-1} + \sum_{i=1}^{p} \alpha_1 \Delta Y_{t-i} + \sum_{i=1}^{q} \alpha_2 \Delta X_{t-i} + \varepsilon_t$$

With Y_t as the dependent variable and its lags Y_{t-i} ; X_t as independent variable and its lags X_{t-i} ; ε_t as white noise process. $\emptyset$ is a constant; $\emptyset_1\ and\ \emptyset_2$ are the long run representation coefficients, Δ represents first differences. The coefficients $\alpha_1\ and\ \alpha_2$ represent the short run dynamics.

Model Stability testing

The ARDL model developed was diagnosed for robustness. Particularly, the researcher tested for normality of distribution of the residuals using the Jarque-Bera (1987) test, Heteroskedasticity using the Breusch-Pagan (1979) test, serial correlation using the Breusch-Godfrey test and structural stability using the Ramsey RESET test.

RESEARCH FINDINGS

Pre-estimation diagnostic findings

At the pre-estimation level, stationarity test results established a mixed integration profile. Only interest rate had native stationarity. Upon first differencing, inflation rate becomes I(1) while Insurance penetration and Exchange rates are at least so (I(1). This is confirmed (both are I(I)) at the 10% significance level. Overall, the stationarity tests reveal a mixed order of integration among the variables- one I(0) and three I(1) which fulfills the ARDL modeling precondition.

Regarding lag length selection for modeling the baseline ARDL, all the four study series were initially factored into an unrestricted Vector Autoregression (VAR) model in levels. The model was assessed for lag length using 4 information criteria (Akaike-AIC, Bayesian-BIC/Schwartz, Hannan-Quinn-HQ and Final Prediction Error-FPE) with a maximum of lag 2. The lag selection metrics are as in Table 4.1.

Table 4.1 Optimal Lag Length Selection

Lag Length	AIC	BIC (Schwarz)	HQ	FPE
Lag 0	6.031	6.23	6.074	416.1
Lag 1	3.735	4.730*	3.951*	43.49*
Lag 2	3.625*	5.416	4.014	47.54

Source: Researcher (2026)

Accordingly, Lag 1 was unanimously obtained via the criteria, leading to adoption of ARDL (1,1,1,1) with Insurance Penetration as the dependent variable.

Modeling

Empirical model**:** From pre-estimation procedures in section 4.1, the resultant model is hence postulated as:

$\Delta INSP_t = \beta_0 + \beta_1 \Delta EXR_t + \beta_2 \Delta INFL_t + \beta_3 \Delta INTR_t + \gamma_1 INSP_{\{t-1\}} + \gamma_2 EXR_{\{t-1\}} + \gamma_3 INFL_{\{t-1\}} + \gamma_4 INTR_{\{t-1\}} + \varepsilon_t$

Where β_0 is a constant, β_{1-3} are the variable change coefficients, γ_1 are the lag operators and ε_t is the residual error term. From the field data, the specific model extracted had the following coefficients (In presented in Table 4.2):

Table 4.2 Unrestricted Error Correction Model

Variable	Coefficient	Std. Error	P- value	Observation (at 5%)
Constant β0	1.134	0.7999	0.1882	Insignificant
Change effects at time t				
ΔEXRt	-0.0097	0.1101	0.2701	Insignificant
ΔINFLt	-0.0055	0.1022	0.1834	Insignificant
ΔINTRt	-0.0469	0.1003	0.0038	Significant
Lag 1 effects (time t-1)				
INSP{t-1}	-0.4907	0.3133	0.0685	Insignificant
EXR{t-1}	0.0069	0.1114	0.1275	Insignificant
INFL{t-1}	-0.0099	0.1067	0.2151	Insignificant
INTR{t-1}	0.021	0.1325	0.2945	Insignificant
Coefficient of Determination (R^2) = 0.6973, Adjusted R^2 = 0.5208, Model fit: F = 3.9442 with significance level = 0.0177 (against the conventional 0.05) indicating a significant fit.				

Source: Researcher (2026)

This table gives a blend of effects, but to determine whether to adopt the findings fully, we had to determine the structural nature of the model. This called for term diagnosis of the model for a cointegration overview.

Bounds Test for Cointegration: Following Pesaran et al. (2001), Table 4.3 was generated.

Table 4.3 Pesaran et al. (2001) Bounds Test Results

F-Test Statistic	Significance Level	I(0) Lower Bound	I(1) Upper Bound
4.2982	5% (α = 0.05)	2.72	3.77

Source: Researcher (2026)

The empirical Wold test statistic on the lag coefficients is 3.2982, above the I(1) upper bound of 3.37 and I(0) upper bound of 2.72, leading to the conclusion that H_0 (all the lag coefficients are equal to zero) cannot be confuted, hence there is a long-run integration structure among the series.

Short-run error correction mechanism**:** Following confirmation of contegration, the methodology proceeded to extract the structural short-run error correction (or shock transmission) mechanism. This was conducted on the lagged parameter of Insurance Penetration to determine how fast how the system is reverting to its long-run equilibrium after a shock on the constituent variables.

Table 4.4 Short-run Error Correction Mechanism

Variable	Coefficient	Std. Error	t-Statistic	Probability value
ΔEXRt	-0.0097	0.0084	-1.1574	0.2701
ΔINFLt	-0.0055	0.0039	-1.4116	0.1834
ΔINTRt	-0.0469	0.0131	-3.5791	0.0038
ECT{t-1}	-0.4907	0.2452	-2.0011	0.0685

Source: Researcher (2026)

Table 4.4 presents an Error correction term ($ECT_{\{t-1\}}$) of -0.4907 which is marginally significant (at 6.85%) at 10% level confirming self-restoration of the long-run structural equilibrium. It means that 49.07 percent of any disturbance or shock on the macroeconomic variables' structural relationship is restored in the period (year in this study) immediately following the shock.

Model robustness and residual diagnostics

The final step of the modeling procedure was to determine the stability of the model via testing for serial correlation, homoscedasticity, normality of distribution of the residual term and structural stability. To accomplish this as per the standard procedure of diagnosing ARDL models, the test proposed and engaged were respectively: The Breusch-Pagan LM Test, the Breusch-Godfrey test, Jarque-Bera test and the CUSUM/CUSUM-SQ test. These are presented in Table 4.6.

Table 4.5 Model robustness and residual diagnostics

Tested aspect	Test Method	P-Value	Findings
Normality Profile	Jarque-Bera Test	0.8521	Normal/Gaussian distribution
Homoscedasticity	Breusch-Pagan Test	0.3942	There is constant variance
Serial Correlation	Breusch-Godfrey LM Test	0.4105	No first-order autocorrelation
Structural Stability	CUSUM / CUSUM-sq	Passed (>0.05)	Parameters are stable

Source: Researcher (2026)

Table 4.5 demonstrates robustness of the model because all the test statistics derived from its parameters and residuals accordingly are compliant with the econometric modeling thresholds.

Accordingly, the model is suitable and reliable for forecasting because the residuals follow a Gaussian distribution, are homoscedastic, do not suffer from first order serial correlation and the parameter estimates are stable.

Results of Hypothesis Tests

The focus of this study was on three specific objectives (1, 2 and 3), to each of which was postulated a contemporaneous non-directional null hypothesis (respectively, H_{01} , H_{02} and H_{03}), following as:

H_{01}: There is no significant relationship between interest rates and the growth of Kenya's insurance industry.

H_{02}: There is no significant relationship between inflation rate and the growth of Kenya's insurance industry.

H_{03}: There is no significant relationship between exchange rate and the growth of Kenya's insurance industry.

All the three hypotheses were upheld at 5% significance level.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Following the findings from the hypothesis tests it can be concluded that: First, there is no significant long-run relationship between interest rates and the growth of Kenya's insurance industry. In the short run however, there is a significant negative influence. Accordingly, dealing with interest rate has to take account of the planning period where in the short run, it is a material impediment to the growth of the insurance sector via insurance penetration.

Secondly, there is no significant relationship between inflation rate and the growth of Kenya's insurance industry. Although there is a negative short-run and long-influence, the parameter estimates are statistically immaterial.

Finally, it can generally be inferred from this research that there is no significant relationship between exchange rate and the growth of Kenya's insurance industry. In the long-run, the effect is positive and in the short-run it is negative, but both are statistically inconsequential in the growth of the insurance sector.

Recommendations

Recommendations proposed for the different stakeholders in the findings of such a study as this ensue.

To insurance managers, it is recommended that in their long-term planning, they may not be overmuch concerned with the analyzed macroeconomic fundamentals in their growth planning. They should be confident that shocks on these variables are recoverable in around two years. In the short-term planning period however, they can be particular to interest rates because these have a significant negative impact on the sector's growth.

To policy makers, management of interest rates around the long-run equilibrium would be essential to oversight of a well-managed insurance growth scenario. The other factors could have disparate insignificant effects and are therefore secondary.

To academia, since the scope of variable selection covered three (inflation, interest rates and exchange rates) variables which is only a part of the macroeconomic system determinants; it is recommended that they explore a broader variable set. Moreover, the sample period can be expanded so that other econometric analyses can be applicable to the series data.

REFERENCES

Acaravci, S. K., Ozturk, I. & Acaravci, A., (2009). Financial Development and Economic Growth: Literature survey and Empricial Evidence from Subsaharan African countries.

Adenekan, A. T., Sanni, G. K., & Itodo, A. I. (2019). Investigating the impact of exchange rate volatility on naira exchange rate in Nigeria. Economic and Financial Review, 57(3), 2.

Adu, G., Marbuah, G. & Mensah, J. T., (2013). Financial development and economic growth in Ghana: Does the measure of financial development matter? Review of Development Finance, pp. 192-203.

African Development Bank Group. (2023). *African economic outlook 2023: Mobilizing private sector financing for climate and green growth*. African Development Bank.

Altavilla, C., Boucinha, M., & Peydró, J. L. (2018). Monetary policy and bank profitability in a low interest rate environment. Economic policy, 33(96), 531-586.

Apergis, N., Fillipidis, I. & Economidou, C., (2007). Financial Deepening and Economic Growth Linkages: A Panel Data Analysis. Review of World Economics: Volume 143, p. 179-198.

Apergis, Nicholas and Poufinas, Thomas (2020). The role of insurance growth in economic growth: Fresh evidence from a panel of OECD countries, The North American Journal of Economics and Finance, Volume 53.

Arcand, J.-L., Berkes, E. & Panizza, U., (2012). Too much finance?. IMF Working Paper.

Asian Development Bank. (2023). *Asian development outlook 2023: Finance for recovery*. Asian Development Bank.

Asinya, F. A. and Uche, W., J. (2018). Impact of inflation on insurance claims in Nigeria: An ARDL bounds F-test approach. *Journal of Economics and Finance 9(6),* 43-53.

Blanco, A., & Cravino, J. (2020). Price rigidities and the relative PPP. Journal of Monetary Economics, 116, 104-116.

Bokhtiar, H., Nahidul, I. and Abu, N. (2018). The effect of macroeconomic variables on the performance of non-life insurance companies in Bangladesh. *Indian Economic Review Volume 53*, (369-383)

Brown, R.L., Durbin, J. and Evans, J. (1975) Techniques for Testing the Constancy of Regression Relationships over Time. Journal of the Royal Statistical Society Series B, 37, 149-192.

Bussière, M., Pfister, C., & Sahuc, J. G. (2020). The link between money and inflation since 2008. Economic research, 232, 8.

Calderon, C. & Liu, L., (2002). The direction of causality between financial development and economic growth. Journal of Development Economics, pp. 321-334.

Ceccheti, S. G. & Kharroubi, E., (2015). Why does financial sector growth crowd out realeconomic growth?. BIS Working Papers.

Cecchetti, S. G. & Kharroubi, E.,(2012). Reassessing the impact of finance on growth. Bank for International Settlements.

Central Bank of Kenya. (2023). *Annual report and financial statements 2023*. Central Bank of Kenya.

Conard, J. W. (2023). Introduction to the Theory of Interest. Univ of California Press.

Cooper, R. N. (2019). Currency devaluation in developing countries. In The International Monetary System (pp. 183-211). Routledge.

Doan Van, D. (2020). Money supply and inflation impact on economic growth. Journal of Financial Economic Policy, 12(1), 121-136.

Dynan, K., & Sheiner, L. (2018). GDP as a measure of economic well-being (Vol. 43, No. 1, pp. 1-52). Hutchins Center Working Paper.

Effiong, E., (2015). Financial Development, Institutions and Economic Growth: Evidence from Sub-Saharan Africa. MPRA.

Engle, R. and Granger, C. (1987) Cointegration and Error Correction: Representation, Estimation and Testing. Econometrica, 55, 251-276.http://dx.doi.org/10.2307/1913236

European Insurance and Occupational Pensions Authority. (2022). *Financial stability report*. EIOPA.

Ferrari, A., Masetti, O., & Ren, J. (2018). Interest rate caps: the theory and the practice. World Bank Policy Research Working Paper, (8398).

Gemma, R. (2018). Introduction to Positivism, Interpretivism and Critical Theory. Nurse Researcher, 25, 41-49. https://doi.org/10.7748/nr.2018.e1466

Granger, C. W. J. (1981). Some Properties of Time Series Data and Their Use in Econometric Model Specification. Journal of Econometrics, 16, 121-130.https://doi.org/10.1016/0304-4076(81)90079-8

Griffith-Jones, S., Karwowski, E. & Dafe, F., (2016). A financial sector to support development in low-income countries. In: Achieving Financial Stability and Growth in Africa. London: Routledge.

Gujarati, D.N. (2003) Basic Econometrics. 4th Edition, McGraw-Hill, New York.

Gujarati, D.N. (2009) Basic Econometrics. Tata McGraw-Hill Education, New Delhi.

Gujarati, D.N. and Porter, D.C. (2009) Basic Econometrics. 5th Edition, McGraw Hill Inc., New York.

Guru, B.K. and Yadav, I.S. (2019), "Financial development and economic growth: panel evidence from BRICS", *Journal of Economics, Finance and Administrative Science*, Vol. 24 No. 47 (113-126).

Guzman, M., Ocampo, J. A., & Stiglitz, J. E. (2018). Real exchange rate policies for economic development. World development, 110, 51-62.

Hashim, Y. A., 2011. Financial Development and Economic Growth in Nigeria. International Journal of Management Science (47-55).

Hossain, A., Biswas, S., Hossain, N. and Poddar, A., (2016). Financial Sector Development and Economic Growth in Bangladesh: A Factor Analysis Based Causality Approach. International Journal of Economics and Finance(229-238).

Huang, H., & Zhang, Z. (2019). Virtual standard currency for approximating foreign exchange rates. International Journal of Electronic Commerce, 23(1), 33-62.

Hussain, I. (2015). Macroeconomy and profitability of insurance companies: A post-crisis scenario in Pakistan, *Pakistan Business Review, 17*, 243-263.

Hussain, S., Nguyen, V. C., Nguyen, Q. M., Nguyen, H. T., & Nguyen, T. T. (2021). Macroeconomic factors, working capital management, and firm performance—A static and dynamic panel analysis. Humanities and Social Sciences Communications, 8(1), 1-14.

Insurance Regulatory Authority. (2022). Insurance companies report 2022

Insurance Regulatory Authority. (2023). *Insurance industry annual report 2023*. Insurance Regulatory Authority of Kenya.

Insurance Regulatory Authority. (2024). *Insurance market performance and risk outlook report*. Insurance Regulatory Authority of Kenya.

International Monetary Fund. (2023). *Global financial stability report*. International Monetary Fund.

International Monetary Fund. (2024). *World economic outlook*. International Monetary Fund.

Ipigansi, P., Egoro, A. and Stephen,. (2022). Effect of Exchange Rate on Insurance Industry Claims Settlement in Nigeria. *Journal of Economics, Management and Social Sciences, 8(2).* 151-157.

Jakab, Z., & Kumhof, M. (2018). Banks are not intermediaries of loanable funds—facts, theory and evidence.

Jarque, C.M. and Bera, A.K. (1987) A Test for Normality of Observations and Regression Residuals. International Statistical Review, 55, 163-172.http://dx.doi.org/10.2307/1403192

Johansen, S., & Julius, K. (1990). Maximum Likelihood Estimation and Inference on Cointegration—With Applications to the Demand for Money. Oxford Bulletin of Economics and Statistics, 52, 169-210.https://doi.org/10.1111/j.1468-0084.1990.mp52002003.x

Kajwang, B. (2022). Influence of macroeconomic factors on the growth of the insurance industry. International Journal of Economics, 7(1), 19-31.

Kamau, A. M. (2023). Underwriting risk, firm size and financial performance of insurance firms in Kenya. Eastern Journal of Economics and Finance, Online Science Publishing, 8 (1), 1-14.

Kamau, A., & Were, M. (2022). Macroeconomic determinants of insurance sector growth in Kenya. *Journal of African Business and Economic Research*, 14(2), 55–72.

Karangwa, M. & Gichondo, A., 2016. An assessment of the sectoral distribution of commercial bank credit on economic growth in Rwanda. National Bank of Rwanda Economic Review, Volume 8 (55-87).

Karekezi, P., Bekondo, B. and Adogbo, A. (2024). Africa Re News 32nd edition February 2024.

Kigabo, Thomas R. and Mikebanyi, Pricille (2021). Financial growth and economic development: The case of Rwanda. National Bank of Rwanda Economic Review, Volume 18.

Kimani, Kariuki F. (2021). Of inflation on financial performance of insurance companies in Kenya. University of Nairobi Repository.

King, J. E. (2022). Post Keynesian Economics. In Handbook of Alternative Theories of Political Economy (pp. 83-95). Edward Elgar Publishing.

Laurenceson, J., and Chai, J. C. H. (2003). Financial reforms and economic development in China. Cheltenham, UK, Edward Elgar., 1-28.

Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. Journal of Economic Literature (688-726)

Li, D., Moshirian, F., Wee, T., and Wu, E. (2009). Foreign exchange exposure: Evidence from the U.S. insurance industry. *Journal of International Financial Markets, Institutions and Money, Elsevier, Vol. 19(2)*, 306-320.

Lu, Y. (2018). The Influence of RMB Real Exchange Rate on the Technical Structure of Sino-US Export Trade Products. *American Journal of Industrial and Business Management*, *08*, 1261–1276. https://doi.org/10.4236/ajibm.2018.85086

Machaj, M. (2023). Monetary Policy and Inflation: Quantity Theory of Money. Taylor & Francis.

Miller, R. C. (2018). International political economy: Contrasting world views. Routledge.

Mwangi, G. (2017). *Effects of Macroeconomic Variables on Financial Perfomance of Insurance Companies in Kenya* (Doctoral dissertation, United States International University-Africa)

Narayan, P. K. (2005). Reformulating Critical Values for the Bounds F-Statistics Approach to Cointegration: An Application to the Tourism Demand Model for Fiji. Department of Economics, Discussion Papers, No. 02/04, Monash University.

Njoki, G. Mwangi and Netshitandani Hulisani (2021). The South African Insurance Industry Survey, (81).

Noor, S. I. M., Rambeli, N. and Ramli (2017). Financial Growth and Economic Development: Evidence from Malaysia. International Journal of Academic Research in Business and Social Sciences.

Okello, J., Kigabo, T., and Mutuyimana, J. (2015). Financial development, monetary policy and economic growth in Rwanda. BNR Economic Review (79-100).

Onafalujo, A. K. (2019). Underwriting performance shocks in the non-life Nigerian insurance industry and macroeconomic risks: A vector auto regressive approach. *Facta Universitatis, Series: Economics and Organization*, 129-144.

Organisation for Economic Co-operation and Development. (2022). *Global insurance market trends*. OECD Publishing.

Organisation for Economic Co-operation and Development. (2023). *Insurance market trends and policy developments*. OECD Publishing.

Organisation for Economic Co-operation and Development. (2024). *OECD economic outlook 2024*. OECD Publishing.

Owino, B., & Muturi, W. (2021). Financial sector performance and economic growth in Kenya. *International Journal of Economics and Finance*, 13(4), 88–102.

Oyadeyi, O. O. (2024). Financial Development, Monetary Policy, and the Monetary Transmission Mechanism—An Asymmetric ARDL Analysis. Economies, 12(8), 191.

Park, Y.S., Konge, L. and Artino, A. R. (2020). Positivism Paradigm in Research. *National Library of Medicine.*

Pesaran, M.H. and Shin, Y. (1999) An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis. In: Strom, S., Ed., Chapter 11 in Econometrics and Economic Theory in the 20th Century the Ragnar Frisch Centennial Symposium, Cambridge University Press, Cambridge, 371-413.

Rashid, H. (2023). *Research Philosophy: Positivism, Interpretivism, and Pragmatism*.https://limbd.org/research-philosophy-positivism-interpretivism-and-pragmatism/

Signé, L., & Johnson, C. (2020). Africa's insurance potential: Trends, drivers, opportunities and strategies (No. 1929). Rabat: Policy Center for the New South.

Stock, J.H. and Watson, M.W. (1993) A Simple Estimator of Cointegrating Vectors in Higher Order Integrated System. Economometrica, 61, 783-820.http://dx.doi.org/10.2307/2951763

Swiss Re Institute. (2024). *World insurance sigma: Global insurance market trends and outlook.* Swiss Re Institute.

Woodridge, J. M. (2009). Introductory Econometrics: A Modern Approach (5th ed.) Michigan State University.

World Bank. (2023). *Global financial development report 2023: Financial inclusion for sustainable growth*. World Bank.

World Bank. (2024). *World development report 2024: Finance, growth, and resilience*. World Bank.