# EFFECT OF PREMIUM INCOMES AND INTEREST RATES ON ECONOMIC GROWTH IN NIGERIA

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***Abstract***

*Despite the challenges plaguing Nigeria insurance industry, it has experienced a growing volume of business underwritten in the past years which amount to an increase in premium collections with a consequential positive effect on the GDP. This research work, therefore, sets out to appraise the effect of premium income and interest rates on economic growth in Nigeria. Five insurance companies were selected to carry out the study for the period between 2010 and 2019. We employed econometric techniques analysis (as a test of descriptive statistics and co-integration) in our methodology. The variables were also subjected to a stationarity test and pooled ordinary least square estimation, fixed effect estimation, and random effect estimation were performed on them. The results show that insurance premius, when combined with net premium, profit after tax, and profit before tax have a considerable impact on the Nigeria economic development.*

**Keywords:** Premium Incomes, Interest Rates Economics Growth, Financial Markets.

## 1. Introduction

The Nigerian insurance industry continues to thrive despite its challenging operating environment. The sector has continually presented a good opportunity for investors and large amount of foreign private investment has been attracted in recent years. However, the industry has been facing challenges largely bothers on their earnings in terms of premiums and investment incomes (Udofia, 2020). Like any other country worldwide, Nigeria economy has been hit by the incident of Covid-19 pandemic. In addition, the year 2020 civil unrest (End Sars protest) also have negative effect in every sector of the economy insurance industry inclusive. Despite these challenges, the industry still experienced an increase in the business volume underwritten in past years which amount to increase in premium collections with consequential positive effect on the GDP (Agbo, 2020). Apart from being a major catalyst to the positive balance of payments, insurance industry also ensures financial stability, provision of employment and accelerated growth in the Nigeria economy. For insurance industry to attain these goals, the importance of interest

rate cannot be overemphasized. Primarily, the role of interest rate is to ensure in the mobilization and utilization of financial for economic growth. Interest rate also encourage swing in assets portfolio of both banks and non-banks public institutions which insurance belongs. Hence, the primary importance to economic agents and policy are influenced by the direction and magnitude of changes in the market interest rates. For insurance industry to attain its full potential, good corporate governance and continuous consumer education is required.

Kumar and Kartheeswari, (2012) posited that the major factor that influence economic growth of any country are the GDP growth rate, the rates of domestic and household savings as well as disposable income. This state of the economy consequentially had significant influence on insurance business. Many of the policies offered by life insurance firms are subject to interest rate fluctuations. For instance, consider a whole life insurance policy, in which the policyholder makes a series of regular payments over time in exchange for a larger fixed payment later on. Interest rate changes affect the present value of such future payments. A fall in interest rates, in particular, causes future payments to bear greater weight, hence increasing the volume of a life company's liabilities. This is a critical type of interest rate risk that the life insurance market must handle. Constant fluctuation in interest rates with real-time market fluctuations can likely influence large-scale interest rate changes. When discussing relationship between interest rates and insurance, one of the critical components in determining profitability for insurance businesses is interest rate risk. Interest rates and bond with other fixed-income securities are inversely related. A rise in interest rate will lead to a fall in bond or other fixed-income investment. Though fluctuations in either way may have impression on an insurance company's operations, changes in interest rate often lead to increase or fall in an insurer's profits. Interest rates fluctuation maybe a reaction to an array of economic events, including shifts in government policy, international and financial market crises, inflation expectations and long-term economic growth. Economic events like these, on the other hand, are often unpredictable (Keith, 1994). Using chosen insurance businesses in Nigeria as case studies, the current study aims to determine the impact of life insurance premiums on Nigeria's economic growth. It seeks to define the function of interest rates as a critical factor in the insurance market development, as well as how this factor has bolstered the insurance industry in Nigeria.

## 2. Literature Review

Fashagba (2018) used insurance data from 2007 to 2016 to investigate the influence of insurance on the Nigeria economic growth. The study finds out that while the relationship between economic growth and non-life insurance premium are optimal, the relationship between economic growth and life insurance premium are adverse. This implies that there is some level of growth

in the Nigeria's life insurance market. Sajid, Arpah and Angappan, (2017) used a regressive panel technique to trail short- and long-term insurance economic development in seven countries including United Kingdom and United States. They concluded that economic growth and insurance have a long-term beneficial and strained connection. The authors also find out that there exists an adverse relationship between future economic development foreign direct investment. Nwafor (2017) conducted research on the impact of insurance underwriting on the Nigeria economic development for the period of 2007 to 2016. He used standard minimum square regression methods and discovered that Nigeria insurance companies' operations had a significant impact on the country's economic growth, development and unemployment rate.

Sambo (2016) investigated the impact of the Nigeria insurance companies' portfolio investment on the country's GDP from 1996 to 2012 by using multiple regression analysis. He discovered that a greater mix of insurance portfolio would have impact on the GDP, consequently improving the investment in the Nigeria healthcare underwriting. Using the VAR system and the granger causality test, Ismail (2015) studied the economic effects of Turkey's insurance business development on its financial growth and development. He concluded that there is a positive association between economic advancements and the insurance sector's ability to finance large investments around the world as well as issuance of long-term loans. Olayungbo and Akinlo (2015) employ the Bayesian TVP-VAR approach to investigate the dynamic by using financial development and insurance distribution in Africa to study short-and long-term variables. Ozuomba (2013) used an error correction model on the data collected from 71 insurance companies in Nigeria to investigate the impact of insurance investment and premiums on Nigeria's economic growth. He found that there is an optimal relationship between investment and economic growth, demonstrating that investment in the insurance business will aids economic development. Mojekwu, Agwuegbo and Olowokudejo, (2011) applied a vibrant factor system to investigated the influence of insurance returns on Nigeria's economic development over a 20-year period from 1981 to 2008. They discovered that there is a positive relationship between economic development and insurance contributions to the economy, implying that an increase in insurance investments will lead to economic growth.

The results of a study conducted by Omar and Owusu (2007) on five life insurance firms in Lagos revealed that insurance reforms will have a favourable influence on the underwriting profit and gross premium of Nigerian insurance firms. This was in line with Abdulkadir's findings (2008). In his research, he found that the reforms have given the insurance business a new face because the players will underwrite larger risks, increasing their gross premium and profitability. Aduloju, Awoponle, and Oke (2008) also conducted an empirical investigation. According to the report, the reforms' recapitalization exercise has

dramatically reduced the number of insurance firms in Nigeria, giving them a competitive advantage to enhance profitability and improve performance. Consolidation of insurance businesses around the world has yielded various consequences empirically. Though insurance consolidation has boosted development and growth in some nations, it has resulted in underdevelopment in others. The studies conducted by Cummins and Weiss (2004) and Davutyan and Klumpes (2008) on the European insurance industry's consolidation show that there exists not too significant negative effect on one hand for the former, but a significant increase in the economy for the latter.

Akinola and Aparisile (2014) applied econometrics and a fixed effect model to study the impact of insurance on economic growth in some selected Sub-Saharan Africa countries. They posited that the impact is significantly positive. Onuorah and Anyaogu (2013) conducted research on how consolidation in the Nigeria insurance industry has impacted on growth of the Nigerian economy. They came to the conclusion that the trend of macroeconomic variables had remained constant throughout time, and that the government should implement more realistic insurance policies in order to accelerate Nigeria's economic growth.

Yusuf (2014) also applied econometric methodology founded on capital assets pricing model (CAPM) to examine the impact of insurance company consolidation on growth and development of Nigeria economy. The results reveal that a unit change in the consolidation strategy will enhance the economy's gross domestic product (GDP) by around 55% while keeping other economic factors constant. Amaechi (2011) used Bank PHB and NICON plc insurance to conduct research on the influence of consolidation on the industry's performance in Nigeria plc. The findings show that consolidation has fuelled increased in the industry underwriting profitability and capacity. Oke (2012) applied a fixed models and co-integration analysis to measure the short and long run link between economic growth, expansion and development of the Nigeria insurance business. The findings show that the expansion and development in the insurance sector have a favourable and considerable impact on economic growth.

Shittu (2012) used unit root, cointegration, Engle Granger casualty test and error correction model (ECM) to investigate the impact of financial intermediation on Nigeria economic growth for the period of 1970-2010. He concluded that there exists a significant impact of financial intermediation on the economic growth of Nigeria. Outreville (1990) posited that the relationship between GDP per capital and logarithm of property-liability premia per capita is significantly positive based on a sample of 55 emerging countries.

Webb, Grace and Skipper (2002) conducted research on the impact of insurance and banking operations on the economic growth using 55 countries cross country data for a between 1980 to1996. The insurance variables were calculated using the averages premiums of life and non-life insurance business. In the first step, they employed the standard least squares estimation approach, and in the second stage, iterated three stages least squares simultaneous estimation was employed. The fallouts of the first estimation that assumed exogenous financial variables, showed that banking development had a favourable effect on economic growth, but insurance factors have no meaningful impact.

Haiss and Sumeji (2008) used a cross-country panel data analysis to conduct research on the insurance investment and premiums impact on GDP growth in some European countries. While the life insurance business has a favourable impact on GDP growth for some countries, a greater impact for liability insurance has visible impact in the other countries. Their findings also highlighted effect of the level of economic development and real interest rate on the insurance-growth nexus.

Pen-Fen, Chin-Chiang, & Chin-Feg (2012) used geographic areas, life expectancy, young dependence ratio, income, social security expenditures, interest rates, private saving rates, and degree of financial development to investigate the impact of life insurance on economic growth and how the insurance-growth nexus is affected by various factors. Their findings revealed that there is a beneficial impact in the development of the life insurance industry on the economic growth. The insurance-growth nexus differed between countries and conditions. Furthermore, they also discovered that the expansion of the life insurance industry and the growth of the stock market are substitutes rather than complements.

Phutkaradze (2014) study the impact of the insurance sector on post-transition country economic growth and development. The analysis discovered that the insurance variables have no statistical effect on the economic growth and development. In the work of Zouhaier (2014), a static panel data model for the period of 1990-2011 was applied on the data from 23 member nations of the Organization for Economic Cooperation and Development (OECD). He discovered that, while the non-life insurance has a beneficial impact on economic growth, general insurance and non-life have a negative impact on the economy. The empirical study of Yinusa and Akinlo (2013) shows that there is a long-run relationship between economic growth and premium which mean insurance development is linked to economic growth.

## 3. Material Methods

This section contains the methodologies and procedures employed to conduct this study. The capital market is used as a catalyst for expansion in the Nigerian insurance business in this study. The researchers conducted descriptive statistics on the collected secondary data. The study's secondary data came from the annual reports and financial statements of the selected insurance companies. Leadway Assurance, Custodian and Allied Plc, Lasaco Assurance Plc, AIICO Insurance Plc, and NEM Insurance Plc are among the chosen insurance companies. These companies were selected based on their performance in terms of premium incomes and profitability. The data was gathered from 2010 through 2019.

### 3.1. Model Specification and Estimation Technique

The specified linear equations below are the model adopted for this study.

$$GDP = \beta_0 + \beta_1 GPR + \beta_2 NPR + \beta_3 PBT + \beta_4 PAT + \beta_5 INT + \mu \quad (1)$$

$\beta_0$, $\beta_1$, $\beta_2$,$\beta_3$, $\beta_4$ and $\beta_5$ are the corresponding parameter estimates of the explanatory variables and the constant term, $\mu$ is the cross-sectional unit effect. $GPR$ is the gross profit for the period under consideration, $NPR$ is the net profit, $PBT$ is the profit before tax, $PAT$and $INT$ is the interest rate. GDP was used as the dependent variable.

We used panel data analysis on this model to achieve the aims of this study in addition to answering research questions raised. Panel data analysis include pooled ordinary least square estimation, fixed effect estimation, and random effect estimation. A pooled regression requires approximating a single equation on all the data at once by utilizing Ordinary Least Squares (OLS) and it is the easiest technique to estimate a panel data regression (Brooks, 2008).

$$y_{it} = \alpha + \beta x_{it} + u_{it} \quad (2)$$

The most significant disadvantage of a pooled regression is that the average or mean values of the variables, in addition to the intermediating variables, remain constant over time and across all cross-sectional entities. As a result, a pooled regression implies no heterogeneity and no temporal specificity.

The fixed-effects model and the random-effects model are the two basic methodologies that can be used in financial research. The error term is decomposed into an entity-specific effect and a remaining error that varies over time and entities in the fixed-effects model (Brooks, 2008; Verbeek, 2012).

$$y_{it} = \alpha + \beta x_{it} + u_i + \gamma_{it} \quad (3)$$

We used the random-effects model in order to get rid of correlations between error terms, which recommends different intercepts for each entity each time period. However, we used Generalized Least Squares (GLS) on the weighted mean by subtracting it from the variables instead of subtracting the whole mean. The equation of random-effects model for entity-specific is presented below:

$$\dot{y_{it}} = \dot{\alpha} + \beta \dot{x_{it}} + \dot{u_{it}} \quad (4)$$

where

$$\dot{y_{it}} = (y_{it} - \theta \overline{y_i}) \quad (5)$$

$$\dot{\alpha} = (1 - \theta)\alpha \quad (6)$$

$$\dot{x_{it}} = (x_{it} - \theta \overline{x_i}) \quad (7)$$

$$\dot{u_{it}} = (u_{it} - \theta \overline{u_i}) \quad (8)$$

and

$$\theta = 1 - \frac{\sigma_\gamma}{\sqrt{T\sigma_\mu^2 + \sigma_\gamma^2}} \quad (9)$$

This transformation is precisely what is required to verify that the mistake terms have no lingering correlation (Brooks, 2008). Due to the fact that fewer parameters are being estimated, random-effects model generally should be more efficient than the fixed-effects model. In addition, because the GLS technique eliminates only as much variance in the variables as is required to remove the error term correlation., degrees of freedom are well-maintained. The random-effects model, on the other hand, has more stringent assumptions because it can only be used when the composite error term is uncorrelated with all explanatory variables; that is, both $(u\ i)$ and $T$ must be independent of all explanatory variables. When the random-effects model is appropriate, a

Hausman test can be used to determine whether the fixed-effects model should be employed instead. The Hausman test assesses the augmented regression's joint significance of the $y's$:

$$\dot{y_{it}} = \dot{\alpha} + \beta\dot{x_{it}} + \delta\widehat{x_{it}} + \dot{u_{it}} \quad (10)$$

Where $\widehat{x_{it}}$ are the within transformations of the explanatory variables. If the null hypothesis stating that $\delta_1 = 0, \ldots, \delta_k = 0$ is rejected, the random-effects model is mis-specified and the fixed-effects model should be used in its place (Brooks, 2008).

We then log-transformed our specified model in equation (1) to allow for skewness using interest rate as a proxy. If the original data follows a log-normal distribution or roughly so, then the log-transformed data follows a normal or approximately normal distribution.

$$lnGDP_{it} = \beta_0 + \beta_1 lnGPR + \beta_2 lnNPR + \beta_3 lnPBT + \beta_4 lnPAT + \beta_5 INT + \epsilon_{it} \quad (11)$$

## 4. Data Presentation and Analysis

In most econometric investigations, the goal is to uncover and launch a relationship between the many economic variables used in the study. To that end, this chapter will be used to assess the impact of insurance premiums on Nigerian economic growth. This is accomplished by determining the link between the dependent variable, Nigeria's gross domestic product, and the independent variables, gross premium, net premium, profit after tax, and profit before tax. With the use of a statistical software tool, this will be accomplished by employing regression analysis to determine outcomes using the Pooled Ordinary Least Square, Fixed effects, and Random effects approaches.

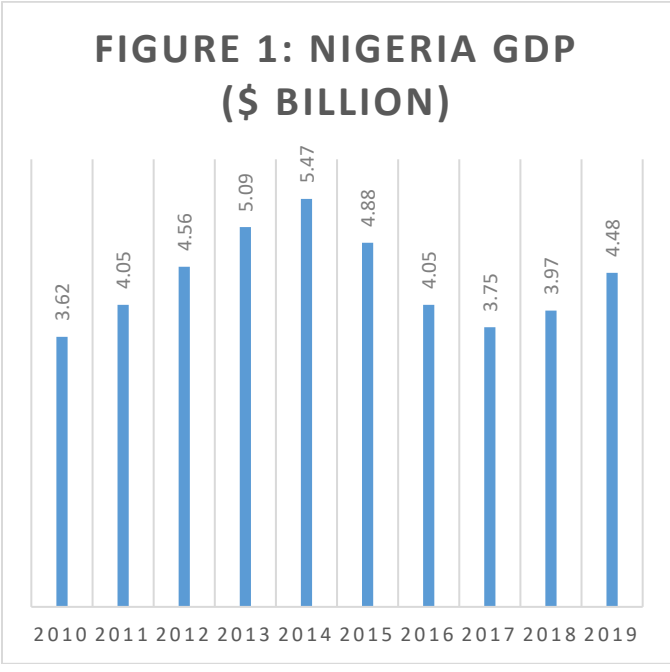
FIGURE 1: NIGERIA GDP ($ BILLION)
3.62
4.05
4.56
5.09
5.47
4.88
4.05
3.75
3.97
4.48
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019

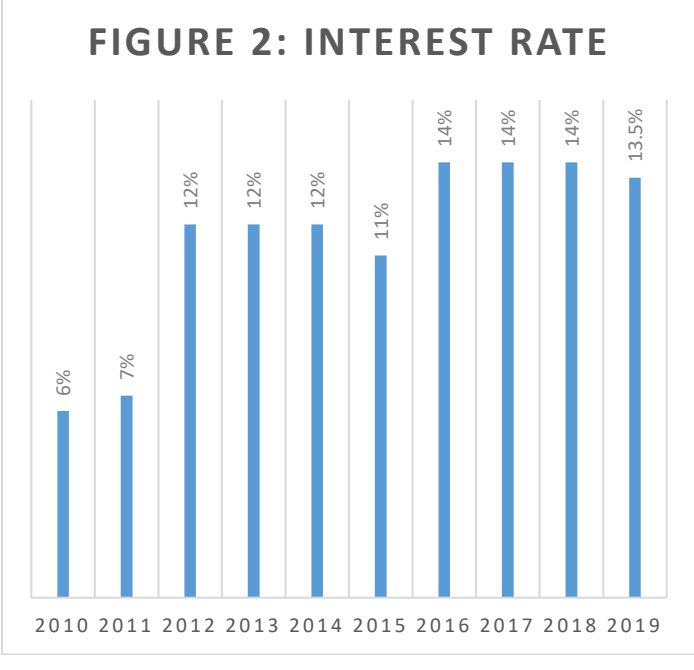
FIGURE 2: INTEREST RATE
6%
7%
12%
12%
12%
11%
14%
14%
14%
13.5%
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019

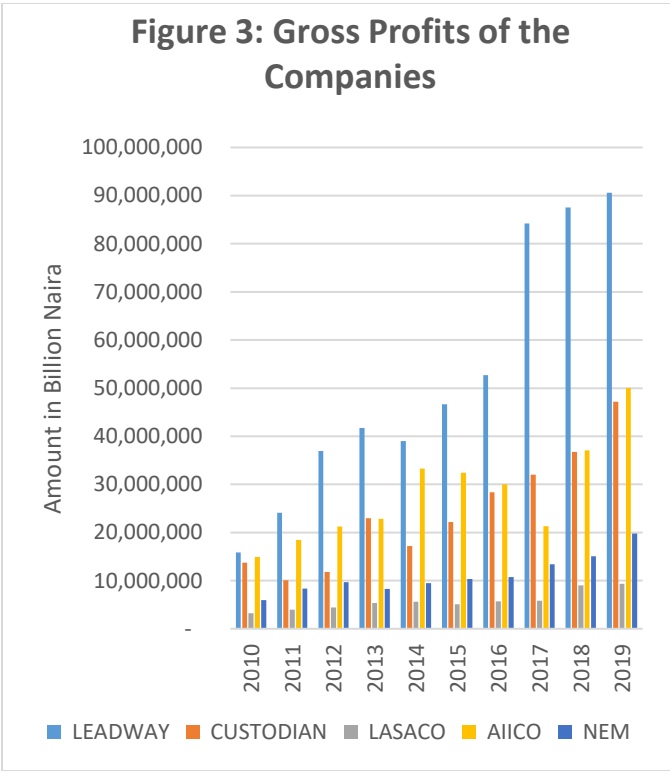
Figure 3: Gross Profits of the Companies
Amount in Billion Naira
100,000,000
90,000,000
80,000,000
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
-
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
LEADWAY
CUSTODIAN
LASACO
AIICO
NEM

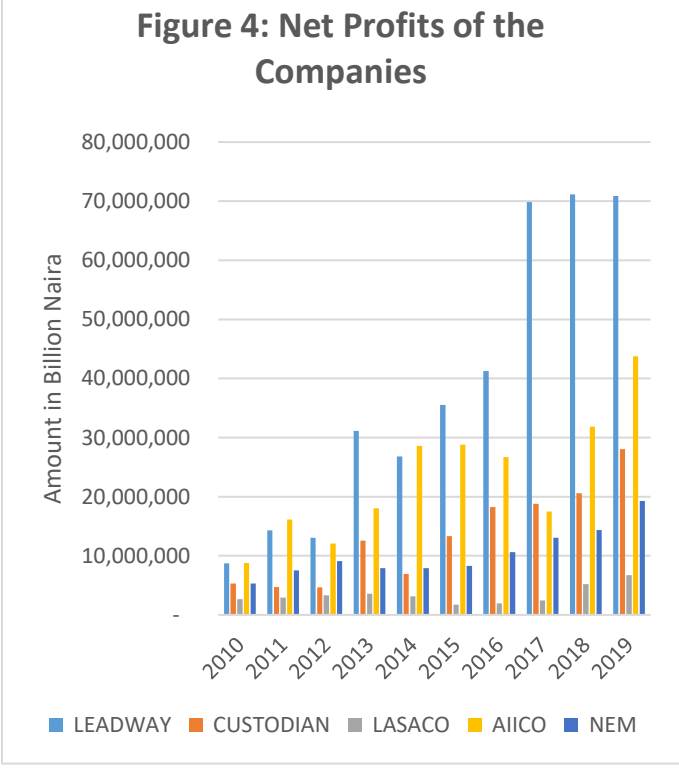
Figure 4: Net Profits of the Companies
Amount in Billion Naira
80,000,000
70,000,000
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
-
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
LEADWAY
CUSTODIAN
LASACO
AIICO
NEM

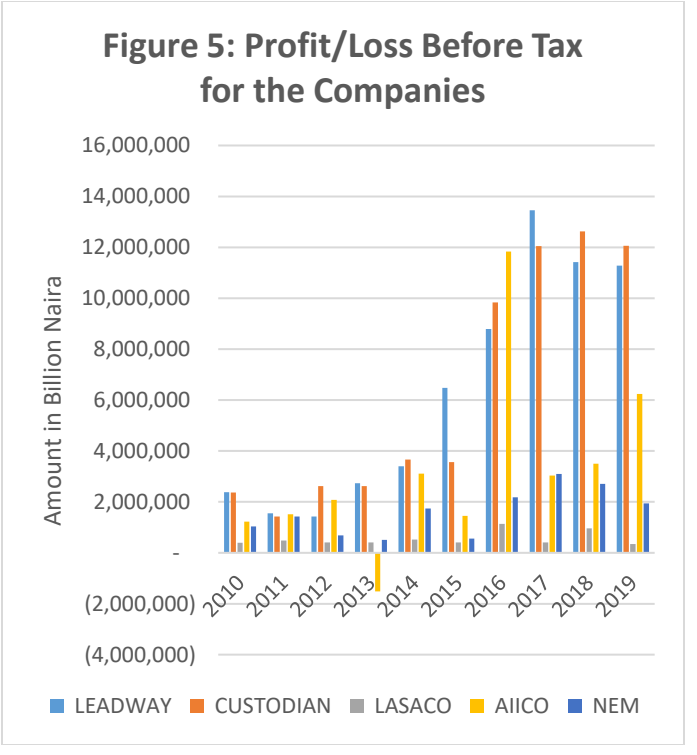
Figure 5: Profit/Loss Before Tax for the Companies
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
-
(2,000,000)
(4,000,000)
Amount in Billion Naira
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
LEADWAY
CUSTODIAN
LASACO
AIICO
NEM

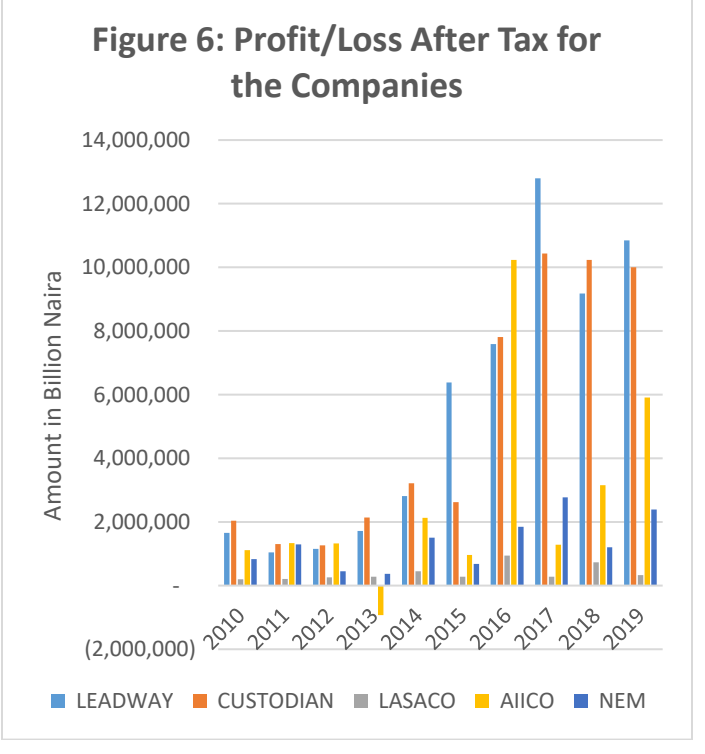
Figure 6: Profit/Loss After Tax for the Companies
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
-
(2,000,000)
Amount in Billion Naira
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
LEADWAY
CUSTODIAN
LASACO
AIICO
NEM

The graphs illustrate trends of the six variables used as dependent and independent variables for the period of 2010 to 2019. Figure 1 present the Nigeria GDP in the period under consideration. It moves from over $3.61Billion in 2010 to its peak of over $5.4Billion in 2014 but nosedive in 2017 to $3.75Billion and later slowly move up to $4.48Billion. The interest rates that were presented in figure 2 steadily moved from 6% in 2010 to 14% in 2018. Figure 3 to shows the gross profits, net profits, profit before tax (PBT) and profit after tax (PAT) of the five selected companies. Leadway Assurance gross and net profits is significantly higher than the other four companies. However, in terms of PBT and PAT, Custodian Assurance also match Leadway Assurance performance from 2017. The least performing companies are LASACO and NEM.

### 4.1. Descriptive Statistics

The influence of insurance premiums on economic growth in Nigeria was explored empirically in this study. To determine the linkages, five insurance firms were studied using pooled ordinary least square, fixed effect, and random effect approaches. Leadway Assurance Custodian and Allied Plc, Lasaco Assurance Plc, AIICO Insurance Plc, and NEM Insurance Plc are the selected insurance companies. The major goal of the research was to assess the empirical influence of insurance premiums on economic growth in Nigeria. As a result, the following is a summary of the findings. The descriptive statistics for the variables GDP, Interest Rate, Gross Premium, Net Premium, Profit Before Tax and Profit After Tax are showed in Table 1 below.

The table shows that the means of the variables under consideration are — $4.38Billion for GDP; 12% for Interest Rate; ₦121,177,537 for Gross Premium; ₦88,513,690 for Net Premium; ₦17,957,991 for Profit Before Tax; and ₦15,013,093 for Profit After Tax. In contrast, the medians for each variable were — $4.26Billion for GDP; 12% for Interest Rate; ₦110,639,771 for Gross Premium; ₦80,523,747 for Net Premium; ₦12,446,455 for Profit Before Tax; and ₦10,523,368 for Profit After Tax. It could be seen that the values of means and medians were very close. This implies the data were evenly distributed with 50% below the median while the remaining 50% at upper part of the median.

**Table 1: Descriptive Statistics**

| Indicators | Nigeria GDP ($ '000) | Interest Rate | Gross Premium | Net Premium | Profit Before Tax | Profit After Tax |
|---|---|---|---|---|---|---|
| Mean | 438,920,000 | 0.12 | 121,177,537 | 88,513,690 | 17,957,991 | 15,013,093 |
| Median | 426,550,000 | 0.12 | 110,639,771 | 80,523,747 | 12,446,455 | 10,523,368 |
| Std. Deviation | 60,808,621 | 0.03 | 52,023,354 | 45,205,364 | 12,530,974 | 11,059,728 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Minimum | 362,000,000 | 0.06 | 53,800,000 | 30,800,000 | 4,760,000 | 3,580,000 |
| Maximum | 547,000,000 | 0.14 | 217,000,000 | 169,000,000 | 33,800,000 | 29,500,000 |
| Skewness | 0.513 | -1.262 | 0.631 | 0.507 | 0.366 | 0.381 |
| Kurtosis | -0.79 | 0.401 | -0.308 | -0.648 | -2.16 | -2.062 |
| Jarque-Bera | 6.4238654 | 5.4673875 | 5.2237945 | 5.9756130 | 11.3189159 | 10.9207655 |
| Probability | 0.0402787 | 0.0649788 | 0.0733952 | 0.0503979 | 0.0034844 | 0.0042519 |

*Author's Computation, 2022*

The standard deviation value of proposes a further detailed and accurate estimate of the dispersion since it specify the instability of the time-series. To this end, the variables gross premium, Net Premium and Profit After Tax had the largest, median and the smallest volatility respectively.

The positive skewness values show that all the variables are rightly skewed except the interest rate with the skewness of the variables less than three. The kurtosis values for all the variables were excessively less than 3 which showed platykurtic distributions. Therefore, the dataset had a lower tail than the normal distribution. It could also be seen that Jarque-Bera test values are high significant values which indicate that at 1% level of significance, the variables under consideration were non-normally distributed.

### 4.2. Pooled OLS, Fixed Effect, and Random Effect Model

Baltagi (2008) stated that the decision of estimating results with a panel or simple regression should be the start of any empirical analysis. To achieve this purpose, a specific test that can aid such a decision should be run. The first results obtained from our analysis is the null hypothesis testing the individual effects, will be rejected, because the OLS estimator was inconsistent and unfit. The estimates of the pooled regression, fixed effect model, and random effect model were showed in table 2.

#### 4.2.1. Pooled OLS Estimation Result for the Model

Table 2 above shows that the coefficient of determination ($R^2$) value of 0.839739 under pooled estimation indicates that changes in exogenous factors account for 84% of the whole variation in economic growth, while the error term accounts for 16% of the total variation. The coefficient's value of Gross Premium is 0.105, implying that a one-unit rise in gross premium will result in a 0.105-unit increase in economic growth in Nigeria and it is statistically significant at 5% with probability value of 0.0501. In the case of the Net Premium, the coefficient is 0.564510, implying that a one-unit rise in net premium will result in a 0.5645-unit increase in Nigerian economic growth. With a p-value of 0.0375, the variable is statistically significant at 5%. In

addition, the coefficient's value of Profit Before Tax is 1.892, implying that a one-unit rise in profit before tax will result in a 1.8925-unit increase in Nigeria's economic growth. However, with a probability value of 0.5892, the variable is not significant at 5%.: The coefficient's value of Profit After Tax is 2.357, implying that a one-unit rise in profit after taxes will result in a 2.357-unit increase in Nigeria's economic growth. With a p-value of 0.4185, the variable is not significant at 5%. For the Interest Rate under pooled effects the coefficient's value is -0.377, implying that every unit increase in interest rate results in a 0.377-unit loss in Nigeria's economic growth. With a p-value of 0.001, the variable is significant at 5%.

**Table 2: Pooled Regression, Fixed Effect and Random Effect Models.**

**Dependent Variable: Log GDP**

| Pooled Regression | | | | | | |
|---|---|---|---|---|---|---|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. | Obs. | R-Square |
| Log GPRE | 0.105555 | 0.052699 | 2.002977 | 0.0501 | 10 | 0.839739 |
| Log NPRE | 0.56451 | 1.67581 | 2.131402 | 0.0375 | 10 | |
| Log PAT | 2.357961 | 2.883611 | 0.81517 | 0.4185 | 10 | |
| Log PBT | 1.892511 | 3.485971 | 0.543182 | 0.5892 | 10 | |
| INT | -0.37752 | 0.056187 | -0.71902 | 0.0000 | 10 | |
| Fixed Effect | | | | | | |
| Log GPRE | 0.102358 | 0.041293 | 2.478824 | 0.0169 | 10 | 0.68587 |
| Log NPRE | 1.854871 | 1.79129 | 0.103037 | 0.9184 | 10 | |
| Log PAT | 4.992131 | 7.741871 | 0.644303 | 0.5226 | 10 | |
| Log PBT | 3.778322 | 2.662491 | 0.141475 | 0.8881 | 10 | |
| INT | -0.32021 | 0.126828 | -0.52478 | 0.0151 | 10 | |
| Random Effect | | | | | | |
| Log GPRE | 0.101985 | 0.039162 | 2.60421 | 0.0118 | 10 | 0.787834 |
| Log NPRE | 8.185621 | 1.70452 | 0.482391 | 0.6314 | 10 | |
| Log PAT | 4.491821 | 4.101291 | 1.097022 | 0.2774 | 10 | |
| Log PBT | 3.161783 | 2.645491 | 0.011989 | 0.9905 | 10 | |
| INT | -0.32932 | 0.086655 | -0.10038 | 0.0004 | 10 | |

*Author's Computation 2022*

### 4.2.2. Fixed Effects Estimate model

Table 2 also show the fixed effect model coefficients. It could be seen that the coefficient of determination ($R^2$) account for 69% of the total variation in economic development, while the error term accounts for 31%. The coefficient's value of the Gross Premium is 0.1023, implying that a one-unit rise in gross premium will result in a 0.1023-unit increase in economic growth in

Nigeria. With a probability value of 0.0169, the variable is statistically significant with $p < 0.05$. The coefficients of Net Premium, Profit Before Tax and Profit After Tax are all positive under fixed effects with 1.854871, 3.778 and 4.992 coefficients respectively. It implies that a one-unit rise in these variables will result in a corresponding increase in the Nigeria economy proxied by GDP. However, with p-value of 0.9184, 0.8881 and 0.5226 respectively, none of the variables is significant. For the Interest Rate, the coefficient is -0.320, implying that every unit increase in profit after tax results in a 0.320-unit loss in Nigerian economic growth. With a p-value of 0.0151, the variable is significant at 5%.

### 4.2.3. Random Effect Estimation Model

The coefficient of determination ($R^2$) value of 0.787 under random effect indicates that changes in exogenous factors account for 79% of the whole variation in economic growth, while the error term accounts for 21% of the total variation. The Gross Premium coefficient's value is 0.102, implying that a one-unit rise in gross premium will result in a 0.102-unit increase in economic growth in Nigeria. With a probability value of 0.0118, the variable is statistically significant at 5%. The Net Premium coefficient's value is 8.185, implying that a one-unit rise in net premium will result in an 8.185-unit increase in Nigeria's economic growth. With a p-value of 0.6314, the variable is not statistically significant at 5%. Profit Before Tax and Profit After Tax coefficient values are 3.161 and 4.491 respectively. These implies that a one-unit rise in these variables will result in a corresponding increase in Nigeria's economic growth. For the Interest Rate, the coefficient's value is -0.329, implying that every unit increase in profit after tax results in a 0.329 unit drop in Nigeria's economic growth. With a p-value of 0.0004, the variable is significant at 5%.

### 4.2.4. Hausman Tests

We run the Hausman test in order to select best model between the fixed effect and the random effect models. For this purpose, we specified a null hypothesis that the differences between the estimates of the fixed effect and the random effect models are not significant. The decision rule is that the fixed effect model should be chosen if the null hypothesis was rejected. Else, the random effect model would be considered to be more adequate. The outputs of this test were showed in table 3. Post estimation test presented in the above tables showed that the most efficient and consistent estimation for the two techniques is the random effect period specific effect estimations as showed in the table 3 below.

**HAUSMAN TESTS**

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|---|---|---|---|
| Cross-section random-Pooled Effect | 1.37594 | 4 | 0.8484 |
| Cross-section random-Fixed Effect | 4.500836 | 4 | 0.3424 |
| Cross-section random-Random Effect | 0.10289 | 4 | 0.9987 |

*Author's Computation, 2022*

## 5. Conclusion

The insurance industry is essential because it provides money for countries' finance markets. By transferring these money into financial systems, the funds gathered in insurance firms for the goal of protecting individuals and organizations against future dangers both provide guarantee for the compensation of individual and institutional losses and serve as the economic foundation. In emerging countries, the insurance sector plays a significant role in their financial systems. In economically underdeveloped countries, premiums earned in the insurance sector hardly cover a major portion of the economy's funding needs. It is possible to draw a conclusion based on the study's findings. The impact of insurance premiums on Nigeria's economic growth is negligible.

The major goal of this research is to find out how premium income and interest rates affect investment decisions in Nigeria. This is necessary by the fact that interest rate behaviour impacts the investment activities and economic growth of any country to a great extent. The findings will aid policymakers in developing and implementing financial policies that promote private and public investment-friendly interest rates, which are critical to Nigeria's economic growth, as well as the development of the country's insurance sector and future insurance premium calculation. Due to the general relationship between interest rates and investment and growth, the research suggests that interest rate behaviour is vital for economic growth. As a result, boosting economic growth in Nigeria necessitates the formulation and implementation of financial policies that promote investment-friendly rates of interest.

## 6. Recommendations

Based on the findings, the following recommendations are suggested;

1. The most important thing for any developing country like is raise insurance knowledge. Compulsory insurances are supposed to familiarize the society with the notion of insurance. The government is expected to help with this so that the insurance industry can participate in financial

markets. Premium pricing strategies in the industry should be re-evaluated.

2. The government should develop and implement economic measures that stimulate the insurance industry, such as enforcing statutory insurances. This can be accomplished through risk-based recapitalization and supervision, which can pave the way for further merger and acquisition activity.
3. Insurance industry stakeholders such as National Insurance Commission (NAICOM), Chartered Insurance Institute of Nigeria (CIIN), and Nigeria Insurance Association (NIA) should embark on promotion of a systematic educational campaign in the media and among the general public to improve the insurance image laundry and market awareness activity.
4. The insurance regulator, the NAICOM, should work toward reducing the number of underwriting firms in Nigeria to a level that the existing insurance business opportunity can handle, paving the way for the emergence of mega insurance companies and reducing the prevalence of unethical practices in all their forms in the Nigerian insurance industry.

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