UNDERWRITING CAPACITY AND PERFORMANCE OF QUOTED INSURANCE FIRMS IN SUB-SAHARAN AFRICAN COUNTRIES

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Abstract

Risk management is a critical aspect of the performance and growth of insurance firms. This study examined the effects of the underwriting capacity of listed insurance companies on their financial performance in selected countries in the sub-Saharan African region. It is argued in the study that internally controlled factors (underwriting capacity) generate risks faced by the insurance firms. The study makes use of secondary data gathered from the annual audited financial statements of the studied insurance organizations. For the period of 2010 to 2019, data from eight (8) chosen sub-Saharan African nations and forty-five (45) insurance companies were used. With the help of dependent variables (ROA, ROE, and Tobin's Q), explanatory variables (shareholders fund, underwriting profit, reserves, earning asset ratio, gross premium, and the ratio of ceded reinsurance), and moderating variables (firm size, economic growth, and inflation rate), the data were analyzed using the system GMM estimation technique. The results from the study reveal that the pattern of effects of underwriting capacity variables differ in terms of the measurement used for performance indicator. In particular, the study found that shareholders' funds, underwriting profit, reserves, earning asset ratio and gross premium written exert significant effects on the performance of the insurance firms, although the effects vary depending on whether ROA, ROE, or Tobin's Q is used as a performance indicator. Underwriting profit was found to have unambiguous significant and positive effects on all the performance indicators while reserves had significant negative effects on all the performance indicators of insurance firms. The ratio of ceded reinsurance was however found to have no significant impact on the performance of listed insurance firms in the selected Sub-Saharan African countries. Optimal risk and shareholder's fund management strategies are therefore recommended in the study.

Keywords: Risk management, Reinsurance utilization, Shareholder's fund, Underwriting Profit

JEL classification: G22; L25

1. INTRODUCTION

It is impossible to overstate how important the insurance sector is to the financial world in which we live. It is at the core of the financial risk management techniques used by people, groups, companies, and society (Hughes, 2013). A robust and established insurance sector is essential for economic growth because it increases a nation's capacity to take risks while also providing long-term cash for long-term investments. As insurance firms compensate company losses and prevent the collapse of economic activity, their significance for businesses and individuals becomes increasingly clear. In addition to preventing losses, insurers assist society economically and socially by lowering worry and stress, increasing employment, and generating accumulated premiums for long-term investments. In order to maintain their position in society, insurance businesses must, like any other sector, keep enhancing their performance (Kazeem, 2015).

For the benefit and protection of policyholders, efficient, fair, safe, and stable insurance markets require favorable financial performance. However, the profitability of insurance businesses may suffer if they are unable to take on bigger unanticipated risks because of inadequate underwriting capacity. Financial capital is essential to every successful firm, but the unique structure of the insurance industry need additional capital in terms of underwriting capability (Onaolapo, 2005). The ability to underwrite effectively is one of the pillars of a successful insurance business since inadequate risk selection leads to severe losses and insurer collapse. Risk evaluation, risk premium calculation, and risk acceptance are all necessary components of underwriting. The financial performance of insurance firms may be impacted by any one of these actions. However, a non-life insurer's underwriting process is likely its most crucial responsibility, making it the biggest source of possible judgments mistakes (Michael, 2015).

Investigation of the influence of underwriting capacity on the performance of insurance firms has not received much attention from researchers. However, there exist conflicting findings on the few empirical studies carried out on this subject matter. While a positive significant relationship was reported in some studies, a negative sign or no significant relationship appeared in others. The balance of evidence does not conclusively support a significant positive or significant negative relationship between underwriting capacity and the performance of insurance firms. For instance, researchers such as Ma and Elango (2008), Iqbal and Rehman (2014), Koc (2016), Soye and Adeyemo (2018), Sognon (2018), Akpan, Nnamseh, Etuk, Edema and Ekanem (2020), and Abass (2020) among others, have investigated the effect of different proxies of underwriting capacity (shareholder's fund, underwriting profit, investment income, reserves, earning asset ratio, gross written premium and reinsurance utilization - the ratio of ceded reinsurance) on the performance of insurance firms. They concluded that underwriting capacity significantly influences the performance of insurance firms.

On the other hand, the studies of Shiu (2004), Rashid (2015), Obonyo (2016), Abass and Obalola (2018), Alani and Sani (2019) on the effect of underwriting capacity on the performance of insurance firms all concluded otherwise: that underwriting capacity has no significant influence on the performance of insurance firms. The mixed results could stem from using different periods, methodologies, and variables to proxy underwriting capacity. Also, the conflicting results could be linked to the level of development of the insurance sector of the concerned economies. Given the conflicting findings from these studies, there is no consensus in the empirical literature on the impact of underwriting capacity on the performance of insurance firms. The mixed and inconclusive nature of these empirical studies creates a gap for further investigation in this study.

Also, this study employs three dependent variables (Returns on Asset (ROA), Returns on Equity (ROE), and Tobin Q) as a proxy for the performance of insurance firms in selected sub-Sahara African countries. Existing studies like Aduloju and Ajemunigbohun, (2017); and Mohamed (2019) used ROA and ROE to capture performance while others utilized either ROA or ROE to capture performance. This study therefore uses both accounting performance measures of ROA and ROE and market value of performance Tobin Q to measure performance. Employing these varying performance measures will no doubt make the results more robust and provide a strong basis for comparative analysis between the various measures, which improves the robustness.

Concerning the method of data analysis previous researches that have examined the effects of underwriting capacity on the performance of insurance firms used simple techniques such as Pearson correlation (Aduloju & Ajemunigbohun, 2017). More importantly, the majority of prior studies employed ordinary least square (OLS) static panel regression with or without fixed or random effect model [Shiu (2004); Ma & Elango (2008); Iqbal and Rehman (2014); Reshid (2015); Obonyo (2016); Soye & Adeyemo (2017); Soye & Adeyemo (2018); Abass (2019), Akpan et al. (2020) and Oyetayo & Abass (2020) among others]; which could not address the triple problem of endogeneity bias, measurement error, and omitted variables.

The remainder of this essay is organized as follows. Review of the literature is presented in Section 2. Section 3 presents the technique, while Section 4 presents the findings analysis. The paper is concluded in Section 5.

2. LITERATURE REVIEW

2.1. CONCEPTUAL CLARIFICATION

2.1.1. CONCEPT OF PERFORMANCE

Performance is a relative concept, it relates to how well an organization is making use of its resources and how poorly such resources are being utilized in other cases thus culminating ineffective performance and ineffective performance.

Performance measures how well a company is doing and how well it is using its resources to generate more money than it is spending and expand its operations (Copisarow, 2000). Adams and Buckle (2003) define performance as a function of the effectiveness of organizational-specific contractual mechanisms to attract, control, and retain managerial skills to maximize shareholders' wealth.

There are different criteria used for measuring performance, the commonly used measure of performance in extant literature include returns on asset (ROA), returns on equity (ROE), returns on investment (ROI), and net interest margin (NIM). The aforementioned are largely accounting measures of performance. Another measure of firms' performance that is appealing to researchers (Zeitun & Tian, 2007; Singh, Tabassum, Darwish & Batsakis, 2018) of late is Tobin Q which is a market measure of performance. It is expressed as the ratio between the summation of the market value of equities and the book value of liabilities to the book value of total assets. In this study, we will utilize ROA, ROE, and Tobin's Q as a surrogate of performance.

Returns on Assets (ROA): An indication of a company's profitability in relation to its total assets is called return on assets (ROA). It also provides insight into how well the management uses its resources to produce profits. It measures the profit after taxes to the total assets. Because it is possible to be efficient while yet using capital inefficiently, ROA demonstrates the management's efficacy in allocating resources (Oladutire, 2014). ROA connects the resources that were employed to generate the results of activities (Orji, 2011). A rising trend in ROA suggests that the company's performance is getting better. On the other hand, a declining trend indicates that performance is getting worse.

Return on Equity (ROE): The rate of return on the ownership stake, or shareholders' equity, of the holders of common stock is measured by returns on equity. It gauges how well a company uses each share of shareholders' equity to produce profits. It is calculated as the ratio of net income to shareholders' equity, which excludes preferred shares in this case. Returns on Equity (ROE) measures a company's profitability in relation to the total shareholder equity reported on the balance sheet (Orji, 2011). A high return on equity insurance company is more likely to be able to generate cash internally.

Tobin's Q: A market-based performance measurement is the Tobin Q and it is measured as a ratio of market capitalization plus total liabilities minus net cash flow to total assets. According to Berg (2016), it is a gauge that looks forward and offers a wealth of information about a company's performance while reflecting how investors value both tangible and intangible assets. Tobin's Q is moreover a reliable metric for contrasting organizations since it divides the replacement costs of tangible assets by the net present value of future cash flows (Lien & Li, 2013).

2.1.2. UNDERWRITING CAPACITY

Underwriting capacity is the combination of the retention power of insurance firms with the treaty or facultative cover offered by reinsurance companies to support their operations, (Onaolapo, 2005) defines underwriting capacity. In addition, according to Kerman (2012), an insurance company's underwriting capacity shows the highest level of risk it is ready to take on. The primary indicators of underwriting capacity are not generally agreed upon; however, the indicators of underwriting capacity used in this study are shareholders' fund, underwriting profit, investment income, reserves, earning asset ratio, gross written premium, and reinsurance utilization, or the ratio of ceded reinsurance.

Shareholder's Fund: The term "shareholders' fund" describes the portion of a company's equity that is owned by the shareholders. Capital from the shareholders' fund provides a business with ongoing ownership. It is determined by the likelihood that an insurance firm may fail. More crucially, the insurance regulator uses the shareholders' fund as a metric to identify insurers that require more monitoring because of their financial fragility or excessive reliance on reinsurance (Robbin, 2004). A policyholder-owned insurance company's shareholders' money are its assets less its liabilities (Kerman, 2012). That is, the number of shareholders' funds can be calculated by subtracting the total amount of liabilities on a company's balance sheet from the total amount of assets.

Underwriting Profit: The technical revenue or operational profit of insurance businesses is known as underwriting profit. Insurance firms typically calculate underwriting profit by summing underwriting premium and investment profits, subtracting income taxes, loading costs, administration costs, and actual claims paid. Underwriting profit in simplified terms is the net of earned premium fewer claims incurred and operating expenses (Kamau, 2013; Akpere, 2015). According to Swiss Re (2013), underwriting profit is the net earned premium minus the total costs (incurred claim – operational expenses + reinsurance commission).

Reserves: Insurance firms maintain reserves to cover the anticipated value of pending claims, and additional money is kept on hand for unforeseen circumstances. In order to support these reserves and capital, financial assets are kept. Regulating bodies establish reserve limits as a minimum sum that insurers are required to lay aside. It makes up a certain percentage of the total present value of all policies that are now in place for a company portfolio, less the present value of any upcoming premiums that will be paid plus interest (Society of Claims Professionals, 2009). According to Faculty and Institute of Actuaries (1997), the necessity for reserves as a crucial factor in determining underwriting capacity includes guaranteeing financial soundness, providing enough pricing to account for future claims costs, and determining the insurer's net worth and retention level.

Earning Asset Ratio: These are income-producing assets owned or held by the insurance company. These assets also have a base value and the ability to

produce additional funds for the insurance company. Insurance companies frequently utilize the earning assets ratio to calculate the percentage of their assets that are actively producing income. It gives the insurance company information about the likelihood that the business will turn a profit. If insurance companies diversify their earning assets investments and implement the hedging methods in the best way, this will improve their capacity to assume more risk and have a positive impact on their performance (Ahmed, Ahmed & Usman, 2011).

Premium: The amount of money billed by the insurer or paid by the insured to acquire the services of the insurance is known as the insurance premium or gross written premium (Vaughan & Vaughan, 2014). According to Garba and Abdulsalam (2011), a premium is a fee assessed to an insured person based on that person's anticipated loss or risk. In this study, the premium income is measured as the gross premium income of all the classes of insurance underwritten by the insurance company.

Reinsurance Utilization: Reinsurance is defined as insurance for insurers (Swiss Re, 2004). Reinsurance utilization measures the degree to which an insurance company utilizes reinsurance to fulfill its obligation to its policyholders (Loomba, 2014). Reinsurance utilization is a decision to purchase reinsurance by an insurer not only for the apparent current condition of risk assumed but also its future conditions (Desjardins & Dionne, 2017). The ratio of ceded reinsurance (RCR) and the Ratio of reinsurance recoverable to policyholders' surplus (RRPHS) are long-established and conventional reinsurance measures. In this study, the ratio of ceded reinsurance (RCR) will be used to proxy reinsurance utilization. In this study, the ratio of ceded reinsurance will be used to measure reinsurance utilization. The ratio of ceded reinsurance (RCR) gives direct information about the volume and magnitude of reinsurance transactions that take place between the parties

2.2. EMPIRICAL REVIEW

In this section, we review some previous empirical studies that have investigated the effect of underwriting capacity on the performance of insurance firms. For instance, Shiu (2004) used three important indicators—investment yield, the percentage change in shareholders' funds, and return on shareholders' funds—to analyze the factors that affected the performance of UK general insurance businesses between 1986 and 1999. The researcher experimentally examined 12 explanatory factors using a panel data set. The outcome demonstrates that reinsurance dependency has a negligible and adverse relationship on the efficiency of UK general insurance businesses.

Ma and Elango (2008) examined the effect of internationalization on the performance of the United States of American property-liability insurance industry for the period 1992 – 2009. The regression result "shows that reinsurance is positively related to firm performance, indicating that firms purchasing more

reinsurance experience more stable performance that contributes to higher risk-adjusted returns.

From 1999 to 2009, Lee and Lee (2012) conducted research on the factors that affect insurer retentions for property-liability insurance businesses in Taiwan. The study evaluated three models: the fixed-effects model, the random-effects model, and the OLS regression and two-panel data models. The findings demonstrate that input costs, underwriting risk (Loss Ratio), and reinsurance use have a considerable impact on the profitability of insurance businesses. The author consequently hypothesizes that, among other things, a decline in the value of these three important indicators will affect how profitable Taiwan's insurance industry is.

Hemrit and Ben-Arab (2012) conducted a study in Tunisia from 2000 to 2009 on the factors that influence the frequency and severity of operational losses for insurance companies. The outcome of the logit regression shows that the frequency of operational losses has no significant impact on profit (underwriting profit/total assets), but has a significant impact on business-line dependent factors like market share (premium/turnover), human factors, and variety of insurance activities.

Iqbal, Rehman, and Shahzad (2014) studied the "change in profitability due to reinsurance utilization and leverage levels of the non-life insurance sector of Pakistan and the period studied was from 2002 - 2012. ROA and ROE were the profitability indicators employed in the study while the Ratio of ceded reinsurance (RCR) and Ratio of reinsurance recoverable to policyholders' surplus (RRPHS) were used to measure reinsurance utilization. Analysis of data was done using panel data regression model (Random Effect). The result of the study reveals that profitability was positively related to reinsurance utilization while leverage levels had a significant negative impact on profitability.

Kamau (2013) studied the relationship between underwriting profit and investment income of non-life insurance companies in Kenya from the year 2000 to 2011. Investment income was proxy by non-life income after tax. The weighted least squares regression was utilized in the analysis. Findings show that underwriting profit exerts a positive and statistically significant weak effect on investment income.

Koc (2016) conducted a study on determinants of the financial performance of insurance companies quoted in Istanbul bourse for the period 2008 - 2015. The outcome of the panel data analysis reveals that there are positive relationships between numbers of agents, technical profit/earned premiums ratio, financial asset investment and financial performance, and a negative relationship between loss ratio and financial performance.

Angima and Mwangi (2017) examined the effect of underwriting and claims management practices on the performance of property and casualty insurance companies for the period 2010 to 2015 using the sample of eighty-two (82) property and casualty insurance companies operating in three (3) East African countries

(Kenya, Uganda, and Tanzania). Financial performance was measure by Return on Asset (ROA). Results of the regression analysis revealed that a negative relationship subsists between underwriting practices and performance while claim management practices positively influence performance. However, underwriting and claim management practices have no significant effect on performance.

Birhanu (2018) examined the effect of underwriting profit and investment income on the profitability of private insurance companies in Ethiopia for the period 2013 – 2017. The ordinary least square (OLS) regression was used to analyze the data. Findings revealed that underwriting profit and investment income positively and significantly influences the profitability of private insurance companies in Ethiopia.

Soye and Adeyemo (2018) investigated the effect of underwriting capacity on the income of the insurance industry in Nigeria for the period 2005 - 2015. Underwriting profit, shareholder's fund, earning asset ratio and investment income were the surrogates for underwriting capacity while gross premium was used to proxy insurance industry income. The result of the regression analysis shows that earning asset and underwriting profit exerts a positive and significant impact on the income of insurance companies while the total investment and shareholder's fund significantly impacted the income of Nigeria insurance companies negatively.

Abass and Obalola (2018) examined the effect of reinsurance utilization on the financial and non-financial performance of the non-life business in the Nigerian insurance industry between the years of 2006 – 2015. Financial performance was measure by ROA and ROE while non-financial performance was measure by using a questionnaire). Reinsurance utilization was proxy by reinsurance dependence (measure as reinsurance ceded/net premium written and ceded premium/total asset). Log transformation regression and content analysis were employed in the study. Results of the regression analysis revealed that a positive relationship subsists between reinsurance ceded/net premiums written but the relationship was not statistically significant. Also, ceded premium/total asset has a negative and significant influence on financial performance.

Abass (2019) examined the effect of reinsurance dependence on the profitability of general insurance companies in Nigeria for the period 2006 to 2015. The researchers utilized return on assets (ROA) and return on equity (ROE) to proxy profitability while the ratio of ceded reinsurance (RCR) and reinsurance dependence ceded premium (RDCP) were used as indicators of reinsurance dependence. The result of the regression analysis shows that the ratio of ceded reinsurance (RCR) had an insignificant positive influence on profitability while reinsurance dependence ceded premium (RDCP) had a positive and significant influence on the profitability of general insurance companies in Nigeria.

Shiu (2020) examined the effect of reinsurance and derivatives usage on the performance of the UK non-life insurance industry for the period 2013 – 2017. The

finding shows that those insurers using more reinsurance tended to have inferior financial performance, whilst those insurers with a predisposition towards risk management tended to have used both reinsurance and derivatives. The result further reveals that those insurers with high loss ratios were found to have inferior financial performance.

Oyetayo and Abass (2020) studied the influence of underwriting capacity on the financial performance of life insurance companies in Nigeria for the period 2008 – 2017. Profitability (ROA), liquidity, and solvency were the surrogates for financial performance while shareholder's fund, reserve, and reinsurance utilization were used to measure the underwriting capacity of insurance companies. The results of the multiple linear regression show that shareholder's fund and reinsurance utilization have a positive and significant influence on financial performance while reserve has an insignificant negative influence on the financial performance of life insurance companies in Nigeria.

3. METHODOLOGY

In this study, the causal research design was utilized since the nature of the data is Longitudinal. The variables involved are ex-post in nature which the researcher does not have the power to influence because they have already occurred. Thus, the structure of the research involves combining cross-sectional data with time-series properties to form a set of panel data. The population of this study comprised all the insurance firms listed in the eight (8) selected sub-Saharan Africa Countries Stock Exchanges as of 31st December 2019. Fifty-three (53) insurance firms listed in the Stock Exchanges of the eight (8) selected sub-Saharan African countries make up the population. Using a combination of purposive and stratified sampling technique, 45 insurance firms were selected from the total fifty-three (53) listed insurance firms in the Stock Exchanges of the 8 selected countries based on the following stratification: Botswana, one (1), Ghana, two (2), Kenya, three (3), Mauritius, four (4), Nigeria, twenty-four (24), South-Africa, eight (8), Uganda, one (1), Zimbabwe, two (2). The sample filtering technique was also utilized in the selection of insurance firms from each country based on the availability of annual reports from the insurance company's website for the period of study (that is, 2010 – 2019). The study employed secondary data that were obtained from the audited annual financial reports of the selected insurance firms under the reference period. The audited annual reports were obtained from the website of the respective companies.

3.1. THEORETICAL FRAMEWORK

This study is anchored on ruin theory. Ruin theory is a stochastic process that increases continuously because of earned premiums and decreases stepwise at times that claims occur. When the capital becomes negative, we say that ruin occurs. Consequently, companies will only offer non-life insurance if they can make a profit, or at least sustain themselves (Gerber & Loisel, 2012). The theory describes an

insurance company that experiences two opposing cash flows: incoming cash premiums and outgoing claims. In an event when the capital becomes negative, one can conclude that ruin occurs. Thus, a high probability of ruin indicates instability in the shareholder's fund, underwriting profit, investment income, reserves, earning asset, gross written premium, and reinsurance or the insurer should attract extra working capital (Kass et al., 2008). An insurance company might be having difficulty with cash flow (cash premium and claims costs) through weak underwriting capacity, this might dovetail to financial performance and by implication considered insolvent (ruined). The probability of ruin is denoted by ψ (u) which assumes that the annual premium and the claims process remain unchanged. The probability is a useful management tool that serves as an indication of the soundness of the insurer's combination of premiums and claims process concerning the available initial capital (Mayers & Smith, 1990; Kass et al., 2009; Oyetayo & Abass, 2020).

3.2. SPECIFICATION OF MODEL

This study built a model underpinned by the ruin theory. The study utilized three models because the study is using both accounting base performance and market-based performance indicators (ROA, ROE, and Tobin's q). Also, we employed seven proxies for underwriting capacity (shareholders' fund, underwriting profit, reserves, earning asset ratio, gross written premium, and reinsurance utilization - the ratio of ceded reinsurance). In the econometric literature, the general form of specifying a dynamic panel model is as follows:

$$Y_{it} = \sum_{j=1}^{m} y'_{i,t} - y_{j-1} + x'_{i,t} + \beta + \alpha_i + \lambda_t + \varepsilon_{i,t} \quad i = 1,2 \dots N \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.1)$$

λ_t and β are parameters to be estimated. $x'_{i,t}$ is (KxL) vector of strictly exogenous covariates, α_i and λ_t are the unobservable individual and the time effects respectively and ε_{it} ϰ iid (0, ς). The standard panel models such as fixed and random effects models are biased and inconsistent, as the lagged dependent variable is correlated with the error term ε_{it}. The inconsistency of the estimated parameters persists even if no correlation in the error term is assumed. Based on theoretical and empirical considerations as well as on data availability, the model of Oyetayo and Abass (2020) was adopted and modified in terms of variables included to proxy underwriting capacity. Oyetayo and Abass (2020) model the influence of underwriting capacity on insurance firms' performance as follows:"

$$LQ_i = \alpha + \beta_1 RS_i + \beta_2 SF_i + \beta_3 RU_i + Є_i \quad (3.2)$$

$$ROA_i = \alpha + \beta_1 RS_i + \beta_2 SF_i + \beta_3 RU_i + Є_i \quad (3.3)$$

$$SV_i = \alpha + \beta_1 RS_i + \beta_2 SF_i + \beta_3 RU_i + Є_i \quad (3.4)$$

Where: $LQ_{i,t}$ (Liquidity), $ROA_{i,t}$ (Return on Asset) and $SV_{i,t}$ (Solvency) represents the performance of insurance firm i; RS_i represents a reserve of insurance firm i; SF_i is shareholders fund of insurance firm i; RU_i is reinsurance utilization of insurance

firm i; ϵ_i the error term which accounts for other possible factors that could influence LQ_i, ROA_i and SV_i that are not captured in the model.

Based on the fact that the study employed different underwriting capacity indicators like underwriting profit, earning asset ratio, gross premium written in addition to the three indicators of underwriting capacity utilized in the Oyetayo and Abass (2020). In addition to ROA and ROE as performance indicators, this research also includes a market-based performance measure (Tobin's q) as the dependent variable. To ascertain the relationship between underwriting capability and performance of insurance businesses in particular Sub-Saharan African countries, the aforementioned models are adjusted.

The functional forms of the models are stated below:

$ROA_{it} = f$ (SHF, URP, RES, EAR, GPW, RCR) ……..…..… (3.5)

$ROE_{it} = f$ (SHF, URP, RES, EAR, GPW, RCR) ……..… (3.6)

$TQ_{it} = f$ (SHF, URP, RES, EAR, GPW, RCR) ….……..…..…. (3.7)

The econometric version of the dynamic panel data model is as follows:

$ROA_{it} = \beta_0+\beta_1ROA_{it-1} + \beta_2SHF_{it} + \beta_3URP_{it} + \beta_4RES_{it} + \beta_5EAR_{it} + \beta_6GPW_{it} + \beta_7RCR_{it} + \mu_{it}$. (3.8)

$ROE_i = \beta_0+\beta_1ROA_{it-1} + \beta_2SHF_{it} + \beta_3URP_{it} + \beta_4RES_{it} + \beta_5EAR_{it} + \beta_6GPW_{it} + \beta_7RCR_{it} + \mu_{it}$ (3.9)

$TQ_{it}= \beta_0+\beta_1ROA_{it-1} + \beta_2SHF_{it} + \beta_3URP_{it} + \beta_4RES_{it} + \beta_5EAR_{it} + \beta_6GPW_{it} + \beta_7RCR_{it} +\mu_{it}$ … (3.10)

Where:

$\beta_0 \ldots \beta_7$ are coefficients of the parameters.
μ_{it} = the stochastic (error) term for insurance firm *i* at time t.

The a *priori* expectation: $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 > 0$, $\beta_6 > 0$, $\beta_7 > 0$. From theory, it is expected that previous year performance, shareholders fund, underwriting profit, reserves, earning asset ratio, gross premium written, ratio of ceded reinsurance are anticipated to improve the performance of insurance companies. The subscripts *i* and *t* refer to individual firms or country (for the macroeconomic variables) and period (2010 - 2019) respectively. ROA_{it-1}, ROE_{it-1} and β_1TQ_{it-1} are lagged dependent variables and their inclusion in the model is meant to take care of potential endogeneity of the independent variable which included the likelihood of omitted variables, simultaneity, and variable measurement error in the context of dynamic panel data method.

Table 3.1: *Description of variables*

Variables	Definition	*a priori sign*
ROA_{it}	Return on asset of insurance firm *i* at time *t*	Dependent Variable
ROE_{it}	Return on equity of firm *i* at time *t*	Dependent Variable
TQ_{it}	Tobin's q of insurance firm *i* at time *t*	Dependent Variable
ROA_{it-1}	Lagged value of the return on asset of insurance firm *i* at time *t*	+
ROE_{it-1}	Lagged value of the return of equity of insurance firm *i* at time *t*	+
TQ_{it-1}	Lagged value of the Tobin's q of insurance firm *i* at time *t*	+
SHF_{it}	Shareholders' fund of insurance firm i at time t.	+
URP_{it}	Underwriting profit of insurance firm i at time t.	+
RES_{it}	Reserves of the insurance firm i at time t.	+
EAR_{it}	Earning asset ratio of insurance firm i at time t.	+
GPW_{it}	Gross written premium of insurance firm i at time t.	+
RCR_{it}	The ratio of ceded reinsurance of insurance firm i at time t.	+

Source: *Author's Compilation, (2021).*

3.3. VARIABLE OPERATIONAL DEFINITIONS

The adopted variables are described in Table 3.2, along with information on the prior researcher who used each variable in their work.

Table 3.2: *Variable Operational Definitions*

S/N	Variable	Type of Variable	Measurement	Sources
1	Return on Asset (ROA)	Dependent Variable	$ROA = \frac{Profit\ after}{-tax\ total\ Assets}$	Aduloju & Ajemunigbohun (2017)
2	Return on Equity (ROE)	Dependent Variable	$ROE = \frac{Profit\ after}{-tax\ total\ Equity}$	Aduloju & Ajemunigbohun (2017)
3	Tobin's Q (TOQ)	Dependent Variable	$\frac{Market\ capitalization + Total\ liabilities - net}{total\ asset}$	Zeitun & Tian (2007)
4	Shareholders' Fund (SHF)	Independent Variable	Measured as the logarithm of total shareholders' fund of the insurance firm	Oyetayo & Abass (2020)
5	Underwriting Profit (URP)	Independent Variable	The underwriting profit of an insurance firm is measure by the logarithm of the total underwriting profit	Soye & Adeyemo (2018)

6	Reserves (RES)	Independent variable	Measured as the logarithm of reserve of the insurance firm	Oyetayo & Abass (2020)
7	Earning Asset Ratio (EAR)	Independent Variable	Measured as premium earned/total asset	Soye & Adeyemo (2018)
8	Gross Premium Written (GPW)	Independent Variable	Measured as the logarithm of gross premium written by the insurance firm	Akpan et al., (2020)
9	The ratio of Ceded Reinsurance (RCR)	Independent Variable	Measure as reinsurance ceded (RC)/net premium written (NPW))	Abbas (2019)

Source: Author's Compilation, (2021).

Data Analysis Techniques

In this paper, statistical and econometric methods are used to perform the data estimation. Descriptive and correlation analyses are included in the statistical analysis. We used the System Generalized Method of Moments (System GMM) estimate method for dynamic panel data models in terms of the inferential statistic. However, before we proceed with system GMM estimation, the data was subjected to various preliminary and diagnostic tests to ensure the reliability and validity of results obtained from the empirical analyses. These preliminary and diagnostics tests include; the panel unit root test and cointegration test. In conducting all our data analysis, we utilized the Econometric View Software (EVIEW) version 10.0

4. EMPIRICAL INVESTIGATION

4.1. STATISTICAL EVALUATION

4.1.1. DESCRIPTIVE STATISTICS

The basic characterization of the datasets is also performed using the descriptive statistics to summarize the data. The annualized summary statistics for all the variables in the study are presented for the sampled companies over the 10 years period. For the performance indicators, average return on assets (ROA) is 2.60, although there are large extreme patterns for the different companies considering the minimum of -78.32 and a maximum of 21.4. The standard deviation is much higher than the mean value, indicating that ROA across the insurance firms for the countries is extremely divergent (this is validated in Figure 4.1a). For return on equity, the average value is 10.08, and the standard deviation is 19.57, which again shows that the ROE values are very divergent across the countries in the study. Average Tobin Q ratio is 1.46, indicating that insurance firms are performing well in the market among the sub-Saharan African (SSA) countries. For each of the performance measures, the minimum values are essentially low (with ROE and ROA having

negative minimum values) which suggests that some of the sampled companies did not perform well over the period. The standard deviations for each of the performance measures is relatively high (compared against the mean respective values). This also indicates that performances across the firms are highly varied, with some of the firms performing well and others performing quite poorly. The J-B values of the variables are also respectively significant at the 1 percent level, suggesting a high level of heterogeneity among the firms in the sample.

Table 4.1a: *Descriptive Statistics*

	Mean	**Max**	**Min**	**Std. Dev.**	**Skew**	**Kurt.**	**J-B**	**Prob**
ROA	2.60	21.40	-78.32	7.77	-3.66	33.13	1705.46	0.00
ROE	10.08	142.18	-158.00	19.56	-1.28	23.47	7874.25	0.00
TBQ	1.46	34.08	0.02	3.99	6.70	48.39	377.62	0.00
SHF	7.07	8.96	4.25	0.85	-1.05	4.58	128.70	0.00
URP	0.42	2.90	0.02	0.37	3.03	16.20	3928.37	0.00
RES	6.55	7.89	3.95	0.80	-1.33	4.31	164.65	0.00
EAR	0.29	1.58	-0.02	0.23	2.36	11.42	1736.81	0.00
GPW	6.55	7.91	3.89	0.76	-1.24	4.57	160.30	0.00
RCR	0.36	28.70	-22.87	1.99	1.31	149.08	3972.80	0.00

Source: *Author's computations, (2021) using Eviews 10.0.*

The standard deviation for the shareholders' fund is low relative to the mean value. This indicates that the shareholders funding of insurance companies is essentially standard and similar across the countries in the study. Similar outcomes are shown for underwriting profits, reserves and gross premium written. Thus, it is seen that much of the insurance activities and indicators are stable over time among African countries and the values are also generally standardized across the countries. Average earnings-asset ratio is 0.29, indicating that average annual earnings in relation to total assets of the insurance firms is about 29 percent. This is a relatively high value and suggests the need for expanded asset base for the insurance companies in the selected countries. The ratio of ceded reinsurance (RCR) is also at 36 percent, showing the higher levels of risks involved in the insurance sector in Africa.

The Jarque-Bera statistics for all the variables are all significant at the 1 percent level, which shows the absence of normality. This outcome is to be expected since a pool of different countries and different companies was adopted for the datasets. Hence, the result shows that firm-level characteristics may be exerting strong heterogenous influences for the datasets. This is a strong basis for providing a panel-form analysis in the regression process for the study.

Both the company-specific and country-specific factors are likely to vary across the countries in the study, given the highly significant J-B test values for the

variables. Thus, descriptive statistics for the variables for each of the countries considered in the empirical analysis are also presented on country basis in Table 4.2b (means and standard deviations). On average the performance indicators of ROA, ROE, and Tobin Q are larger for insurance firms in Mauritius (average ROE of 157.23), South Africa and Botswana. Ghanaian companies also performed well in terms of the Tobin Q ratio which indicates that these firms are better performed in the financial markets. Essentially, insurance firms in these countries are more efficient and profitable. Nigerian companies performed the least in all the indicators, highlighting the difficulty faced by Nigerian insurance companies in terms of financial performance.

Average shareholders' funds in the companies are higher in Uganda and Kenya, while South Africa recorded the highest average underwriting profits, indicating the level of development of the South African insurance market. In terms of reserves, Ugandan companies recorded the largest reserve values, while South African and Ghanaian companies indicated the largest earnings ratios. Moreover, Kenya is the clear leader in terms of growth in per capita income among the nations in the sample.

Table 4.1b: *Descriptive Statistics for Individual Countries*

Variable	*Botswana*		*Ghana*		*Kenya*		*Mauritius*		*Nigeria*		*South Africa*		*Uganda*		*Zimbabwe*	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
ROE	18.79	4.96	12.58	13.86	12.60	27.53	157.29	393.91	10.01	83.28	18.58	18.42	10.12	16.87	13.28	15.37
ROA	3.07	0.66	5.50	5.84	4.90	3.85	3.02	2.31	0.81	9.14	5.16	7.14	2.78	4.72	4.30	4.04
TBQ	2.69	0.83	0.81	0.18	0.92	0.24	0.94	0.13	0.68	0.30	1.37	0.58	0.89	0.14	1.20	2.06
SHF	7.16	0.04	5.57	0.32	7.56	0.28	7.14	0.45	7.20	0.33	7.23	1.36	7.96	0.05	5.20	0.47
URP	0.27	0.03	0.37	0.13	0.17	0.06	0.25	0.22	0.39	0.27	0.68	0.63	0.56	0.10	0.58	0.35
RES	6.38	0.12	5.17	0.32	6.96	0.43	6.05	0.40	6.85	0.32	6.48	1.03	7.46	0.16	4.64	0.50
EAR	0.14	0.01	0.36	0.11	0.21	0.09	0.14	0.06	0.30	0.17	0.39	0.40	0.09	0.01	0.29	0.14
GPW	6.33	0.06	5.23	0.29	7.01	0.28	6.41	0.31	6.75	0.41	6.66	0.97	7.05	0.15	4.63	0.56
RCR	0.03	0.02	0.37	0.25	0.76	6.23	0.41	0.38	0.32	1.55	0.41	0.79	0.38	0.21	0.13	0.34

Source: *Author's computation, (2021) using Eviews 10.0.*

4.1.2. CORRELATION ANALYSIS

With the use of the correlation analysis displayed in Table 4.2, the study's patterns of correlations among its independent variables are assessed. Strong negative correlations are seen to exist between EAR and all the other underwriting capacity variables, indicating that earnings among the insurance firms move in opposite direction with underwriting capacity indicators of the companies. The

correlation coefficients between reserves and both the gross premium written by the insurance firms and the shareholders' funds in the firms are positive and indicate that reserves, funds level and premium of the insurance firms are all factors that improve together among insurance firms. Underwriting profits are also slightly positively correlated with shareholders' funds and reserves of the companies.

Table 4.2: *Correlation among the explanatory variables*

Variable	EAR	GPW	RCR	RES	SHF	URP
GPW	-0.219					
	(0.000)					
RCR	-0.012	-0.003				
	(0.799)	(0.951)				
RES	-0.379	0.881	-0.006			
	(0.000)	(0.000)	(0.899)			
SHF	-0.500	0.912	-0.022	0.887		
	(0.000)	(0.000)	(0.649)	(0.000)		
URP	-0.233	-0.095	-0.027	0.046	0.096	
	(0.000)	(0.044)	(0.572)	(0.336)	(0.042)	

Source: *author's computation, (2021) using Eviews 10.0. (Probabilities in parentheses below each coefficient)*

4.2. INFERENTIAL ANALYSIS

4.2.1. CROSS-SECTION DEPENDENCE TEST

As noted above, it is necessary to disentangle the cross-sectional features of the relevant variables in order to observe the pattern of dependence. This is because, the insurance firms in the sample are all SSA companies and may therefore likely exhibit similar responses to overall patterns of macroeconomic and firm-specific factors. This can present certain levels of interdependencies that are related to spatial autoregressive processes among the variables (Adegboye, 2020). In the dataset, the number of cross-sectional units (45 companies) in this study is more than the time period (10 years). This means that the Breusch and Pagan (1980) LM test may not provide the needed efficiency in terms of measurements. Hence, the cross-sectional dependence (CD) test developed by Pesaran (2004) is used since it is more applicable for a large number of cross-sectional units (N) observed over T time periods. The test reported in Table 4.3 is implemented for the three equations estimated in the study for the Peseran cross-sectional dependence (CD) procedure.

Table 4.3: *Cross-section Dependence Test Results*

Model series tested	Pesaran CD	P-value	Abs corr
ROA	0.24	0.81	0.11
ROE	0.82	0.41	0.17
TBQ	1.94	0.11	0.15

Source: *Author's computation, (2021) using Eviews 10.0.*

From the result in Table 4.3, it is seen that the Peseran CD test fails to reject the null hypothesis of absence of cross-sectional dependence in the block of variables. This implies the absence of cross-sectional dependence for the estimation structure. This outcome further contributes to the efficiency of the estimation procedure especially as the estimation also allows for slope heterogeneity across panel units (Beqiraj, Fedeli & Forte, 2018). We thus proceed by testing for unit root and for the presence of stationarity and co-integration among the variables in the study.

4.2.2. PANEL UNIT ROOT TESTS

The data utilized for this analysis reflects both the common (homogeneous) qualities of the companies included in the study as well as the country- and firm-specific characteristics (individual heterogeneity). For the purpose of preventing the occurrence of "spurious" inference, it is necessary to utilize panel unit root tests to ascertain whether the data are stationary. In this work, the homogeneous panel's stationarity qualities were investigated using the test created by Levin, Lin, and Chu (LLC) (2002). These tests presuppose that the nations' co-integration vectors are equal. However, it is expected that each of the study's participating nations, along with the enterprises, will demonstrate variations in their economic and financial policies, as well as institutionally unseen traits. This means that the homogenous unit roots alone may not suffice for capturing the stationarity status of the data sets given that the common unit root assumption may not be sufficiently realistic. To overcome this seemingly unrealistic assumption for the selected datasets, the Im, Pesaran and Shin - IPS (2003) and the Augmented Dickey-Fuller test (which allows for heterogeneity in the panel's cross-section and assumes a null hypothesis of no co-integration in the panel data) are also conducted. All the unit root test results are presented in table 4.4. Note that only the tests for first differences (X_t-X_{t-1}) are reported in the results since the variables are essentially in ratios.

Table 4.4: *Panel Data Unit Root Tests Results *in first difference*

Variable	Homogenous Unit Root Process	Heterogeneous Unit Root Process		Remarks (order of integratio)
	Intercept and Trend			
	LLC	IPS	ADF-Fisher	
	X_t-X_{t-1}	X_t-X_{t-1}	X_t-X_{t-1}	
ROA	-10.24**	-5.51**	196.89	I[1]
ROE	26.69**	-13.52**	353.74**	I[1]
TBQ	-16.63**	-7.85**	252.84**	I[1]
SHF	-3.07**	-1.77*	129.82**	I[1]
URP	-17.49**	-5.81**	195.54**	I[1]
RES	-11.53**	-3.44**	165.68**	I[1]

EAR	-9.28**	-3.79**	161.65**	I[1]
GPW	-14.49**	-4.96**	190.49**	I[1]
RCR	-7.12**	-3.17**	146.28**	I[1]

*Note: ** and * indicate significant at 1% and 5 % levels respectively; IPS = Im, Pesaran & Shin; LLC = Levin, Lin & Chu*

Source: Author's computation, (2021) using Eviews 10.0.

In the Table, only the test results that vary are shown. The coefficients of the first difference test for all the variables show that they are all stationary, as can be shown (given that the critical test values are higher than the test statistic). Given this circumstance, it is demonstrated that the variables are all integrated of the same order one (i.e., I[1]), allowing for the performance of a co-integrated analysis for the variables with useful results. The unit root findings strongly suggest that the variables are all stationary, with each variable having the value I[1].

4.2.3. PANEL COINTEGRATION TEST

However, it is possible to create the long-term circumstances of the variable interactions to provide a more solid foundation for a dynamic relationship between the variables. The results of the Pedroni and Kao panel cointegration tests on the panel and group assumptions are shown in Table 4.5, together with the corresponding variance ratios and rho statistics (non-parametric tests).

Table 4.5: *Panel Cointegration Test Result*

ROA equation	**Panel Statistics**	**Group Statistics**	**Kao (ADF)**
Variance ratio	-3.33		-3.89**
Rho	7.99**	11.15**	
IPS	-13.16**	-21.12**	
ADF	-2.84**	-3.93**	
ROE equation	**Panel Statistics**	**Group Statistics**	**Kao (ADF)**
Variance ratio	-6.10		-5.584**
Rho	8.58**	10.75**	
IPS	-9.34**	-17.74**	
ADF	-2.27**	-4.03**	
Tobin's Q ratio equation	**Panel Statistics**	**Group Statistics**	**Kao (ADF)**
Variance ratio	-1.99		-1.705*
Rho	6.18**	11.20**	
IPS	-4.11**	-20.15**	
ADF	-2.05**	-3.95**	

*Note: **, * indicates the rejection of the null hypothesis of no cointegration at the 0.01 and 0.05 level of significance respectively*

Source: *Author's computation, (2021) using Eviews 10.0.*

For both the panel and group assumptions, the coefficients of the IPS and Augmented Dickey Fuller test statistics are significant at the 5% level. In light of this, panel cointegration is well supported by both the ADF-t and non-parametric-t statistics. Another residual-based (Kao) panel cointegration test is used to supplement these findings. The null hypothesis of no cointegration may be rejected at the 5% level for each of the equations based on the Kao residual-based cointegration test presented in Table 4.5. As a result, the results of the cointegration tests indicate that the variables in the research have a significant long-term link. Thus, the empirical study may make use of the dynamic panel data estimation approach.

4.3. REGRESSION RESULTS FOR UNDERWRITING CAPACITY AND INSURANCE FIRMS PERFORMANCE

In this section, the equations specified in section three are estimated and the results are presented and interpreted for the goal of drawing relevant policy conclusions. The dynamic panel data (DPD) estimations made with the system GMM provide the foundation for the estimated equations in this section. The results are presented in Table 4.6 where the probability of the Hansen J-statistic has the expected values and both the first and second order Arellano and Bond tests also possess the expected coefficients and significance level. This shows that the segregated results are efficient in the estimation of the effects on ROA. In terms of the individual coefficients of the variables, EAR, RES and SHF all possess negative signs, suggesting that these variables exert negative effects on ROA. All the other underwriting variables have positive coefficients and are significant at the 1 percent level (except RCR).

***Table 4.6**: Results for determination of ROA*

Variable	*Underwriting capacity*	
	Coefficient	Prob.
ROA_{t-1}	0.146**	0.000
EAR	-0.620	0.154
GPW	2.157**	0.000
RCR	0.002	0.554
RES	-2.405**	0.000
SHF	-5.084**	0.000
URP	0.910**	0.000
Hansen J (prob)	0.426	
AR(1) (prob)	-2.09*	
AR(2) (prob)	-0.73	

Note: The symbols * and ** denote significance at the 5% and 1% levels, respectively.
Source: Calculation by the author, made in 2021 with Eviews 10.0.

Table 4.7 shows the results for the estimates of the ROE equation. The diagnostic tests are all impressive and indicate precise estimation and instrument selection procedures. The coefficients of the estimated model for the underwriting

capacity equation, the signs and significance of the estimated coefficients are all in line with the baseline estimates, thereby indicating a strong robustness for the estimates.

Table 4.7: *Results for determination of ROE*

Variable	*Underwriting capacity*	
	Coefficient	**Prob.**
ROE_{t-1}	0.067**	0.000
EAR	11.433**	0.004
GPW	15.022**	0.000
RCR	-0.017	0.667
RES	-16.854**	0.000
SHF	12.194**	0.000
URP	3.012**	0.001
Hansen J (prob)	0.381	
AR(1) (prob)	-2.26*	
AR(2) (prob)	-0.84	

Note: The symbols * and ** denote significance at the 5% and 1% levels, respectively.
Source: Calculation by the author, made in 2021 with Eviews 10.0.

The results of the Tobin's Q are presented in Table 4.8 where the probability of the Hansen J-statistic has the expected values and both the first and second order Arellano and Bond tests also possess the expected coefficients and significance level. This shows that the results are efficient in the estimation of the influence on Tobin's Q. In terms of the individual coefficients of the variables, only RES possesses negative signs, suggesting that reserves also exert negative effects on the market performance of the companies. All the other underwriting variables have positive coefficients and are significant at the 1 percent level (except RCR and SHF). The results indicate that the estimates are robust both in terms of the signs of variable and their significance level.

Table 4.8: *Results for determination of Tobin's Q*

Variable	*Underwriting capacity*	
	Coefficient	**Prob.**
$TOBINQ_{t-1}$	0.789**	0.000
EAR	2.971**	0.000
GPW	0.544**	0.018
RCR	0.000	0.762
RES	-1.123**	0.000
SHF	0.273	0.366
URP	0.788**	0.000
Hansen J (prob)	0.384	
AR(1) (prob)	-1.49*	
AR(2) (prob)	-0.668	

Note: The symbols * and ** denote significance at the 5% and 1% levels, respectively.

Source: Calculation by the author, made in 2021 with Eviews 10.0.

4.4. DISCUSSION OF FINDINGS

The study finds that shareholders' funds have significant negative impact on ROA, non-significant effect on ROE, but a significant positive impact on Tobins Q. This outcome is similar to previous findings by Soye and Adeyemo (2018), Alani and Sani (2019) and Oyetayo and Abass (2020) who also found varied impacts of shareholders' funds on insurance firms' performance in Nigeria. These results therefore appear to highlight the presence of an optimal shareholders' fund input for insurance firms in terms of boosting operational efficiency. This implies that acquisition and use of shareholders' funds may need to be more efficiently controlled. Although shareholders' funds are pivotal in controlling other underwriting systems and capacities among the companies, excessive funds may act as an inhibitor to improvements in financial efficiency among the insurance firms. The coefficient of earnings-to-assets ratio is also negative and indicates that rising earnings in terms of assets may not be an efficiency enhancement factor, especially in the short term for insurance companies from the sample.

From the results, underwriting profits have clear and unambiguous positive impact on all the measures of financial performance of the companies. Thus, efficiency in underwriting (which ultimately leads to more profits) is expected to boost insurance companies at all levels. Birhanu (2018) and Soye and Adeyemo (2018) also found similar results for Ethiopia and Nigeria respectively, where underwriting profits are considered as an integral aspect of the drive by insurance companies to improve overall efficiency and market performance.

Moreover, reserves in the companies were also shown to negatively affect all measures of performance of the insurance companies. This result demonstrates the inefficiency-enhancing role of retention policy among insurance firms. Though retention may act as a risk aversion strategy, the result from the study has shown that it does not provide enough effects to improve the performance of the companies. The results follow the outcomes of previous studies and corroborate the findings of Oyetayo and Abass (2020) for Nigeria (where they found a weak negative effect). In the same vein, the study is in consonance with findings that show that increased retention generally limits performance of insurance companies, especially in terms of market value and return on equity (Soye & Adeyemo, 2018; Mohamed, 2019).

In general, the results from the study show that the positive impact of underwriting capacity on the performance of insurance companies is better observed through the market performance of the firms. This implies that it is Tobin's Q as an indicator of performance that better reflects how underwriting capacity contributes to firm performance. This outcome is important because it shows that boosting underwriting capacity in terms of operational efficiency, funding activities and revenues is directed at stimulating the market performance of the firms. Apparently, the result indicates that investors are quick to consider the underwriting systems of insurance companies in valuation of the firms. This result is in line with pure

textbook propositions about insurance firms and is also supported by previous studies (Mankai & Belgacem, 2013; Reshid, 2015)

5. CONCLUSION AND RECOMMENDATION

5.1. CONCLUSION

This study investigates the effects of underwriting capacity of insurance companies on their financial performance for selected sub-Saharan African countries. Consider that underwriting capacity is an internally controlled factor within the insurance industry. Thus, the study presents the performance of the firms as depending on factors that they can easily manipulate the insurance firms. In general, the factors considered tend to intensify the background for risks faced by the insurance operators for which appropriate strategies need to be adapted since the factors are controllable. Forty-five (45) insurance firms in eight selected countries in the sub-Saharan African region with virile insurance sectors were used in the analysis for the period 2010 to 2019. A dynamic framework was devised for the panel data analysis using the system GMM estimation technique. The results reveal that the patterns of relationships differ in terms of the factors considered for performance indicator.

5.2. RECOMMENDATIONS

The following policy recommendation is made in accordance with the outcomes of this research:

(i) There is need for a strategy to manage shareholders' funds in an optimal manner among insurance firms. Although shareholders' funds are pivotal in controlling other underwriting capacities among the companies, excessive funds may act as an inhibitor to improvements in financial efficiency among the insurance firms. Thus, the companies need not overemphasis the role of shareholders' funds in the effective promotion of performance among the insurance firms.

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), 36 - 43.

Abass, O. A., & Obalola, M. A. (2018). Reinsurance Utilization and Performance Of Non-Life Business in the Nigerian Insurance Industry: A mixed method approach. *The Journal of Risk Management and Insurance*, *22*(2), 18-30.

Adams, M., & Buckle, M. (2003). The Determinants of Corporate Financial Performance in the Bermuda Insurance Market. *Applied Financial Economics*, *13*(2), 133 - 143.

Adegboye, A. C. (2020). Macroeconomic Policies and Sustainable Employment Yields in sub-Saharan Africa. *African Development Review, 32*(4), 515 – 527. https://doi.org/10.1111/1467-8268.12457.

Aduloju, S. A., & Ajemunigbohun, S. S. (2017). Reinsurance and Performance of the Ceding Companies: The Nigerian insurance industry experience. *Economics and Business, 31*(2), 19 – 29.

Ahmed, Z., Naveed, A., & Usman, A. (2011). Determinants of Performance: A Case of Life Insurance Sector of Pakistan. *International Research Journal of Finance and Economics, 61*(4), 123 - 128.

Aigbovo, O. & Uwubanmwen, A. E. (2014). Financial System Development and Economic Growth: The Nigerian Stock Market and Bank Perspective. *Asian Journal of Business Management 6* (4), 155-172

Akpan, S. S., Nnamseh, M. P., Etuk, S. G., Edema, A. J. M., & Ekanem, B. C. (2020). Managing the Underwriting Functions and Profitability Paradoxes of Nigerian Insurers: A pooled panel model study. *International Journal of Innovation, Creativity and Change*, *14*(4), 1083 - 1097.

Akpere, P. (2015). The challenges of Nigerian insurance industry and possible solutions. Retrieved from http://www.businessdayonline.com/the-challenges-of-nigerian-insurance-indutsry -and-possible-solutions-3.

Alani, G. O., & Sani, J. (2019). Effect of recapitalization on financial performance of insurance companies in Nigeria. *International Journal of Public Administration and Management Research, 5*(1), 146 - 160.

Angima, C. B., & Mwangi, M. (2017). Effects of underwriting and claims management on performance of property and casualty insurance companies in East Africa. *European Scientific Journal, 13*(13), 358 – 373.

Beqiraj, E., Fedeli, S., & Forte, F, (2018). Public debt sustainability: An empirical study on OECD countries. *Journal of Macroeconomics, Elsevier, 58*(C), 238-248. DOI: 10.1016/j.jmacro.2018.10.002

Berg, J. V. (2016). Corporate diversification and firm performance: The effect of the global financial crisis on diversification in India. (Master's thesis, University of Groningen, Indian). Retrieved from http://www.diva-portal.org/smash/get/diva2:910140/

Birhanu, T. (2018). Effects of underwriting result and investment income to the profitability of private insurance companies in Ethiopia. (Master's thesis, Addis Ababa University, Ethiopia). Retrieved from http://etd.aau.edu.et/handle/123456789/12455

Birhanu, T. (2018). Effects of underwriting result and investment income to the profitability of private insurance companies in Ethiopia. (Master's thesis, Addis Ababa University, Ethiopia). Retrieved from http://etd.aau.edu.et/handle/123456789/12455

Breusch, T. S. & Pagan, A. R. (1980). The Lagrange multiplier test and its applications to model specification in econometrics, *Review of Economic Studies, 47*(1), 239-253.

Copisarow, R. (2000). The application of microcredit technology to the UK: Key commercial and policy issues. *Journal of Microfinance/ESR Review, 2*(1), 13-42.

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

Faculty and Institute of Actuaries (1997). Introduction to Reserving. Retrieved from https://www.actuaries.crml-2.pdf-AdobeAcrobatReader.

Garba, J., & Abdulsalam, H. (2011). Factors affecting the patronage of insurance services in Borno state, Nigeria. *International Journal of Economic Development Research and Investment, 2*(1), 1-11.

Gerber, H. U., & Loisel, S. (2012). Why ruin theory should be of interest for insurance practitioners and risk managers nowadays. Laboratoire de Sciences Actuarielle et Financiere. Retrieved from https://www.researchgate.net

Hemrit, W. & Ben-Arab, M. (2012). The determinants of frequency and severity of operational losses in Tunisian insurance industry. *The Journal of Risk Finance, 13*(5), 438 - 475

Hughes, D. J. (2013). Accounting for individual differences in financial behaviour: the role of personality in insurance claims and credit behavior. (Unpublished Doctoral Dissertation, University of Manchester).

Im, K. S., M. H. Pesaran, & Y. Shin. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics 115*(1), 53–74.

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), 1-13.

Kaas, R., Goovaerts, M., Dhaene, J., & Denuit, M. (2008). *Modern Actuarial Risk Theory*, (2nd ed.). London, New York: Springer-Verlag Berlin Heidelberg

Kamau, M., H. (2013). The relationship between underwriting profit and investment income for the general insurance industry in Kenya. (Master's thesis, University of Nairobi). Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/59232/ Mwangi_pdf

Kazeem, H. S. (2015). Firm specific characteristics and financial performance of listed insurance firms in Nigeria. (Unpublished Master's thesis, Ahmadu Bello University, Zaria, Nigeria).

Kerman, T. T. (2012) impact of capacity level on reinsurance and cat bond markets. (Unpublished Master's thesis, School of Applied Mathematics of Middle East Technical University).

Koc, I. O. (2016). Determining factors in financial performance of publicly traded insurance companies at Istanbul Stock Exchange. *International Journal of Business and Social Science*, *7*(11), 169 - 177.

Lee, H. H., & Lee, C. Y. (2011). Determinants of property liability insurer retention: evidence from Taiwan insurance industry. *African Journal of Business Management*, *5*(32), 12543–12550.

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics 108*(1), 1 - 24.

Lien, Y. C., & Li, S. (2013). Does diversification add firm value in emerging economies? Effect of corporate governance. *Journal of Business Research*, *66*(12), 2425 - 2430.

Loomba, J. (2014). *Risk management and insurance planning*. Delhi, India: PHI Learning Private Limited.

Ma, Y., & Elango, B. (2008). When do international operations lead to improved performance? An analysis of property-liability insurer. *Risk Management and Insurance Reviews*, *11*(1), 141 – 155.

Mankai, S., & Belgacem, A. (2013). Interactions between risk-taking, capital, and reinsurance for property-liability insurance firms. (Working Paper No. 20). Retrieved from https://www.ipag.fr/wpcontent/uploads/recherche/WP/IPAG_WP_2014_154.pdf.

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

Micheal, Z. (2015). Insurance underwriting and broking in the London insurance market: The role of reputation and trust in the insurance. (Unpublished Doctoral Dissertation, University of Southampton).

Mohamed, H. (2019). The effect of reinsurance operations on the financial performance of non-life insurance companies in the Egyptian market - A quantitative study. Retrieved from https://ssrn.com/abstract=3490874 or http://dx.doi.org/10.2139/ssrn.3490874

Obonyo, S. N. (2016). The effect of reinsurance programmes on financial performance of general insurance companies in Kenya. (Unpublished Master's. thesis, University of Nairobi).

Oladutire, E. O. (2014). Capital gains tax and enterprise financial performance: A study of manufacturing firms in Nigeria. (Unpublished Master's thesis, University of Port-Harcourt, Nigeria).

Onaolapo, W. (2005). Imperatives of capital in insurance operations. Retrieved from https://onaolapo.org/pdf/Imperatives%20of%20Capital%20in%20Insurance%20Operations.pdf

Orji, L. (2011). Investment monitoring systems and financial performance of multinationals in Rivers State, Nigeria. (Unpublished master's thesis, University of Port-Harcourt, Nigeria).

Oyetayo, Y. A., & Abass, O. A. (2020). Underwriting capacity and financial performance of non-life insurance companies in Nigeria. *Academic Journal of Economic Studies*, *6*(2), 73 - 80

Pesaran, M .H (2004). General diagnostic tests for cross section dependence in panels, faculty of economics, Retrieved from <https://www.repository.cam.ac.uk/handle/1810/446>.

Reshid, S. (2015). Determinants of insurance companies' profitability in Ethiopia. (Unpublished Master's thesis, Addis Ababa University).

Reshid, S. (2015). Determinants of insurance companies' profitability in Ethiopia. (Unpublished Master's thesis, Addis Ababa University).

Robbin, I. (2004). The underwriting profit provision. Retrieved from https://www.casact.org

Shiu, Y. (2020). How does reinsurance and derivatives usage affect financial performance? Evidence from the UK non-life insurance industry. *Economic Modelling*, *88*(2), 376 – 385.

Shiu, Y. M. (2004). Determinants of United Kingdom general insurance company performance. *British Actuarial Journal*, *10*(5), 1079 – 1110.

Singh, S., Tabassum, N., Darwish, K. T., & Batsakis, G. (2018). Corporate *Governance* and Tobin's Q as a measure of organizational performance. *British Journal of Management*, *29*(1), 171–190.

Society of Claims Professionals (2009). The society of claims professionals. Retrieved from https://www.socp.org.uk/media/10121029/the-society-of-claims-professionals-issue-1-2020.pdf.

Sognon, G. S. (2018). Reinsurance and financial performance of short-term insurance companies in South Africa. (Unpublished Master's thesis, University of Cape Town).

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), 177 – 190.

Soye, Y. A., & Adeyemo, D. L. (2018). Underwriting capacity and income of insurance companies: A case of Nigeria. *International Journal of Innovative Science and Research Technology*, *3*(10), 731-738.

Swiss Re (2013). Underwriting priorities. Retrieved from https://www.swissre.com

Swiss Re. (2004). Understanding reinsurance: How reinsurance creates value and manages risk. Economic Research and Consulting, Swiss Reinsurance Company, Mythenquai 50/60.

Vaughan, E. J., & Vaughan, T. M. (2014). *Fundamentals of risk and insurance.* (11th ed.). Rivers Street, Hoboken, USA: John Wiley and Sons, Inc.

Zeitun, R., & Tian, G. (2007). Capital structure and corporate performance: Evidence from Jordan. *Australasian Accounting Business and Finance Journal*, *1*(4), 40 - 61.