

## Does Consolidation HAVE Any Effecton the Operational Efficiency in Nigerian Insurance Firms?

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**Abstract:** The effect of consolidation on the operational efficiency in Nigerian insurance firms is being assessed in this study. The model of the study was underpinned by the regulatory and efficient market monitoring hypothesis. The secondary data were gotten from the financial statements of the insurance firms. This study covered the period of years between 2009 and 2016. The Pooled Least Square Method, Fixed Effect Model, Random Effect Model and Hausman Test were employed as the estimation techniques. The results of the Random Effect Model showed that capital base is positively significant, while total assets have negative and insignificant effect on operational efficiency. In addition, liquidity and total premium have positive and insignificant effect on operational efficiency. Based on the findings of the study, it is suggested that Nigerian insurance firms should consider assets reconstruction. They should also ensure that the total premium received is optimally employed in income generating assets. In addition, the liquid assets, especially cash, should be invested where interests would be earned while the cash remains easily accessible. Overall, consolidation exerts a significant positive effect on the operational efficiency of Nigerian insurance firms because the capital base is the most important element of the consolidation exercise.

**Keywords:** consolidation; operational efficiency; composite insurance; recapitalization

**JEL Classification:** F23

### 1. Introduction

Consolidation has been the key policy tool adopted in correcting paucities in the Nigerian financial sector (Somoye, 2008). Therefore, the aim of consolidation in the insurance sector was to increase its performance (Isimoya, 2014). The reason is that the asset of any nation is measured by the worth of its amassed wealth and the proportion at which its wealth increases through its savings and investments. Due to increasing wave of globalization and technological changes, the insurance industry in Nigeria has experienced remarkable changes. The importance of this industry in stimulating growth in the economy cannot be over emphasized, in that it serves as a facilitator to development through its structure (Emori, Nkamare & Nneji, 2014;

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Sanni & Alanni, 2013). Obviously, a stable and reliable financial system brings about a strong and viable economy.

The insurance sector when organized, controlled and feasible according to Irukwu (2003) plays a deliberate role in the economy. According to Oba (2003), the condition of the insurance industry of a country is a replication of its economy. The insurance sector can be stated to be one of the key determinants for developing the wealth of a nation. This is because it performs a very significant role in the mobilization of investible resources of the economy (Oba, 2003). Irukwu (2003) further noted that the insurance sector contributes a lot to the growth and steadiness of the national economy making it an important service industry in the financial sector. The sector functions by performing its principal role of risk bearing and also the subordinate function of mobilizing funds for investment in the economy. Through these functions the insurance sector promotes a saving culture and facilitates the credit system.

The consolidation exercise in the insurance sector according to Obaremi (2006) was unavoidable, thereby, trailing hard on the heels of the banking sector's consolidation exercise. The reason being that, the banking sector's consolidation exercise made it more cost efficient (Furlong, 1994). The insurance sector before the recapitalization and consolidation exercise did not meet up with its role and had challenges. Thus, the sector helpless and could not attract businesses both locally and globally. In addition, prior to consolidation, the insurance sector was characterized by undercapitalization of its existing firms; shortage of human capital and specialized skills; low asset quality; prominence of unethical practices; poor business infrastructural facilities; absence of novelty in product development; insurance premium flight; and low underwriting capability of the firms (Chukwulozie, 2008). These kept the insurance firm inefficient and unable to achieve their potentials.

Consolidation in the insurance sector results in larger capital base, assets, customers etc. These are supposed to have positive effects on performance. This is because consolidation in the financial sector created extraordinary change that ensured versatile, strong and reliable institutions with improved liquidity and ability to assume risk.

The advent of consolidation in the Nigerian financial sector attracted much attention. Several researchers studied the effects of consolidation on financial sector performance, especially in the banking and insurance sectors. Several researchers investigated the effects of consolidation on economic growth and insurance sector development (Akinlo, 2013; Mojekwu, Agwuwgbo & Olowokudejo, 2011; Eze & Okoye, 2013; Oke, 2012; Awwal, 2011). Although scholars proposed that consolidation impacts positively on performance, the insurance sector is still redundant. This exposes a gap. There is need to know if consolidation improves the operational efficiency of Nigerian insurance firms. Also, it is necessary to investigate

the impact of consolidation on operational income in relation to operational cost. Hence this study is contributing to knowledge by taking another dimension to capture firm's output based on operational efficiency. This is different from earlier studies based on financial performance.

## **2. Literature Review**

### **2.1. Conceptual Clarification**

Insurance can be defined to be a social arrangement which makes available financial reimbursement for the effects of an adversity. This reimbursement is gotten from accrued contributions of all participants involved in the arrangement (Isimoya, 2007). According to Awwal (2011), insurance is a contract in which the insurer for a consideration or for a sum of money (known as the premium) agrees to reimburse the insured (beneficiary) an amount of money whenever the occurrence insured against occurs. Insurance firms are like banks or the capital market in that they attend to the needs of business units and household units in the process of intermediation. Insurance firms gather premiums and firms' reserve funds by accepting claims (Oke, 2012).

An insurance agreement is a procedure whereby one party i.e. the insurer undertakes to pay another party (the policy holder) a specified sum of money in case of an adverse occurrence (Diacon & Carter, 1984). This is detailed in a contract called insurance policy. Insurance contracts which are also known as their products or services are classified as either life or non-life policies. According to Matis and Ilies (2014), life insurance is an agreement with an individual which is meant to aid in reducing the effects of troubles caused by natural disaster, accident, disease, etc. It entails reimbursement of the insured with a particular amount in association with the manifestation of definite events (death, disability, etc.). There are various life insurance policies (contracts) and these are termed variable life insurance, whole life insurance, universal life insurance, variable universal life policies and endowment insurance (Ibiwoye, Ideji & Oke, 2010; Nessim, 2010).

Life insurance policies assemble savings for long-term investment purposes, bringing about economic growth and development (Ibiwoye, Ideji & Oke, 2010). Life insurance products are one of the main sources of long-term finance which boosts the growth of capital markets (Catalan, Impavido & Musalem, 2000). The general (non-life) insurance is an agreement between the insurer (i.e. insurance firm) and the insured whereby the insurer accepts to compensate the assured against damages. The damages are such as resulted from the happening of stated events within a specific period. This insurance agreement comprises of the fire, marine and credit insurance, oil and gas, accident, contractor's all risks; bond and suretyship, etc. (Eze & Okoye, 2013).

The premium is the amount contributed by the insured for the insurance cover to be given in the policy (Awwal, 2011). This is mostly invested to produce more income for the insurance firm. A “claim” on the other hand is a request made by the insured or his beneficiary for compensation or indemnity following a loss in accordance with the terms of an insurance contract. According to Haise and Sumegi (2008), insurance firms by accepting claims pool premiums and firm reserve funds. Oke (2012) states that the insurance firms reimburse the one suffering a loss and also stabilizes the financial states of individuals and firms. This is made possible when the risk involved is transferred. Haise and Sumegi (2008) opined that the main role played by insurance firms to their clients is risk transfer. The insured hereby contributes a premium which secures him against precise uncertainty.

Literarily, consolidation is the process of making firms stronger, more effective and more certain. Consolidation as opined by Soludo (2005) is a combination or amalgamation in which all the firms involved are legally dissolved and a new firm formed. This is with the objective of enhancing performance. This was also supported by Bebeji (2013) who opined that consolidation is a policy which enhances performance. Prior to the recapitalization in the year 2003, the insurance sector was branded by factors (Chukwulozie, 2008) which restricted the insurance firms from achieving potential development. These factors include: Insurance premium flight, under-capitalization of standing insurance firms; low asset value; low yields on capital; shortage of suitable human capital and expert skill; deficiency in the confidence and trust of consumers on the uses/appropriateness of insurance services; presence of too many peripheral players; noteworthy corporate governance matters; existence of unscrupulous practices; low business infrastructural services in ICT; low awareness of the services of insurance firms; deficiency in improvement of product development; low GDP per capital figures and pitiable corporate governance configurations. Babalola (2008) observed that much growth was not witnessed in the insurance sector before the consolidation/recapitalization exercise.

The first major recapitalization exercise according to Fatula, (2007) was announced by the insurance Act 2003, Section 9, which raised the minimum capital requirements by 650%. The exercise concluded with 107 insurance firms which is inclusive of the re-insurance operatives in the market. This exercise was judged unsuccessful. According to Ibrahim and Abubakar, (2012), insurance firms were mandated to raise their capital from #20 million to #150 million, #70 million to #300 million and #150 million to #350 million for the life, non-life (general) and the re-insurance firms correspondingly. In September 2005, there was another recapitalization exercise which the minister of finance at that time declared a fresh minimum capital rule with a deadline of 28<sup>th</sup> February, 2007. The 2007 recapitalization instruction made necessary a minimum of #2 billion for the life insurance and the #3 billion for the non – life insurance firms. This new directive enforced many insurance firms to merge so as to meet up the requirements. After

lapse of time, 49 insurance firms and 2 re-insurance firms fulfilled the new requirement and were licensed by government.

## **2.2. Theoretical Underpinning: Regulatory and Market Monitoring Hypothesis**

This hypothesis asserts that regulators inspire financial institutions to raise their capital to match with the quantity of risks they underwrite. This may be realized through a well-organized market monitoring, toward sufficient capital base of a firm. (Calomiris & Kahn, 1991; Berger, 1995). Thus, the activities of regulators and supervisors are vital factors. These affect the interrelationship between capital adequacy risk management and financial institutions' competence. (Shrieves & Dahl, 1992; Jacques & Nigro, 1997; Aggarwal & Jacques, 1998; Editz, Michael & Perraudin, 1998).

### **Empirical Review**

Muhlnickel and Weib (2015) analyzed a sample of 394 trans-national, domestic and cross-border mergers, by regression analysis. They found a positive strong relationship between consolidation and moderate systemic risk in the insurance sector. They also found strong experiential evidence which supports the hypotheses that: firm size, non-traditional financing undertakings and divergence across lines, add up to undermining the effects of insurance consolidation.

Eling and Luhnen (2010) provided a broad efficiency comparison of 6462 insurers from 36 countries, conducted from 2002-2006. Data envelopment with stochastic frontier analyses were applied to various countries, organizations, firms and firms of varying sizes with respect to life and non-life insurers. They observed stable technical and cost efficiency growth in the international markets with large differences among countries.

Marijuana, Sandra and Lime (2009) scrutinized the link between insurance sector development and GDP growth using the data of 10 transition European Union member countries covering the years 1992 to 2007. The variables used as proxy for the insurance sector were: life, non-life and total insurance. These were used along with other control variables like: education, openness, inflation, investment, bank credit and stock capitalization. The study revealed a significant and positive relationship between insurance sector development and GDP growth.

Greene and Segal (2004) examined the connection between cost inefficiency and profitability in the U.S. life insurance industry for the period of 1995-1998. The study found out that cost inefficiency in the life industry is considerable in relation to earnings. It also found that inefficiency has a negative connection with profitability measures such as the return on equity, while stock-owned firms and policy-owned firms were efficient and lucrative. Rai (1996) observed the cost efficiency of insurance firms situated in 11 countries for a period of 5 years (1988-1992). The results showed that cost efficiency varies according to their country, size

and specialization. The firms from Finland and France had the least cost efficiency while those in the U.K had the highest.

Eling and Hwang (2011) analyzed the efficiency of non-life insurance firms in BRIC countries, i.e. Brazil, Russia, India and China; for the period, 2000-2008. They used the multi-stage data envelopment analysis (DEA) approach which showed that the environment intensely impacts on the efficiency of non-life insurers functioning in the BRIC countries. Kubai (2011) examined if the cost efficiency of Kenya's insurance firms were influenced by market share, cost of debt and firm size in 36 insurance firms over the years 2005-2009. He made use of the stochastic econometric cost frontier approach with cost function estimation. The results revealed that cost efficiency is present in Kenya's insurance firms. The study also found out that market share, cost of debt and the size of an insurance firm affect cost efficiency.

Borges, Nektarios and Barros (2008) analyzed the efficiency of the Greek life insurance industry. The study the Mann-Whitney Z Test with cross-efficiency and super-efficiency models. Their findings were that life and quoted life insurance firms as well as those involved in mergers and acquisition exhibit higher efficiency. Hwang (2007) examined cost efficiency in the China insurance industry. The stochastic frontier approach (SFA) was applied on 90% of the assets of the commercial insurance firms in China for a period of 1999-2004. The result shows that; in considering cost efficiency, the property insurance industry and state-owned firms are inferior to the life insurance industry, non-state owned firms and foreign insurance firms. For profit efficiency, the results shows that life insurance industry is more efficient than the property insurance industry.

Arena (2008) studied causal relationship between insurance market activity and economic growth by using 56 countries comprising the developed and developing ones covering the years 1976-2004. The generalized method of moment for dynamic models of panel data shows a significantly positive effect of the total, life and non-life insurance market movements on economic growth. Amer, Moustafa and Eldomiaty (2011) examined the connection between bank's relative competitive position and operating efficiency. This was done by scrutinizing the financial outline of the highly versus the lowly competitive banks. The results show that the operating efficiency of highly competitive banks is influenced positively and significantly by explanatory variables such as: asset quality, capital adequacy, credit risk and liquidity of the bank.

Odunga, Nyangweso and Nkobe (2013) examined the effect liquidity and capital adequacy have on the operating efficiency of commercial banks in Kenya. They pursued to inaugurate the effect of bank specific liquidity ratios and capital adequacy ratios on operating efficiency for the period of 2005-2011. The findings indicated that there is a positive and significant influence the previous year operational efficiency ratio, liquid assets to short-term liabilities ratio and total capital ratio have

on the bank operating efficiency. The fixed effect regression was employed to analyze the data. Ibrahim and Abubakar (2012) studied recapitalization and profitability of quoted insurance firms in Nigeria covering 2002-2009. The regression analysis showed that recapitalization had not significantly influenced the profitability of quoted insurance firms in Nigeria before and after their capitalization exercise. Oke (2012) did a study on insurance sector development and growth in Nigeria. The fixed effect model along with the cointegration analysis were employed covering the years 1985 and 2009. The results showed that there is a significantly positive effect insurance sector growth and development have on economic growth.

Eze and Okoye (2013) in their study examined the effect of insurance practice on the growth of the Nigerian economy from 1980-2011. Employing the unit root tests, Johansen co-integration test and error correction model, it was observed that the Nigerian economy is influenced significantly by insurance capital. Also, a causal relationship exists between insurance sector development and economic growth in Nigeria. Furthermore, the Nigerian economy is significantly affected by the practice of insurance. Similarly, Mojekwu, Agwuwgbo and Olowokudejo (2011) using a dynamic factor model, assessed the impact of insurance contributions on the growth of Nigerian economy covering 1981-2008 indicated a first-order auto regressive model between the volume of insurance contribution and economic growth in Nigeria. This implies positive correlation between economic growth and insurance contributions. Hence, a rise in insurance contribution leads to a rise in economic growth. Akinlo (2013) using the Vector Error Correction Model (VECM) and the co-integration test analyzed the data covering the period 1986-2010. The study showed that when the endogenous variable is the GDP, there exists a cointegration between inflation, premium, interest rate and GDP. Furthermore, the study revealed no existence of causality between premium and economic growth in the short run. On the other hand, causality exists between economic growth and premium, inflation and interest rate in the long run. He concluded that insurance positively impacts economic growth in Nigeria as they offer the required long-term fund for investment and clearing risks.

Awwal (2011) carried out a research on how consolidation impacts insurance firms on economic growth and development. The economic technique method of analysis was used. The econometric model was based on Capital Asset Pricing Model. The time frame was from 1988-2008. The study found consolidation policy to have a positive impact on economic growth and development if all structural bottlenecks to implementation are removed. Usman (2009) researched into optimal production scale and precisely assessed the importance of entrepreneurial price on business performance in the Nigerian insurance industry. The Cobb-Douglas cost and profit functional models were used to explore the performance of casually selected insurance firms. The result revealed that labour price is important in this study even though it showed an inverse association with business performance. They used 30

firms which were classified into small, medium and large scale firms. The small scale firms have 100-150 million naira worth of assets, the medium scale has from 151-500 million naira worth of assets and the large scale have from 501 million naira worth of assets and above.

### 3. Research and Method

#### 3.1. Data Sources and Description

Fifty-one (51) insurance firms emerged from the 2007 consolidation exercise in Nigeria: These are 49 insurance and 2 re-insurance firms. Out of the 49 insurance firms, 13 are composite. The focus of this study is on composite insurance firms; thus, 10 out of the 13 registered composite insurance firms were investigated for the period of 2009-2016. The choice of 2009 is based on our quest for the aftermath effect of the recapitalization exercise that led to mergers and absorptions of many insurance firms. It was recorded that Nigerian Insurance companies records significant growth after the 2007 consolidation exercise<sup>1</sup>. The data for this study were obtained from the financial statements of the selected 10 composite insurance firms.

#### 3.2. Model Specification

The study is underpinned by the Regulatory and Market Monitoring Hypothesis. The restricted profit function model of Usman (2009) was modified in this study.

The model was:

$$\ln pbt = \ln c + \theta_1 \ln l_p + \theta_2 \ln k_p + \theta_3 \ln e_p + \beta_1 \ln z + \beta_2 \ln m_2 + \beta_3 \ln cl + \ln \sum i$$

This model emanated from the production function:

$$W = f(S_1, S_2, \dots, S_n)$$

Where  $W$  is the output and  $S$  are the various inputs.

Therefore, to fit in this model into this study, operational efficiency was taking as the output while the various independent and control variables (capital base, total asset, total premium and liquidity) are taken as the inputs used to achieve the output.

Hence, the model reads:

<sup>1</sup> <https://www.proshareng.com/news/Capital-Market/Insurance-industry-records-49.33Percent-growth/8966>.



$$OE_{it} = \alpha + \beta_1 CB_{it} + \beta_1 \sum_{r=2}^4 S_n$$

Here,  $S_n$  is the vector of the control variables included in the study to avoid bi-simultaneity bias.

The model in detail is:

$$OE_{it} = \alpha + \beta_1 CB_{it} + \beta_2 TA_{it} + \beta_3 TP_{it} + \beta_4 LP_{it} + \varepsilon_{it}$$

Where  $\varepsilon_{it}$  = error term,  $i$  = cross-sectional units,  $t$  = observed dated periods,  $\alpha$  = overall constant of the model,  $OE$  = Operational Efficiency,  $CB$  = Capital Base,  $TA$  = Total Assets of the insurance firm,  $TP$  = Total Premium for Life and Non-life Insurance,  $LP$  = Liquidity Position.

$\beta_1 - \beta_4$  = Regression parameters which is the slope of each variable.

### Estimation Technique

Panel data regression is used to examine the relationship between the dependent variable (Operational Efficiency) and the regressors. Precisely, pooled least square, fixed effect and the random effect techniques were used.

### 3.3. Description of Variables

**Operational Efficiency:** The operational efficiency ratio is the ratio of the operating income of the insurance firm to their operating expenses. The firm is termed to be efficient if there is a reduction in their operating expenses with respect to their operating income.

$$Y = \text{Operating Efficiency Ratio} = \frac{\text{Operating income}}{\text{Operating expenses}}$$

**Capital Base:** This study considers total equity as surrogates for the capital base. This comprises of issued share capital, share premium, retained earnings and reserves. The natural logarithm of this data was used to reduce the volume of the data and bring it to ratio form.

**Total Asset:** Total assets is used to measure the size of the insurance firm as used by Akotey Sackey, Amoah and Manso (2013). This comprises both the tangible and intangible assets. This data is naturally logged to bring it to ratio form.

**Total Premium:** For this study, total premium is measured by the premium income of both life and non-life insurance activities. According to Mehari and Aemiro (2013), premium measures the rate of market penetration. The data is naturally logged to bring it to ratio form.

**Liquidity Position:** The liquidity position for the insurance firms is measured by the liquidity ratio. For this study, the accounting measure of value is Current Assets divided Current Liabilities as used in Ahmed, Ahmed, and Ahmed (2010).

$$\text{Liquidity Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

#### 4. Estimation of the Model

This section of the paper starts with the preliminary analysis and then the main static regression analysis was conducted and discussed.

**Table 1. Descriptive Statistics**

	OE	TA	CB	TP	LP
Mean	0.057647	16.59875	15.82246	15.58840	1.636709
Median	0.092972	16.48280	15.66389	15.48292	1.707101
Maximum	1.115799	18.42651	16.95386	17.32030	3.892579
Minimum	-1.164445	15.62943	14.54286	13.52545	-0.085801
Std. Dev.	0.325991	0.655579	0.488491	0.904237	0.762826
Skewness	-1.106027	0.749026	-0.014518	-0.061638	0.247294
Kurtosis	8.123650	3.180410	2.582077	2.513682	3.639775
Jarque-Bera	85.64868	6.260950	0.482633	0.692181	1.798306
Probability	0.000000	0.043697	0.785593	0.707448	0.406914
Sum	3.804675	1095.517	1044.282	1028.835	108.0228
Sum Sq. Dev.	6.907569	27.93597	15.51055	53.14685	37.82371
Observations	66	66	66	66	66
Cross sections	10	10	10	10	10

*Source: Author's Computation (2018)*

Table 1 shows the descriptive statistics of the data series used in the current study. OE averaged 0.057 and varies from a minimum of -1.164 to a maximum of 1.116. TA, CB, TP, and LP have a mean of 16.598, 15.822, 15.588, 1.636 and ranges from a minimum of 15.629, 14.542, 13.525 and 0.085 to a maximum of 18.426, 16.953, 17.320 and 3.892 respectively. It can be seen from the *p*-value of Jarque-Bera statistics that except OE and TA, all variables are normally distributed. The statistics for Kurtosis shows that OE is leptokurtic since its distribution is peaked relative to normal while TA, CB, TP, and LP are platykurtic suggesting that their distributions are flat relative to normal. The statistics for skewness shows that all OE, CB, and TP are negatively skewed while TA and LP are positively skewed.

#### 4.2. Model Estimation Results

The result of the pooled, fixed and random OLS estimations are presented below.

**Table 2. Pooled Regression Result Table**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.669	1.375	-1.940	0.056
TA	-0.117	0.160	-0.730	0.467
CB	0.218	0.122	1.788	0.078
TP	0.074	0.102	0.721	0.473
LP	0.037	0.057	0.644	0.521
R <sup>2</sup> = 0.120; Adj R <sup>2</sup> = 0.062, R = 0.25; F-statistic = 2.090 (0.093); DW = 1.136				

Source: Authors' Computation (2018)

The relationship between the dependent variable (OE) and the independent variables (TA, CB, TP, and LP) in Table 2 can be expressed mathematically as:

$$OE = -2.669 - 0.117 TA + 0.218 CB + 0.074 TP + 0.037 LP$$

The coefficient of a constant parameter of the composite insurance firms shows a negative figure of -2.669. This implies that if all the explanatory variables are held constant, a unit increase in all other variables other than TA, CB, TP, and LP will bring about 2.669 units decrease in OE. The slope of CB, TB, and LP has expected positive signs. Holding other factors constant, CB, TP, and LP are positively related to OE such that a unit rise in CB, TP and LP lead to 0.218, 0.074 and 0.037 units rise in OE respectively. Conversely, TA has a negative relationship with OE. This implies that if all other factors are held constant, a unit increase in TA will bring about 0.117 decreases in OE. Considering the significance of the explanatory variables, it can be seen that probability of *t*-statistics are greater than 5% for all the regressors with the exception of C. These mean that TA, CB, TP, and LP are not statistically significant in explaining OE.

DW of 1.136 suggests a positive serial correlation. The prob *f*-statistic (0.093) is higher than the 5% significant level, hence the acceptance of the null hypothesis. The positive adjusted R<sup>2</sup> of 0.062 shows that model is not poorly fit but TA, CB, TP, and LP can only explain 6.3% of the changes in OE. The correlation coefficient 0.25 ( $\sqrt{0.062}$ ) shows that there is an insignificant positive relationship between explanatory variables and OE. Presence of serial correlation, poor prob(F-statistic) low R and R<sup>2</sup> and the fact that pooled OLS assumes that the intercepts and slope coefficients are identical for all the ten composite insurance firms which may disrupt the true picture of the relationship between OE, TA, CB, TP and LP across the ten firms lead to fixed effect estimation.

**Table 3. Fixed Effect Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.247	2.669	-0.467	0.642
TA	-0.206	0.169	-1.217	0.229
CB	0.303	0.151	1.999	0.050
TP	-0.011	0.114	-0.103	0.918
LP	0.070	0.066	1.053	0.297
Fixed Effects (Cross)		R-squared	0.397	
AIIC—C	0.035	Adjusted R-squared	0.246	
CONT—C	0.115	F-statistic	2.634	
CORN—C	0.072	Prob(F-statistic)	0.006	
GOLD—C	-0.405	Durbin-Watson stat	1.639	
GRAT—C	-0.192			
LASA—C	0.026			
LEAD—C	0.141			
MUTU—C	0.189			
NIGE—C	0.197			
STAN—C	-0.431			

Source: Author's Computation (2018) using E-view Statistical Package, version 7.0

The relationship between the dependent variable and the independent variables in Table 3 can be expressed mathematically as:

$$OE = -1.247 - 0.206 TA + 0.303 CB - 0.011 TP + 0.070 LP$$

Differential intercept coefficient relates positively with OE for each firm except for GOLD, GRAT, and STAN. Hence, if all independent variables are held constant, a unit rise in all other factors other than TA, CB, TP, and LP will bring about 0.035, 0.115, 0.072, 0.026, 0.141, 0.189 and 0.197 units increase in OE of AIICO, CONTINENTAL, CORNERSTONE, LASACO, LEADWAY, MUTUAL, and NIGER respectively. The same will lead to 0.405, 0.192 and 0.431 unit reduction in OE of GOLDLINK, GREAT NIGERIA, and STANDARD respectively. The differential intercept may be due to a unique feature of each firm. With respect to slope coefficients which are assumed to be cross-sectional and time invariant, CB and LP have expected positive signs. Putting other factors aside, CB and LP have a positive impact on OE of the ten composite insurance firms such that a unit rise in CB and LP lead to 0.303 and 0.070 units rise in OE respectively. Conversely, TA and TP have a negative relationship with OE. This implies that if all other factors are held constant, a unit increase in TA and TP bring about 0.206 and 0.011 decreases in OE respectively.

The probability of t-statistics is greater than 5% for all the regressors with the exception of CB. These mean that TA, TP, and LP are not statistically significant in explaining OE of the ten composite insurance firms but CB has a significant impact on the OE of insurance firms. DW statistics of DW of 1.639 is a significant improvement over 1.136 in pooled OLS and an indication of the absence of serial

correlation among residuals. The  $f$ -statistic has also improved and the situation for the significance of the whole model is satisfied given lower than 5% prob ( $f$ -statistics). Adjusted  $R^2$  of 0.246 shows that TA, CB, TP, and LP can explain 24.6% of the variations in OE of composite insurance firms. The correlation coefficient 0.496 ( $\sqrt{0.246320}$ ) shows that there is an insignificant positive relationship between explanatory variables and OE.

**Table 4. Random Effect**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.672	1.803	-1.482	0.144
TA	-0.153	0.160	-0.956	0.342
CB	0.291	0.133	2.180	0.033
TP	0.038	0.102	0.370	0.712
LP	0.034	0.057	0.610	0.543
Random Effects (Cross)				
AIIC—C	-0.045	R-squared	0.451	
CONT—C	0.087	Adjusted R <sup>2</sup>	0.443	
CORN—C	0.083	S.E. of regression	0.278	
GOLD—C	-0.083	F-statistic	2.954(0.049)	
GRAT—C	-0.086	Mean dependent var	0.028	
LASA—C	0.076	S.D. dependent var	0.284	
LEAD—C	0.020	Sum squared resid	4.715	
MUTU—C	0.122	Durbin-Watson stat	1.429	
NIGE—C	0.121			
STAN—C	-0.295			

Source: Authors' Computation (2018)

The average intercept coefficient for all the insurance firms maintains an insignificant negative relationship with OE. However the differential intercepts show varying types of relationship with OE as it shows positive relationships of 0.087, 0.083, 0.076, 0.020, 0.122 and 0.121 in CONTINENTAL, CORNERSTONE, LASACO, LEADWAY, MUTUAL, NIGER and negative relationship of 0.045, 0.083, 0.086 and 0.295 in AIICO, GOLDLINK, GREAT NIGERIA and STANDARD respectively. Hence holding average intercept, TA, CB, TP and LP constant; a unit rise in differential intercept tends to increase OE by 0.087, 0.083, 0.076, 0.020, 0.122, 0.121 in CONTINENTAL, CORNERSTONE, LASACO, LEADWAY, MUTUAL, NIGER and reduce it by 0.045, 0.083, 0.086 and 0.295 in AIICO, GOLDLINK, GREAT NIGERIA and STANDARD respectively. It can be seen that CB, TP, and LP relate positively with OE. Keeping all other factors constant, a unit increase in CB, TP, and LP brings about 0.291, 0.038 and 0.034 unit increase respectively in OE of insurance firms. Conversely, a unit change in TA brings about 0.153 units reduction in OE, all other things being equal. As it is in fixed effect result, the probability of t-statistics is greater than 5% for all the regressors except CB. These mean that TA, TP, and LP are not statistically significant in explaining OE.

Only CB has a  $t$ -statistic greater than 2(2.180) and  $p$ -value smaller than 0.05(0.0331), hence has a significant impact on the OE of insurance firms. It can be seen that DW statistics of 1.429193 shows the positive serial correlation among residuals. The prob  $f$ -statistic (0.049639) is lower than the 0.05 meaning that the model is a good fit. Adjusted  $R^2$  of 0.44391 shows that TA, CB, TP, and LP can explain 44.4% of the variations in OE of composite insurance firms. It expedient to make a test that indirectly tests whether or not the appropriate estimation model is random effects/pooled OLS, OR fixed effect/first difference. The test is known as Hausman test. The outcome of the test is presented table 5.

**Table 5. Hausman Test Table**

Correlated Random Effects - Hausman Test				
Pool: Untitled				
Test cross-section random effects				
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	
Cross-section random	2.220084	4	0.6954	
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
TA	-0.206582	-0.153055	0.003184	0.3428
CB	0.303627	0.291915	0.005150	0.8704
TP	-0.011881	0.038118	0.002619	0.3285
LP	0.070431	0.034975	0.001188	0.3036
Cross-section random effects test equation:				
Dependent Variable: OE				
Method: Panel Least Squares				
Sample: 2009 -2016				
Included observations: 8				
Cross-sections included: 10				
Total pool (unbalanced) observations: 66				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.247542	2.669895	-0.467263	0.6423
CB	0.303627	0.151879	1.999133	0.0508
TP	-0.011881	0.114895	-0.103410	0.9180
LP	0.070431	0.066853	1.053530	0.2970
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.397056	Mean dependent var	0.057647	
Adjusted R-squared	0.246320	S.D. dependent var	0.325991	
S.E. of regression	0.283008	Akaike info criterion	0.499152	
Sum squared resid	4.164878	Schwarz criterion	0.963624	
Log likelihood	-2.472007	Hannan-Quinn criteria	0.682687	
F-statistic	2.634114	Durbin-Watson stat	1.639008	
Prob(F-statistic)	0.006734			

Source: Authors' Computation (2018)

The null hypothesis of the Hausman test is that both estimators are consistent.

Thus,  $corr(x_{it}c_i) = 0$ .

The null hypothesis cannot be rejected on a 5% significance level, and therefore the study concludes that the unobserved characteristics and the explanatory variables are uncorrelated. In other words, the rule of thumb is to select random effect estimator when prob (chi-square statistics) is greater than 5% or not significant. It can be detected from Table 5 that  $p$ -value of Chi-Square Statistic is 0.6954. Therefore the study concludes that the random effects estimator is the most efficient to use in this case.

## 5. Discussion of Findings

The random effect estimation reveal that capital base has a significantly positive effect on operational efficiency. This implies that as the capital base of insurance firms increase due to consolidation exercise, the firms become more efficient by earning more in income relative to expenses. It further substantiates the fact that the role of capital in the realization of a firm cannot be overemphasized. This observation is consistent with the underpinned theory and *a priori* expectation. Furthermore, it is consistent with the findings of Eldomiaty, Fakri, Moustafa, and Amer, (2015) in Egypt and Odunga, Nwangweso, and Nkobe, (2013) in Kenya. The study reveals that total premium of Nigerian insurance firms have a positive but insignificant impact on operational efficiency. The positive sign is in consonance with the theory and *a priori* expectation. The insignificant contribution may not be unconnected to the fact that premium is inefficiently invested. This supports the findings of Mehari and Aemiro (2013) in Ethiopia and Chen and Wong (2004) in Asian. Similarly, the study finds that the Nigerian insurance firms' liquidity position has a positive but insignificant effect on firms' operational efficiency. Here, the *a priori* expectation holds in term of the sign. It is not surprising that high liquidity contributes insignificantly to operational efficiency in income. Idle cash earns nothing but ensures safety. The insignificance of liquidity is consistent with the submission of Mehari and Aemiro (2013) in Ethiopia. Conversely, the study discloses that total assets have a negative and statistically insignificant effect on the operational efficiency of Nigerian insurance firms. The negative sign disagrees with the *a priori* expectation and theory. The implication of this is that the firms' assets are not efficiently deployed in generating income relative to expenses incurred in the course of their business. This may be due to the fact that a significant proportion of the firms' assets are too liquid to earn a reasonable return and the long-term investment have not been generating much. Overall, consolidation exerts a significant positive impact on the operational efficiency of the insurance industry. This is true when the study considers the fact that capital base is the most important

element of the consolidation exercise and the same portend positive and statistically significant effect on the operational efficiency of composite insurance firms.

## 6. Recommendations

Based on this with other findings, the following recommendations are made:

Nigerian insurance firms' management must as a matter of urgency deploy the firms' assets efficiently in generating income relative to expenses incurred in the course of their business. The firms' management must also ensure that total premium received is optimally employed in income generating assets. Nigerian insurance firms should ensure that liquid assets, especially cash, are judiciously invested e.g. a bank deposit account where interest would be earned but the cash remains easily accessible. Nigerian insurance firms should periodically review their minimum capital base whereby capital is braced up relative to the volume of insurance businesses they undertake. Investors and shareholders should be favourably disposed to consolidation because it would lead to their benefits.

## References

- Aggarwal, R. & Jacques, K.T. (1998). Assessing the Impact of Prompt Corrective Action on Bank Capital and Risk. *Economic Policy*, 4, pp. 23-32.
- Ahmed, N.; Ahmed, Z. & Ahmed, I. (2010). Determinants of Capital Structure: A Case of Life Insurance Sector of Pakistan. *European Journal of Economics, Finance and Administrative Sciences*, 24(1), pp. 7-13.
- Akinlo, T. (2013, March). The Causal Relationship between Insurance and Economic Growth in Nigeria (1986-2010). *Australian Journal of Business and Management Research*, 2(12), pp. 49-57.
- Akotey, J.O.; Sackey, F.G.; Amoah, L. & Manso, R.F. (2013). The Financial Performance of Life Insurance Firms in Ghana. *Research Paper*, 2(1), pp. 1-12.
- Amer, H.M.; Moustafa, W. & Eldomiaty, T. (2011). Determinants of Operating Efficiency for Lowly and Highly Competitive Banks in Egypt. *Business and Economic Conference*. Cambridge.
- Arena, M. (2008). Does Insurance Market Promote Economic Growth? A Cross-Country Study for Industrialised and Developing Countries. *Journal of Risk Insurance*, 75(4), pp. 921-946.
- Awwal, M.Y. (2011). An Evaluation of the Impact of the Consolidation of the Insurance firms on the Economic Growth and Development in Nigeria. *M Sc Thesis*. Zaria: Ahmadu Bello University, Department of Economics.
- Babalola, O. (2008). *The Role of Insurance Industry in the Nigerian Economy*. Spurring Economic Growth. V. I. Lagos: BGL Limited Insurance Round Table.
- Bebeji, A. (2013). Consolidation and Asset Quality of Banks in Nigeria. *International Journal of Business and Management Invention*, 2(2), pp. 12-20.



- Berger, A.N. (1995). The Profit Structure Relationship in Banking: Tests of Market Power and Efficient Structure Hypothesis. *Journal of Money, Credit and Banking*, 27, pp. 404-431.
- Borges, M.R.; Nektarios, M. & Barros, C.P. (2008). Analyzing the Efficiency of the Greek Life Insurance Industry. *European Research Studies*, XI(3), pp. 1-17.
- Calomiris, C.W. & Kahn, C.M. (1991). The Role of Demandable Debt in Structuring Optimal Banking Arrangements. *American Economic Review*, 81(3), pp. 497-513.
- Catalan, M.; Impavido, G. & Musalem. (2000). Contractual Savings or Stock Market Development: Which Leads? *Policy Research Working Paper*, no 2, World Bank, Financial Sector Development Department, Washington D. C.
- Chen, R. & Wong, K.A. (2004). The Determinants of Financial Health of Asian Insurance Firms. *The Journal of Risk and Insurance*, 71(3), pp. 469-499.
- Chukwulozie, O. (2008). The benefit of Insurance Recapitalization in the Economy. *Lagos Organisational Review*, 1(11), pp. 53-60.
- Diacon, S.R. & Carter, R.L. (1984). *Success in Insurance*. 50. Albermarle Street, London W1X4BD: John Murray Publishers Ltd.
- Editz, T.; Michael, T. & Perraudin, W. (1998). The Impact of Capital Requirements on U.K Bank Behaviour. *Reserve Bank of New York Policy Review*, 4(3), pp. 15-22.
- Eldomiati, T.; Fakri, A.; Moustafa, W. & Amer, H. (2015). The Financial Determinants of Operating Efficiency for Low and High Competitive Banks in Egypt. *Journal of Finance and Bank Management*, 3(2), pp. 7-23.
- Eling, M. & Huang, W. (2011). An Efficiency Comparison of the Non-Life Insurance Industry in the BRIC Countries. *Working papers on Risk and Management*. Nos 94, University of St. Gallen, Institute of Insurance Economics.
- Eling, M. & Luhnen, M. (2010). Efficiency in the International Insurance Industry: A Cross-Country Comparison. *Journal of Banking and Finance*, 34(2010), pp. 1497-1509.
- Emori, E.; Nkamare, S. & Nneji, I. (2014). The Impact of Banking Consolidation on the Economic Development of Nigeria. *Research Journal of Finance and Accounting*, 5(16), pp. 113-119.
- Eze, O.R. & Okoye, V. (2013). Analysis of Insurance Practices and Economic Growth in Nigeria: Using Co- integration Tests and Error Correction Model. *Global Advanced Research Journal of Management and Business Studies*, 2(1), pp. 63-70.
- Fatula, O. (2007). The Imperative of Recapitalization and Consolidation in the Nigerian Insurance Industry. *Bar Review*, (128), pp. 32-39.
- Greene, W.H. & Segal, D. (2004). Profitability and Efficiency in the U.S. Life Insurance Industry. *Journal of Productivity Analysis*, 5(21), pp. 229-247.
- Haise, P. & Sumeg, K. (2008). The Relationship between Insurance and Economic Growth in Europe. A Theoretical and Empirical Analysis. *Empirica*, 35(4), pp. 405-431.
- Huang, W. (2007). *Efficiency in the China Insurance Industry: 1999-2004*. University of Toronto, Wuhan University.
- Ibiwoye, A.; Ideji, J.O. & Oke, B.O. (2010). The Determinants of Life Insurance Consumption in Nigeria: A Co-integration Approach. *International Journal of Academic Research*, 2(4), pp. 351-358.

- Ibrahim, H. & Abubakar, S. (2012). *Recapitalization and Profitability of Quoted Insurance Firms in Nigeria*. Zaria: Ahmadu Bello University, Department of Business Administration.
- Irukwu, J.O. (2003). The Evolution of Insurance in Nigeria. In *the Compendium of Insurance Business in Nigeria*. The Financial Service Group LCCI+CBS Consulting Ltd.
- Isimoya, O. (2014). Business Ethics in Insurance Industry in Nigeria. *International Journal of Management and Sustainability*, 3(6), pp. 341-359.
- Isimoya, O.A. (2007). *Fundamentals of Insurance* (Revised ed.). Mushin, Lagos: Concept Publications Ltd.
- Jacques, K. & Nigro, P. (1997). Risk-based Capital, Portfolio Risk, and Bank Capital: A Simultaneous Equation Approach. *Journal of Economics and Business*, 49(6), pp. 533-547.
- Kubai, P.M. (2011). Cost efficiency of Insurance Firms in Kenya. *M Sc. Thesis*. University of Nairobi, School of Business.
- Marijuana, C.; Sandra, L. & Lime, P. (2009). Insurance Sector Development and Economic Growth in Transition countries. *International Resources Journal of Finance, Economic* (34).
- Matis, C.R.M. & Ilies, L. (2014). Customer Relationship Management in the Insurance Industry. *Procedia Economics and Finance*, 15(2014), pp. 1138-1145.
- Mehari, D. & Aemiro, T. (2013). Firm Specific Factors that Determine Insurance Firms' Performance in Ethiopia. *European Scientific Journal*, 9(10), pp. 245-256.
- Mojekwu, J.; Agwuwgbo, S. & Olowokudejo, F. (2011). The Impact of Insurance Contributions on Economic Growth in Nigeria. *Journal of Economics and International Finance*, 3(7), pp. 444-451.
- Muhlnick, J. & Weib, G.N. (2015). Consolidation and Systemic Risk in the International Insurance Industry. *Journal of Financial Stability*, 18(1), pp. 187-202.
- Mulcherjee, T.K.; Kiyamaz, H. & Baker, H.K. (2004). Merger Motives and Target Valuation: A Survey of Evidence from CFOs. *Journal of Applied Finance*, 14, pp. 7-24.
- Nessim, D. (2010). *Analysis and Valuation of Insurance firms*. Study 2, Columbia Business School, Centre for Excellence in Accounting and Security analysis.
- Oba, O. (2003, November). Insurance a Vehicle for Revitalising the Economy. The Insurance Perspective. *The Nigerian insurer*.
- Obaremi, N. (2006). Insurance in Nigeria. *An African Business Special Report*, pp. 51-62.
- Odunga, R.M.; Nwangweso, P.M.; Carter, D.A. & Mwarumba, M. (2013). Credit Risk, Capital Adequacy and Operating Efficiency of Commercial Banks in Kenya. *Journal of Business and Management Invention*, 2(9), pp. 6-12.
- Odunga, R.M.; Nyangweso, P.M. & Nkobe, D.K. (2013). Liquidity, Capital Adequacy and Operating Efficiency of Commercial Banks in Kenya. *Research Journal of Finance and Accounting*, 4(8), pp. 76-81.
- Oke, M.O. (2012). Insurance Sector Development and Growth in Nigeria. *African Journal of Business Management*, 6(23), pp. 7016-7023.
- Rai, A. (1996). Cost Efficiency of International Insurance Firms. *Journal of Financial Services Research*, 10(1), pp. 213-233.

- Sanni, J. & Alanni, G.O. (2013). A Comparative Analysis of Pre and Post Recapitalization Financial of Banks in Nigeria. *International Journal of Capacity Building in Education and Management*, 2(1), pp. 79-90.
- Shrieves, R.E. & Dahl, D. (1992). The Relationship Between Risk and Capital in Commercial Banks. *Journal of Banking and Finance*, 16, pp. 439-453.
- Soludo, C. (2005, January). The rationale for Mergers and Acquisition. *Business Day*, p. 15.
- Somoye, R.O. (2008). The Performances of Commercial Banks in Post-Consolidation Period in Nigeria: An Empirical Review. *European Journal of Economics, Finance and Administrative Sciences*, 14(3), pp. 10-25.
- Usman, O.A. (2009). Scale Economies and Performance Evaluation of Insurance Market in Nigeria. *Med Well Journals the Social Sciences*, 4(1), pp. 1-11.