TIME SERIES ANALYSIS OF FIRE INSURANCE PREMIUM AND CLAIMS IN NIGERIA USING AUTO REGRESSIVE DISTRIBUTED LAG (ARDL) MODEL.

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ABSTRACT

Premium income and claims payout are critical elements of underwriting performance and risk exposure of insurance firms in Nigeria, but their dynamic relationship remains underexplored. This study examined the short-run and long-run equilibrium relationship between Nigeria's total fire insurance premium and claims over 17 years period (2007 to 2023) using an ex-post facto research design and secondary data sourced from the Nigerian Insurers Association (NIA) and audited financial statements of selected insurer. Utilizing Autoregressive Distributed Lag (ARDL) model, the study established that premium and claim exhibited a long-run relationship but discovered that claims did not respond to short-term adjustment in premium which is an indication that premium adjustments do not immediately affect claims. The deviations from equilibrium were corrected at a speed of 57.5% per period by the the Error Correction Term (ECT), a moderate performance reflecting institutional lag from claims response time. The study recommends investment in effective predictive pricing technology, improvement in claims management and better regulatory guidelines for enhanced underwriting discipline. More research should focus on comparative dynamics between different types of insurance policies and test the moderating effect of macroeconomic determinants.

Keywords: *Fire Insurance, Fire insurance Premium, Claims, Auto Regressive Distributed Lag (ARDL) Model*

INTRODUCTION

Fire insurance is the foundation of the property insurance policy which provides protection to individuals and businesses against fortuitous fire-related incidents. Fire insurance in Nigeria is important in stimulating economic activities and diversification of risk (Ukpong, Aduloju & Fadun, 2024). It also offers a significant contribution to the growth of the insurance industry, as increase in premium income of insurers is positively correlated with assets expansion (Yusuf, Aduloju & Oluwaleye, 2023). The relevance of fire insurance resulted from the prevalence of fire incidents in Nigeria leading to premium increase experienced in recent years (Ukpong, Aduloju & Fadun, 2024).

Furthermore, fire insurance incorporates other causes and events that are not purely fire-related (Fadun, Aduloju & Ukpong, 2024; Agarwal, 2021). For instance, a typical fire insurance policy provides automatic coverage for damages resulting from fire, lightning and

limited explosions. This can be extended to include damages resulting from special perils such as flood, strike, riot, civil commotion, earthquake, etc.

The National Insurance Commission (NAICOM) reported a gross written premium of N1.17billion in Q3 of 2024, representing a 60.9 percent year on increase, with fire insurance accounting to 21.3 per cent of this surge (NAICOM 2025). Notably, fire insurance also attained the highest retention growth, increasing by 41.7% year-on-year (NAICOM, 2022). However, this remarkable growth is hindered by operational challenges. For instance, NAICOM (2025) reported a loss ratio of 71.5% in Q3 2024 which underscored the disproportionate amount of claims in relation to premiums collected by insurers, indicating systemic underwriting strain.

The Nigerian insurance sector unlike developed economies still grapples with the challenge of insufficient premium reserve. Oladunni and Okonkwo (2022) argued that inequitable premium could hinder the claims paying ability of insurers, resulting in lack of trust by policyholders. According to Uruakpa (2019), insurance premium must be adequate to cover expected claims and other related administrative expenses. In the past years, the Nigerian insurance market pricing for fire insurance was discriminatory, throwing the entire market into unhealthy competition and incessant rate cutting. This resulted in significant fire losses to insurers and reinsurers as premiums received was inadequate to cater for reported claims, creating a situation where insurers struggled to settle valid claims.

Following this development, the Professional Reinsurers Association of Nigeria (PRAN) in 2021 responded by imposed minimum rates and declared to participate in the pricing of mega fire risks (Africa Re, 2021). PRAN also introduced a top market risk clause warranty, requiring that all risks with values above NGN 30billion must be referred to the lead reinsurer for determination of applicable rates and deductibles, prior to treaty cession. Although this development was slated to commence in 2021, PRAN postponed the implementation to July 2022 with a three-year moratorium plan to achieve full compliance. Despite this intervention aimed at addressing unjust premium pricing, the impact of these adjustments on claims performance over time remains unclear, particularly in the face of economic challenges such as inflation, exchange rate volatility and high cost of reinsurance. This necessitates the need for an effective and sustainable pricing model.

Therefore, this study investigated the short-run and long-run relationship between fire insurance premium and claims in Nigeria using the Auto Regressive Distributed Lag (ARDL) model. It seeks to understand how premium changes if at all, affect the dynamics of settlement of claims over time and whether the trends in claims in turn affect premium adjustments or not. By examining the implication of time between the variables and whether or not short-run and long-run equilibrium relationship exists between them, the study contributes to more accurate actuarial pricing, better underwriting practice, and effective risk management. The study also offers valuable information to insurers, regulators, and policymakers to facilitate financial stability and sustainability of the Nigerian insurance industry.

LITERATURE REVIEW

Theoretical Review

The theory of insurance premium forms the foundation of this study.

The Theory of Insurance Premium

The Theory of Insurance Premium, rooted in Arrow's (1953) capital asset pricing model (CAPM) and further analyzed by Sharpe (1964), Lintner (1965), and Mossin (1966), likens the payment of insurance premiums and claim recoveries to investing in a risky asset, where market demand and supply determine prices. According to Kahane (1979) and Bühlmann (1970), premiums should reflect expected claims and appropriate risk loadings, which account for underwriting risk, profit margins, administrative expenses, and claim settlement costs. The insurer's ability to estimate expected claims and determine fair risk loading is central to premium pricing. Despite its relevance, researchers have criticized it for being a one-period model that only considers expectation and variance, making it inadequate for long-term risk assessment. To address this, Borch (1985) and Fiedler (2018) introduced an actuarial risk theory based on continuous-time stochastic processes, which provides a more dynamic and realistic approach to risk evaluation.

Ukpong (2019) applied this theory in her study, investigating the relationship between premiums and claims paid in the Nigerian insurance industry, demonstrating its practical relevance in modern insurance markets. This study applies the theory to fire insurance premiums and claims in Nigeria, where factors such as historical claims data, risk loadings, market conditions, and regulatory policies shape premium adjustment. Fire insurance pricing depends not only on expected losses but also on external factors like inflation, economic conditions, and reinsurance costs. Given the limitations of Arrow's model, integrating actuarial models enhances the understanding of premium-claims relationships, ensuring more accurate pricing and risk management in the Nigerian fire insurance market.

Conceptual Review

Fire Insurance

Fire insurance is a form of property insurance designed to indemnify the policyholder against financial losses resulting from fire damage to their assets. It provides protection against fire related losses or damage (Akindipe & Isimoya 2022). In Nigeria today, a typical fire policy provides coverage to the policyholder for damages resulting from fire, lightening and limited explosion, subject to terms and condition of the policy. This means that damages resulting from explosion of gas used for domestic purposes are usually covered under a typical fire policy in Nigeria. However, the policy excludes coverage for damages resulting from explosion of gas and boilers used for industrial purposes. This is because the peril is more suited to an a more specific policy-engineering insurance. Although certain fundamental risks such as war, nuclear risks, earthquake, etc., are often excluded from coverage under this policy (Ade, 2018), it is not unusual to have some of the risks extended for an additional premium charge to make the policy coverage more robust.

For a claim to subsist under fire insurance policy, the following three requirements must be met: there must be something on fire which ought not to be, there must be actual ignition and the fire must be accidental. This suggests that the property must have been harmed or burned

by fire, as destruction from heat or smoke without actual ignition falls outside the scope of coverage.

Fire Insurance Premium

Fire insurance premium refers to the cost of purchasing a fire insurance policy. It plays a significant role in the Nigerian economy, covering 10% of the non-life insurance business in the country (NAICOM, 2023). The Nigeran insurance industry gross written premium income in Q3 of 2024 hit N1,173.1 billion, representing a 60.9 per cent year-on-increase, with fire insurance contributing 21.3 per cent of this figure (NAICOM, 2024). Similarly, NAICOM (2022) equally reported that the industry recorded highest rate of retention increase in the fire insurance portfolio, growing by 41.7 per cent year on. Fadun, Aduloju, and Ukpong, (2024) further highlighted the positive role fire insurance premium plays and empirically established a positive link with Nigeria's GDP, suggesting that fire insurance stimulates economic activities by providing risk diversification and financial intermediation.

To address the declining reserves and profitability caused by high frequency and severity of claims and indiscriminate rate cutting, PRAN in conjunction with the Fire Office Committee rolled out the revised Nigerian Fire Insurance Underwriting Manual with minimum rates and a new discount structure embedded therein (Adesina, 2021). This revision was aimed at smoothening out escalating claims payout, particularly in manufacturing sectors which had witnessed a significant increase in fire claims (Africa Re, 2021). It was also sought to restore underwriting standardization and equitable premium model for the entire industry.

Auto Regressive Distributed Lag (ARDL) Model

Scholars widely use ARDL as an advanced econometric method in time series data analysis to investigate the relation between two or more variables. The model is flexible and suitable for determining the long-run and short-run effects independent variables have on dependent variables (Syarifah et al., 2021). ARDL is effective in modelling stationary output series as a function of current and past values of stationary input series (Mills, 2019)." (Mills, 2019). More recently, scholars have extended the ARDL approach to incorporate asymmetric and nonlinear models such as quantile ARDL models and spatio-temporal applications (Cho et al., 2021).

The ARDL command in programs facilitates model estimation with best lag selection based on information criteria and allows for both levels and error-correction forms of the model (Kripfganz & Schneider, 2018). Moreover, the bound-testing method of cointegration is offered as a postestimation option, adding to the usefulness of the model in examining long-run relationships between variables (Kripfganz & Schneider, 2018). This study applies the ARDL model to explore the long-run and short-run relationships between fire insurance premiums and claims in Nigeria's insurance industry from 2007 to 2023

Conceptual Framework

The conceptual framework in Figure 1 below shows the study variables and helps depict the relationship between the variables.

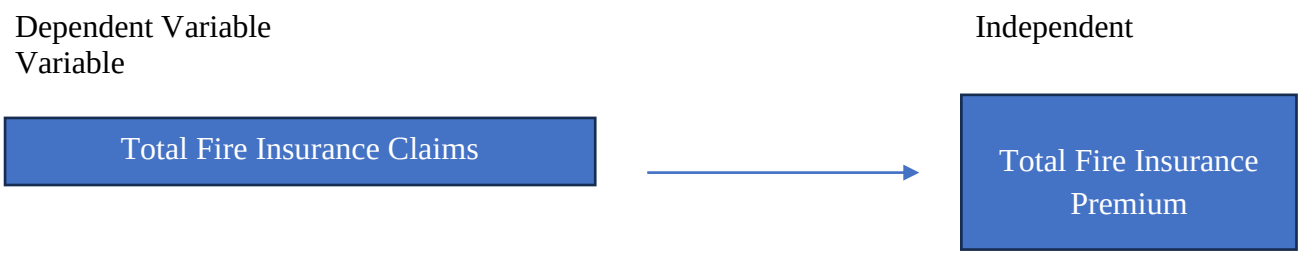

Figure 1 Conceptual Framework
Source: *(Researcher, 2025)*

Empirical Review

Stakeholders in the Nigerian insurance industry have pondered on the relationship between fire insurance premium and claims, in light of historical claim trends and premium patterns observed over the years.

Akindipe and Isimoya (2022) explored the relationship between fire insurance and claims in Nigeria over a twelve-year (12) period -2010 to 2021 and found a positive relationship between them. They argued that despite the established relationship; administrative costs and underwriting expenses continue to affect insurers' profitability. A similar study conducted by Ukpong (2019) portrayed a more wholistic view of the entire insurance market in Nigeria, investigating the relationship between total premiums and claims paid irrespective of the class of insurance. She found no significant relationship between claims paid and premium received in the Nigerian insurance industry, even though total premium explained over 90 percent of variation in claims paid.

Insurers' financial stability can be critically determined by the relationship between premium income and claims cost. Agbamuche (2012) found that premiums constitute the major source of funds available to the insurance industry in Nigeria. Claims, on the other hand, significantly impact insurers' financial stability. Dansu and Yusuf (2014) opined that claim cost calculation includes total losses incurred plus adjusted expenses, whilst loss ratio which is a critical risk indicator, constitutes total paid claims plus adjusted expenses divided by total premium earned. A high loss ratio is an indication of poor risk selection, and can negatively impact profitability.

Furthermore, Bassey, Ankoh, and Ekanem (2024) in their empirical study of the impact of claims settlement on insurance company's profitability in Nigeria found that total income and expenditure of insurers significantly impacted their profitability, but surprisingly, total premium and total claims paid did not. Consequently, they emphasized the need for more sensitization and awareness campaigns on loss control to the insured and encourage reinvestment of insurance premium income into the Nigerian economy to increase profitability. Similarly, Ayuba, Azuoonwu and Agugua (2018), empirically found that claim settlement has a significant impact on the performance of general insurance businesses, including fire insurance, in Nigeria. They directly linked poor premium collection among others as major hinderance to better claims service and called for improved service quality and equitable premium pricing for improved performance. This indicate while premium income and claims payout alone may not directly determine profitability, equitable premium pricing, efficient claims settlement and improved premium pooling are critical for better performance and financial sustainability of the insurance industry.

Rautiainen, et al. (2005) narrowed their study to how changes in injury claim frequency influenced premium rebates, and concluded that reduction in premium led to lower overall claim rates. However, they acknowledged the possibility of a bias in their finding due to underreporting, noting that other factors may contribute to the observed pattern-decline.

These studies reflect the interplay between insurance premium and claims payment with varying findings. Collectively, the evidence suggests that despite the vital role of premium income to insurers' financial stability and sustainability, excessive claims payouts can affect their bottom line and threaten business continuity.

Research Gap

Few studies have examined the relationship between fire insurance premium income and claims. Most existing ones overlook the dynamics of the association between fire insurance premium and claims. These studies typically employ static models that do not factor time dimension into their analysis, thereby overlooking the short-run and long-run relationships between the variables.

In the same vein, there is hardly any application of time series method using the ARDL model to explore the interplay of fire insurance premium and claims over time. This constitutes a critical methodological gap. This study fills that gap by providing a dynamic analysis of their relationship, which is crucial for pricing, risk management, and policy formulation in the Nigeria's fire insurance sector.

METHODOLOGY

This study adopted an ex-post facto research design which entails collection of data over a particular period of time and allows for inference of potential long-run associations based on observed trends. This design is appropriate because the study investigates the long-term relationship between gross fire insurance premiums and claims over the period 2007–2023. It allows for the establishment of causal relationships through observed patterns and behaviour in financial time series data.

The population of the study comprises all licensed non-life insurance firms operating in Nigeria. However, the study focuses specifically on fire insurance data reported nationally. The sample is made up of aggregate national data of gross fire insurance premiums and claims, extracted from the Nigerian Insurers Association (NIA) and audited financial reports of firms with complete fire insurance data over the period of 2007-2023. The choice of aggregate national data was due to limited availability of disaggregated firm-level data across the limited period of study. This purposive sampling approach supports the inclusion of complete and consistent time series data.

This study uses secondary data comprising aggregate annual time series data for fire insurance premiums and claims in Nigeria for the period, 2007 to 2023. The data were obtained from Nigerian Insurers Association (NIA) digest and publicly available financial statements of insurers. The data were applied using both descriptive and inferential statistical techniques with the help of E-Views 12 software.

Model Specification

The ARDL model of the relationship between gross fire insurance claims and premiums is given below:

$$CLAIMS_t = \alpha_0 + \Sigma(\beta_i PREMIUM_{t-i}) + \Sigma(\delta_j CLAIMS_{t-j}) + \lambda ECT_{t-1} + \varepsilon_t$$

Where:
• CLAIMS = Gross fire insurance claims

• PREMIUM = Gross fire insurance premiums

• ECT_{t-1} = Error correction term lagged one period

• α_0 = Constant

• ε_t = Error term

• t = time period

The ARDL was adopted due to its flexibility in handling small sample sizes and variables with different levels of integration, making it suitable for a data set of 17 observations. In addition, it generates parameter estimates for both short-run and long-run estimates and provides deeper understanding between the variables under study.

DISCUSSION OF RESULTS

The data used for this study was sourced from Nigerian Insurers Association (NIA) digest and audited financial statements of Nigerian non-life insurance companies over 17 years- 2007 to 2023. The dependent variable is fire insurance claim and the independent variable is represented by fire insurance premium. The descriptive statistics of mean, median, standard deviation, minimum, and maximum values were computed to understand the distribution and trends of premiums and claims over the study period. The results from the ARDL model are subsequently used to analyze the short-run and long-run relationship between fire insurance premiums and claims. This also includes estimation of the error correction term to ascertain the speed of adjustment towards long-run equilibrium.

Pre-estimation Diagnostic Tests

Unit Root Test

Unit root testing performs a vital role in time series analysis by determining if a series is stationary or non-stationary. A time series displays a unit root when it experiences shocks persistently, suggesting that its statistical properties such as the mean and variance are time-dependent. It is important to identify a unit root since non-stationary data can cause a spurious regression result. The widely used method of unit root testing include the

Augmented Dickey-Fuller (ADF) test which assists in formulating the right transformations needed to stabilize the series for accurate modelling and inference.

***Table 1: Unit Root Test*Table 4.2: Augmented Dickey-Fuller (ADF) Test**

	At Level				**At First difference**			
Parameters	ADF test Statistic	Test critical value @ 5%	Prob.*	Order	ADF test Statistic	Test critical value @ 5%	Prob.*	Order
Gross Claims	-2.10882	-3.065585	0.2438	I(1)	-5.70601	-3.081002	0.0004	I(1)
Gross Premium	1.954515	-3.065585	0.3455	I(1)	-3.84722	-3.119910	0.0455	I (1)

Source: *E-View (2025)*

As revealed in Table 1, the ADF results show a non-stationarity of gross premium and claims at level I (1) which became stationary after first differencing. This confirms that gross premiums and gross claims are integrated of order one I (1), making the variables suitable for ARDL modelling.

Cointegration

Cointegration refers to statistical relationship between non-stationary time series variables that may exhibit short-term fluctuations, but align or move together over the long term in a predictable and stable manner, suggesting a long-run equilibrium relationship between them.

Table 2: Cointegration Test

Hypothesized No. of CE(s)	**Eigenvalue**	**.05 Critical Value**	**Prob.****	**Eigenvalue**	**.05 Critical Value**	**Prob.****
*None **	*0.594590*	*15.49471*	*0.0329*	*0.594590*	*14.26460*	*0.0648*
At most 1	*0.189122*	*3.841466*	*0.0762*	*0.189122*	*3.841466*	*0.0762*

Source: *E-view Computation (2025)*

As shown in Table 2, the results of the cointegration tests revealed that the null hypothesis of no cointegration (None) is rejected at the 5% level of significance for the first statistic (p = 0.0329), suggesting there is at least one cointegrating relationship. For the second test and the hypothesis of at most one cointegrating equation, however, the p-values are greater than 0.05, and thus those null hypotheses are not rejected.

ARDL Bounds Test

Table 3: ARDL Bounds Test

Test Statistic	Value	k

F-statistic	5.774538	1
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	4.04	4.78
5%	4.94	5.73
2.5%	5.77	6.68
1%	6.84	7.84

Source: *E-view Computation (2025)*

As shown in Table 3, the ARDL bounds test generated an F-statistic of 5.774538 for a single explanatory variable (k=1). It lies above the upper critical bound at both the 10% (4.78) and 5% (5.73) significance levels, indicating the presence of a long-run cointegration relationship. The null hypothesis of no cointegration is therefore rejected at these significance levels.

ARDL Cointegrating And Long Run Form

Table 4: ARDL Cointegrating And Long Run Form

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PREMIUM)	0.155737	0.167562	0.929430	0.3696
CointEq (-1)	-0.575007	0.254719	-2.257416	0.0418
Cointeq = CLAIMS - (0.2708*PREMIUM + 4163669.2284)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PREMIUM	0.270844	0.244779	1.106481	0.2886
C	4163669.228430	8974137.304998	0.463963	0.6503

Source: *E-view Computation (2025)*

The ARDL cointegration results displayed in Table 4 generate a statistically significant and negative error correction term (coefficient = -0.5750, p = 0.0418). This confirms the presence of a long-run equilibrium relationship and implies that any disequilibrium between claims and premiums is corrected by approximately 58% in each period. This strong and effective error correction mechanism confirms the presence of long-run equilibrium despite the lack of statistical significance in the individual long-run premium coefficient. On the other hand, the short-run effect of premium changes (D(PREMIUM)) on claims is positive but not statistically significant (p = 0.3696), which implies that claims have minimal short-run responsiveness to premium change.

One explanation for the insignificant short-run relationship between premiums and claims is the presence of institutional and operational lags in the insurance process. Changes in

premiums often reflect prior risk assessments and may not immediately impact claims, which are triggered by independent, fortuitous occurrences. Policy term, regulatory lag, and claim cycle also can separate short-term premium adjustment from current claim experience. This lag effect restricts the responsiveness in the short run, albeit the presence of a long-run equilibrium relationship.

Post-estimation Diagnostic Tests

Table 5: Test for serial correlation

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.405980	Prob. F (2,11)	0.6759
Obs*R-squared	1.099848	Prob. Chi-Square (2)	0.5770

Source: *E-view Computation (2025)*

As shown in Table 5, the Breusch-Godfrey Serial Correlation LM Test provides large p-values (0.6759 and 0.5770) that confirm the lack of serial correlation in the model residuals. This confirms that error terms of the ARDL model are independent over time, guaranteeing the reliability and validity of regression estimates.

Discussion of Results

The ARDL empirical results reveal a complex relationship between gross claims and gross premiums in the Nigerian insurance industry. The analysis further reveals no significant short-run effects but a statistically significant error correction term (ECT) that propels adjustment towards long-run equilibrium. This means that claims payment does not immediately respond to changes in premiums received by insurers but adjusts over the longer term, reflecting underlying structural and operational factors in the industry. This result agrees with Akindipe and Isimoya (2022), who confirmed a positive relationship between fire insurance premiums and claims, but indicated that administrative and underwriting costs diminish overall returns. Similarly, Ukpong (2019) found no significant short-term association between premium and claims, even though premiums explained more than 90% of the variation in claims in her model, reaffirming that premiums affect claims behavior mostly in the long run as a result of delays or regulatory or operational lags.

The financial significance of the premiums-claims relationship is well established in extant literature. Agbamuche (2012) and Dansu and Yusuf (2014) emphasize that premiums serve as the main funding source for insurers and claims represent a primary cost, with loss ratios functioning as key risk metrics that capture long-term financial health rather than immediate reactions. This is corroborated by international studies (Amoroso, 2012; Fiedler, 2018; Harrington & Niehaus, 2006) that stress the necessity of a long-run balance between premiums and claims, with claims smoothing over time instead of reacting sharply to premium fluctuations. Further supporting this perspective, Bassey, Ankoh, & Ekanem (2024) demonstrate that firm performance depends more on the structure of income and expenditure, with claims being more sensitive to strategic management than to short-term premium changes. Behavioral factors such as underreporting of claims and delays in claim payments contribute to the slow and gradual response of claims to changes in premiums, causing a delay in claim adjustments over time (Rautiainen, et al., 2005) and (Ayuba et al., 2018).

Events on the international fronts further support the findings of this study. For example, the Canadian Office of the Superintendent of Financial Institutions (OSFI) promotes long-term, actuarially driven risk approaches, emphasizing forward-looking underwriting to increase insurer resiliency. Firms like Manulife and Sun Life adopt multi-period strategies which project future risks and maintain a long-term equilibrium of claims and premiums, restricting exposure to future massive losses in the long term. Similarly, in the United Kingdom, some insurers like Aviva and Prudential leverage time-based risk modelling with the aid of advanced predictive tools to manage delayed claims and shifting risk, ensuring accurate pricing and long-term financial stability.

South Africa has the most advanced insurance market in Africa, aided by more advanced regulatory frameworks and technology adoption, unlike Nigeria, Kenya, Ghana and other countries which face delays from underdeveloped infrastructure and limited actuarial capacity. However, Nigeria's long-term premiums-claims patterns reflect the global focus on balancing claims and premiums over the long term, though its technological and operational maturity lags behind more advanced insurance markets.

Policy and Industry Implication

The ARDL empirical results revealed a stable long-run relationship between aggregate fire insurance premiums claims for the period 2007-2023, while suggesting that delays in claims settlement, complex cost dynamics and organizational practice within the Nigerian insurance industry interfere with short-run interactions between the two variables.

This necessitates formulation of policies structured to strategically incorporate long-term pricing approaches, regulation and risk management rather than expecting claims to respond instantly to premium adjustment.

Conclusion

This research investigated time series analysis on fire insurance gross premiums and claims using the ARDL model. The model established a long-run equilibrium relationship between claims and premiums with an error correction term, where any deviation is corrected at a speed of 57.5% on average in each period. Despite the long-run relationship observed between premiums and claims, the model established that premiums do not significantly influence claims in the short run. This indicates that claims are not directly or immediately influenced by premium changes. This means that total premiums and claims over the period in question approach long-run equilibrium adjustment, but are insensitive to short-run premium changes, likely due to institutional lag, policy response lags, or industry considerations. The evidence highlights the relevance of long-term thinking to insurance policy and premium determination. It also suggests that subsequent research incorporate broader economic and regulatory influences to account for more nuanced insurance industry dynamics.

Recommendations

Based on the findings of this study, the following recommendations are:

i. Since a long-run equilibrium relationship exists between claims and premiums, insurers must focus on improving their forecasting models to capture delayed claim effects, allowing for better long-term premium pricing strategies.

ii. As the effects of claims on premiums are weak in the short term, existing models of pricing may be miscalculating the risk. Insurers as well as regulators need to re-evaluate their practices for setting premiums based on current and future liabilities. Current exercises may be non-transparent and not consider future obligations.

iii. The absence of a significant change in claims due to short-term changes in premiums indicates a possible inefficiency in claims processing. Claims can be better aligned to premiums through enhancing customer communication with insurers as well as streamlining, digitizing administrative tasks related to, and automating claims settlement procedures

iv. Industry regulators could motivate validations of dynamic systems subjected to changing industry data and trends by urging a minimum standard on the reporting of premium expenses, mandate periodically scheduled performance assessment audits based on claims settlement ratios, and issue risks associated with the lack of transparent accountability on financial management to foster better structural governance across the insurance firms which will encourage more responsible financial management.

Suggestions for Further Studies

Further research should consider examining macroeconomic factors like inflation, interest rates, and GDP growth to further understand their impact on claims and premiums. Moreover, using non-linear models or employing non-linear machine learning algorithms would be able to capture complex relationships that linear ARDL models miss. Cross-country or cross-sectoral (e.g., life/non-life) comparative studies could provide wider perspective. Further research should also utilize panel data for improved accuracy and to control for entity-specific effects to enhance the generalizability of results. At last, the impact of regulatory policy and technological change on the dynamics of claims could deepen the understanding of changing trends within the insurance industry.

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