Reinsurance: A Risk Management Instrument for Insurance Companies' Profitability (A Case of Non-Life Insurance in Nigeria)

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Abstract

The study is carried out to determine reinsurance in place of a risk management instrument and its effect on the non-life insurance firms' profitability in Nigeria, adopting ex-post-facto design, with multiple correlation and regression model to analyze the data obtained from Nigeria Insurers Association Digest report 2007 to 2018, which is indicating 12 years of study sample size. The findings of the study show that Premium Cession Ratio (PCR) and Net Retention Ratio (NRR) have positive effect on the profitability (ROA) of insurance companies but not significant with their coefficient values of (0.059880 and 0.006273) and their associated probability values of (0.2811 and 0.8880) respectively. However, the findings reveal that Reinsurance Dependence Cede Premium (RDC) and Reinsurance Commission to Shareholder's Equity (RCS) have affected the profitability (ROA) of insurance business entities negatively and insignificantly with their values of coefficient (-0.266824 and -0.894553) and their corresponding p-value is (0.5149 and 0.3497) respectively.

Keywords: *reinsurance; risk management; profitability; insurance company; shareholders' fund.*

JEL Classification: *G22; G23; G24.*

Introduction

With no doubt, insurance companies perform vital roles in the financial service industry of many economies by helping in lowering risk exposures, allocation of resources efficiently, minimizing cost of transaction costs, adjusting loss, managing financial losses, and contributing to the growth of economic. Therefore, one of the main goals of managing insurance enterprises is to make income as a fundamental requisite for engaging in any insurance corporate operation. The insurance sector in the country has witnessed gradual growth in revenue due to complexity and dynamic of Nigeria business environment.

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Insurance industry is a one of the financial institutions that specializes in providing vital financial services for the economic growth and development. As a one of the financial institutions that offers risk protections in the economy, it manages both its own risks and financial performance concurrently. According to Agiobenebo and Ezirim (2002) insurance firms specialized in financial services, for instance they underwrite risks that are inherent in the country's economic activities, and mobilize of huge amount of money through collection of premiums for their long term investments.

Evidently speaking, Nigerian insurance business firms have been concentrating on underwriting method of the cash-flow business, as they are operating price strategy to drive for lager market share. Therefore, many insurance entities have become insolvent and have gone out from the market. Like other financial companies, insurance firms try to hedge their risks against potentially huge losses and ruins, such as those related to natural catastrophic losses. And many of these hedging is facilitated by the reinsurance market globally. Insurers that are risk averse players use reinsurance to spread their business, also to reduce their risk exposures. However, the risk neutral underwriters purchase reinsurance to upturn their firms' value. When insurance companies ceded portion of their risks volume, they reduce their potential risks, minimizing their underwriting profit, and invariably decrease their net premium. However, this will improve their capital.

Statement of the Problem

Due to the global world and civilize era, both individuals and organizations who engage in one or more economic activities are prone to unique or more risks. Consequentially, ample risks protection required against the adverse deviation of expected result in their daily activities. More of this are the financial institutions, including insurance firms. Insurance industry deals with many forms of risks that could leads to catastrophic eventualities. However, in order to hedge against this nature and quantum of such risks that cannot be effectively and efficiently manage for better optimal working environment, it is extremely important for insurance companies to have adequate reinsurance covers in place. According to Cummins, Dionne, Gagne, & Nouira (2008) insurance protects against the organizations' external risk in their operations and hence, uses hedging strategies, such as derivative and reinsurance, so as to minimize the economical or financial threat emanating from the failures of the capital market. Also, Garven, Hillard & Grace, (2014) posited that in order for insurance company to reduce the heavy obligations, the company try to transfer portion of its liability to other risk shouldering organizations, the reinsurance firms. This means that, there is high tendency of insurance companies to entangle in insolvency as a result of catastrophic claims, if they minimize reinsurance coverage. However, reinsuring business potential risks attract some implications on the account book of the primary insurance companies: this includes lowering the net premium of the cedants, after they have ceded their reinsurance premiums. More so, it lowering the underwriting profits of the primary insurers which will unavoidably devastating the companies' return on investment and return on their assets. On this note this study stands to investigate how reinsurance as a risk management tool has impacted the non-life insurance business' profitability in Nigeria. Therefore, the precise study objectives are: to examine the effect of premium cession ratio on non-life business' profitability; to ascertain the influence of net retention ratio on the profitability general insurance business in Nigeria; to determine the significant effect of reinsurance dependence cede premium on the profitability of non-life insurance companies; and to investigate how reinsurance commission to shareholder's equity has influence the profitability of non-life insurance firms in Nigeria.

Study Hypotheses

H_1 Premium cession ratio has no significant effect on the profitability of non-life insurance firms in Nigeria**.**

H_2 Net risk retention ratio has not affected the profitability of general business insurance in Nigeria significantly.

H_3 Reinsurance dependence cede premium has no significant impact on the profitability of non-life business in Nigeria.

H_4 Reinsurance commission to shareholder's equity (RCS) ratio has no significant influence on the profitability of general business insurance in Nigeria.

Literature Review

Reinsurance as a risk management tool

Insurance companies as the risk takers can only effectively manage their risks by often buying reinsurance coverage, as this will help to mitigate against the risk of bankruptcy risk, and increasing their risk assumption capacity. Reinsurance is a vital risk management instrument that can be used by the cedants to reduce their business risks and the volatilities of their financial report, in order to stabilize their companies' solvency. According to OECD (2018) international reinsurance business, supported by many developments and inventions in the modern times, may possibly add to risk management of insurance sector by improving the financial capacity of the cedants to offer protection and assisting them to manage catastrophic risks (and giving professional advice for risk quantification). Historically, reinsurance is seen as an effective and valuable capital risk management instrument. O'Neill & Menze (2017) opined that reinsurance is used to minimize loss exposure, allow capital to sustain improved writing of premiums, manage the instability of earnings, and efficiently use of the capital that the companies manage generally.

When an insurance company professionally employed the utilization of reinsurance coverage, smooth cash flow and capital improvement are guaranteed, while the risk of bankruptcy is prevented. Reinsurance is one of the financial tools that allows insurance companies to reduce the risks of loss ratio volatilities in cash flow, and minimize their underwriting risks. Mohamed (2019) affirms that when insurance organization purchasing reinsurance covers it seeks to improve its financial performance, financial security and financial stability over a period of time. Both life and general insurance businesses are coping with a lot of serious challenges that are hindering their potential growth, and hurting their profitability. Adequate utilization of reinsurance coverages by the primary insurers will make efficient capital available and improve their financial ability to manage disastrous risks. Burcă and Bătrînca (2014) submitted that reinsurance minimizes the bankruptcy risk, and increases the financial steadiness of the primary insurer, there it can be said that reinsurance process is a risk management. Reinsurance markets play a crucial part in lines of insurance business' risk management, with casualty, life, and business of health insurance (OECD, 2018).

Insurance companies and profitability

Kimmel, Weygandt, & Kieso (2012) believe that profit indicates the earning capacity and the success of business corporation. Profitability is one of the major goals of the insurance companies in maximizing the wealth of their investors. Burca and Batrinca (2014) see profitability as main objective of management of insurance company that is proxy of financial performance. Malik, (2011) believes that profitability is evaluated by return on assets (ROA) which is a key sign of how gainful companies are, in relative to their total assets. Profits are

very essential to determine the sustainability of insurance companies as the insuring public will be curious to know about the profit of a particular company purposely to determine whether or not the company will meet their financial obligations in the future. Also, the shareholders will so be inquisitive to understand the position of their investments. Evidently, ever since general insurance transactions have been established in Nigeria, the sector has been experiencing fluctuations in its profitability. This is illustrated in Figure 1, below. Many studied have evaluated the insurance companies' profitability with proxy of Return on Assets (ROA) which will also be an index for this study.
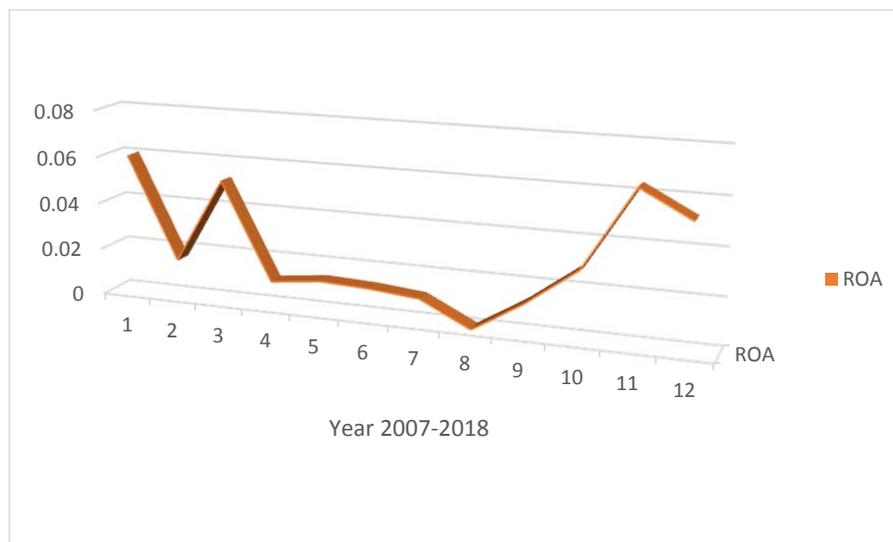

Fig. 1. Nigerian Non-Life Insurance Business Profitability from 2007-2018

Source: Authors, 2022.

Reinsurance commission to shareholder's equity and profitability of Nigerian insurance companies

Reinsurance companies may share the expenses that the cedants are likely to incur, and the profits from providing reinsurance protection. The sharing that each insurer maintains is called reinsurance or ceding commissions (Kwon & Wolfrom, 2016). An effective reinsurance contract transfers risk from the primary insurer's balance sheet, generally reducing the requirement of capital for the risk assumed by the cedants (Comerford, Fulcher, Beers, & Maher, 2020). The utilization of reinsurance will allow the cedants to partly transfer risks off their financial report, however, the ultimate responsibility to the insureds still remain with the ceding companies. Reinsurance is a funds risk management instrument that helps the primary insurers' Shareholders funds to hedge against catastrophic risks that would have ruin the shareholders' investments. Karim (2012) affirms that reinsurance officer in the ceding company has a professional role to show by integrating reinsurance capital into the company's financing structure in a way that increases the money matters to equity holders. World Bank (2009) averred that ceding part of the risks can provide a source of financing particularly if the reinsurance company agrees to advance the expected profits of the business in the future in form of reinsurance commission. The overall impact of the reinsurances purchased by the cedant is to increase the weighted average cost of capital (Karim, 2012). The reinsurance subjected capital properties can help the cedants to lower yearly combined loss ratios, also decrease the requisite stage of retained venture assets. This quality can assist to inform the investors about the surety, hence minimizing the investment cost and improving the returns for equity of the shareholders (Shimpi, 2002). The greater the commission of ceding to the investors' equity ratio, the higher the respite of excess the cedant benefits provisionally (Kwon and Wolfrom, 2016). The

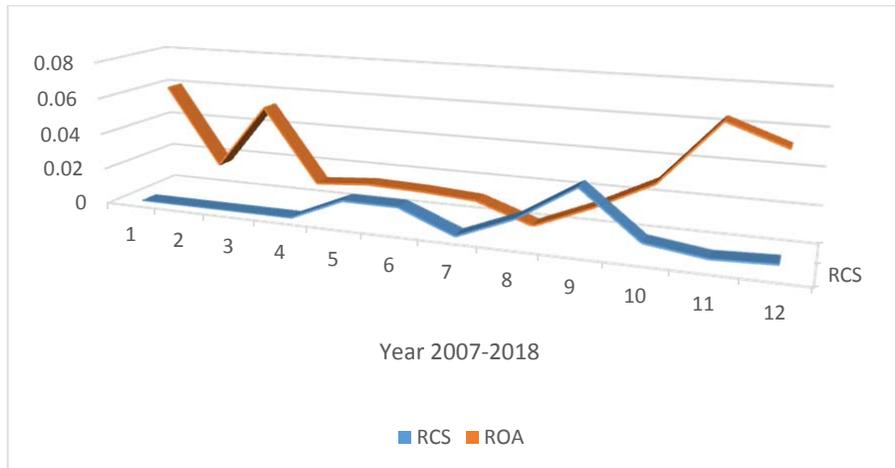relationship between these two factors in Nigerian non-life sector is demonstrated in Figure 2, below.

Fig. 2. Nigerian Non-Life I Business Profitability & Reinsurance Commission to Shareholder's Equity from 2007-2018

Source: Authors, 2022.

Net retention ratio and the Nigerian insurance companies' profitability

Ratio of net retention is an evaluation of how much of risks are being retained by the cedant rather than being ceding them to reinsurance companies, and how much of risks that are not ceded to reinsurers. This is measure as net premium to gross premium. This ratio reflects the whole underwriting capacities of an insurance company and its risk management strategies. A low retention ratio for an underwriting firm indicates that the underwriters have utilized high reinsurance coverage, and primarily the company has reinsured fully to minimize the volatility in its profit. Surya and Sudha (2020) averred that the ratio serves as a sign of risk management policy for the insurance entities. According to Insurance & Pensions Commission (2012) a too little retention ratio can be a signal of inadequate utilization of reinsurance protection for further reasons which may be financial, instead of transfer of insurance risk. However, a high retention ratio in general may be an indication of insufficient financial capacity of an insurance company. The connection between these two elements is shown in Figure 3, below.
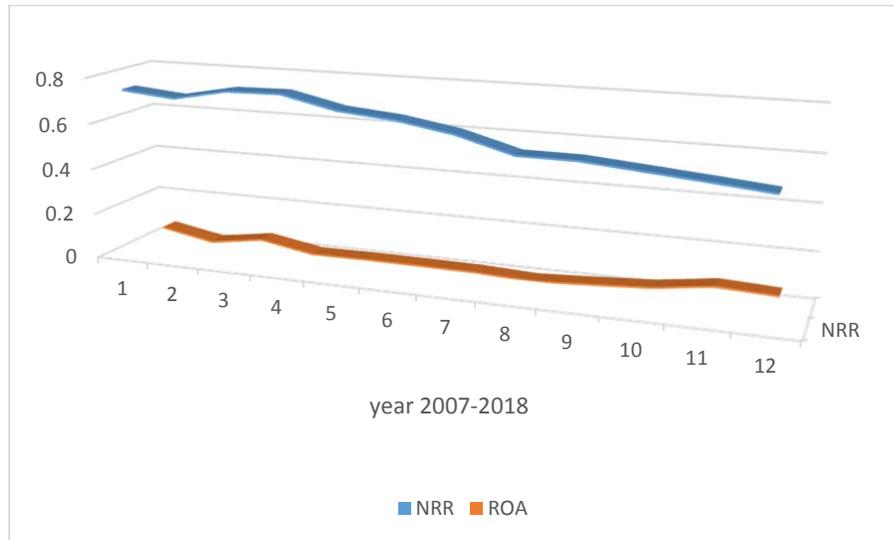
Fig. 3. Nigerian Non-Life I Business Profitability & Net Retention Ratio from 2007-2018
Source: Authors, 2022.

Premium cession ratio and the profitability of Nigerian insurance companies

At the country and company level, cession ratio is determined by market, and business line. The related premium for this ratio is normally on a written-and-gross basis beyond when it is on an earned-and-net basis (Kwon & Wolfrom, 2016). Considering the cost of capital when insurance companies are utilizing reinsurance is very paramount to maintain their financial viability in the future. When adequate reinsurance covers are continuously using by the cedants, there is certainty of increment in their financial strength to accept more volume of businesses. However, inadequate use or failure of primary companies to embrace reinsurance utilization may cause them to offset claims, especially catastrophe claims with their capital and reserve, and result to adverse effect on their profitability. Therefore, reinsurance is a mechanism that allows insurance firms to spread their assumed risks, and prevent their business entities against catastrophic losses. Reinsurance is a risk management tool that creates enabling platform for insurance companies to minimize their capital requirement and mitigate against higher claimant payout. According to Comerford, Fulcher, Beers, & Maher (2020) the reinsurance protection results to an improved ratio of solvency coverage for the cedant companies**.** Kwon & Wolfrom (2016) asserted that the lower this ratio, the better the financial capacity of the primary underwriters in assuming the domestic risks. The association between these variables is presented in Figure 4, below.
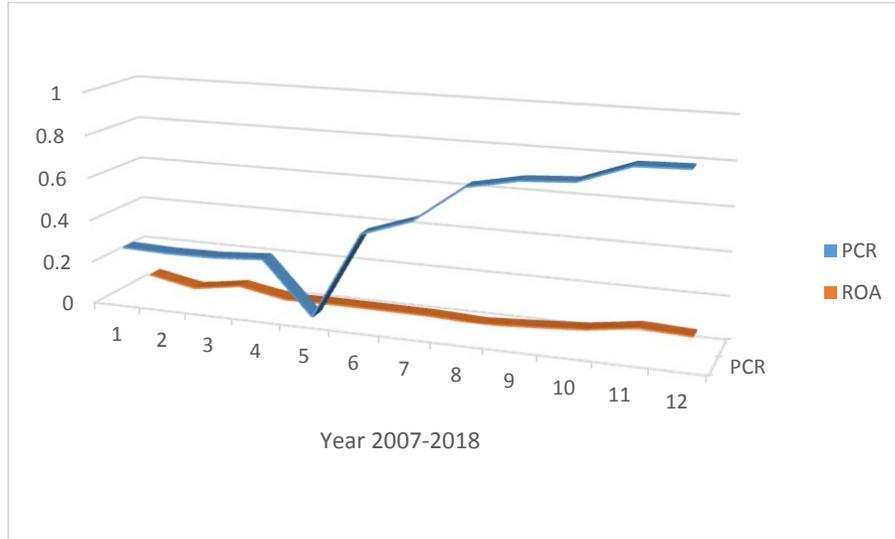
Fig. 4. Nigerian Non-Life I Business Profitability & Premium Cession Ratio from 2007-2018
Source: Authors, 2022.

Reinsurance dependence cede premium and profitability of insurance companies

As a dependent capital mechanism, reinsurance can assist the cedants to minimize the limit of equity, and manage their capital resource allocation efficiently. Obonyo (2016) expresses that firms who buy more reinsurance coverages achieve more steady financial performance which makes them to record great risk-adjusted revenues. Increasing reinsurance dependence may raise operational stability of the insurer. This method of risk transfer by primary insurance companies through reinsurance is called reinsurance dependence. Therefore, using reinsurance will enable the insurers to partake in a diversity of risk investments, with the same working capital. The buying of reinsurance protection is anticipated to be higher for the primary insurer, because of the lower connection between cedants' investment income, and their higher claims payment cost (Garven and Lamm-Tennant, 2003). Obonyo (2016) opined that the cedants more often than never take up reinsurance coverages, to prevent their companies against catastrophic claims, improve underwriting strength, and steady their incomes. However, Lee and Lee (2012) asserted that when insurance companies increase their reinsurance dependence, it may lead to low premium retention rates that can reduce the potential of their profitability. Choi and Weiss (2005) also, affirm that using more reinsurance by the cedants, grow slower compare to those who reinsured less business or acquired more reinsurance coverage from their counterpart insurance firms. The relationship between these factors is presented in Figure 5, below.
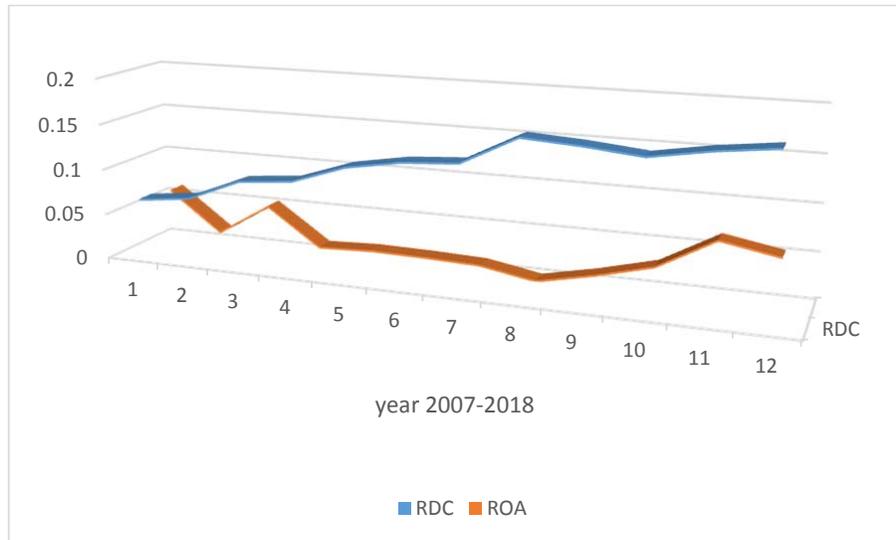
Fig. 5. Nigerian Non-Life I Business Profitability & Reinsurance Dependence Cede Premium from 2007-2018

Source: Authors, 2022.

Research framework

This section is carried out to depict the conceptual framework for this study. The framework illustrates a diagrammatical connection between the predicted variable and the set of predictor variables.
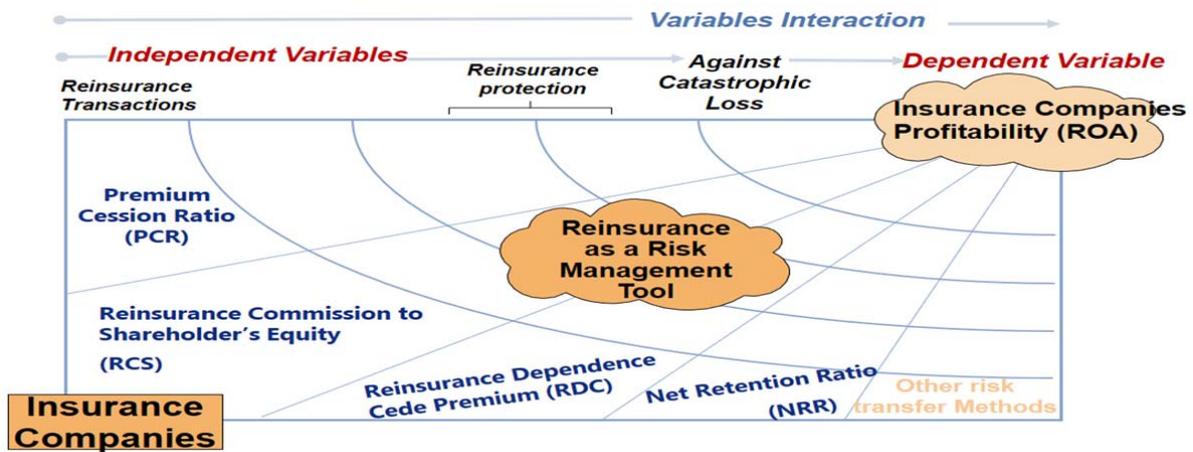
Fig. 6. Study Conceptual Model

Source: Authors, 2022.

For this study, the dependent variable is return on assets (proxy for financial insurance companies profitability) as measured by profitability ratio. Premium Cession Ratio (PCR), Net Retention Ratio (NRR), Reinsurance Dependence Cede Premium (RDC), Reinsurance Commission to Shareholder's Equity (RCS) (proxies for reinsurance) are the independent variables. Figure 6 above displays the variables relationship.

Empirical review of other related literature

Abass (2019) investigated how reinsurance dependence has affected the non-life business profitability in Nigeria, making use of regression analysis. The finding of the study established that the variables of reinsurance dependence jointly impacted the profitability of non-life underwriters in the country. The research submitted that non-life business should be increasing their capital base repeatedly. Cummins, Dionne, Gagne, & Nouira (2019) empirically, analyzed the reinsurance costs and benefits for a sample of United State property-liability insurance companies. Findings of the study show that buying of reinsurance increases the cost insurers significantly. However, it reduces their loss ratio volatility significantly.

Bressan (2018) empirically studied the evidence for reinsurance effect on the solvency, profitability, and taxes of insurance business. Their study suggests that cedants' capital reduces in the amount of used reinsurance. Those insurance companies are more susceptible to providing reinsurance protection to other organizations as they collect growing amounts of reinsurance coverage for their own. Scordis & Steinorth (2012) their study affirmed that reinsurance usage has a strong positive connection with value form small enterprises. The result suggests that shareholders fully know the value of hedging in the absence of noise in the business' environment. Also, the hedging usage creates value for shareholders because it may be a low expensive auxiliary to holding capital. In his study, Vineet (2013) examined the connection between reinsurance and equity cost in the United Kingdom's non-life entities, using Panel data samples with the aid of Rubinstein-Leland (R-L) analysis to evaluate the equity cost. The study's result shows that reinsurance can reduce the equity cost for the cedants provided the reinsuring cost is lesser than the price cut in frictional costs realized from reinsurance.

Methodology

This research adopted a quantitative study method based on *ex-post-facto* design to explain how reinsurance as a risk management instrument has affected the profit income of general insurance business in Nigeria, as designated in this research framework. Ex-post-facto design is chosen for this because the design has to do with the use of existing data to describe prior events by ascertaining the degree at which the information relates to the events. The variables to be used by the researcher cannot manipulated (Onwumere, 2009). The population for the study is all registered non-life insurance firms in Nigeria. The study sample is all quoted Nigerian general insurance business **organizations**. The data for the study was obtained from the insurance sector annual reports, that is, the Nigerian Insurers Association (NIA) digestive report from 2007 to 2018. Therefore, the sample size for this study is twelve years (2007-2018). Adopted multiple linear correlation and regression model to analyze the sourced data.

Measurement of variables

The variables chosen for this study has to do with reinsurance transaction by Nigerian insurance companies and their profitability within the period of this study. The notation of these variable are presented in Table 1, below.

Table 1. Evaluation of Dependent and independent Variables

V/N	Variables	Proxy	Measurement	Variables specification
Y	Return on Assets	ROA	PAT/Total Assets	Dependent
x_1	Premium Cession Ratio	PCR	Reinsurance Ceded/ Net Premium Written	Independent
x_2	Net Retention Ratio	NRR	Net written premium/Gross written premium	Independent

Table 1 (cont.)

x_3	Reinsurance Dependence Cede Premium	RDC	Ceded Premium/Total Asset	Independent
x_4	Reinsurance Commission to Shareholder's Equity	RCS	Reinsurance Commission/ Shareholder's Equity	Independent

Source: Authors, 2022.

Model specification

Multiple regression analysis has been chosen for this research, and the model for this analysis is:

$$Y = a_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 \ldots\ldots + \beta_n x_n \qquad (1)$$

Where a_0, and β_1 are the model parameters.

$$\mathcal{ROA} = a_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \epsilon \qquad (2)$$

Where:

ROA= Return on Assets (ROA);
$a_o, \beta_1, \beta_2, \beta_3$, and $\beta_4 x_4$= Parameters;
x_1 = Premium Cession Ratio (PCR);
x_2 = Net Retention Ratio (NRR);
x_3 = Reinsurance Dependence Cede Premium (RDC);
x_4 = Reinsurance Commission to Shareholder's Equity (RCS);
e = error term.

Unit root test

Unit root study is a pre-test that is evaluated prior to the regression estimation; this test was carried out to ascertain the stationary features of the variables chosen for this research.

Table 2. Unit Root Table

Variables	ADF t-statistic at the difference	ADF t-statistic Value	5% critical value	Probability	Order of integration
ROA	2nd	-9.877427	-1.988198	0.0001	2(0)
PCR	2nd	-6.483396	-1.988198	0.0001	2(0)
NRR	2nd	-4.799314	-1.988198	0.0003	2(0)
RDC	2nd	-4.625361	-1.995865	0.0006	2(0)
RCS	2nd	-5.689942	--1.995865	0.0002	2(0)

Source: Authors, 2022.

Data Analysis and Interpretation

Correlation Analysis

Table 3. Correlation model

Variables	Symbols	y	x_1	x_2	x_3	x_4
ROA	y	1.0000				
PCR	x_1	0.1865	1.0000			
NRR	x_2	0.0716	0.6237	1.0000		
RDC	x_3	0.0801	0.8383	0.5547	1.0000	
RCS	x_4	0.3976	0.3285	0.1905	0.5343	1.0000

Source: Authors, 2022.

Table 3, above shows the correlation outcomes between the set of explanatory variables and the predicted variable. The table reveals that weak relationship currently exists between PCR and ROA with the (r=0.1865). Also, the table establishes that weak connection occurs between NRR and ROA with their (r=0.0716). Furthermore, the correlation result affirms that weak relationship exists between RDC and ROA, with the corresponding (r=0.0801). Lastly, the outcomes in the correlation table specifies that RCS has weak relationship with ROA with their associated (r=0.3976). Since the strength of relationships between the series of independent variables (PCR, NRR, RDC, and RCS) and the dependent variable (ROA) are: 0.1865; 0.0716; 0.0801; and 0.3976 respectively, which are within +0 to +0.30 range, according to the rules of thumb, there is positive weak relationship between them. Therefore, any modification in any of the independent variables will cause insignificant change to ROA of non-life insurance business in Nigeria.

Regression Analysis

In order to evaluate how reinsurance transactions has been as a risk management instrument to manage the business of insurance companies in Nigeria, precisely in the area of their profitability. The study used multivariate regression in Table 4, below to demonstrate how the explanatory variables $(x_1 - x_4)$ affect the dependent variable (Y).

Table 4. Regression Table

Dependent Variable: ROA
Method: Least Squares
Date: 04/10/21   Time: 23:02
Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.036116	0.049362	0.731671	0.4881
PCR	0.059880	0.051274	1.167842	0.2811
NRR	0.006273	0.042962	0.146013	0.8880
RDC	-0.266824	0.389059	-0.685820	0.5149
RCS	-0.894553	0.892729	-1.002042	0.3497

R-squared	0.320857	Mean dependent var	0.028058
Adjusted R-squared	-0.067225	S.D. dependent var	0.022553
S.E. of regression	0.023298	Akaike info criterion	-4.386525
Sum squared resid	0.003800	Schwarz criterion	-4.184480
Log likelihood	31.31915	Hannan-Quinn criter.	-4.461329
F-statistic	0.826776	Durbin-Watson stat	2.226389
Prob(F-statistic)	0.548043		

Source: Authors, 2022.

The multivariate regression analysis above establishes how reinsurance as a risk management tool proxy by: Premium Cession Ratio (PCR); Net Retention Ratio (NRR); Reinsurance Dependence Cede Premium (RDC); and Reinsurance Commission to Shareholder's Equity (RCS) have impacted the profitability of Nigerian non-life insurance business operations proxy by (ROA).

$$ROA = 0.036116 + 0.059880.PCR + 0.006273.NRR - 0.266824.RDC - 0.894553.RCS + \varepsilon \qquad (3)$$

The aforementioned regression model reveals that PCR and NRR's coefficient signs are positive. This indicates that once there is an increase of PCR by one unit, there will be 0.059% or 5.9% increase in ROA if other factors are held constant. In relations to amount in reinsurance transaction, for every one unit of premium cession to the reinsurance business entities, the non-life firms will experience an increase of 0.059% or 5.9% in their business. In a technical sense,

this ratio shows how an insurance company is depending on reinsurance security. From the regression result, it indicates that the dependence of the non-life insurance firms on reinsurance organization within the time of this research is 5%. Also, a unit increase in NRR will automatically leads to 0.006% or 0.6% improvement in the ROA of non-life business in Nigeria. Therefore, for every retention capacity of business worth of one unit, the non-life corporation will realize additional of 0.006% or 0.6% revenue in their businesses. Technically, this ratio shows the efficiency of general insurance corporations operating in the economy within the period considered for this research. Therefore, with 0.6, it means that the non-life companies have ceded 0.6% of their assumed risks to the reinsurer companies within these periods, while only 99.4% were retained with them. This means that non-life insurance firms in Nigeria are operating efficiently at the local level. According to Kwon and Wolfrom, (2016) the lesser this ratio, the greater the financial strength of the national insurance companies in assuming local business risks.

However, the regression analysis establishes that the coefficient signs of RDC and RCS are negative. This infers that a unit rise in RDC will lead to reduction in the ROA of non-life insurance business in Nigeria by 0.266% or 26.6%. In relation to reinsurance transaction, for every one-unit worth of risks business that non-life companies are depending on reinsurers in the economy, they stand to lose 0.266% or 26.6% of their profits, this could be as a result of high volume of businesses ceded to the reinsurance firms within the period of this study. Technically, the greater the ratio the better the surplus to experience by the insurance firm within short time. Kwon and Wolfrom, (2016) asserted that the greater the ratio, the healthier the relief of surplus the insurance company enjoys in the short term. In the same vein, an increase in RCS will result to 0.895% or 89.5% reduction in ROA general insurance business in the economy. Likewise, for each ₦1 Million worth of business give to reinsurance firms, the non-life insurers will experience the loss of ₦ 895,000 in their ROA. This could be because inadequate commissions are paid to them by the reinsurers.

Table 4, above presents the regression result for the study. The R-squared within the model shows a value of 0.320857 meaning that the reinsurance as a tool of risk management proxies (PCR, NRR, RDC, and RCS) are jointly able to explain 32.1% of variations in ROA of the non-life insurance corporations operating in Nigeria. However, the remaining variables not captured in the regression model would explained the remaining 67.9%.

The statistical significance of the explanatory variables' coefficients results from the Standard Error, T-Statistic and the value of probability for each coefficient reveals that all the considered independents variables are not statistically significant.

The F value is 0.826776 with the corresponding p-value of 0.548043 that is >0.05 in the regression result, this means that all the variabilities of the general insurance business' profitability were not explain by the reinsurance variables in the model since there Prob (F-statistic) value is greater than 5%. Thus these variables collectively did not stimulate the profitability of general insurance companies in Nigeria as at the time of this study. Therefore, Premium Cession Ratio; Reinsurance Commission to Shareholder's Equity; Reinsurance Dependence Cede Premium; and Net Retention Ratio are jointly not good explanatory variables to influence the profitability general insurance business in Nigeria.

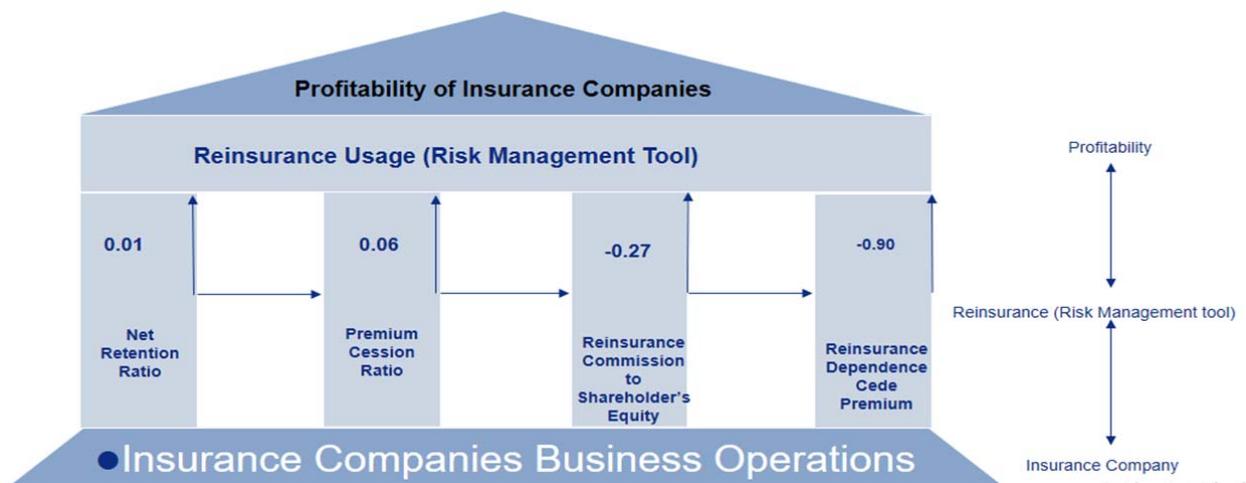The summary of the regression output is represented in Figure 7, below.

Fig. 7. Regression Result

Source: Authors, 2022.

Heteroskedasticity Test

Heteroscedasticity test is determined in Table 5, below to establish whether the regression analysis can predict the explained variable reliably across all values of the manipulated variables.

Table 5. Heteroscedasticity Analysis

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.879423	Prob. F(4,7)	0.1055
Obs*R-squared	7.463798	Prob. Chi-Square(4)	0.1133
Scaled explained SS	0.505468	Prob. Chi-Square(4)	0.9730

Source: Authors, 2022.

Breusch-Pagan-Godfreytest model above revealed that P = 0.1055, indicating that F-statistics is higher than 0.05 significance level. Hence, with reference to aforementioned analysis, in connection with the p-value of the obs R-squared, the model's residuals reveal that they are homoscedastic.

Testing of Hypotheses

Hypothesis 1

Premium cession ratio has no significant effect on the profitability of non-life insurance firms in Nigeria**.**

Premium cession ratio is the outwards risks from the primary insurers to the reinsurance companies divided by the net earned premium of the cedants. Premium cession is resulted from the part of the cedant's business ceded to the reinsurance firms. While cession according Kwon & Wolfrom (2016) means the portion of portfolio of risk that an insurance firm finances with, or transfers to another insurance company. The regression outcome in Table 4 affirms that premium cession ratio (PCR) has affected the profitability (ROA) of non-life Nigerian insurance business positively and insignificantly within the period of this research. Therefore, the study *accepts hypothesis 1 which says* premium cession ratio has no significant effect on the profitability of non-life insurance firms in Nigeria. This result is consistent with the work of

premium cession ratio. This result is in line with the study of Vineet (2013) that insurers who utilize reinsurance as risk management generally attain smaller risk premiums (equity cost) compare to insurers who refused to buy reinsurance.

Hypothesis 2

Net risk retention ratio has not affected the profitability of general business insurance in Nigeria significantly.

Risk retention ratio is one of the major indicators that show insurance companies' risk underwriting efficiency, and determine their financial strength. This ratio reveals the amount of risk businesses the cedant ceded to the reinsurance companies, which indicates the financial strength of the primary insurers. Mwangi and Murigu (2015) asserted that a greater retention ratio with lesser claims ratio is probably to have positive impact on the performance of insurer. The aforementioned regression table above established that net retention ratio (NRR) influenced the profitability (ROA) of general insurance business in Nigeria positively within the period of this study, but not significant. This result is conforming to the research work of Hasibuan, Sadalia, & Muda (2020) which affirmed that retention ratio influenced the financial performance of insurance companies positively. However, it is insignificant to their ROA. Thus, the study *accepted hypothesis 2* which states that risk retention ratio has no significant influence on the profitability of general business insurance in Nigeria.

Hypothesis 3

Reinsurance dependence cede premium has no significant impact on the profitability of non-life business in Nigeria.

Reinsurance dependency come to existence in the insurance business when insurance companies purchase reinsurance coverages basically to diversify their business portfolio; increase their underwriting strength; stabilize their book of account; and protect themselves against catastrophic loss that could jeopardize the smooth running of their business. However, Sognon (2018) established that insurers who cede much premiums in an attempt to diversify their business become low profitable. The regression model above avowed that reinsurance dependence cede premium (RDC) has negative impact on the profitability (ROA) of non-life insurance firms in Nigeria within the period of this research, but not significant. Thus, the study *accepted hypothesis 3* which states that reinsurance dependence cede premium has no significant influence on the profitability of non-life business in Nigeria. This result is consistent with the study of Shiu (2014) which averred that reinsurance dependence has negative relationship with insurers' profitability insignificantly, but it is not significant. Also, Reshid, S. (2015) affirmed in his study that reinsurance dependency has adverse influence on the profitability of insurance companies insignificantly.

Hypothesis 4

Reinsurance commission to shareholder's equity (RCS) ratio has no significant influence on the profitability of general business insurance in Nigeria.

Reinsurers might share the businesses expenses and other expenditures that the primary insurers are expected to incur and make profits from the provision of reinsurance protection. Hence, the outlays and profits sharing depends rest on the part of reinsurance program. This sharing is usually refers to as reinsurance commissions, or ceding commissions (Kwon and Wolfrom, 2016). The regression analysis above affirmed that reinsurance commission to shareholder's equity ratio (RCS) has negative impact on the profitability (ROA) of non-life insurance companies in Nigeria within the time of this study, but not significant. Hence, the study *accepted hypothesis 4* which positions that reinsurance commission to shareholder's equity ratio (RCS) has not influenced the profitability of general business insurance in Nigeria significantly.

Conclusion

Reinsurance as a financial risk management tool has been used by insurance companies over the years to minimize their business risks exposure while letting them to maintain their capital base. Therefore, it stands as the essential financial tool that helps the primary insurers to manage their assets, capital and underwriting activities efficiently. According to OECD (2018) reinsurance is seen as a valuable and effective capital and risk management instrument. The investigated how reinsurance as a risk management tool has affected the business activities of non-life insurance firms in Nigeria. From all indications, reinsurance protection has affected the profitability of general insurance business in Nigeria, but not significant. This may be due to the reasons that the primary insurers are not effectively utilizing reinsurance coverage, are trying to retain business risks more than their retention capacity.

Recommendation

Based on the analysis's findings, the study provides the following recommendations in Nigeria and globally at large that:

o Insurance firms in the country should give reinsurance usage the utmost priority in their risk management decision making, so that a good competitive that enhances financial soundness, and improve good reputation can be maintain within the economy.
o Furthermore, non-life insurance business should be prudent enough to strongly embrace adequate usage of reinsurance coverage globally as a sophisticated tool to hedge and mitigate against residual risks in their business operations.
o Insurance companies and their stakeholders should prudently and consistently perform the role of 'gatekeeper' by avoiding unapproved reinsurers in order to prevent the risk of counterparty.
o The reinsurance companies within the economy of Nigeria should improve their sophistication level in a proactive manner to prevent against catastrophic losses and volatilities that are embedded in the primary insurance business operations.

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