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Empirical Analysis of Reinsurance Dependence on the Profitability of General Insurance Business in Nigeria

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Abstract

Reinsurance arrangement serves as a capital management tool often used by an insurer to mitigate against catastrophic loss. Despite its importance among insurance companies, scholars from recent schools of thought have queried its use. They argue that reinsurance may be costly, and on the long run affect insurers' financial performance. Hence, this study investigated the influence of reinsurance dependence on the profitability of general insurance companies in Nigeria. The study employed descriptive research design. A census of forty one (41) general insurance operating in Nigeria from 2006 to 2015 we used for the study. The study used Return on Assets (ROA) and Return on Assets (ROE) as proxies of profitability while Ratio of Ceded Reinsurance (RCR) and Reinsurance Dependence Ceded Premium (RDCP) were used as indicators of reinsurance dependence. The study adopted regression analysis using logarithmic transformation of model. The finding established that reinsurance dependence variables jointly influence the profitability of general insurance companies in Nigeria, though; RCR had no significant influence on profitability. Therefore, purchase reinsurance does not affect profitability but over reliance (dependence) over a period of time may be deduced to low profitability. This study recommended that general insurance companies in Nigeria should continually increase their capital base. This may translate to increase in financial capacity and on the long run depend less of reinsurance protection.

Key words

Reinsurance, reinsurance dependence, profitability, general insurance business

JEL Codes: G22

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1. Introduction

Risks have ever been present since the existence of man and if not properly mitigated may lead to disruption of lives, property, earnings and businesses. The dynamism associated with the concept of risk has many disciplines like economics, finance; accounting, mathematics, statistics, business management and the like define it with no consensus. Interestingly, from insurance perspective, there seems to be no convergent view among scholars as to what constitutes risk. Despite this divergent view, common feature shared by the authors is that exposure to risk is created whenever an act gives rise to possibility of loss (Rejda, 2008; Vaughan and Vaughan, 2014; Dorfman, 2015). Risk may not be eradicated; it may however be reduced or managed. The process of reducing or managing risk is therefore known as risk management (Nyce, 2006). Harrigton and Niehaus (2004) define risk management as an effort of individuals or business organisations to efficiently and effectively assess, control, and finance risk in order to minimizing the adverse effects of losses. Though, there are other techniques, insurance is seen as one of the effective ways of managing risks. Risk management through insurance is based on the principles of large numbers as proposed by Chevalier in 1654 and cited from Swiss Re (2013). However, operation of insurance business is different from other financial intermediations because of its inverse cycle nature. What this suggests is that insurance companies need to form an expectation of future risks before they can be accepted (Lelyveld *et al*., 2011). The performance of these expectations to the insureds among other functions relies on the availability of reinsurance arrangement (Baur and Donoghue, 2004). Programme is fundamental to insurance business cycle because it is hinged on the foundation that if too many risks are accepted by insurers, premium received may be insufficient to cover the required pay outs which may lead to financial distress (Obalola and Abass, 2016).

Despite the importance of reinsurance arrangement to insurance companies, scholars from recent schools of thought have queried its use (Garven and Tennant, 2003; Cole and McCullough, 2006; Lee and Lee, 2012; Iqbal and Rehman, 2014a). The crux of their argument focuses on the fact that reinsurance may be costly, uneconomical, reduce insurance company's efficiency and on the long run affect the financial performance. This study tries to find out whether reinsurance dependence is actually a blessing to insurance companies or a curse in disguise. Hence, this study focuses on the reinsurance dependence and its likely impact on the performance of general insurance companies in Nigeria.

1.1. Problem statement

Insurance companies rely on reinsurance protection for financial stability. This is evidenced by previous studies carried out in United States America, Australia, Canada, France, Germany, Switzerland, Taiwan and Pakistan (Iqbal and Rehman, 2014a; Chen *et al*., 2001; Carneiro and Sherris, 2005; Lee and Lee, 2012; Tang and Weng, 2012). While the outcomes of some of these studies highlight the significance of reinsurance to the survival of insurance companies, there seems not to be a universal agreement on the direction of reinsurance contribution to the profitability of insurance companies. In Nigeria, the situation seems not different. Insurance companies depend heavily on reinsurance for financial protection. According Nigerian Insurance Digest (2015), 42.3% of Gross Premium Written (GPW) was ceded to reinsurers by general insurance companies in Nigeria as at 2015. This is higher than the average of 26.54% for African insurance market and 6% for global insurance market for the same year under review. This notwithstanding, the performance of insurance companies appears to have remained low. Moreover, the frequent usage of reinsurance protection by Nigerian general insurance companies appears to be an indication that they are not financially buoyant to underwrite large unexpected losses which has affected their operations over a period of time. Due to this, the industry has been facing a drastic reduction in Return on Assets (ROA), a viable sign of anaemic profits that are not adequately contributing to the bottom line of general insurance companies and in turn exposes them to insolvency risk. This scenario has made insurance companies in Nigeria less appealing to lenders and shareholders as currently seen in the Nigerian stock market. Though, few works have been done on the negative effect reinsurance demand might have on the solvency of insurance companies (Chen *et al.,* 2001, Hoerger *et al.,* 1990; Froot 2001), there is dearth of empirical evidence on whether reinsurance dependence may affect financial performance of insurance companies. Most importantly, there is no known study, to the best of the researcher's knowledge, on the impact of reinsurance dependence on the financial performance of general insurance companies in Nigeria. This research aims to fill this gap. The aim of this study is to examine the influence reinsurance dependence has on the profitability of general insurance companies in Nigeria. In view of this, the hypothesis to be addressed in this study is;

H_{o1} Reinsurance dependence does not significantly affect the profitability of general insurance companies in Nigeria.

2. Literature review

2.1. The Vagueness of reinsurance concept

Insurer's success depends not only charging adequate rates or pricing, but thrives in the ability to pay claims when it arises which is largely depend on financial solvency, commitment of adequate equity, capital and adequate reinsurance protection. In achieving these tasks, insurer further transfers part or whole risks assumed from the insured to another risk bearer that possesses the financial strength, technical expertise and experience to handle such risks (Loomba, 2014). Reinsurance is, therefore, risk management mechanism for insurance companies. Dorfman and Cather (2015) define reinsurance as an arrangement that an insurance company obtains to protect itself against losses sustained under policies that it has issued. Hence, reinsurance serves as a mechanism often used by an insurer to mitigate against catastrophic loss and also a instrument for risk diversification, risk financing and capital management (Garven, 1987; Harrington and Niehaus, 2003; Plantin, 2006). Reinsurance is vague because it is hardly known outside the insurance sector (Santosh and Upinder, 2007). Diacon and Carter (2007) further explain the vagueness of reinsurance as transaction that takes place in several stages, enabling insured risks to be spread more widely among a large number of insurers and reinsurers within a geographical space.

2.2. Concept of reinsurance dependence

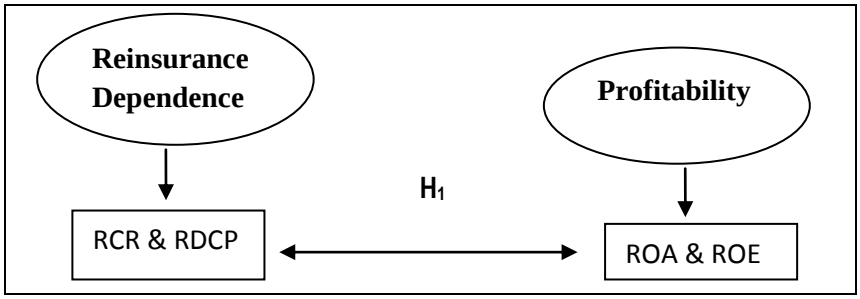
Reinsurance Dependence (RD) shows the potential risk exposure of insurance companies to the collectability problem of reinsurance arrangements either in the short run or on the long run (Cummins *et al*., 2012; Iqbal and Rehman, 2014b). It is an indication of the volume of insurance company's dependence on its insurers to settle claims. Proxies of reinsurance dependence are Ratio of Ceded Reinsurance (RCR) and Reinsurance Dependence Ceded Premium (RDCP) (Mayers and Smith, 1990; Cole and McCullough, 2006; Cummins *et al*., 2012; Lee and Lee, 2012; Iqbal and Rehman, 2014a; Iqbal *et al*., 2014; Burca and Batrinca, 2014). RCR is the mostly used proxy to measure reinsurance dependence based on the current decision or short term. According to Dansu (2016), RCR measures the degree to which an insurance company utilises reinsurance to its policyholders and by extension shows an indication of direct volume and extent of reinsurance transactions that take place between an insurer and reinsurer (Iqbal *et al*., 2014). However, RDCP measures the degree of reinsurance concentration and reinsurance exposure of insurance companies over a long period of time. RDCP shows volume of insurance dependence on its reinsurers to settle claims and the rate of the insurer's exposure to failure of the reinsurer to deliver (Cole and McCullough, 2006). Both when combined, measure the dependence of an insurer to the potential exposure to the collectability problems of reinsurance either on the short run or on the long run (Iqbal and Rehman, 2014a).

2.3. Concept of profitability

Profitability is the ability of an organisation to consistently make profit or surplus over expenses (Carton, 2004). Hofstrand (2006) further stresses the usefulness of profitability as the primary goal of all business ventures, without profitability the business will not survive in the long run. In measuring profitability of an organisation, profitability ratios are mostly adopted. Profitability ratios are indicators for the firm's overall efficiency. They are used as a measure for earnings generated by the company during a period of time based on its level of sales, assets, capital employed, net worth and earnings per share (Karaca and Cigdem, 2012; Heikal *et al.,* 2014). Various scholars have used various types of financial ratios to measure profitability of an organisation. For the purpose of this study, profitability ratios shall be narrowed down to Return on Assets (ROA) and Return on Equity (ROE). ROA measures an organisation ability to utilize its assets to create profits. It gives an organisation an idea on how efficient management is using its assets to generate earnings (Bambang *et al*., 2012 Malik, 2011). ROA is more sensitive to capital structure (Hitt and Hoskisson, 1997; Kozak, 2011). ROA has been extensively used as conventional measure of profitability of insurance companies' operations (Cole and McCullogh, 2006; Abate, 2012; Mankai and Belgacem, 2013; Curak *et al*., 2014; Iqbal *et al.,* 2014; Burca and Batrinca, 2014; Obalola and Abass, 2016). Return on Equity (ROE) however measures an organisation's profitability which reveals how much profit a company generates with the money shareholders have invested. It is an indicator that shows how much profit a company generates with shareholders' investment (Dansu, 2016). Return on equity (ROE) is also useful for evaluating the profitability of insurance companies (Cummins and Nini, 2002; Malik, 2011; Iqbal *et al*., 2014; Dansu, 2016; Ibrahim, 2016).

2.4. Theoretical framework

Several theories have been proposed to explain the interactions between reinsurance dependence and profitability of insurance companies. Some of the theories include the expected-utility theory, capital structure theory, contingent claim theory, ruin theory, corporate demand theory and optimal reinsurance theory. However, this study is hinged on the Optimal Reinsurance Theory (ORT). ORT was proposed by Borch (1960) and Arrow (1963. ORT proposes how best to utilise reinsurance arrangement because an insurer incurs additional costs through reinsurance premium (Tan and Weng, 2014). In essence, the higher the expected risk transferred to reinsurer, the more costly reinsurance premium and vice-versa. ORT model according to Bazaz and Najafabadi (2015) can be classified into three categories. The first category considers optimal criterion from insurer's view point (Chai and Tan, 2011). The second category considers optimal reinsurance theory from reinsurer's point of view (Ignatov *et al.,* 2004). While the third category combines some well-known reinsurance strategies with optimal properties like quota shares and excess of loss (Liang and Guo, 2011). In the process of delivering optimal strategies solutions to insurers according to Liang and Guo (2011), Tan and Weng (2013) and Bazaz and Najafabadi (2015) rests on assumptions that; insurance market consists of one insurer and one reinsurer; the reinsurer sets its own pricing rule which may be a function of its own cost of capital; insurer has perfect information about the reinsurance pricing rule; and that insurer and reinsurer have access to the same information on the underlying loss distribution. By choosing the reinsurance coverage, the insurer attempts to achieve the optimal balance between the reduction in the cost and the price for shifting such variation to the reinsurer (Yisheng, 2005).



Source: Researcher's design (2018)

Figure 1. Conceptual Framework

2.5. Reinsurance dependence and profitability: An empirical literature review

Chen *et al.* (2001) investigates "the effect of ceded reinsurance on the solvency of primary insurers". The study is hinged on the fact that less solvent insurer tend to use more reinsurance because of its inability to raise needed capital in the financial market. Nine hundred and eighty (980) property and liability insurance companies were involved in the study. The study reveals that utilisation of reinsurance could be an indicator that exposes the insurer's risk. In a related study, Cole and McCullough (2006) investigated corporate demand for reinsurance. The aim of the study is to examine the state of the international reinsurance market on the demand for reinsurance by property and casualty insurance companies in United

States of America. Findings from the study reveal that an insurer with higher profits tends to depend less on reinsurance because they have higher capacity to weather financial pressures. Furthermore, Lee and Lee (2012) carry out similar study in Taiwan. In their study, they examine the determinants of insurer retentions for property-liability insurance companies in the Taiwan insurance industry. Findings from the study share the same view with Graven and Tennant (2003) and Cole and McCullough (2006) which assert that insurance companies that are more profitable are in a better position to absorb large unexpected losses and therefore be less affected by the under investment problem.

Mankai and Belgacem (2013) embark on a study titled "interactions between risk taking, capital and reinsurance for property and liability insurance firms". Objective the authors aimed to achieve from the study is to analyse capitalization policy and its relationship to risk- taking. The result is consistent with their theoretical hypotheses and further highlights the existence of significant relationship between the key variables (risk-taking, capital and reinsurance) and supporting the view that they are jointly determined. Iqbal and Rehman (2014a) carried out a study on reinsurance analysis with respect to its impact on the performance of non-life insurance companies in Pakistan. The article examines whether reinsurance practice positively affects the performance of non-life insurers in Pakistan or conversely has any negative effect on them. They opine that whether insurers are financially stable or unstable, they should try to reduce their dependence and exposure on reinsurance because the increased reliance exposes them to the potential risk of declined performance. A more explicit and interesting study that shows the interaction between reinsurance utilisation and performance of insurance companies is that of Iqbal *et al.* (2014). The study titled "analysis of change in profitability due to reinsurance utilisation and leverage levels of non-life insurance sector of Pakistan" is to examine the relationship between profitability reinsurance and leverage level of private sector non-life insurers in Pakistan. The study indicates that increased dependence on reinsurance arrangement will decrease profitability as leverage level has a significant negative impact on the profitability. They further suggest that for insurance companies to increase their underwriting capacity and stabilize their earnings, they must depend less on reinsurance.

3. Methodology of research

Longitudinal descriptive research design was employed for this study. The research design was employed because it studies the selection of a representative panel or group of individuals of the identified population over a stretched of time and repeated measurement of the group over fixed interval of time. The population of the study comprises forty one (41) licensed general insurance companies operating in Nigeria. General insurance companies are companies that underwrite risks except risk(s) associated with life. Census sampling technique was adopted using secondary data. This study adopted time series (aggregate industry data comprising of forty one general insurance companies) as computed by Nigerian Insurers Association (NIA), a self regulatory body in the industry. The data covered a ten year period of 2006 to 2015. Methods of that analysis adopted were descriptive, simple linear regression and multiple linear regression. Reliability, robustness, normality, multicollinearity, autocorrelation and heteroscedasticity tests were carried out on the data.

3.1. Model specification and analytical variables

This study formulates a linear panel model of the following form:

$$PT = f(RD) \quad (1)$$

Where RD is Reinsurance Dependence

PT is Profitability

Breaking down the independent variable (RD) further into two components, we have;

$$RD = f(RCR, RDCP, \varepsilon) \quad (1a)$$

Breaking down the dependent variable (PT) further into two components, we have;

$$PT\ (ROA, ROE, \varepsilon) \quad (1b)$$

Model Equation

$$PT = a_1 + b_1(RCR) + b_2(RDCP)_{+\varepsilon} \quad (2)$$

Due to inconsistent in raw data, the above models were transformed using logarithmic transformation of model as follows:

$$\log_e PT = a_1 + b_1 \log_e(RCR) + b_2 \log_e(RDCP)_{+\varepsilon} \quad (3)$$

Table 1. Definition of variables

Variables		Definitions
Dependent Variables:		
PT	-	Profitability
ROA	-	Return on Assets
ROE	-	Return on Equity
	-	Error Term
Independent Variables		
RD	-	Reinsurance Dependence (RCR &RDCP)
RCR	-	Ratio of Ceded Reinsurance
RDCP	-	Reinsurance Dependence Ceded Premium

Table 2. Definition of Internal Determinants Variables (Proxies)

S/N	Variables	Proxy	Measurement	Variable Specification
1.	Ratio of Ceded Reinsurance	RCR	Reinsurance Ceded/ Net Premium Written.	Independent
2.	Reinsurance Dependence Cede Premium	RDCP	Ceded Premium/Total Asset	Independent
3.	Return on Assets	ROA	PAT/Total Assets	Dependent
4.	Return on Equity	ROE	PAT/Shareholders' Equity.	Dependent

4. Data Analysis

Table 3. Descriptive Analysis for (ROA, ROE, PT, RCR and RDCP)

	ROA	ROE	PT	RCR	RDCP
Mean	0.021681	0.027931	0.049612	0.466837	0.119316
Median	0.012343	0.019003	0.031346	0.447008	0.127524
Maximum	0.069113	0.084881	0.153994	0.733746	0.166156
Minimum	-0.006572	-0.007905	-0.014477	0.297056	0.071160
Std. Dev.	0.027510	0.032594	0.060104	0.153329	0.033066
Skewness	0.724147	0.537635	0.845754	0.521568	-0.088752
Kurtosis	2.042769	1.965510	2.190788	2.179407	1.867562
Jarque-Bera	1.255770	0.927656	1.465010	0.733960	0.547468
Probability	0.533720	0.628872	0.480703	0.692824	0.760534
Sum	0.216812	0.279314	2.461423	4.668368	1.193158
Sum Sq. Dev.	0.006811	0.009561	0.387889	0.211589	0.009840
Observations	10	10	10	10	10

Source: Researcher's computation using e-views 10, (2018)

Table 4. Test of Hypothesis (The regression coefficient of LOG_PT)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.49E-15	1.95E-15	2.301367	0.0549
LOG_RCR	2.73E-15	1.60E-15	1.710829	0.1309
LOG_RDCP	1.13E-4	4.43E-6	2.26E+15	0.0000
R-squared	0.965000	Mean dependent var		-1.833609
Adjusted R-squared	0.931000	S.D. dependent var		1.172622
S.E. of regression	1.205020	Sum squared resid		1.00E-29
F-statistic	4.330000	Durbin-Watson stat		2.236162
Prob(F-statistic)	0.008000			

5. Results

The descriptive statistics on table 3 shows reinsurance as a major risk financing technique adopted by general insurance companies in Nigeria. This is however evidence as there was steady increase in reinsurance arrangement from 2006-2015 under review. This finding further buttresses the views of Dionne and Triski (2008), Vermont (2012), Rejda (2013), Obalola and Abass (2016). The whole industry under review recorded the lowest profit in 2008 with ROA and ROE at minimum. Incidentally, RCR (Ratio of Ceded Reinsurance) which gives direct information about the volume and magnitude of reinsurance transactions that take place between the two parties was at minimum in the same year, 2008. The result of hypothesis (H_{o1}) on table 4 reveals the influence of reinsurance dependence on profitability. The finding of the study

presents the p-value of 0.008000. This however means that reinsurance dependence has a high degree of influence on the profitability level of general insurance companies in Nigeria. This finding shares convergent view with Carneiro and Sherris (2008) and Veprauskaite and Sherris (2012). However, a further check reveals that RCR as one of the indicators of reinsurance dependence does not affect the profitability of non-life insurance companies in Nigeria at p-value of 0.1309. This implies is that Ratio of Ceded Reinsurance (RCR) which measures the degree to which an insurance company utilises reinsurance to its policyholders on the short does not have any significant impact on profitability. Conversely, the result also reveals that Reinsurance Dependence Ceded Premium (RDCP) as one of the indicators of reinsurance dependence affects profitability at p-value of 0.000. The implication is that RDCP which measures the reinsurance dependence over a long period of time influences profitability of general insurance companies in Nigeria. In other words, reinsurance does not affect general insurance companies in Nigeria but excessive (dependence) utilisation without recourse to increasing risk retention level over a period of time may be deduced to low profitability turn out. This finding shares a similar view with Chen *et al.* (2001), Lee and Lee (2012), Iqbal and Rehman, (2014a), Iqbal and Rehman (2014b), Iqbal *et al.* (2014), Cummins *et al*., (2011) and Iqbal and Rehman, (2014b).

6. Conclusions

Reinsurance is fundamental to insurance companies' operations. Though, it is very vague because it is a secondary market for insurance risks, it is hardly known outside insurance sector. Reinsurance serves as a capital management tool available to insurance companies, at the same time; insurers substitute it for capital which may allow them hold less capital thereby increasing their insolvency probability. The central point of this argument is focused on the fact that reinsurance dependence might affect insurance companies' operations on the long run, may be costly, uneconomical, reduce insurer's efficiency and its inability of sufficient assets to meet its debts, and on the long run erodes the profitability of general insurance companies in Nigeria. Since the p-values of the partial regression coefficient are less than 0.05, the study therefore suggested the rejection of null hypothesis. The study further authenticates the adaptation of Optimal Reinsurance Theory (ORT) used for this study. The overall result of this study supports the school of thought that proposes that reinsurance dependence by general insurance companies has a strong significant influence on their profitability. This study therefore recommends that general insurance companies in Nigeria should increase insurance penetration, capital, size and clientele base. This may translate to increase in financial capacity, bottom line and experience large pool of homogeneous exposures which will make the outcome more predictable and on the long run demand less of reinsurance protection.

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