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Effects of Reinsurance Utilisation on the Capital Adequacy of Non-life Insurance Companies in Nigeria

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Abstract: Reinsurance is one the most significant risk management tools employed by primary insurers. Its level of utilisation is hinged on capital sufficiency of primary insurer. Despite its usefulness, many researchers have queried its excessive reliance. This study examined the effect of reinsurance utilisation on the capital adequacy of non-life insurance company in Nigeria. The study adopted a descriptive research design and relied on secondary data of gleaned from annual financial statements between 2011 and 2020. The study population comprised of all the fifty-six (56) non-life insurance firms in Nigeria. Stratified sampling technique was adopted in selecting twenty. These selected companies (market leaders) controlled more than 70% market share of the industry. The study adopted reinsurance dependence and reinsurance ceded proportion as proxies of reinsurance utilisation while financial leverage and return on asset were used as indicators of capital adequacy. The study revealed a significant joint effects of reinsurance utilisation on the return on asset and financial leverage of non-life insurance companies in Nigeria. The study recommended that reinsurance facilities be given adequate attention by insurance companies. More importantly, non-life insurance companies should diversify their investment portfolios and take into cognizance underwriting factors such as past loss experience, size of risks and frequency of losses.

Keywords: Reinsurance; Capital Adequacy; Reinsurance Dependence; Financial Leverage; Solvency; Profitability; Return on Assets

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1. Introduction

Insurance is a crucial risk management device deployed in mitigating risks. The management of these risks is hinged on sufficient funding from premiums collected to pay claims in the event of a loss and to engage in successful investment opportunities (Ajemunigbohun, 2017). This presupposes that an insurance company's operation and function must include the efficient use and management of resources in order to maintain financial stability (European Central Bank, 2009). Therefore, requirement for effective resource management by insurance company is justified by the exposure to losses resulting from risks they have covered in their portfolio. In order to bridge this gap, reinsurance is risk management device explored by insurers to reduce their loss exposure (Abass, 2019). Adoption of rreinsurance has direct or indirect effect on insurers' profitability (Abass & Obalola, 2018). Reinsurance arrangement enables an insurer improve its underwriting capacity without raising its capital, and by extension reduces the profitability of losses (Pitselis, 2008; Abass & Ojikutu, 2019). Other benefits of reinsurance include, improvement in capital and underwriting capacity, reduces financial stress among others (Garven & Tennant, 2003; Cummins, Dionne & Nouira, 2008; Pitselis, 2008). Relatedly, studies have shown that, notwithstanding its utilisation, reinsurance has an impact on the capital sufficiency of primary insurer. Hence, many researchers have queried the excessive dependence on reinsurance. Their argument is hinged on the fact that reinsurance may costly, increase insolvency risk, encourages low risk retention and in the long erodes insurers' performance (Cummins, Feng, & Weiss, 2012; Lee & Urruta,1993; Abass & Obalola, 2018). Therefore, the focus of this study is to determine whether or not changes in reinsurance have an impact on the capital adequacy of non-life insurance companies in Nigeria.

2. Literature Review

2.1. Conceptual Review

Reinsurance, according to Outreville (2002), is the transference of responsibility from the primary insurer—the business that issued the insurance contract—to a different insurer, the reinsurance firm. A cession of an insurance company is the term used to describe the business placed with a reinsurer (Dorfman & Cather, 2015). Though, the policyholders are the primary beneficiary of reinsurance agreements, they however lack legal recourse against the reinsurer. Therefore, a reinsurance contract, in accordance with Soye (2017), only addresses the actual insured event or exposures, and the reinsurer is exclusively accountable to the ceding insurance company. Its adoption further maintains insurance companies' financial soundness, solvency, stability, aids shareholders in risk management, assures long-term viability and increase in the volume of premium (Garven & Tennant, 2003; Zeng, 2005; Meier &

Outreville, 2006). It also lowers regulatory expenses and the volatility of financial statements as a method to stabilize their earnings (Baur & Donoghue, 2004).

Reinsurance utilisation (RU) is the choice of an insurer to take up reinsurance for both the assumed risk future contingencies as well as its apparent present ones (Desjardins & Dionne, 2017). It is a specialized kind of risk financing that may also result in the regulatory restriction on the ratio of capital to insurance underwriting capacity, projected bankruptcy, expenses, and capital management choice being relaxed (Garven & Tennant, 2003). Reinsurance utilisation is largely dependent on leverage, size, underwriting outcomes, investment returns, and ownership structure (Curak, Utrobicic & Kovac, 2014; Meier & Outreville, 2003).

Reinsurance Dependence (RD), on the other hand, illustrates how insurance firms may be exposed to the collectability issue with reinsurance contracts in the short or long-term (Cummins, 2012 & Iqbal; Rehman, 2014). It serves as a measure of how much an insurance business depends on its insurers to resolve claims. Reinsurance Dependence according to Lee and Lee (2012) and Burca and Batrinca (2014) may be measured by Ratio of Ceded Reinsurance (RCR) and Reinsurance Dependence Ceded Premium. While RCR assesses the extent to which insurance company uses reinsurance to protect its policyholders, RDCP evaluates the level of reinsurance exposure and concentration of insurance businesses over a period of time (Lee & Lee, 2012; Burca & Batrinca, 2014; Iqbal, Rehman & Shahzad, 2014; Iqbal & Rehman, 2014).

The regulatory body's minimum capital requirement for a financial institution is known as capital adequacy (Cummins, 2007). It is the capital necessary for a risk financing vehicle, such as a captive insurance company, to cover their liabilities. When compared to life insurance and commercial banks, which hold capital that is subject to considerable tax and agency costs, non-life insurance companies hold a disproportionately high amount of capital. The RBC (risk-based capital) ratio, which is the ratio of total adjusted capital to RBC, is used to evaluate capital adequacy. Dong, Qinxue, Chuyi, and Kexin (2017) defined risk-based capital as the minimal amount of capital an organisation must hold depending on its level of risk. Pragmatically, a well formulated RBC rules can assist regulators in identifying vulnerable insurers so that the regulator can formally act when an insurer's capital falls below predetermined thresholds (National Association of Insurance Commissioners, 2021). RBC, meanwhile, has received scathing criticism for its poor capacity to foresee the insolvency of property-liability insurers (Cummins, Grace & Phillips, 1999; Cummins, et al, 2012). Furthermore, past research suggests that flaws in the current RBC system would probably cause some financially sound insurers to make undesired and unanticipated choices in an effort to avoid being mistakenly labeled as requiring regulatory attention (Cummins, Harrington, & Niehaus, 1994).

The word "leverage" is used to characterize the usage of specific fixed expenses (they operate as a "lever") that effect on the performance of the firm that is on its noticeably enhanced profitability (Kapil, 2011). A set operational cost and a fixed finance cost serve as the "lever" for a business. This separates the three categories of leverage into total, operating, and financial leverage (Victorija, 2015). It is argued that a corporation employs financial leverage if fixed cost capital (debt or preferred capital) is incorporated in its capital structure and has a set interest rate or fixed preferred dividend payments (Victorija, 2015). A corporation is considered to be leveraged if it has debt on its balance sheet, and unleveraged if it simply uses stock to fund its operations (Rahul, 2008). Debt produces "financial leverage" since it has a beneficial impact on shareholder returns in good times and a negative impact on them in bad times (leverage). A "levered business" employs a combination of equity and several types of debt, as opposed to an "unlevered firm1," which simply uses equity capital (Rahul, 2008).

2.2. Theoretical Review

The Corporate Demand Theory (CDT) is the focus of this study. Corporate Demand Theory is the theory that explains the driving forces behind an insurance company's decision to take up reinsurance. The theory clarifies the drivers behind why primary insurers buy reinsurance. An insurer reinsures its business for a variety of reasons, including diversifying the risk of its portfolios and reducing the likelihood of ruin, to benefit from the knowledge and experience of reinsurers, and to stabilize shareholder returns (Doherty & Tinic, 1981). CDT proposes that reinsurance utilsation may be beneficial on the short run and a cost on the long run. Short run benefits include risk mitigation, reduction in volatility, increase in underwriting capacity, spread of risk among other (Mayers & Smith, 1990; Pitselis, 2008; Cummins et al., 2008; Hoerger et al., 1990; Iqbal and Rehman, 2014). Long run costs of reinsurance include insufficient retained premium, increase in reinsurance premium, low profitability, insolvency, high transaction cost, and lower retention capacity (Chen, Hamwi & Hudson, 2001; Froot, 2007; Lee & Lee, 2012; Iqbal & Rehman, 2014a; Cummins et al, 2016).

2.3. Empirical Literature

The impact of reinsurance on the capital sufficiency and performance of non-life insurance businesses has been the subject of several prior studies. According to Berger, Cummins, and Tennyson (1992) profitability rises noticeably when reinsurance is ceded. Data gathered from 918 property and liability businesses in the US were used by Chen, et al. (2001) to analyse the impact of ceded reinsurance on primary insurer solvency. The research found out that insurers' use of reinsurance may

increase the likelihood of insolvency. The study provided additional evidence in support of this claim by demonstrating that a less solvent insurer is more likely to seek out additional reinsurance coverage due to his perceived inability to acquire capital in the financial market. On the other hand, the market structure, effectiveness, and performance of the property liability insurance sector in the United States were examined by Choi and Weiss (2005). The researchers took into account both the reinsurance ceded proportion and the reinsurance assumed proportion. Reinsurance assumed proportion was found to be inversely linked to insurer profitability while reinsurance ceded proportion is positively related. The same reinsurance ceded proportion was used by Ma and Elango (2008) in their analysis of internationalization and the performance of the property liability insurance sector. It was discovered that reinsurance and risk-adjusted return on assets are positively correlated. Similar to this, research conducted by Cummins, Dionne, Gagne, and Nouira (2008) examined the expenses and advantages of reinsurance for primary insurers. The study concluded that the same factors that motivate people and companies to buy insurance also drive primary insurers' need for reinsurance. Based on Taiwanese property-liability insurance companies, Lee & Lee (2012) investigated the relationship between the usage of reinsurance and insurer performance. The study's findings revealed that a relationship exists between reinsurance and insurance company performance. This claim was established by evidence that insurance businesses with greater ROA tend to use minimal reinsurance. Relatedly, Iqbal and Rehman (2014) conducted a study on reinsurance analysis' effect on Pakistan's non-life insurance industry's performance. They found out that higher reliance on reinsurance contracts would result in lower profitability since debt level has a major detrimental effect on profitability. It was opined that insurance companies should rely less on reinsurance if they wish to expand their underwriting capacity and stabilize their profitability.

3. Methodology and Model Specification

This study adopted ex-post facto research design. This study is centered on non-life Insurance Companies in Nigeria. The study population comprised of all the fifty-six (56) insurance firms in Nigeria (Nigeria Insurance Association, 2020). This study relied on secondary data gleaned from the Nigerian Insurance Digest between 2011 and 2020. Stratified sampling technique was used in selecting twenty (20) insurance companies. The selected companies controlled more than 70% of the market share. Multiple regression analysis was utilized in the analysis of data obtained for the purpose of this study.

The functional forms of the model of the models are stated as;

$$FL = \beta o + \beta 1\,\mathrm{RD} + \beta 2\,\mathrm{RC} + \mu$$

$$ROA = \beta o + \beta 1\,\mathrm{RD} + \beta 2\,\mathrm{RC} + \mu$$

Where:

βo = Constant Term

$RD\beta_1$ = Coefficient of Reinsurance dependence

$RU\beta_2$ = Coefficient of Reinsurance ceded proportion

μ = Error Term

ROA = Return on Assets

FL = Financial leverage

RD = Reinsurance Dependence

RU = Reinsurance Ceded proportion

Table 1. Variable Measurement

Variable	Proxies	Definition/Measurement	Expected outcome
Independent Variable: Reinsurance	Reinsurance Dependence	Reinsurance incurred/ (Assets -Liability)	+/-
	RC= Reinsurance Cede Proportion	Reinsurance Outward/ Gross Premium	+/-
Dependent Variable: Capital adequacy	FL= Financial leverage ROA = Return on Asset	Investment – Total assets Net income/ Total assets	+/-

Presentation of Data

Table 2. Model Summary of Effect of Reinsurance Dependence and Reinsurance Utilisation on ROA of Non-Life Insurance Companies in Nigeria.

Dependent Variable: ROA
Method: Panel Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RD	-0.053506	0.028779	-1.859187	0.0646
RU	-0.621241	0.357597	-1.737264	0.0840
C	0.712546	0.734670	0.969885	0.3334

R-squared	0.041826	Mean dependent var	-0.076311
Adjusted R-squared	0.026032	S.D. dependent var	0.571130
S.E. of regression	0.563647	Akaike info criterion	1.712495
Sum squared resid	57.82111	Schwarz criterion	1.781866
Log likelihood	-155.2620	Hannan-Quinn criter.	1.740607
F-statistic	2.648182	Durbin-Watson stat	1.252470
Prob(F-statistic)	0.050393		

Table 2 reveals that the coefficient of determination (Adj R = 0.0260) which suggests that reinsurance utilisation and reinsurance dependence jointly explains 2.6% of the changes in return on asset of insurance companies in Nigeria. This implies that aside reinsurance utilisation and reinsurance dependence, there are several other factors that determine changes or fluctuations of return on asset of insurance companies in Nigeria. This result is not statistically significant because the p-value of the result (0.05039) is greater than 0.05 level of significance used for the study. The research hypothesis is therefore rejected. Thus, reinsurance utilisation and reinsurance dependence jointly wield positive significant influence on the return on asset of insurance companies in Nigeria. This result contradicts the findings of Iqbal and Rehman (2014) who found that higher reliance on reinsurance contracts would result in lower profitability since debt level has a major detrimental effect on profitability.

Table 3. Model Summary of Effect of Reinsurance Dependence and Reinsurance Utilisation on Financial Leverage of Non-Life Insurance Companies in Nigeria.

Dependent Variable: Financial Leverage
Method: Panel Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RD	0.862158	0.051496	16.74228	0.0000
RU	-0.010960	0.019828	-0.552771	0.5810
C	-0.006864	0.014684	-0.467451	0.6406

R-squared	0.562516	Mean dependent var	0.180090
Adjusted R-squared	0.560509	S.D. dependent var	0.213361
S.E. of regression	0.141446	Akaike info criterion	-1.064754
Sum squared resid	4.361493	Schwarz criterion	-1.033903
Log likelihood	119.1230	Hannan-Quinn criter.	-1.052296
F-statistic	280.3038	Durbin-Watson stat	1.449255
Prob(F-statistic)	0.000000		

Table 3 further reveals the coefficient of determination (Adj R2 = 0.5605) suggests that reinsurance utilization and reinsurance dependence jointly explain 56.3% of the changes in financial leverage of insurance companies in Nigeria. This implies that aside reinsurance utilisation and reinsurance dependence, there are several other factors that determine changes of financial leverage of insurance companies in Nigeria. This result is statistically significant because the p-value of the result (0.05039) is greater than 0.05 level of significance used for the study. The research hypothesis is therefore rejected. Thus, reinsurance utilization and reinsurance dependence jointly wield positive significant influence on the financial leverage of insurance companies in Nigeria. This result is in consonance with the study of Chen,

Hamwi, and Hudson (2001) primary insurers' use of reinsurance may increase the likelihood that an insurer may go insolvent.

4. Conclusion and Recommendations

Reinsurance is a vital tool that insurance firms may capitalize on, when striving to reduce risks and uncertainty. In fact, reinsurance give insurance firms opportunity to have more stable portfolio as well limitation in the fluctuation of annual accounts. All these would invariably ensure that these firms achieve better financial performance. However, based on the findings of the study, it can be concluded that the optimal utilization of reinsurance among non-life insurance companies in Nigeria assist to a large extent in achieving adequacy of capital.

The study recommends that the management of the firms should ensure they maintain adequate level of debt to ensure that they do not affect other functions of the firm. Insurance firms are also enjoined to ensure that each of their portfolios are optimally reinsured. This would go a long way to assist Insurers in protecting their protecting their portfolio as well as keeping good business for their account.

References

Abass, O. A. (2019). Empirical analysis of reinsurance dependence on the profitability of general insurance business in Nigeria. *Academic Journal of Economic Studies*, 5(4), pp. 136–43.

Abass, O. A. & Obalola, M. A. (2018). Reinsurance utilisation and performance of non- life business in the Nigerian insurance industry: a mixed methods approach. *The Journal of Risk Management and Insurance, 22* (2), pp. 18-32.

Abass, O. A. & Ojikutu, R. K. (2019). Interaction between capital and demand for reinsurance; an empirical study of non-life insurance business in Nigeria. *LASU Journal of Management Sciences, 5*(1): pp. 42-53.

Ajemunigbohun, S. S. (2017) Reinsurance and performance of the ceding companies: The Nigeriainsurance industry experience. *Economics and business*. 3(1), pp. 19-29

Baur, P. & Donoghue, A. B. (2004). *Understanding reinsurance: how reinsurance creates value and manage risk.* Retrieved from https://www.grahambishop.com/documents store.

Berger, L.; Cummins, J. D. & Tennyson, S. (1992). Reinsurance and the liability insurance crisis. *Journal of Risk Management and Uncertainty*, 5(3), pp. 253-72.

Burca, A. M. & Batrinca, G. (2014). The demand for reinsurance in the Romanian insurance market. *International of Academic Research in Accounting, Finance and Management Sciences*, 4(1), pp. 299-308.

Chen, Y.; Hamwi, I. & Hudson, T. (2001). The effect of ceded reinsurance on solvency of primary insurers. *International advance in Economics Research, 7*(1), pp. 65-82.

Choi, B. P. & Weiss, M. A. (2005). An empirical investigation of market structure, efficiency, and performance in property-liability insurance. *Journal of Risk & Insurance*, 72(4), pp. 635-673.

Cummins, J. D.; Dionne, G., Gagne. R., & Nouira, A. (2008). The cost and benefits of reinsurance. *A publication of interuniversity research centre on enterprise networks, logistics and transportation (CIRRELT).*

Cummins, J. D.; Feng, Z. & Weiss, M. A. (2012). Reinsurance counterparty relationships and firm performance in the U.S. property-liability insurance industry. *Working paper*, Temple University, Philadelphia. Retrieved from http://ssrn.com/abstract=1997444.

Cummins, J. D. (2007). Reinsurance for natural and man-made catastrophes in the United States: current state of the market and regulatory reforms. *Risk Management and Insurance Review*, 10 (2), pp. 179-220.

Curak, M.; Utrobicic, M. & Kovac, D. (2014). Firms' specific characteristics and reinsurance-evidence from Croatian insurance companies. 23(1), pp. 29-42

Desjardins, D. & Dionne, G. (2017). Reinsurance demand and liquidity creation. *Centre Interuniversitaire de recherché sur les reseaux d' enterprise, la logistique et le transport, CIRRELT*. Retrieved from https://www.cirrelt.ca/DocumentsTravail/CIRRELT-2017-20.pdf.

Doherty, N. A. & Tiniç, S. M. (1981). Reinsurance under conditions of capital market equilibrium: a note. *The Journal of Finance, 36*(1), pp. 949-953.

Dong, S. S.; Qinxue, L.; Chuyi, M. & Kexin, L. (2017). *Risk based capital (RBC) for an Illinios Based Insurance Company.* Being undergraduate research retrieved from https://math.illinois.edu/system/files/inline-files/Risk%20Based%20Capital.pdf.

Dorfman, M. S. & Cather, D. (2015). *Introduction to risk management and insurance (10th eds)*. Noida, India: Pearson India Education Services Pvt. Ltd.

Elango, B.; Ma, Y. L. & Pope, N. (2008) An investigation into the diversification performance relationship in the US property-liability insurance industry. *Journal of risk and insurance* 73(1), pp. 169-192.

European Central Bank (2009). Importance of insurance companies for financial stability. *Financial Stability Review*, pp. 160-168.

Froot, K. A. (2001). The market for catastrophe risk: a clinical examination. *Journal of Financial Economics*, 60(2-3), pp. 529-571.

Garven, J. R. & Tennant, J.L. (2003). The demand for reinsurance: theory and empirical test. *Insurance and Risk Management*, 7(3), pp. 217–237.

Harrington, S. E. & Niehaus, G. R. (2004). *Risk management and insurance* (2nd ed.). New York: McGraw-Hill.

Hoerger, T. J.; Sloan, F. A. & Hassan, M. (1990). Loss volatility, bankruptcy and the demand for reinsurance. *Journal of Risk and Uncertainty*, (3), pp. 221-245.

Iqbal, H. T. & Rehman, M. (2014). Empirical analysis of reinsurance utilization and dependence with respect to its impact on the performance of domestic non-life stock insurance companies operating in the private sector of Pakistan. *International Journal of Financial Services Management*, pp. 95-110.

Iqbal, H. T. & Rehman, M. U. (2014a), Reinsurance analysis with respect to its impact on the performance: Evidence from non-life insurers in Pakistan. *The IEB International Journal of Finance*, pp. 90-113.

Iqbal, H. T.; Rehman, M. U. & Shahzad, S. J. H. (2014). Analysis of change in profitability due to reinsurance utilization and leverage levels: evidence from non-life insurance sector of Pakistan. *Journal of Independent Studies and Research – Management, Social Sciences and Economics*, 12 (1), pp. 1-13.

Kapil, Sh. (2011). Financial management. *Dorling Kindersley* (India) Pvt, Ltd. 725.

Lee, H., & Lee, C. (2012). An analysis of reinsurance and firm performance: evidence from the Taiwan property-liability insurance industry. *The International Association for the Study of Insurance Economics*, pp. 1018-5895.

Mayers, D. & Smith, C. W. (1990). On the corporate demand for reinsurance: evidence from the reinsurance market. *Journal of Business*, *63*(1), pp. 19-40.

Meier, U.B. & Outreville, J. (2006) 'Business cycle in insurance and reinsurance: the case of France, Germany and Switzerland', *The Journal of Risk and Finance*, 7(2), pp. 160–173.

Outreville, J. F. (2002). Introduction to insurance and reinsurance coverage. In dror, D.M. A.S Social reinsurance: A new approach to sustainable community health financing. ILO and WB, pp. 59-74.

Pitselis, G. (2008). An overview on solvency supervision, regulations and prediction of insolvency. *Belgian Actuarial Bulletin*, 8 (1), pp. 37-53.

Soye, Y. A. & Adeyemo, D. L. (2017). Evaluation of impact of reinsurance mechanism on insurance companies' sustainability in Nigeria. International *Journal of Research, Innovations and Sustainable Development*, 7(1), pp. 1-14.

Viktorija, B. (2015). Financial leverage and its determinants in companies producing electricity from wind resources in Latvia. Economics and Business 27 (2015), pp. 29-39.

Zeng, L. (2005). Enhancing reinsurance efficiency by using index-based instrument. *The journal of Risk and Finance*, 6(1), pp. 6-16.