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Marine and Aviation Insurance and its Effect on the Growth of the Nigerian Economy

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Abstract

This study investigates the relationship between marine and aviation insurance and the growth of the Nigerian economy from 1998 to 2023. Using an ex-post facto research design, the study analyzed time-series data obtained from credible sources such as the Central Bank of Nigeria (CBN), Insurance Digest, and National Insurance Commission (NAICOM). The research aimed to examine the effects of Marine and Aviation Gross Premium, Net Premium, Gross Claims Paid, and Net Claims Paid on economic growth. The study employed statistical tools such as Descriptive Statistics, Augmented Dickey-Fuller Unit Root Test, Auto-Regressive Distributed Lag (ARDL) Bound Test, and the Short-run Error Correction Model (ECM). Post-estimation tests, including the Correlogram Squared Test and Breusch-Godfrey Serial Correlation LM Test, were conducted to assess model stability. The findings revealed that Marine and Aviation Gross Premium negatively and significantly impacted economic growth, whereas Marine and Aviation Net Premium had a positive and significant effect. On the other hand, Gross Claims Paid had a negative but insignificant effect, while Net Claims Paid showed a positive yet insignificant effect on the economy. The study concluded that while past economic performance influences current growth, the effects of insurance premiums on economic growth are mixed. Claims, both gross and net, did not significantly impact economic growth in the short run. The findings align with prior research, highlighting the importance of regulatory improvements, enhanced insurance penetration, and operational efficiency to fully exploit the economic potential of marine and aviation insurance in Nigeria. The study recommends strengthening premium regulations, improving net premiums through flexible products and awareness campaigns, enhancing claims management through digital platforms, and addressing low insurance penetration with government interventions.

Keywords: Marine Insurance, Aviation Insurance, Economic Growth, Insurance Premium, Claims Management, Nigeria, Regulatory Improvements, Insurance Penetration.

Introduction

Insurance is a critical mechanism for managing risks and mitigating financial losses in both personal and business contexts. Marine and aviation insurance, two major branches of the insurance industry, play a pivotal role in facilitating global trade and ensuring the sustainability of the transportation sector. Marine insurance provides coverage against risks associated with the transportation of goods and vessels over water, including damage, loss,

or theft during transit (Gatzert & Kosub, 2020). Aviation insurance, on the other hand, offers protection for aircraft operations, including liabilities to passengers, cargo, and third parties (Flitman et al., 2022). Together, these forms of insurance serve as financial safeguards, ensuring that critical sectors of the Nigerian economy remain resilient to the risks posed by unforeseen events.

The Nigerian economy, as a developing market, heavily relies on trade, logistics, and transportation to drive economic growth. The maritime sector accounts for a significant portion of international trade, as Nigeria is a major exporter of crude oil and a net importer of consumer and industrial goods (Okonkwo & Oluwagbemiga, 2022). Similarly, the aviation sector plays a crucial role in connecting Nigeria to global markets, supporting tourism, and enhancing the mobility of goods and people. Insurance coverage in these sectors not only promotes business confidence but also ensures that losses are minimized when accidents, piracy, or operational disruptions occur (Adeyemo & Adeniran, 2021).

Despite its potential, the penetration of marine and aviation insurance in Nigeria remains limited due to challenges such as low awareness, regulatory bottlenecks, and an unstable economic environment. Industry reports indicate that less than 10% of vessels operating in Nigerian waters have adequate marine insurance coverage (Nwankwo et al., 2023). Likewise, aviation insurance is predominantly dominated by foreign underwriters, raising concerns about capital flight and the capacity of domestic insurers to provide adequate coverage (Ekeocha & Nduka, 2023). These gaps highlight the need for enhanced regulatory frameworks and capacity building to stimulate the growth of these insurance sectors.

Marine and aviation insurance contribute significantly to economic growth by promoting trade, safeguarding investments, and enhancing the resilience of critical infrastructure (Zhu et al., 2021). In addition, these insurance products provide financial security to businesses, enabling them to recover quickly from disruptions and avoid prolonged downtimes. By facilitating international trade and ensuring the operational continuity of logistics, marine and aviation insurance indirectly support job creation, government revenue, and the stability of the financial system in Nigeria. Studies have shown a positive correlation between insurance penetration and economic growth, emphasizing the need to deepen insurance coverage in these sectors (Ogungbemi et al., 2022).

This study examines the impact of marine and aviation insurance on the growth of the Nigerian economy, focusing on their contributions to trade, infrastructure, and risk management. It aims to provide evidence-based insights into how enhanced insurance penetration can address existing challenges and unlock the full potential of these sectors for economic development. The findings will not only contribute to the academic discourse but also inform policymakers, industry stakeholders, and insurers about strategies for improving service delivery and fostering sustainable economic growth in Nigeria.

Statement of the Problem

Marine and aviation insurance are vital to mitigating risks in Nigeria's trade and transportation sectors, which are critical to the nation's economic growth. Marine insurance safeguards against risks associated with maritime transportation, while aviation insurance protects aircraft operations, passengers, and cargo (Gatzert & Kosub, 2020; Flitman et al., 2022). These forms of insurance not only promote trade and investment confidence but also provide financial security against disruptions in logistics and infrastructure. Despite their importance, the penetration of marine and aviation insurance in Nigeria remains limited, largely due to low awareness, inadequate regulatory support, and an unstable economic environment (Nwankwo et al., 2023). The maritime sector, for instance, has been noted to have less than 10% insurance coverage for vessels operating in Nigerian waters, while the aviation sector relies heavily on foreign underwriters, raising concerns about capital flight and the limited capacity of domestic insurers (Ekeocha & Nduka, 2023). These issues call for a deeper understanding of how these insurance classes contribute to Nigeria's economic resilience and growth.

The link between insurance penetration and economic growth has been well documented, but inconsistencies in findings highlight critical gaps in the literature. While studies like Ogungbemi et al. (2022) have demonstrated a positive correlation between insurance penetration and economic growth, other research has focused on challenges such as claim delays, poor regulatory enforcement, and limited domestic underwriting capacity (Adeyemo & Adeniran, 2021). Furthermore, while some studies emphasize the significant role of insurance in supporting trade and transportation infrastructure, others reveal that these benefits are often undermined by operational inefficiencies and regulatory bottlenecks (Zhu et al., 2021; Oluwole, 2018). For example, the predominance of foreign underwriters in aviation insurance raises questions about the domestic industry's ability to capture value and promote economic stability. These inconsistencies suggest that a sector-specific analysis focusing on marine and aviation insurance is needed to provide clarity on their unique contributions to economic growth.

This study fills the gap by focusing specifically on marine and aviation insurance and their impact on Nigeria's economic growth, using key variables such as gross premium, net premium, gross claims paid, and net claims paid to measure their contributions. By examining how these variables influence Real Gross Domestic Product (RGDP), this study addresses the limited focus on sector-specific insurance dynamics and the economic implications of inadequate penetration. It seeks to provide evidence-based recommendations to bridge existing gaps in insurance coverage, enhance regulatory frameworks, and promote sustainable economic growth in Nigeria's trade and transportation sectors.

Research Questions

The study shall be guided by the following research questions;

1. To what extent does marine and aviation insurance gross premium income affect the economic growth (RGDP) in Nigeria?
2. To what extent does marine and aviation net premium affect the economic growth (RGDP) in Nigeria?
3. What effect does marine and aviation insurance gross claim paid have on the economic growth (RGDP) in Nigeria?
4. What effect does marine and aviation insurance net claim paid have on the economic growth (RGDP) in Nigeria?

Hypotheses of the Study

The questions of the research shall be answered in an alternate hypothesis form;

H_{01}: Marine and aviation insurance gross premium income have a significant effect on the economic growth in Nigeria.

H_{02}: Marine and Aviation insurance gross claim paid have a significant effect on the economic growth in Nigeria.

H_{03}: Marine and Aviation insurance gross claim paid have a significant effect on the economic growth in Nigeria.

H_{04}: Insurance total claim have a significant effect on the economic growth in Nigeria.

Literature Review

Conceptual Review

Marine and aviation insurance are critical components of the global insurance industry, providing essential risk mitigation mechanisms for the transportation and logistics sectors. Marine insurance, with its origins tracing back to ancient trade practices, protects against financial losses associated with the shipping of goods, vessels, and other maritime assets (Gatzert & Kosub, 2020). This form of insurance covers risks such as damage to ships and cargo, piracy, and liability for environmental hazards. Aviation insurance, introduced with the advent of air travel, offers comprehensive coverage for aircraft, liabilities to passengers, cargo, and third parties, as well as operational disruptions (Flitman et al., 2022). Together, these insurance classes ensure the resilience of industries that underpin international trade and economic growth.

Recent trends show a growing demand for marine and aviation insurance as global trade and air travel continue to recover from disruptions caused by the COVID-19 pandemic. According to the International Union of Marine Insurance (IUMI, 2023), global marine insurance premiums increased by 6.4% in 2022, driven by higher trade volumes and rising asset values. Similarly, the aviation insurance market has witnessed robust growth, bolstered by increased passenger traffic and higher demand for cargo transportation. Insurers are also innovating by integrating advanced technologies such as telematics and predictive analytics to enhance risk assessment and claims processing, thus improving operational efficiency.

Despite its importance, marine and aviation insurance face significant challenges, including exposure to high-value risks, climate change, and geopolitical tensions. For instance, the ongoing conflict in Ukraine has disrupted global supply chains, increasing the demand for war-risk insurance coverage for maritime and aviation operations (Lloyd's Market Report, 2023). In addition, the rising frequency of natural disasters poses substantial risks to shipping and aviation operations, necessitating higher premiums and more stringent underwriting standards. Insurers must continuously adapt to these dynamic risk environments to provide adequate protection.

Global regulatory frameworks also play a pivotal role in shaping the marine and aviation insurance sectors. The International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) establish guidelines to ensure safety and compliance in these industries. These frameworks, along with national regulations, influence insurance practices and determine coverage requirements for marine and aviation activities. However, inconsistencies in enforcement and variations in regulatory standards across regions pose challenges for insurers and policyholders alike (Adeyemo & Adeniran, 2021).

Marine and Aviation Insurance in Nigeria

In Nigeria, marine and aviation insurance play a crucial role in supporting the country's trade and transportation sectors. As a leading exporter of crude oil and a significant importer of industrial goods and consumer products, Nigeria relies heavily on its maritime and aviation infrastructure. Marine insurance provides coverage for shipping activities, including cargo and vessel protection, while aviation insurance safeguards aircraft operations and associated liabilities (Okonkwo & Oluwagbemiga, 2022). These insurance products are vital for mitigating risks and ensuring the continuity of economic activities.

The Nigerian marine and aviation insurance market has witnessed steady growth over the years, albeit with significant challenges. Industry reports indicate that marine insurance premiums account for approximately 12% of the country's general insurance market, while aviation insurance remains a smaller but critical segment (NIA, 2023). This growth is attributed to increased trade activities, infrastructural development in the transportation sector, and a rising awareness of the importance of insurance among businesses and individuals.

Despite these positive developments, the penetration of marine and aviation insurance in Nigeria remains relatively low compared to global standards. Regulatory bottlenecks, low public awareness, and the dominance of foreign underwriters in the aviation insurance sector have hindered the growth of domestic insurers (Ekeocha & Nduka, 2023). Furthermore, challenges such as piracy in the Gulf of Guinea and aviation safety concerns have heightened the risk exposure of insurers, leading to higher premiums and reduced affordability for local businesses.

The Nigerian insurance industry is governed by the National Insurance Commission (NAICOM), which oversees regulatory compliance and promotes best practices. In recent years, NAICOM has introduced several reforms to enhance the capacity of domestic

insurers and improve industry standards. For instance, the commission's recapitalization policy aims to strengthen the financial base of insurance companies, enabling them to underwrite higher-value risks in marine and aviation sectors (Adeyemo & Adeniran, 2021). However, the implementation of these reforms has faced resistance from industry stakeholders, highlighting the need for more collaborative approaches.

Variables for Measuring Marine and Aviation Insurance:

Marine and Aviation Insurance Gross Premium

Marine and aviation insurance gross premium represents the total amount of premium income generated from policies underwritten in these sectors before deducting reinsurance and other expenses. It serves as a key indicator of market size and growth, reflecting the level of risk coverage provided by insurers (Oyewole et al., 2018). In Nigeria, gross premiums for marine and aviation insurance have shown moderate growth in recent years, driven by increased trade volumes and higher demand for cargo transportation insurance.

Global trends indicate a steady increase in gross premiums for marine and aviation insurance, with developed markets leading the charge. For example, the IUMI (2023) reported that global marine insurance premiums reached $33 billion in 2022, representing a 6.4% year-on-year growth. In Nigeria, however, gross premiums remain constrained by low insurance penetration and the dominance of foreign underwriters in the aviation sector (Ekeocha & Nduka, 2023). Addressing these challenges requires targeted efforts to enhance public awareness and build the capacity of domestic insurers.

Marine and Aviation Net Premium

Net premium refers to the portion of gross premium retained by insurers after deducting reinsurance costs. It provides insights into the financial health and risk-bearing capacity of insurance companies. In Nigeria, marine and aviation insurance net premiums have been affected by high reinsurance costs, as local insurers often cede significant portions of their business to international reinsurers (NIA, 2023). This reliance on reinsurance highlights the need for domestic capacity building to reduce capital flight and strengthen the industry.

Marine and Aviation Insurance Gross Claim Paid

Gross claims paid represent the total amount of claims settled by insurers for losses incurred under marine and aviation policies. This variable is critical for assessing the claims-paying ability and operational efficiency of insurance companies. In Nigeria, gross claims paid in these sectors have increased in recent years due to rising incidences of piracy, accidents, and operational disruptions (Nwankwo et al., 2023). Efficient claims management is essential for building trust among policyholders and ensuring customer satisfaction.

Marine and Aviation Net Claims Paid

Net claims paid, the amount settled by insurers after accounting for reinsurance recoveries, is a key measure of profitability and risk exposure. High net claims paid can erode profitability, emphasizing the need for effective risk management strategies. Nigerian insurers must invest in advanced analytics and data-driven decision-making to improve claims processing and enhance operational efficiency (Adeyemo & Adeniran, 2021).

Economic Growth Concept

Economic growth is a fundamental indicator of a nation's development, reflecting the increase in the production of goods and services over time. Measured by metrics such as Real Gross Domestic Product (RGDP), economic growth is influenced by various factors, including trade, investment, infrastructure development, and financial services. In Nigeria, the insurance industry, particularly marine and aviation insurance, plays a crucial role in supporting economic growth by mitigating risks and promoting business confidence (Ogungbemi et al., 2022).

The relationship between insurance and economic growth has been widely studied, with findings indicating a positive correlation. Insurance facilitates economic activities by providing financial security, enabling businesses to recover from losses and continue operations without significant disruptions. For instance, the availability of marine and aviation insurance ensures that shipping companies, airlines, and related businesses can operate with minimal interruptions, even in the face of unpredictable risks such as piracy, accidents, or natural disasters (Gatzert & Kosub, 2020). This support contributes to the overall economic stability and fosters investor confidence.

Theoretical Framework

Financial Intermediation Theory

The Financial Intermediation Theory, first introduced by Schumpeter (1911) and later expanded by Goldsmith (1969) and McKinnon (1973), posits that financial institutions act as intermediaries that allocate resources efficiently, reduce risks, and promote economic growth. Insurance, as a financial intermediary, plays a critical role in mitigating risks and providing liquidity to individuals and businesses, enabling them to undertake productive activities. This theory views insurance services, including marine and aviation insurance, as mechanisms that facilitate trade and economic stability by absorbing sector-specific risks.

In the context of Nigeria, marine and aviation insurance are key drivers of financial intermediation. By providing coverage for risks associated with trade and transportation, such as cargo loss, piracy, and aviation accidents, these insurance types ensure the smooth operation of businesses in critical sectors of the economy. Their role in reducing operational uncertainties helps to attract investments, foster business continuity, and enhance trade facilitation. Thus, the theory explains how insurance contributes to resource allocation and economic productivity, particularly in a developing economy like Nigeria.

This theory is particularly relevant to the study of marine and aviation insurance's effects on economic growth because it underscores their role in creating a stable economic environment. By ensuring that businesses and investors are protected against significant risks, these insurance services directly contribute to sectoral development, infrastructure support, and GDP growth. The Financial Intermediation Theory therefore provides a comprehensive framework for understanding how marine and aviation insurance enhance economic resilience and support the Nigerian economy's overall performance.

Risk Management Theory

The Risk Management Theory, rooted in the works of Markowitz (1952) on portfolio theory and further advanced by Stulz (1984), highlights the importance of identifying, assessing, and mitigating risks to economic decision-making. This theory positions insurance as an essential tool for managing uncertainties in business operations, protecting assets, and ensuring continuity. It explains how businesses use insurance to safeguard against potential financial losses, enabling them to focus on core operational and growth strategies.

In Nigeria, the relevance of Risk Management Theory becomes apparent in sectors like marine and aviation, where uncertainties and risks such as piracy, natural disasters, and accidents are prevalent. Marine and aviation insurance directly mitigate these risks, ensuring that trade routes remain operational and businesses in these sectors are shielded from catastrophic losses. By doing so, insurance enhances investor confidence and facilitates trade and transportation, which are vital to Nigeria's economic activities.

This theory aligns with the study of marine and aviation insurance's impact on economic growth by demonstrating how risk mitigation fosters stability and resilience in key sectors. By reducing the financial burden of unforeseen events, insurance allows businesses to allocate resources efficiently and focus on growth. The application of Risk Management Theory in this study helps explain how marine and aviation insurance support economic performance by creating a risk-free environment for business operations (Markowitz, 1952; Stulz, 1984).

Endogenous Growth Theory

The Endogenous Growth Theory, developed by Romer (1986, 1990) and Lucas (1988), emphasizes the role of human capital, innovation, and financial services in driving sustainable economic growth. According to this theory, investments in knowledge, technology, and infrastructure yield long-term benefits for economic performance. Insurance services are viewed as critical enablers of such investments by protecting assets and providing financial support for innovation.

Marine and aviation insurance in Nigeria contribute to economic growth by enhancing productivity in transportation and logistics sectors. Through risk protection, these insurance services promote innovation and efficiency in trade and infrastructure development. For instance, by covering the risks associated with maritime operations and

aviation services, insurance fosters confidence in businesses and encourages investment in advanced technology and operational improvements. This, in turn, leads to greater sectoral output and contributes to economic growth.

Endogenous Growth Theory is particularly relevant to understanding how marine and aviation insurance impact economic development. By ensuring stability and encouraging innovation in critical sectors, insurance facilitates sustainable economic performance. The theory's emphasis on the role of financial services in productivity growth makes it a valuable framework for exploring the dynamic relationship between insurance and Nigeria's economic performance (Romer, 1986; Lucas, 1988).

Among the three theories, the Financial Intermediation Theory is most suitable for anchoring this study. This theory provides a robust explanation of how insurance functions as a financial intermediary to promote economic stability and growth. In the Nigerian context, marine and aviation insurance mitigate trade and transportation risks, facilitate resource allocation, and attract investments. These functions align closely with the theory's central tenets of risk absorption and financial intermediation.

Empirical Reviews

Ogungbemi et al. (2022) explored the role of insurance penetration in driving economic growth in Nigeria, with a focus on marine and aviation insurance sectors. Using time-series data from 2000 to 2021, the study adopted a Vector Error Correction Model (VECM) to analyze the short- and long-term effects of insurance activities on economic growth, proxied by real GDP. The findings revealed a significant positive correlation between insurance penetration, particularly in trade-related policies like marine and aviation insurance, and economic output. The authors attributed this impact to the sector's ability to mitigate risks, promote confidence in transportation and logistics, and attract foreign direct investment. However, the study also highlighted challenges such as low penetration rates and inefficient claims processing, which limit the full potential of the industry. The study concludes with a call for regulatory reforms and public-private partnerships to enhance local underwriting capacity and address systemic bottlenecks.

Adeyemo and Adeniran (2021) investigated the regulatory environment of Nigeria's insurance sector and its implications for marine and aviation insurance. Their mixed-methods research utilized both qualitative interviews with industry stakeholders and quantitative data on gross premiums and claims settled from 2015 to 2020. Findings highlighted regulatory bottlenecks, including inconsistent enforcement of policies by the National Insurance Commission (NAICOM) and inadequate capitalization of local underwriters. These factors limited the sector's ability to contribute meaningfully to economic growth. Additionally, the study emphasized the dominance of foreign underwriters in aviation insurance, which contributed to capital flight and undermined the domestic industry's development. The authors recommended strengthening regulatory frameworks and incentivizing local underwriters to increase their capacity for high-risk sectors like aviation and maritime trade.

Zhu et al. (2021) conducted a comparative study examining the effectiveness of marine and aviation insurance in supporting economic growth in developing economies, including Nigeria. The study utilized a panel data approach, analyzing data from 20 countries between 2000 and 2020. The research revealed that while marine and aviation insurance significantly contributed to trade facilitation and economic stability, operational inefficiencies such as delays in claims settlement, corruption, and limited technological adoption undermined their potential benefits in Nigeria. The study further observed that the integration of advanced analytics and risk management technologies in other developing countries led to better outcomes, suggesting an area for policy intervention in Nigeria. The authors called for investments in digital infrastructure to streamline insurance operations and enhance customer trust.

Although published slightly earlier, Oluwole's (2018) seminal work remains relevant in discussing the challenges of foreign dominance in Nigeria's aviation insurance market. The study utilized case studies of local and foreign underwriters operating in Nigeria to assess the economic implications of capital flight. Findings indicated that 65% of aviation insurance premiums were ceded to foreign underwriters, resulting in reduced domestic market growth. While marine insurance showed better local retention, issues such as piracy risks in the Gulf of Guinea required reliance on international reinsurers, further straining the local industry. The study advocated for targeted capacity-building initiatives to enable local insurers to handle high-value risks and retain a greater share of premiums within the economy.

Ekeocha and Nduka (2023) examined the penetration of marine and aviation insurance in Nigeria and its economic implications. Using survey data from 150 insurance professionals and industry reports, the study revealed that penetration remained below 0.2% of GDP, significantly lower than the global average of 3.5%. Contributing factors included low public awareness, inadequate regulatory enforcement, and high premiums driven by geopolitical risks such as piracy in the Gulf of Guinea. The study also observed that improved penetration could unlock significant economic benefits, including increased trade efficiency and enhanced investor confidence. Recommendations included intensified public awareness campaigns and government-led initiatives to subsidize premiums in high-risk sectors.

Nwankwo et al. (2023) focused on the role of claims management in marine and aviation insurance and its impact on economic stability in Nigeria. Using data on claims settled between 2010 and 2022, the study employed regression analysis to evaluate the relationship between efficient claims processing and policyholder confidence. Results indicated a direct correlation between timely claims settlement and increased uptake of insurance products, which in turn bolstered economic activities in the trade and transport sectors. However, inefficiencies such as prolonged claims processing times and disputes over liability undermined customer trust. The authors suggested implementing automated claims systems and stricter oversight to address these challenges.

Okonkwo and Oluwagbemiga (2022) analyzed the role of the National Insurance Commission (NAICOM) in promoting marine and aviation insurance market growth. The study combined policy analysis with financial data from insurance companies to assess the effectiveness of regulatory interventions. Findings indicated that NAICOM's recapitalization policy had improved local insurers' capacity to underwrite large-scale risks but faced resistance from industry stakeholders. The study also noted that reforms in premium pricing and risk assessment standards had positive effects on market growth. However, inconsistencies in enforcement and limited stakeholder collaboration hindered the full realization of these benefits.

Oyewole et al. (2020) explored trends in gross premiums for marine and aviation insurance in Nigeria and their relationship to economic indicators. Using econometric models, the study found that gross premiums for these sectors grew by an average of 4.8% annually from 2010 to 2019, correlating positively with trade volumes and infrastructural development. However, challenges such as high reinsurance costs and low penetration limited the sectors' overall economic contributions. The study recommended policies to encourage local underwriters and reduce dependence on international reinsurers.

The International Union of Marine Insurance (IUMI) in its 2023 report provided insights into the global trends affecting marine insurance and their implications for economies like Nigeria. The report highlighted that global marine insurance premiums rose by 6.4% in 2022, driven by higher trade volumes and rising asset values. For Nigeria, these trends underscored the need to align domestic practices with global standards, particularly in areas like risk assessment and regulatory compliance. The report also emphasized the role of international collaboration in addressing challenges like piracy and climate change.

In a follow-up study, Ogungbemi et al. (2022) examined the synergies between marine and aviation insurance and broader economic stability in Nigeria. Using macroeconomic data and sector-specific indicators, the study identified a strong linkage between insurance activities and reduced volatility in trade and transport sectors. The authors argued that the predictability provided by robust insurance mechanisms encouraged investments and enhanced GDP growth. However, systemic issues such as regulatory inefficiencies and low public awareness remained significant barriers to maximizing these benefits.

Isimoya and Akindipe (2022) examined the relationship between gross premium income and claims settlement in Nigeria's marine and aviation insurance markets from 2011 to 2021. Data sourced from the Nigerian Insurers Association (NIA) annual reports and digest on gross premium income and gross claims paid were analyzed using a stationarity test, which confirmed the data's stability at the 1%, 5%, and 10% significance levels. Ordinary least squares regression analysis revealed a computed probability value of 0.0866, exceeding the 0.05 threshold for statistical significance, indicating an insignificant relationship between the variables. Additionally, the coefficient of determination (R^2 = 0.291294) showed that gross premium income accounted for only 29.12% of total claims paid. These findings suggest that the relationship between gross premium income and claims settlement in Nigeria's marine and aviation insurance sectors is statistically

insignificant, highlighting inefficiencies in the market and the need for improvements to enhance sector performance.

Methodology

The study adopted an ex-post facto research design, which is appropriate for analyzing existing data from credible and reliable sources that cannot be manipulated by the researcher. Time-series data spanning 1998 to 2023 were utilized, sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, the Insurance Digest, and the annual reports of the National Insurance Commission (NAICOM). The analysis employed a range of statistical tools, including Descriptive Statistics, Augmented Dickey-Fuller Unit Root Test, Auto-Regressive Distributed Lag (ARDL) Bound Test, and the Short-run Error Correction Model (ECM). Post-estimation tests were conducted to evaluate the stability and validity of the ECM model using the Residual Diagnostic and Model Stability Test. These included the Correlogram Squared Test, Breusch-Godfrey Serial Correlation LM Test, Histogram Normality Test, and CUSUM of Squares Test. The choice of this methodology is justified as it ensures rigorous analysis of the data, enhances the robustness of the results, and provides a reliable framework for understanding the relationships under study.

Model Specification

The variable used for this research work include: Marine and Aviation Gross Premium, Marine and Aviation Net Premium, Marine and Aviation Gross Claim, Marine and Aviation Net Claim, and Real Gross Domestic Product.

Thus, the model can be specified functionally as:

$RGDP = f(MAGPR, MANPR, MAGC, MANC)$ .....(1)

Explicitly, this is specified to carry its parameters

$RGDP = b_0+b_1MAGPR+ b_2MANPR+b_3MAGC+ b_4MANC+ e$.....(2)

Where:

RGDP: Real Gross Domestic Product;

MAGPR: Marine and Aviation Gross Premium

MANPR: Marine and Aviation Net Premium

MAGC: Marine and Aviation Gross Claim

MANC: Marine and Aviation Net Claim

b_0: Constant.

b_1-b_4: Co-efficient

e: Random or error term

Results and Discussion

Table 1: Descriptive Statistics

	RGDP	MAGPR	MANPR	MAGCP	MANC
Mean	51618.55	17477.28	10190.24	5263.809	2920.361
Median	56061.62	16549.04	10405.09	3870.800	2635.455
Maximum	72647.17	42455.69	19722.35	13303.84	7492.040
Minimum	22332.87	1624.009	893.9200	129.4840	56.42000
Std. Dev.	18449.76	11602.18	6152.019	4490.413	2227.812
Skewness	-0.337800	0.532598	-0.113505	0.593306	0.438097
Kurtosis	1.568927	2.420986	1.676913	1.898725	2.013411
Jarque-Bera	2.713106	1.592392	1.952268	2.839256	1.886164
Probability	0.257547	0.451042	0.376765	0.241804	0.389426
Sum	1342082.	454409.2	264946.2	136859.0	75929.39
Sum Sq. Dev.	8.51E+09	3.37E+09	9.46E+08	5.04E+08	1.24E+08
Observations	**26**	**26**	**26**	**26**	**26**

Source: Eviews 10

Table 1 summarizes the descriptive statistics for the study variables, including Real Gross Domestic Product (RGDP), Marine and Aviation Gross Premium (MAGPR), Net Premium (MANPR), Gross Claim (MAGCP), and Net Claim (MANC). RGDP has a mean of 51,618.55 and moderate variability (standard deviation of 18,449.76), with values ranging from 22,332.87 to 72,647.17. MAGPR and MANPR exhibit mean values of 17,477.28 and 10,190.24, while MAGCP and MANC have mean values of 5,263.81 and 2,920.36, respectively, reflecting differences in premium and claim levels. The Jarque-Bera test shows all variables are normally distributed (p-values > 0.05), ensuring suitability for further statistical analysis.

Table 2: Augmented Dickey-Fuller Unit Root Result

Variables	Test Results @Levels			Test Results @1st Difference			Order of Integration
	Trend and Intercept			Trend and Intercept			
	t-stat	Critical Value	Prob.	t-stat	Critical Value	Prob.	
LgRGDP	1.1614	-3.632896	0.9998	-4.0287	-3.644963	0.0240	I(1)
LgMAGPR	-2.2473	-3.632896	0.4427	-5.7073	-3.644963	0.0008	I(1)
LgMANPR	-1.5512	-3.632896	0.7791	-5.3597	-3.644963	0.0016	I(1)
LgMAGCP	8.2752	-3.632896	0.0000				1(0)
LgMANC	-7.8968	-3.632896	0.0000				I(0)

Source: Author Computation from E-view output, 2024

Table 2 presents the Augmented Dickey-Fuller (ADF) Unit Root Test results for the study variables. The test assesses stationarity at levels and first differences with trend and intercept. At levels, LgRGDP, LgMAGPR, and LgMANPR are non-stationary, as their probabilities exceed 0.05. However, after first differencing, these variables become

stationary with probabilities below 0.05, confirming integration of order one, I(1). Conversely, LgMAGCP and LgMANC are stationary at levels with significant probabilities, indicating integration of order zero, I(0). These results validate the mix of I(0) and I(1) variables, justifying the use of the Auto Regressive Distributed Lag (ARDL) approach for further analysis.

Table 3: ARDL Bound Test for co-integration

ARDL Bounds Test
Date: 12/18/24 Time: 14:09
Sample: 1998 2023
Included observations: 26
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	5.882525	4
Critical Value Bounds		
Significance	Io Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Eviews 9 output, 2024

Table 3 displays the ARDL Bound Test results for co-integration, analyzing the long-run relationships among the variables. The calculated F-statistic value of 5.882525 exceeds the upper bound critical values at all significance levels (10%, 5%, 2.5%, and 1%), which are 3.52, 4.01, 4.49, and 5.06, respectively. This indicates the rejection of the null hypothesis of no long-run relationships, confirming the existence of a long-term equilibrium relationship among the variables under study. These findings support the appropriateness of the ARDL approach for modeling the short-run and long-run dynamics of the variables.

Table 4: ARDL short run Correction Model Results

Dependent Variable: D(LGRGDP)
Method: Least Squares
Date: 12/24/22 Time: 14:25
Sample (adjusted): 2000 2020
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.024255	0.009587	2.530091	0.0240
D(LGRGDP(-1))	0.521567	0.159000	3.280297	0.0055
D(LGMAGPI)	-0.083452	0.035849	-2.327843	0.0354
D(LGMANPR)	0.086510	0.029073	2.975623	0.0100
D(LGMAGCP)	-0.011847	0.036929	-0.320812	0.7531
D(LGMANC)	0.014211	0.027963	0.508201	0.6192
ECM(-1)	-0.149006	0.064357	-2.315293	0.0363

R-squared	0.739083	Mean dependent var	0.054695
Adjusted R-squared	0.627261	S.D. dependent var	0.036870
S.E. of regression	0.022510	Akaike info criterion	-4.488495
Sum squared resid	0.007094	Schwarz criterion	-4.140321
Log likelihood	54.12920	Hannan-Quinn criter.	-4.412932
F-statistic	6.609483	Durbin-Watson stat	2.130634
Prob(F-statistic)	0.001767		

Source: Eview 9 Output

Residual Diagnostic Test

Table 5: Correlogram Squared Test

Date: 12/18/24 Time: 14:27
Sample: 1998 2023
Included observations: 26

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. *| . |	. *| . |	1	-0.128	-0.128	0.3932	0.531
. *| . |	. *| . |	2	-0.136	-0.155	0.8619	0.650
. | . |	. | . |	3	0.060	0.021	0.9579	0.811
. *| . |	. *| . |	4	-0.076	-0.089	1.1217	0.891
. *| . |	. *| . |	5	-0.129	-0.147	1.6216	0.899

Source: From Eview 9

The results of the correlogram squared test are used to complement the Durbin-Watson statistic in the regression table. When the p-values exceed 5%, it indicates that the model is free from autocorrelation issues. In this analysis, all p-values across periods 1 to 5 are well

above the 5% threshold, confirming that the model does not suffer from autocorrelation problems. hese results confirm the adequacy of the model in terms of residual independence, indicating that the model is well-specified and reliable for inference.

Table 6: Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.585302	Prob. F(2,12)	0.2449
Obs*R-squared	4.388928	Prob. Chi-Square(2)	0.1114

Source: From Eview 9

The Breusch-Godfrey Serial Correlation LM test was conducted to assess the presence of serial correlation in the model. The results show an F-statistic of 1.585302 with a corresponding probability value of 0.2449, and an Obs*R-squared value of 4.388928 with a Chi-Square probability of 0.1114. Since both p-values are above the 5% significance level, the test confirms that the model does not exhibit serial correlation.

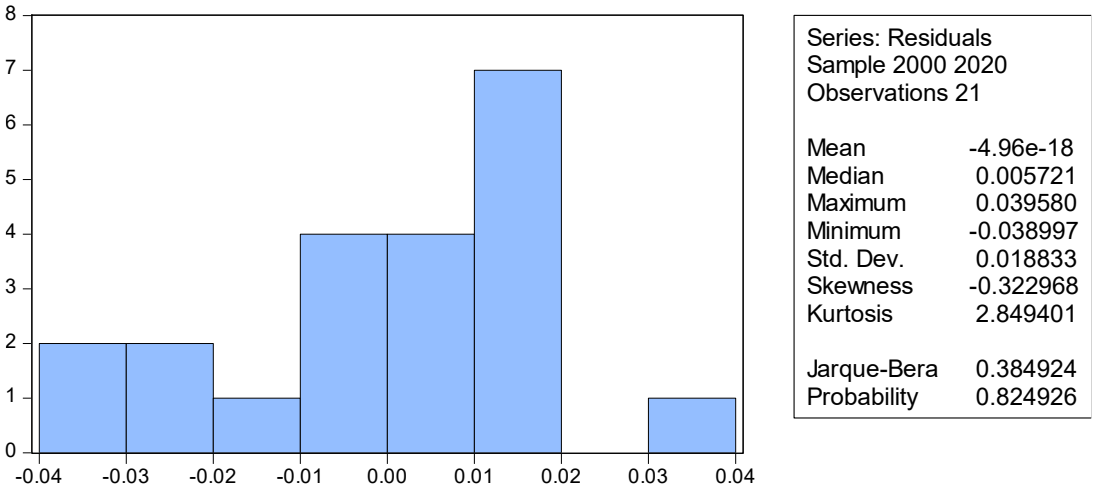

Figure 1: Histogram Test of Normality

The histogram test of normality, as shown in Figure 1, reports a Jarque-Bera probability value of 0.824926, which is significantly greater than the 5% threshold (0.05). This result implies that the residuals of the model are normally distributed, confirming the stability and reliability of the model. A normally distributed residual supports the validity of the statistical inferences, ensuring that the model is well-specified and suitable for explaining the relationship among the variables under study.

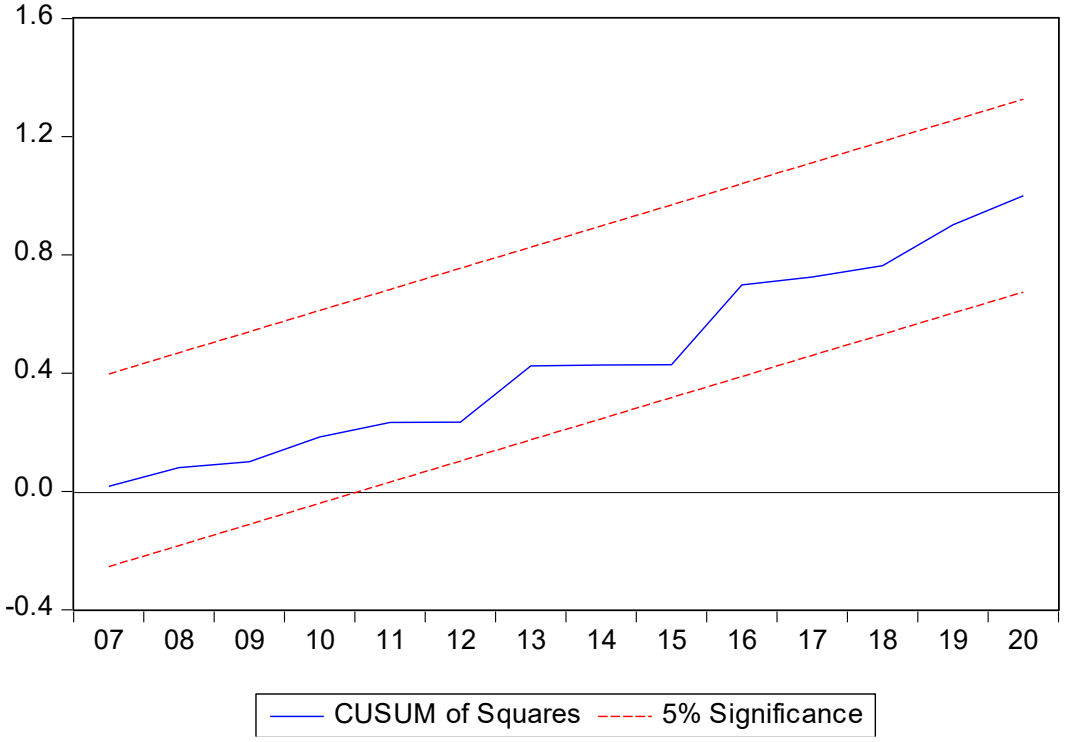

Figure 2: Stability test (CUSUM Residual Test)

The CUSUM Residual Test result, where the cumulative sum line remains inside the critical boundaries, indicates that the coefficients of the Error Correction Model (ECM) are stable over time. This stability suggests that the long-run relationships between the variables in the model have not significantly changed, validating the ECM as a reliable tool for capturing these relationships. The stability of the model implies its suitability for forecasting and policy analysis, as it ensures that the model's coefficients remain consistent, thereby providing dependable predictions and supporting the model's overall validity for economic interpretations and decision-making.

Hypotheses Testing

The E-view highlighted the result that is significant with the output indicating significant at 5% level. Reject the null hypothesis if *p*-value ≤ 0.05. The formulated hypotheses are;

H_{01}: Marine and aviation insurance gross premium have a significant effect on the economic growth in Nigeria.

Looking closely at the above table, key factors like P-value of 0.0354<5% level of significance and t-statistic value of -2.327843, indicates that the alternate hypothesis is accepted. Therefore, the study concludes that Marine and aviation insurance gross premium has a negative but significant effect on the economic growth in Nigeria.

H_{02}: Marine and Aviation insurance net premium have a significant effect on the economic growth in Nigeria.

Glancing through Table 4, we see again the probability value of 0.0100<5% level of significance. It also has a t-statistics of 2.975623. The implication is that the alternate hypothesis is accepted. The study concludes that Marine and Aviation insurance net premium have a positive and significant effect on the growth of the Nigerian economy.

H_{03}: Marine and Aviation insurance gross claim paid have a significant effect on the economic growth in Nigeria.

Result from Table 4, shows the probability value of 0.7531>5% level of significance. It also has a t-statistics of -0.320812. The implication is that the alternate hypothesis is rejected. Therefore, the study concludes that Marine and Aviation insurance gross claim paid has a negative and insignificant impact on the economic growth in Nigeria.

H_{04}: Marine and Aviation insurance net claim paid have a significant effect on the economic growth in Nigeria.

Result from Table 4.3, shows the probability value of 0.6192>5% level of significance. It also has a t-statistics of 0.508201. The implication is that the alternate hypothesis is rejected. Therefore, the study concludes that Marine and Aviation insurance net claim paid has a positive but insignificant effect on the economic growth in Nigeria.

Discussion of Result and Findings

The findings from the ARDL short-run correction model provide key insights into the dynamics of marine and aviation insurance's impact on economic growth in Nigeria, as proxied by Real GDP (RGDP).

Lagged Real GDP (D(LGRGDP(-1))) coefficient of 0.521567: This result suggests that past economic performance (real GDP) significantly influences current economic growth. The positive and significant coefficient indicates that an increase in real GDP in the previous period leads to an increase in the current period, implying that economic growth has a persistent effect. This finding aligns with Ogungbemi et al. (2022), who observed that insurance penetration, especially in the marine and aviation sectors, positively affects economic output, suggesting that the effects of past economic stability continue to promote future growth.

Marine and Aviation Gross Premium (D(LGMAGPI)) coefficient of -0.083452: The negative and statistically significant coefficient suggests that an increase in gross premiums in the marine and aviation insurance sectors is associated with a decrease in current economic growth. This result could reflect the high costs and potential inefficiencies in the insurance market, which may limit its positive economic impact. The findings of Adeyemo

and Adeniran (2021) support this, as their study highlighted regulatory bottlenecks and inconsistent enforcement of policies, which can impede the growth potential of the insurance sector and reduce its contribution to the broader economy.

Marine and Aviation Net Premium (D(LGMANPR)) coefficient of 0.086510: This positive and significant coefficient indicates that an increase in net premiums in the marine and aviation insurance sectors positively influences economic growth. This suggests that more robust and efficient insurance operations can foster economic development, potentially by mitigating risks in trade and transport. Zhu et al. (2021) noted that while operational inefficiencies limit the potential benefits, more effective insurance markets can support economic stability, thus aligning with this finding.

Marine and Aviation Gross Claim (D(LGMAGCP)) coefficient of -0.011847: The insignificant coefficient for gross claims indicates that changes in the volume of claims do not have a statistically significant effect on economic growth in the short term. This finding suggests that while claims are an integral part of the insurance business, their direct impact on economic performance might be less pronounced compared to premiums. Ekeocha and Nduka (2023) observed that the penetration of insurance, especially in high-risk sectors like marine and aviation, remains low, which could explain the weak relationship between gross claims and economic output.

Marine and Aviation Net Claim (D(LGMANC)) coefficient of 0.014211: Similarly, the insignificant coefficient for net claims suggests that variations in net claims do not have a notable effect on economic growth in the short term. This is consistent with Nwankwo et al. (2023), who found that inefficiencies in claims management, such as delayed settlements, can undermine the sector's ability to drive economic growth, potentially explaining the weak effect of net claims on GDP.

Error Correction Term (ECM(-1)) coefficient of -0.149006: The negative and statistically significant coefficient for the error correction term indicates that the model adjusts to long-term equilibrium, with a correction speed of approximately 15% per period. This suggests that any short-term deviations from equilibrium are gradually corrected over time. This aligns with Okonkwo and Oluwagbemiga (2022), who found that regulatory reforms, such as NAICOM's recapitalization policy, helped improve the capacity of local insurers and corrected inefficiencies in the sector, enabling a better alignment with long-term economic goals.

Conclusion

The findings imply that past economic performance plays a crucial role in determining current growth, while the effects of marine and aviation insurance premiums on economic growth are mixed. Gross and net claims do not appear to significantly affect economic

growth in the short run, and the error correction term highlights the gradual adjustment of the economy to a long-term equilibrium. These findings are consistent with prior studies that emphasize the need for regulatory improvements, increased insurance penetration, and enhanced operational efficiency to maximize the economic benefits of the marine and aviation insurance sectors in Nigeria.

Recommendations

Recommendations from the findings of the study have it that:

Strengthening the Impact of Gross Premium: NAICOM should regulate premiums to make them more affordable, especially in high-risk sectors like marine and aviation. This can be achieved through tax breaks, subsidies, and promoting local underwriters.

Improving Net Premiums and Economic Growth: Insurance companies should design more affordable and flexible insurance products. Public awareness campaigns should be launched to promote the benefits of insurance, leading to higher net premiums.

Efficient Claims Management: Insurance companies should invest in digital claims processing platforms to expedite settlements. NAICOM should enforce timely claims processing through penalties for delays.

Addressing Low Insurance Penetration: The government should subsidize premiums for high-risk sectors like marine and aviation. Public awareness campaigns should highlight insurance's role in mitigating risks and attracting investments.

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Appendix

Table 1: data for aviation and marine insurance on economic growth in Nigeria from 1998 to 2023

YEAR	Marine and Aviation Gross Premium (₦,Mill)	Marine and Aviation Net Premium (₦,Mill)	Marine and Aviation Gross Claim (₦,Mill)	Marine and Aviation Net Claim (₦,Mill)	Real Gross Domestic Product (₦,Bill)
1998	1,624.01	893.92	129.48	56.42	22,332.87
1999	2,349.66	956.78	1,068.93	785.21	22,449.41
2000	3,103.37	1,335.26	440.83	234.13	23,688.28
2001	3,997.07	1,625.32	790.65	560.15	25,267.54
2002	4,269.54	2,547.35	900.88	759.26	28,957.71
2003	7,219.71	4,467.89	1,240.57	985.17	31,709.45
2004	7,959.76	5,598.01	1,361.42	872.22	35,020.55
2005	10,983.38	5,032.95	1,266.22	928.7	37,474.95
2006	10,493.41	5,315.48	1,493.41	862.23	39,995.50
2007	10,757.81	7,154.96	1,904.23	895.465	42,992.41
2008	16,510.25	13,012.41	3,185.00	2,014.31	46,012.52
2009	17,191.14	10,083.69	4,556.60	3,311.87	49,856.10
2010	21,264.62	15,071.67	2,965.17	2,217.64	54,612.20
2011	22,558.84	16,680.44	2,889.58	1,534.44	57,511.04
2012	26,077.15	16,636.39	8,042.04	5,204.59	59,929.89
2013	14,726.61	9,561.03	6,288.55	4,046.65	63,218.72
2014	18,342.52	12,987.83	5,437.56	4,227.14	67,152.79
2015	16,582.31	10,242.06	7,015.32	4,366.97	69,023.93
2016	16,515.76	10,851.24	6,879.16	4,249.81	67,931.24
2017	16,916.21	10,568.12	5,570.08	3,053.27	68,490.98
2018	26,472.04	14,740.78	13,303.84	7,128.17	69,810.02
2019	27,972.82	16,608.87	11,349.68	7,492.04	71,387.83
2020	33,107.78	16,608.87	12,922.09	5,784.63	70,800.54
2021	35,819.95	17,854.26	12,143.45	5,458.07	71,656.65
2022	39,137.82	18,788.31	11,952.58	4,786.30	72,151.91
2023	42,455.69	19,722.35	11,761.70	4,114.53	72,647.17

Source: CBN Bulletin, NAICOM annual reports, Insurance Digest